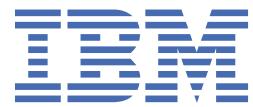


IBM Cognos Analytics - Reporting  
Version 11.0

*User Guide*



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# Contents

<b>Chapter 1. Getting started in IBM Cognos Analytics - Reporting.....</b>	<b>1</b>
The user interface.....	1
Work in design, structure, or preview view.....	6
Report layout and queries.....	7
Layout.....	7
Queries.....	8
Report objects.....	8
Find objects in a report.....	9
Relational and dimensional reporting styles.....	10
Options.....	12
Web browser settings.....	16
<b>Chapter 2. Creating a report.....</b>	<b>19</b>
Templates and themes.....	19
Adding data.....	19
Inserting a single data item.....	20
Validating a report.....	21
Running a report.....	22
Limited and fully interactive reports.....	24
Specify Not to Render a Page If It Does Not Contain Data.....	25
Controlling the Rows Per Page for Multiple Containers in HTML and PDF.....	25
Producing a Report in CSV Format.....	26
Producing a Report in Microsoft Excel Format.....	26
Producing a Report in XML Format.....	27
Viewing performance details.....	28
View Lineage Information for a Data Item.....	28
The IBM Cognos Analytics lineage tool.....	29
Access the IBM InfoSphere Information Governance Catalog.....	30
Support for bidirectional languages.....	31
Reports for workspaces in Cognos Workspace.....	32
Prompts in workspaces in Cognos Workspace.....	33
Enable filters in workspaces in Cognos Workspace.....	34
Creating Reports for IBM Cognos for Microsoft Office.....	34
Creating Reports for Mobile Devices.....	35
The IBM Cognos Software Development Kit.....	35
<b>Chapter 3. Lists.....</b>	<b>37</b>
Set list properties.....	37
Hide columns in list reports.....	38
Creating a scrollable list.....	38
Using Repeaters.....	38
<b>Chapter 4. Crosstabs.....</b>	<b>41</b>
Crosstab Nodes and Crosstab Node Members.....	41
Set Crosstab Properties.....	43
Create a Single-Edge Crosstab.....	44
Create a Nested Crosstab.....	44
Creating headers automatically for sets in crosstabs.....	45
Showing crosstab values as percentages.....	46
Specify the Default Measure.....	47

Swap Columns and Rows.....	47
Indent Data.....	47
Change a List into a Crosstab.....	48
<b>Chapter 5. Charts.....</b>	<b>49</b>
Current Default Charts and Legacy Charts.....	49
Creating Charts.....	49
Chart Objects.....	49
Chart Types.....	53
Choosing a Chart Type and Configuration.....	53
Column Charts.....	54
Line Charts.....	54
Pie Charts.....	55
Bar Charts.....	56
Area Charts.....	56
Point Charts.....	57
Combination Charts.....	57
Scatter Charts.....	58
Bubble Charts.....	59
Quadrant Charts.....	60
Bullet Charts.....	60
Gauge Charts.....	61
Pareto Charts.....	62
Progressive Column Charts.....	62
Microcharts.....	63
Marimekko Charts.....	64
Radar Charts.....	64
Polar Charts.....	64
Range Indicator Charts.....	65
Chart Configurations.....	65
Convert Charts From One Type to Another.....	68
Convert Legacy Charts to Current Default Charts.....	69
Limitations When Converting Legacy Charts.....	69
Customizing chart properties.....	70
Resize a Current Default Chart.....	73
Resize a Legacy Chart.....	74
Customizing the Color Palette of a Chart.....	74
Creating a Conditional Color Palette in a Chart.....	76
Change a Chart Background in a Current Default Chart.....	79
Change a Chart Background in a Legacy Chart.....	80
Add background effects to a chart object in a legacy chart.....	80
Add Colored Regions in a Current Default Chart.....	81
Specify Custom Label Text.....	82
Customizing the Axes of a Chart.....	83
Showing Gridlines in a Chart.....	86
Customize the Legend in a Current Default Chart.....	87
Customize the Items in the Legend of a Legacy Chart.....	88
Adding a note to a chart.....	89
Adding a baseline to a chart.....	90
Adding markers to charts.....	92
Display Trendlines in Current Default Charts.....	95
Display Regression Lines in Legacy Scatter or Bubble Charts.....	96
Showing data labels or values in current default charts.....	97
Showing data values in current default pie and donut charts.....	98
Define Query Context When Customizing Legend Entries, Legend Titles, or Axis Labels.....	98
Summarize Small Slices, Bars, or Columns in Current Default Charts.....	98
Customizing lines and data points in a line chart.....	99

Customize a Current Default Combination Chart.....	100
Create a Matrix of Current Default Charts.....	101
Customize a Current Default Gauge Chart.....	103
Customize a Legacy Gauge Chart.....	104
Defining color by value in current default scatter or bubble charts.....	104
Specify the Bubble Size in a Current Default Bubble Chart.....	105
Set the Position of the First Slice in a Current Default Pie Chart.....	106
Creating a Donut Chart from a Current Default Pie Chart.....	106
Pull Out Pie Slices in a Current Default Pie Chart.....	107
Define the Cumulation Line in a Current Default Pareto Chart.....	108
Define the Cumulation Line in a Legacy Pareto Chart.....	109
Insert a Microchart into a Crosstab.....	109
Customize a Current Default Bullet Chart.....	109
Changing the number of hotspots in a chart.....	110
Create a drill-up and drill-down chart.....	110
<b>Chapter 6. Extensible visualizations.....</b>	<b>113</b>
Adding a visualization to a report.....	113
Example - Adding a treemap visualization .....	114
Example - Adding a heatmap visualization .....	115
Example - Adding a packed bubble visualization .....	117
Example - Adding a network diagram.....	118
Visualization properties.....	119
Choosing where visualizations are rendered.....	119
Resizing a visualization.....	120
Changing the nesting order .....	120
Specifying the range values that are displayed.....	121
Summarizing data in a visualization.....	122
Populating a visualization with data from the visualization definition.....	123
Updating visualizations.....	123
Converting visualizations from one type to another.....	123
Sorting a category field by a measure in visualizations.....	124
<b>Chapter 7. Maps.....</b>	<b>127</b>
Adding a map to a report.....	127
Using latitude and longitude location information in a map.....	128
Setting up Mapbox to work with IBM Cognos Analytics.....	129
Using custom point or region information from Mapbox in a map visualization in a report.....	130
Geospatial data.....	133
Ambiguous data.....	133
<b>Chapter 8. Active Reports.....</b>	<b>135</b>
Active Report Controls.....	135
Active Report Variables.....	136
Convert an Existing Report to an Active Report.....	136
Specify Active Report Properties.....	136
Adding Interactivity to a Report.....	137
Create and Manage Active Report Variables.....	137
Adding Controls to a Report.....	139
Add Data to a Control.....	143
Define a Connection Between Controls.....	145
Specify the Selection Behavior of a Control.....	146
Specify the Reaction Behavior of a Control.....	146
Set the No Value List Item.....	148
Show or Hide a Column or Row.....	148
Sort Data in a List.....	149
Recommendation - use master detail relationships when authoring decks.....	149

Creating a data list.....	150
Formatting an active report in the preview view.....	151
Summarizing Data in the Active Report Output.....	151
Creating application links to other reports or external web pages.....	152
Run or Save an Active Report.....	153
<b>Chapter 9. Relational Reporting Style.....</b>	<b>155</b>
Add Relational Data to a Report.....	155
Group Relational Data.....	156
Perform Advanced Grouping.....	156
Creating relational custom groups.....	157
Set the Group Span for a Column.....	157
Divide data into sections.....	158
Summarizing Data Relationally.....	159
Add a Simple Summary.....	160
Set the Auto Group & Summarize Property.....	160
Specify Detail or Summary Aggregation in the Model.....	161
Specify Aggregation Properties for a Data Item.....	161
Use Summary Functions in Data Item Expressions.....	161
Summary Functions.....	163
Focusing Relational Data.....	167
Create a detail or summary filter.....	167
Edit or remove a filter.....	171
Browse or Search the Values of a Data Item.....	171
Ignoring the Time Component in Date Columns.....	172
Sorting Relational Data.....	172
Perform Advanced Layout Sorting.....	173
Working with Relational Queries.....	173
Specify a List of Data Items for an Object.....	174
Relate a Query to a Layout.....	174
Connecting Queries Between Different Data Sources.....	174
Add a Query to a Relational Report.....	175
Create a Union Query.....	176
Create a Join Relationship.....	177
Reference a Package Item in a Child Query.....	177
Create a Master Detail Relationship.....	178
Working with Queries in SQL.....	179
Using relational calculations.....	182
Create a simple calculation.....	183
Insert a Query Calculation.....	184
Create a Layout Calculation.....	185
<b>Chapter 10. Dimensional Reporting Style.....</b>	<b>187</b>
Add dimensional data to a report.....	187
Customize the Source Tree.....	188
Insert a member.....	188
Search for a Member.....	189
Nest Members.....	190
Insert a Hierarchy.....	190
Insert a Member Property.....	191
Create a Set of Members.....	191
Sharing sets between reports.....	191
Edit a Set.....	193
Extended Data Items.....	196
Tips for working with ragged or unbalanced hierarchies.....	196
Creating dimensional custom groups.....	197
Summarizing data dimensionally.....	198

Add a Simple Summary.....	200
Summarizing values in crosstabs.....	200
Summarizing Member Sets.....	202
Rolling and Moving Averages.....	203
Show Data for Specific Time Periods.....	203
Summary Functions.....	204
Focusing Dimensional Data.....	208
Create a context filter.....	209
Sorting Dimensional Data.....	211
Sort Sets by Label.....	211
Sort Sets in the Opposite Axis by Value.....	212
Perform Advanced Set Sorting.....	212
Working with Dimensional Queries.....	213
Specify a List of Data Items for an Object.....	213
Relate a Query to a Layout.....	213
Using Dimensional Data Sources with Queries.....	214
Connecting Queries Between Different Data Sources.....	214
Multiple-fact Queries.....	214
Add a Query to a Dimensional Report.....	218
Add Dimension Information to a Query.....	219
Create a Master Detail Relationship.....	220
Working with Queries in SQL or MDX.....	223
Using Dimensional Calculations.....	227
Create a Simple Member Calculation.....	227
Insert a Query Calculation.....	228
Create a Layout Calculation.....	230
Create an Intersection (Tuple).....	231
Assigning a Hierarchy or Dimension.....	231
Drilling Up and Drilling Down in Dimensional Reports.....	231
Member Sets.....	231
Create a drill-up and drill-down report.....	232
<b>Chapter 11. Adding Prompts to Filter Data.....</b>	<b>237</b>
Using customized parameters.....	238
Use the Build prompt page tool.....	239
Build Your Own Prompt and Prompt Page.....	239
Create a parameter to produce a prompt.....	242
Create a Prompt Directly in a Report Page.....	243
Modifying prompts.....	244
Change the Prompt Control Interface.....	244
Specify that a prompt requires user input.....	244
Allow Users to Select Multiple Values in a Prompt.....	245
Show or Hide Prompt Status.....	245
Specify a Default Selection for a Prompt.....	245
Customize Prompt Text.....	246
Specify Prompt Values.....	246
Add a Prompt Button.....	247
Create a Cascading Prompt.....	247
Control the Data That Appears in a Tree Prompt.....	248
Using in_range Filters with Character Data.....	248
Showing prompt values in generated SQL or MDX.....	249
<b>Chapter 12. Laying Out a Report.....</b>	<b>251</b>
Report layout.....	251
The Page Structure View.....	251
Copy object formatting.....	252
Add a header or footer to a report or list.....	253

Add borders to an object.....	254
Add a Text Item to a Report.....	254
Specify the font for a report.....	254
Insert an Image in a Report.....	255
Insert a Background Image in an Object.....	256
Add background effects.....	256
Add background effects to a chart.....	257
Add a background gradient to a page.....	257
Add a drop shadow to a container.....	257
Insert a Formatting Object in a Report.....	258
Elements supported in rich text items.....	260
Adding JavaScript to a report.....	261
Align an Object in a Report.....	262
Using a table to control where objects appear.....	262
Apply a Table Style.....	263
Apply Padding to an Object.....	264
Set Margins for an Object.....	264
Add multiple items to a single column.....	264
Reuse a Layout Object.....	265
Change a Reused Object.....	265
Update Reused Objects.....	266
Specify text and container direction.....	266
Specify line spacing and breaking.....	268
Specify the Height and Width of an Object.....	269
Control how other objects flow around an object.....	269
Specify Report Properties.....	270
Create and modify report and object styles.....	271
Modify the report style.....	271
Modify object styles.....	271
Reusing styles from another report.....	272
(Don't Print) class.....	273
Modify classes to format Query Studio reports.....	273
Modifying the default layout style sheet.....	274
Add color to an object.....	274

<b>Chapter 13. Working with your external data.....</b>	<b>277</b>
Manage external data.....	277
Preparing to work with your external data.....	279
Import data.....	280
Map data.....	281
Finish importing data.....	282
Publish the package.....	282
Edit your external data.....	283
Delete your external data.....	283
Running a report that contains external data.....	284
Making your reports public.....	284

<b>Chapter 14. Using conditions.....</b>	<b>285</b>
Highlight data using a conditional style.....	285
Create a new conditional style.....	286
Reuse an existing conditional style.....	287
Create an advanced conditional style.....	287
Manage conditional styles.....	287
Highlight data using a style variable.....	288
Adding conditional rendering to a report.....	288
Add a variable from the condition explorer.....	289
Add a variable from the properties pane.....	289

Hide or show an object.....	290
Add conditional rendering.....	291
Add multiple layouts.....	291
Setting up a multilingual reporting environment.....	291
Create a multilingual report in Reporting.....	292
<b>Chapter 15. Bursting Reports.....</b>	<b>295</b>
Defining Burst Recipients.....	295
Create a Calculated Field.....	295
Creating the Burst Table in the Source Database.....	296
Importing the Table into a Package.....	296
Specify a Burst Group.....	297
Set Burst Options.....	297
Enable Bursting.....	298
Creating Burst Reports Using Dimensional Data Sources.....	299
<b>Chapter 16. Format data.....</b>	<b>301</b>
Set the default data formats.....	301
Specify the data format for an object.....	302
Specifying the number of decimals in numbers.....	302
Digit shaping in charts and maps.....	302
Locale-sensitive properties.....	304
Suppress empty cells.....	304
Suppressing null cells by using filters.....	305
Specify what appears for data containers that contain no data.....	305
Using patterns to format data.....	306
Pattern guidelines.....	306
Date and time symbols.....	307
Decimal format symbols.....	313
<b>Chapter 17. Using query macros.....</b>	<b>315</b>
Syntax.....	315
Add a query macro.....	317
Creating prompts using query macros.....	318
Examples - selecting country or region prompts.....	320
Examples - creating prompts that use parameter maps.....	322
Examples - creating a multiple value prompt.....	323
<b>Chapter 18. Using drill-through access.....</b>	<b>325</b>
Understanding drill-through concepts.....	326
Drill-through paths.....	326
Selection contexts.....	326
Drilling through to different report formats.....	326
Drilling through between packages.....	327
Bookmark references.....	327
Members and values.....	328
Member unique names.....	328
Conformed dimensions.....	329
Business keys.....	330
Scope.....	330
Mapped parameters.....	330
Drilling through on dates between PowerCubes and relational packages.....	331
Set up drill-through access in a report.....	331
Create a parameter in the target.....	332
Create a drill-through definition.....	333
Defining independent drill-through definitions for crosstabs.....	335
Specify the drill-through text.....	335

<b>Chapter 19. Working with multiple pages.....</b>	<b>337</b>
Add a page to a report.....	337
Page breaks, page sets, and page layers.....	337
Creating page breaks.....	338
Join nested page sets.....	339
Create page layers.....	340
Add a bookmark.....	340
Create a table of contents.....	342
Insert page numbers in a report.....	343
Control page breaks and page numbering.....	343
Creating a report booklet.....	345
Producing tabbed reports.....	346
<b>Chapter 20. Managing existing reports.....</b>	<b>349</b>
Copy a report to the clipboard.....	349
Copy a report to the clipboard in Internet Explorer.....	349
Copy a report to the clipboard in Firefox.....	349
Open a report from the Clipboard.....	349
Open a file from another studio.....	350
Analysis Studio query specification.....	350
Managing changes in the package.....	354
Update a name reference.....	354
Changing the package.....	355
<b>Appendix A. Troubleshooting.....</b>	<b>357</b>
Problems Creating Reports.....	357
Division by Zero Operation Appears Differently in Lists and Crosstabs.....	357
Application error appears when upgrading a report.....	357
Nested List Report Containing a Data Item That is Grouped More Than Once Does Not Run After Upgrade.....	357
Background Color in Template Does not Appear.....	358
Subtotals in Grouped Lists.....	358
Chart Labels Overwrite One Another.....	358
Chart Shows Only Every Second Label.....	358
Chart Gradient Backgrounds Appear Gray in Internet Explorer.....	358
Metadata Change in Oracle Essbase Not Reflected in Reports and in the Studios.....	359
Relationships Not Maintained in a Report With Overlapping Set Levels.....	359
Summaries in Query Calculations Include Nulls with SAP BW Data Sources.....	359
Creating Sections on Reports That Access SAP BW Data Sources.....	360
Error Characters (--) Appear in Reports.....	360
Columns, Rows, or Data Disappear With SSAS 2005 Cubes.....	360
Function Unreliable with Sets.....	361
Searching for values might return unexpected results.....	361
Report Differences Between TM1 Executive Viewer and IBM Cognos Analytics with TM1 Data Sources.....	361
Order of Metadata Tree Differs for TM1 Data Sources.....	361
MSR-PD-0012 error when importing external data.....	362
MSR-PD-0013 error when importing external data.....	362
Problems Calculating Data.....	362
Unexpected Summary Values in Nested Sets.....	362
Null Results for Calculations Using SAP BW Data Sources.....	363
Incorrect Results with IBM Cognos PowerCubes and Time Measures.....	363
Incorrect Results in Summaries When Using OLAP Data Sources.....	363
Problems Filtering Data.....	365
Unexplained Discrepancies in Number Calculations.....	365
Error when filtering on a _make_timestamp column.....	367

Problems Running Reports.....	367
Report runs slowly.....	367
Summaries in a report do not correspond to the visible members.....	369
QE-DEF-0288 Cannot Find the Database in the Content Store.....	371
Parse Errors When Opening or Running an Upgraded Report.....	371
Overflow Error Occurs When a Value in a Crosstab Is More Than 19 Characters.....	371
The ORA-00907 Error Appears When Running a Report.....	371
A Report or Analysis Does Not Run Because of Missing Items.....	371
Cannot View Burst Report.....	371
An upgraded report does not retain its original look.....	372
Measure Format Disappears in SSAS 2005.....	372
Drill-through Links are Not Active in the Safari Browser.....	373
Data Does Not Appear in a Target Report or the Wrong Data Appears.....	373
A Running Total in Grouped Reports Gives Unexpected Results.....	373
Recursive evaluation error.....	374
Arithmetic Overflow Error When Running a Report in PDF Format.....	374
RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-69' UDA-SQL-0043 Error.....	374
Problems with viewing saved Active Report output in Mozilla Firefox 8 or later versions.....	374
Problems with large SAP BW queries.....	375
Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service.....	375
PCA-ERR-0087 error when you run a large report.....	375
Differences in the appearance of charts that are run in different formats or on different operating systems.....	375
Out-of-memory errors with reports that are run in interactive HTML format.....	376
Charts in PDF Output Show Unexpected Results.....	376
Result set of a multi-fact query contains blanks.....	376
Cognos Statistics object is not displayed in a report.....	377
Problems When Drilling Through.....	377
Cannot Drill Through Between PowerCubes Because MUNs Do Not Match.....	377
Unexpected or Empty Results When Drilling Through.....	378
Cannot Drill Through From a Relational Source to a Cube.....	379
Calculations Do Not Appear in the Target Report.....	380
Nested Crosstab Only Filters on Some Items.....	380
Data is Not Filtered in the Target Report After Drill-Through.....	380
Drill-through links in active reports do not work.....	380
<b>Appendix B. Limitations when using dimensional data sources.....</b>	<b>383</b>
Running a Report Against a Dimensional Data Source.....	383
Limitations When Using Set Expressions in List Reports.....	383
Limitations When Using Clauses in Summary Functions.....	384
Limited Support for Relational Functions When Used with OLAP Data Sources.....	385
Limitations When Summarizing Measures in DMR Data Sources.....	385
Limitations when filtering dimensional data sources.....	386
Error Characters (--) When Filtering.....	386
Limitations When Specifying the Scope of Summary Filters with Dimensional Data Sources.....	387
Limitations When Filtering Data Using an SAP BW Data Source.....	387
Considerations when Creating Calculations.....	388
Calculation Solve Order.....	388
Length of Expressions.....	388
Quality of Service Indicators.....	388
Using Quotation Marks in Literal Strings.....	389
Limitations of calculations in dimensional reporting.....	389
Creating Expressions Using SAP BW Data Sources.....	389
Using Microsoft Excel Functions with SSAS 2005 Data Sources.....	390
Concatenating Strings.....	390
Intersecting Calculations in Crosstabs and Charts.....	390

Null (Missing) Values in Calculations and Summaries.....	392
Dimensional coercion rules.....	394
Recommendation - Use Member Unique Name (MUN) Aliases.....	397
Limitations When Formatting Empty Cells in SAP BW Data Sources.....	398
<b>Appendix C. Limitations When Producing Reports in Microsoft Excel Format.....</b>	<b>399</b>
Unable to Load Images from the IBM Cognos Analytics Content Store in a Report.....	399
Blank Worksheet Appears.....	399
Warning Message Appears When Excel Opens an IBM Cognos Analytics Report.....	399
Spreadsheet Content Not Saved for Reports Saved in XLS Format.....	399
Unable to Nest Labels in Charts.....	399
Data Series Are Truncated.....	400
Colors Different From Those in HTML or PDF.....	400
Repeating Pie Charts.....	400
Unable to Skip Discrete Axis Labels.....	400
Unsupported IBM Cognos Analytics Formatting.....	400
Cells Contain Series of #.....	401
Table and Column Widths.....	401
Secure Socket Layer (SSL) Is Not Supported in Some Excel Formats and Versions.....	401
Number Formats Become Currency Formats in Japanese Excel.....	401
Reports Show Data in Wrong Columns.....	402
Unable to Access Reports on Remote Servers.....	402
Drill-through Reports Are Not Supported in Excel.....	402
Map Reports Are Not Supported in Excel.....	402
Unsupported Excel Formatting.....	402
Hyperlink Buttons Are Not Supported in Excel.....	402
Unable to View Reports in Excel Format Sent as Email Attachments.....	403
Many items on axis produces empty chart in Excel.....	403
Chart legend titles are not supported in Excel.....	403
Unsupported Chart Properties in Excel.....	403
Unsupported chart types in Excel.....	404
Cell Height and Width Are Incorrect.....	405
<b>Appendix D. Prompt API for IBM Cognos Analytics.....</b>	<b>407</b>
cognos.Prompt object.....	407
cognos.Prompt.getControlByName method.....	407
cognos.Prompt.getControls method.....	407
cognos.Prompt.Control object.....	408
cognos.Prompt.Control.addValue method.....	408
cognos.Prompt.Control.clearValues method.....	409
cognos.Prompt.Control.getName method.....	409
cognos.Prompt.Control.getValues method.....	409
cognos.Prompt.Control.setValidator method.....	410
cognos.Prompt.Control.setValues method.....	411
cognos.Report object.....	412
cognos.Report.getReport method.....	412
cognos.Report.sendRequest method.....	412
cognos.Report.Action object.....	413
cognos.Report.Action.BACK.....	413
cognos.Report.Action.CANCEL.....	413
cognos.Report.Action.FINISH.....	413
cognos.Report.Action.NEXT.....	413
cognos.Report.Action.REPROMPT.....	413
cognos.Value class.....	413
<b>Appendix E. Legacy Map Manager maps.....</b>	<b>415</b>
The Reporting map object.....	415

Creating a map report.....	416
Set Map Properties.....	416
Defining Data Values for the Region Layer.....	418
Match Data Values to Names in the Map File.....	418
Define Data Values for the Point Layer.....	419
Add Colors to the Region or Point Layer.....	419
Add a Legend Title to a Map.....	420
Add a Note to a Map.....	420
Drill Through to Another Report From a Map.....	420
Edit a Map.....	421
Additional Maps.....	422
Location intelligence.....	422
<b>About this guide.....</b>	<b>423</b>
<b>Index.....</b>	<b>425</b>



# Chapter 1. Getting started in IBM Cognos Analytics - Reporting

IBM® Cognos® Analytics - Reporting is a Web-based report authoring tool that professional report authors and developers use to build sophisticated, multiple-page, multiple-query reports against multiple databases. With Cognos Analytics - Reporting, you can create any reports that your organization requires, such as invoices, statements, and weekly sales and inventory reports.

## The user interface

You enter the IBM Cognos Analytics - Reporting user interface by creating a new report or by opening an existing report in the Cognos Analytics portal.

Many Cognos Analytics user interfaces use standard HTML, including the Cognos Analytics portal, Cognos Analytics - Reporting, and HTML viewers and reports. As reports have moved from quirks to standard HTML, there might be small differences in item sizes. These differences do not have an impact on the majority of reports that were created in previous Cognos versions. However, minor changes might be required in a small number of existing reports, such as reports that are printed on forms. For more information, see the technote [Cognos Analytics conversion to Standards Mode](http://www.ibm.com/support/docview.wss?uid=swg21982010) (<http://www.ibm.com/support/docview.wss?uid=swg21982010>).

The following table describes where you can find features and functions in the Cognos Analytics - Reporting user interface.

*Table 1. Cognos Analytics - Reporting function mapping*

Cognos Analytics - Reporting interface	Function
	Save as Convert to Template Convert to Active Report
	Toggles between editing the report (edit mode) and viewing the report (view mode)
 Welcome ▾	Switch between the IBM Cognos Analytics portal and new or opened reports
	Page design view Page preview view Page structure view
	Properties for the selected object. The properties that are available are different for each type of object.
	Locked Options Layout components Conditional styles Clear all parameters

Table 1. Cognos Analytics - Reporting function mapping (continued)

Cognos Analytics - Reporting interface	Function
	Show Filters pane Appears only in view mode and opens the <b>Filters</b> pane.
	Run the report using the current run options. The data is refreshed (database requered) only if you change the output format from the last time you ran the report. To change the output format, see run options. Appears only in edit mode.
	Specify run options for the report and run the report. Run options include output format, orientation of the report, how much data to return, language, rows per page, accessibility features, bidirectional support, and performance details. Appears only in view mode.
	Refresh the report using the same prompt values. Appears only in view mode. <b>Note:</b> To ensure that the data is refreshed, disable the <b>Use local cache</b> property in the properties for the query.
	Add report data by opening a package or data module. <b>Source</b> tab <b>Data items</b> tab <b>Tip:</b> You can create a report with no data.
	Toolbox items
	Report pages Prompt pages Report overview Classes
	Queries Condition explorer Active Report controls Active Report variables

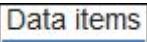
Table 1. Cognos Analytics - Reporting function mapping (continued)

Cognos Analytics - Reporting interface	Function
 Report right-click menu	Find report objects Validate report Auto correct validation errors Show specification Open report from clipboard Copy report to clipboard Show generated SQL or MDX
 right-click a query	View tabular data

Slide-out panes contain objects that you can add to a report. You add objects to a report by dragging them to the work area.

### Data pane

Use the **Data** pane  to add report data to a report and to view queries that are created.

- The **Source** tab  contains items from the package selected for the report, such as data items and calculations.
- The **Data Items** tab  describes the queries created in the report. You can add existing query items to a report from this tab.

### Toolbox pane

The **Toolbox** pane  contains various objects that you can add to a report, such as text and graphics. Toolbox items are organized into different groups.

Add items that you use often to the **PINNED** group. Items in the **PINNED** group appear in the Add circular menu . To add a toolbox item to the **PINNED** group, right-click the item and click **Add to Pinned Toolbox Items**. To remove an item from the **PINNED** group, right-click the item and click **Remove from Pinned Toolbox Items**.

### Pages pane

**11.0.5** Use the **Pages** pane  to view or create new report pages and prompt pages, and to create and modify classes.

### Queries pane

**11.0.5** Use the **Queries** pane  to create or modify queries in relational reporting or dimensional reporting and to perform complex tasks, such as defining union joins and writing SQL statements. The Queries pane also contains the following items:

- The Condition Explorer  is used to work with variables to define conditions in a report.

- If you are authoring an active report, the **Active Report controls** icon  shows the controls and active report variables inserted in a report and their relationships to one another. You can click a control in this tab to quickly locate the control in the report and set default values for variables.
- If you are authoring an active report, the **Active Report variables** icon  shows the active report variables defined in a report. Use this tab to create new variables and set default values.

## Properties pane



The **Properties** pane  lists the properties that you can set for an object in a report or for the entire report.

When you specify a value for a property, press Enter, click another property, or save the report to ensure that the value is saved.

**Tip:** You can view a description of the currently selected property in the information pane.

## Filters pane



**11.0.7** In view mode, use the **Filters** pane  to view all filters that are created by the report consumer on the report output. When you click a filter in this pane, all data containers that use the selected filter are automatically highlighted in the report. When a data container is selected, the filter pane is updated instantly to display only filters that are applied to the selected data container. You can edit or delete the filter directly in the pane.

You can resize the filter pane, and pin or unpin the pane depending on the screen resolution. Report authors also have the option to make an authored filter visible to report consumers so that they can interact with it in this pane.

The pane cannot be used to create or view low-level filter expressions that are manually created in the expression editor. All filters that were created in earlier versions of Cognos Analytics have the interactive filtering feature disabled by default.

This feature is not available for active reports.

## Report object toolbar

In addition to the **Properties** pane, you can modify an object in a report by clicking icons in the toolbar that appears when the object is selected. The icons that are available depend on the object type.

**Tip:** The appearance of report object toolbars is controlled by the option **Show on-demand UI on right click** (, **Options**, **View** tab).

## Page Layers area

When you are working with dimensional data, use the **Page layers** area to create sections, or page breaks, in a report to show values for each member on a separate page. For example, you can drag

**Northern Europe** sales territory from the **Source** tab  to the Page layers area. The report is broken into a separate page for each territory within northern Europe. Each page's context appears in the report header.

For more information, see “[Create page layers](#)” on page 340.

## Context Filter area

When you work with dimensional data, use the **Context filter** area to filter your report to show values, or context, for only a specific data item. This technique is also known as a slicer filter. For example, you can

drag **Sales Territory** from the **Source** tab  to the **Context filter** area. When you click a specific territory from the list, the values in the crosstab change to represent data for that territory.

For more information, see [“Create a context filter” on page 209](#).

## Visual Aids icon

The visual aids icon  provides the following options to help you when you are designing reports in the layout. The visual aids icon is found in the toolbar that appears when you select the page body in the report.

Option	Description
<b>Show Boundary Lines</b>	Shows all boundary lines around objects.
<b>Force Boundary Lines</b>	Overrides boundary lines around objects.
<b>Show Repeating</b>	Repeats objects when you insert them. For example, when you insert a data item in a crosstab, the data item appears in each row or in each column of the crosstab.
<b>Show Page Header &amp; Footer</b>	Shows the page header and page footer.
<b>Show Drag &amp; Drop Padding</b>	Shows drag-and-drop zone when the <b>Padding</b> property for an object is set to <b>0</b> . If the <b>Padding</b> property is set to a value that is greater than the minimum padding that IBM Cognos Analytics - Reporting uses to show drag-and-drop zones, only the minimum padding is shown.
<b>Show Hidden Objects</b>	Shows objects for which the <b>Box Type</b> property was set to <b>None</b> or for which the <b>Visible</b> property was set to <b>No</b> .
<b>Show Sorting</b>	Shows the sorting icon for data items for which a sort order was specified. For more information about sorting data, see <a href="#">“Sorting Relational Data” on page 172</a> or <a href="#">“Sorting Dimensional Data” on page 211</a> .
<b>Show Grouping</b>	Shows the grouping icon for grouped data items.
<b>Show Source Type</b>	Shows the icon for the source type of objects, such as layout calculation.
<b>Show Data Item Type</b>	Shows the icon for the type of data item, such as query item, member, or measure.
<b>Show Drill-through Definitions</b>	Shows data items for which the drill-through definition was defined as a hyperlink.
<b>Show Table of Contents Entries</b>	Shows table of contents entries inserted in the report.
<b>Show Bookmarks</b>	Shows bookmarks inserted in the report.

Option	Description
<b>Show Master Detail Relationships</b>	Shows master detail relationships defined in the report. <b>Tip:</b> Pausing the pointer over the master detail relationship icon shows the relationship.
<b>Show No Data Contents Tab Control</b>	Shows tabs if the data container's <b>No Data Contents</b> property is set to <b>Yes</b> .
<b>Show Repeater and Singleton Containers</b>	Shows repeater and singleton containers inserted in the report.
<b>Show Interactive Object Controls</b>	Shows controls for active report application objects. For more information about active reports, see Chapter 8, "Active Reports," on page 135.
<b>Show Container Selectors</b>	Shows a small selector (three orange dots) for the following container objects, which you can click to select all the objects within them: list, crosstab, repeater table, table of contents, table, and active report application objects.
<b>Show Empty Text</b>	Shows empty text item objects that were inserted in the report.
<b>Show Insertion Icons</b>	Shows the Add circular menu  .

## Work in design, structure, or preview view

IBM Cognos Analytics - Reporting has three views in which you can author reports: Page design view, Page structure view, and Page preview view.

You choose a report authoring view by clicking the Page views icon . Different options are available in each view, so you often need to use all views. For example, you must use the Page design and Page structure views to remove sections in relational reporting.

### Page design view

The default view in Cognos Analytics - Reporting. In this view, you can see what your report will look like after you run it.

### Page structure view

Displays an overview of all of the report objects in your report in a tree structure, which is organized by page.

### Page preview view

Shows you the current report page with live data. In this view, you can edit the report, such as inserting data items into empty data containers.

When you are authoring an IBM Cognos Active Report, the page preview view shows you live data as you format the report.

### Related concepts

[The Page Structure View](#)

### Related tasks

[Formatting an active report in the preview view](#)

IBM Cognos Active Report has a preview view that you can use to format an active report and immediately see the layout changes. You no longer have to run the report whenever you make a formatting change.

## Report layout and queries

---

All reports have two components: a layout component that defines the report appearance and a query component that defines report data. Understanding these components will help you design effective reports.

### Layout

A layout is a set of pages that defines the appearance and formatting of a report.

When you design the layout of a report, you

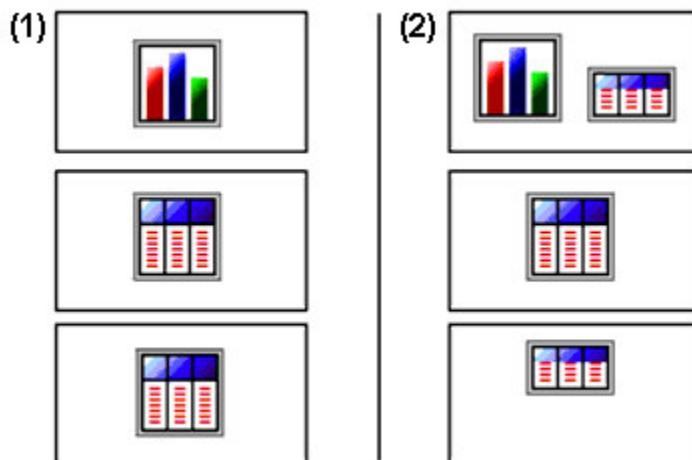
- present the data in a meaningful way by using lists, crosstabs, charts, and maps
- add formatting, such as borders, color, images, and page numbers
- specify how the data flows from one page to the next

### Pages

Pages are containers for the layout objects that you use to build a report. A page is made up of the following mandatory and optional components:

- page header (optional)
- page body (mandatory)
- page footer (optional)

When you run a report, the amount of data queried often exceeds one page. As a result, a page will repeat until all the data is shown. You have control over how data flows from one page to the next. For example, here are alternative representations of a report that contains a chart and a lengthy list.



**1** The chart appears on its own page. The list begins on the next page and fills subsequent pages until all rows appear.

**2** The chart and the first few rows of the list appear on the first page. The rest of the data in the list appears on the subsequent pages.

### Objects

You add layout objects to a page when you create a report. Below are objects that you will use often when building reports in IBM Cognos Analytics - Reporting:

- **list**  
Add a list to show data in rows and columns.
- **crosstab**  
Add a crosstab to show data in a grid with dimensions along the rows and columns and measures in the cells or intersection points.
- **chart**
- **map**
- **repeater**  
Add a repeater to show each instance of a certain column or data item in a separate frame.
- **text**
- **block**  
Add a block to hold text or other information. Blocks are often used to lay out horizontal bands of information.
- **table**

### **Related tasks**

[Insert a Formatting Object in a Report](#)

## **Queries**

Queries determine what data items appear in the report. Sometimes you want detailed rows of data, which you obtain by using a simple SELECT statement. Other times you must calculate totals or averages using summary functions and grouped columns or must apply filters to show only the data you want.

IBM Cognos Analytics - Reporting automatically creates the queries you need as you build reports. However, you can modify these queries or create your own custom queries to get the results you want.

### **Related concepts**

[Working with Relational Queries](#)

[Working with Dimensional Queries](#)

## **Report objects**

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You build reports by adding objects and manipulating them to obtain the results you want. To understand how to work with objects in IBM Cognos Analytics - Reporting, you must be familiar with the following concepts:

- [object types](#)
- [objects as containers](#)
- [locking and unlocking objects](#)
- [hierarchy of objects](#)

### **Object types**

In IBM Cognos Analytics - Reporting, layout objects are either inline or block. You can insert other objects on the same line as an inline object, but not on the same line as a block object. When you insert an object horizontally before or after a block object, the object appears on the line vertically before or after the block object. Examples of inline objects include graphics and text items. Examples of block objects include any report type (list, crosstab, chart, map, or repeater) and tables.

You can also use an object's floating property to define how other objects flow around the object. For example, you can specify how text flows around an image.

## Objects as containers

Objects, such as tables, blocks, and any report frame, are containers in which you can insert other objects. For example, you can insert a list in one cell of a table and a chart in another.

You can also nest objects to create a sophisticated layout. For example, you can insert a table in a cell of another table.

## Locking and unlocking objects

To manipulate the contents of some objects, you must first unlock the object. For example, you have a list that contains the column Product Name. You want to insert a graphic inside the Product Name column to show an image of each product. Unlock the list to insert the image object inside a list column.

To unlock a report, click the **More** icon  and then click **Locked**. All layout objects in a report are unlocked. Note that this setting is not saved with the report.

## Hierarchy of objects

In IBM Cognos Analytics - Reporting, objects are organized hierarchically. For example, a list contains list columns, and each list column contains a text item, which is the name of the inserted data item.

The hierarchy of objects is useful to remember when you apply formatting because formatting is applied to the child objects of the object. For example, you can specify that all list column titles in a list have red as the background color. The formatting is automatically applied to any new columns you add to the list because the formatting is applied to the list and is therefore applied to the objects in the list. If you apply formatting to a specific object, it will override the same formatting specified for the parent object.

## Find objects in a report

You can quickly locate specific objects in a report by using **Find**.

### About this task

A search box is also available in the **Toolbox**  and **Pages**  panes. Use the search box to find items within those panes.

### Procedure

1. Click the **Pages** icon .
2. Right-click the **Report** icon  and click **Find**.
3. Click **Find what** and choose the type of object to find.
4. In the **Options** box, specify the search criteria.

For example, if you want to find the objects that reference a specific data item, you must specify the query that contains the data item and the data item name.

5. To search for objects that are hidden in the report, in the **View** box, select the **Show hidden objects** check box.
6. In the **View** box, under **Page view**, select whether you want to do the search in the Page design, Page structure, or Page preview view.
7. Click **Find All** or **Find Next**.

## Results

The first object that meets the search criteria is selected in the report. Continue clicking **Find Next** to show all other objects that meet the search criteria.

**Note:** In some cases, such as searching for a data item that is used to define a conditional style, IBM Cognos Analytics - Reporting cannot directly select the object in the report. Instead, Reporting selects the object that uses the object for which you are searching.

## Related concepts

[Work in design, structure, or preview view](#)

# Relational and dimensional reporting styles

---

You can create reports in IBM Cognos Analytics - Reporting using either a relational reporting style or a dimensional reporting style.

The Reporting tools and query language are the same for both styles. However, it is important to choose a reporting style to ensure that you are making the most of your data and to avoid mixing dimensional and relational concepts.

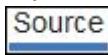
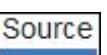
## How to choose a reporting style

When authoring a report, first choose your preferred reporting style for working with data: relational or dimensional. You can choose a reporting style from your viewpoint:

- If you think about your data as tables and columns, you have a relational viewpoint and should use a relational reporting style.
- If you think about your data as a number of dimensions intersecting at cells, you have a dimensional viewpoint and should use a dimensional reporting style.

## Relational reporting style

The relational reporting style consists of lists. You focus the data with filters and summarize with header and footer summaries.

- If your data is purely relational, then only query subjects and query items appear in the **Source** tab , and you must use the relational reporting style.
- If your data is dimensional, then dimensions appear in the **Source** tab , and you can still use a relational reporting style, but instead of query items (columns) and query subjects (tables), you use measures, levels, and level properties.

To see an example of relational style reporting with dimensional data, see the Manager Profile sample report in the GO Data Warehouse (analysis) package.

The relational reporting style is similar to report authoring in IBM Cognos Query Studio.

## Dimensional reporting style

The dimensional reporting style consists of measures and members from different hierarchies arranged in a crosstab with cell values at the intersections. You focus the data with set expressions that navigate from specific members in the hierarchy and summarize with set summaries.

To see an example of dimensional style reporting with dimensional data, see the GO Balance Sheet as at Dec 31, 2012 sample report in the GO Data Warehouse (analysis) package.

The dimensional reporting style is similar to report authoring in IBM Cognos Analysis Studio.

## Guidelines for each reporting style

This user guide is divided into relational and dimensional reporting sections so that you can follow the best practices for using this product with the reporting style that you have chosen. The following table outlines the best practices for both reporting styles.

Item	Relational reporting	Dimensional reporting
Report type	Lists Crosstabs pivoted from lists Charts created from lists Maps created from scratch or from lists	Crosstabs Charts created from scratch or from crosstabs Maps created from scratch or from crosstabs
Package tree	<p>In the <b>Source</b> tab , click the <b>Options</b> icon , and then click <b>View members tree</b>.</p> <p>If you are using dimensional data, hide members in the source tree by right-clicking the tree, clicking <b>Package Tree Settings</b>, and clearing the check boxes for <b>Members</b> and <b>Members for each level</b>.</p> <p>The view will include the following:</p> <ul style="list-style-type: none"> <li>package</li> <li>folder</li> <li>namespace</li> <li>query subject</li> <li>query item</li> <li>measure</li> <li>level</li> </ul>	<p>In the <b>Source</b> tab, click the <b>Options</b> icon, and then click <b>View members tree</b>.</p> <p>Ensure that the option <b>Create sets</b> is selected.</p> <p>The view will include the following:</p> <ul style="list-style-type: none"> <li>package</li> <li>folder</li> <li>measure</li> <li>member</li> <li>named set</li> </ul>
Inserting data	<p>From the package tree, add query items or levels to the report.</p> <p>Avoid using hierarchies directly in the report.</p> <p>Avoid using named sets.</p>	<p>From the package tree, add sets of members to the report.</p> <p>You can also choose to insert just the member, just the children of the member, or the member and its children.</p>
Calculating data	<p>Add query calculations using only relational and common constructs.</p> <p>Choose only <b>Other expression</b>.</p>	<p>Add query calculations using only dimensional and common constructs.</p> <p>Use <b>Other expression</b> only for value calculations.</p> <p>Avoid <b>Common functions</b> that are marked with an exclamation mark (!) because they have limited support.</p>

Item	Relational reporting	Dimensional reporting
Summarizing data	Headers and footers in lists Crosstab member summaries; for example, aggregate within detail	Member set summaries; for example, aggregate within set
Focusing data	Add detail or summary filters to view only the data you want to see. For example, add the <b>Quarter</b> query item to a list and filter by <b>Q3</b> .	Add only the relevant members to an edge of the crosstab or to the context filter. For example, only add the <b>Q3</b> member to your report.  Use a set expression such as <b>Topcount</b> or <b>Filter</b> .
Drilling	Drilling through by value	Drilling through by member  Drilling up and down
Page and section breaks	Simple page breaks  Page sets  Sections  Master detail relationships using parameterized filters	Simple page breaks  Page sets  Page layers  Master detail relationships using parameterized edge or slicer expressions

## Options

You can set various options that control the appearance and behavior of IBM Cognos Analytics - Reporting (More icon , Options).

### View Options

Table 2. Descriptions of the options on the <b>View</b> tab of the <b>Options</b> window	
Option	Description
<b>Show new data container dialog</b>	Shows the new data container dialog boxes when the <b>Show this dialog in the future</b> check box was previously cleared.
<b>Reuse IBM Cognos Viewer window</b>	Reuses the same IBM Cognos Viewer window when you rerun a report without first closing the window.

Table 2. Descriptions of the options on the **View** tab of the **Options** window (continued)

Option	Description
<b>Show on demand toolbar on right-click</b>	Show the report object toolbar only when you right-click the object. The default setting is to show report object toolbars when you highlight an object. You can control when you want to see these toolbars by enabling this feature, which is also used for accessibility. When you author reports with accessibility features enabled, the <b>Show on-demand UI on right click</b> option is automatically selected. As a result, report object toolbars do not appear. To show an object's toolbar, navigate to the object and press the <b>Enter</b> key.
<b>Start page view</b>	Enables you to start Reporting in <b>Design</b> , <b>Structure</b> , or <b>Preview</b> view. For the change to take effect, you must close and then restart Reporting.

## Edit Options

Table 3. Descriptions of the options on the **Edit** tab of the **Options** window

Option	Description
<b>Wrap text in editors</b>	Automatically wraps text in all editors where you can define expressions.
<b>Automatically populate values list</b>	When building expressions in the expression editor, automatically shows values when you browse the data of a data item.
<b>Automatically validate expressions</b>	Automatically validates calculations, such as filters, created in the expression editor. For more information, see <a href="#">“Using relational calculations” on page 182</a> or <a href="#">“Using Dimensional Calculations” on page 227</a> .
<b>In-place edit</b>	Enables the editing of text in place when double-clicking.
<b>Allow crosstab nesting beside individual items</b>	Specifies to create a crosstab node when a data item is inserted in a crosstab. This option allows nesting under individual items instead of only on the entire crosstab edge.
<b>Enable drill-up or drill-down links</b>	For data items where drill-up or drill-down is possible, enables drill-up or drill-down links. When you select a data item, it becomes a link that you can click to drill up or down. Also, you can still double-click data items to drill up and down. By default, this option is enabled. You can also control drill options in the Properties pane. At the report level, in the <b>Data</b> section.

*Table 3. Descriptions of the options on the **Edit** tab of the **Options** window (continued)*

<b>Option</b>	<b>Description</b>
<b>Drop replace on crosstab and chart nodes</b>	When you use drag-and-drop techniques, this setting determines the behavior for replacing an item.
<b>Double-click on member action</b>	When working with dimensional data, specifies what happens when you double-click a member data item.  By default, you drill down or up on the item that you double-click.
<b>Layout dimensions</b>	Specifies the width and height of the area where you will create reports.

## Report Options

*Table 4. Descriptions of the options on the **Report** tab of the **Options** window*

<b>Option</b>	<b>Description</b>
<b>Alias member unique names</b>	When working with a dimensional data source, creates an alias when you add a member to the report or to an expression.
<b>Delete unreferenced query objects</b>	Automatically deletes query objects linked to another object. For example, if you delete a list, the query linked to the list is deleted as well.
<b>Delete unreferenced conditional styles and palettes</b>	Automatically deletes conditional styles or palettes when the last data item that refers to the conditional style or palette is also deleted.
<b>Table Style inheritance</b>	When a table style is applied to a list or crosstab, specifies whether new objects inserted in the list or crosstab should inherit the style. For more information, see <a href="#">“Apply a Table Style” on page 263</a> .
<b>Automatic group and summary behavior for lists</b>	When working with lists, automatically adds an overall aggregate summary in the list footer and a summary for any groups in the list. When grouping a column, automatically makes it the first column in the list.
<b>Automatically create crosstab headers for sets</b>	When adding sets in a crosstab that uses a dimensional data source, automatically adds header labels on new columns and rows. The headers help consumers of the report to understand where the data is in the hierarchy.

*Table 4. Descriptions of the options on the **Report** tab of the **Options** window (continued)*

Option	Description
<b>Limit on inserted individual members</b>	When working with a dimensional data source, limits the number of child members that are inserted. For example, you specify 3 for this option and, in the toolbar, you specify the option to insert children when you drag a member to a data container. You then drag the Camping Equipment member to the rows of a crosstab. What you see as rows are the child members Cooking Gear, Tents, and Sleeping Bags and a row named Others (Camping Equipment) for the remaining child members of Camping Equipment.

### Advanced Options

*Table 5. Descriptions of the options on the **Advanced** tab of the **Options** window*

Option	Description
<b>Use operating system clipboard</b>	Uses the Microsoft Windows (or other operating system) clipboard instead of the internal Reporting clipboard.
<b>Use legacy chart authoring</b>	Enables you to create new reports using the legacy charts instead of the default charts and disables the automatic upgrade of charts in existing reports to the current default charts. Select this check box if you do not want to upgrade the charts in your existing reports.
<b>Disable previews</b>	When editing properties such as date and number formatting, does not display a sample of the formatting that is applied to data. When this option is not enabled, either sample data or data from your data source is displayed with formatting options applied.  Additionally, when in <b>Page Design</b> view, displays a static image for a chart instead of updating the chart with a preview of your chart, using simulated data.
<b>Active Report validation of visualization</b>	Specifies whether to validate visualizations in an active report when the report is run from Reporting.
<b>Report styles used for new reports</b>	Specifies which report styles to use by default when creating new reports.  For more information about report styles, see “Create and modify report and object styles” on page 271.

Table 5. Descriptions of the options on the **Advanced** tab of the **Options** window (continued)

Option	Description
<b>Map feature display limit</b>	When working with maps, specifies the maximum number of features that can appear in a map.
<b>Member display count limit (in source tree)</b>	When working with dimensional data, specifies the maximum number of members that can appear in the <b>Source</b> tab  before you must perform a search.

#### Related concepts

[Recommendation - Use Member Unique Name \(MUN\) Aliases](#)

## Web browser settings

IBM Cognos Analytics - Reporting can be used in the Microsoft Internet Explorer and Mozilla Firefox Web browsers.

To review an up-to-date list of the environments that are supported by IBM Cognos products, including information about operating systems, patches, browsers, web servers, directory servers, database servers, and application servers, visit [Supported Software Environments](http://www.ibm.com/support/docview.wss?uid=swg27047186) (<http://www.ibm.com/support/docview.wss?uid=swg27047186>).

IBM Cognos Analytics uses the default browser configurations provided by Internet Explorer and Firefox. Additional required settings are specific to the browser.

For Internet Explorer, the following settings are required:

- Allow Cookies
- Active Scripting
- Allow META REFRESH
- Run ActiveX controls and plug-ins
- Script ActiveX controls marked safe for scripting
- Binary and script behaviors
- Allow programmatic clipboard access
- Userdata persistence
- Enable pop-ups for the IBM Cognos Analytics server

For Firefox, the following settings are required:

- Allow Cookies
- Enable Java™
- Enable JavaScript
- Load Images
- Enable pop-ups for the IBM Cognos Analytics server

Reporting uses the native Microsoft Internet Explorer XML support, which is a component of the browser. ActiveX support must be enabled because Microsoft implements XML using ActiveX. IBM Cognos Analytics does not provide or download ActiveX controls. Only the ActiveX controls that are installed as part of Internet Explorer are enabled through this configuration.

For more information about the Web browser configuration and cookies used by IBM Cognos Analytics, see the IBM Cognos Analytics *Installation and Configuration Guide*.



# Chapter 2. Creating a report

Create a report by clicking the **New** icon  in the IBM Cognos Analytics portal and then clicking **Report**.

When you create a report, you are actually creating a report specification. The report specification defines the queries and prompts that are used to retrieve data and the layouts and styles used to present the data. For simplicity, the report specification is named by the same name as the report.

## Templates and themes

IBM Cognos Analytics includes several basic report templates and color themes that you can choose from when you create a new report.

The templates and themes are stored in the **Templates.zip** deployment file. If you do not see the list of templates and themes when you create a new report, ask your administrator to import the deployment file into Cognos Administration. After the deployment file is imported, the templates appear in the **Templates** folder in **Team content**.

You can also create your own report templates and themes, and make them available to other users. Save the templates in the **Templates** folder in **Team content**, and save themes in the **Style Reference Reports** folder in the **Templates** folder. When saving your own template or theme, do not use the name of an existing Cognos Analytics template or theme. Otherwise, your template or theme might be overwritten when Cognos Analytics is upgraded to a later version. Any report or theme that is saved in the **Templates** folder appears in the list of templates or themes when you create a new report.

**Note:** When you select a template in the **Templates and themes** window, you can see a preview of the template in the right pane. The preview applies only for the Style Reference Reports in the template folder. Any styles you apply to a custom template do not display in the preview pane.

You can also convert a report to a template by clicking **Save > Convert to Template**.

**Tip:** By default, templates or themes that you create are identified by a blank icon in the list of available templates and themes. You can associate your own icon to a template or theme. Save the icon as an SVG with the same name as the template or theme, replacing any blank spaces in the name with the underscore (\_) character. For example, if you create a template that is named My template, save the icon as `My_template.svg`. Then, ask your administrator to add the icon to the folder `install_location\webcontent\bi\pat\images\templateReports` for templates or `install_location\webcontent\bi\pat\images\themeReports` for themes.

### Related tasks

[Reusing styles from another report](#)

You can apply local and global styles or themes from one report in another report.

## Adding data

Add data to a report by loading packages or data modules in IBM Cognos Analytics - Reporting.

### About this task

**11.0.3** You can add data from multiple packages that use the dynamic query mode, from a single package that uses the compatible query mode, or from a single data module.

The following list provides information about authoring reports that reference multiple packages.

- You must set one of the packages as the default package.

When a report is run, Cognos Analytics checks the package capabilities of the package that is used by the report. In a report that references multiple packages, package capabilities are checked only for the default package.

**Tip:** The first package that you add to a report is set as the default package.

- A query can reference only one package.
- Query set operations (join, union, intercept, except), master detail relationships, and the Build prompt page tool are not supported.
- Drill through and external data are supported only for the default package.

### Procedure

1. Click the **Data** icon .

2. Click the **Add report data** icon .

3. Open the packages that you want, or open a single data module.

4. If you opened multiple packages, to specify a package as the default package, right-click an item in the package and select **Set default package**.

5. To delete a package, right-click an item in the package and select **Delete package**.

6. To replace a package by another package, right-click an item in the package and select **Replace package**.

If queries exist that use the package that you are replacing, model paths in the queries are updated to the new package.

**Tip:** You can also change the package that is used by a query by modifying the **Data model** query property.

### Related tasks

[Changing the package](#)

## Inserting a single data item

You can insert a single data item anywhere in your report using the singleton object. The singleton object retrieves only the first row value for that query. Inserting a single data item is useful when you want to show a value that is independent from the rest of the values in the report or when you want to insert some boilerplate text, such as a company name and address. For example, you can add the total revenue value in the header of each page in a report.

You can associate multiple singleton objects with a single query in relational reporting and dimensional reporting to optimize performance, such as when all the data items in the singleton are from the same database table. In addition, two or more singletons can reference data items from the same query. This is useful when using a single query is more efficient to display a set of single values than using multiple queries.

You can also filter the data item in the singleton. For example, you can show the total revenue for only the year 2012.

Queries that are associated to a singleton object are not supported when producing report output in delimited text (CSV) format.

**Tip:** The Returns by Damage, Failed Orders and Complaints in 2012 sample report in the GO Data Warehouse (analysis) package includes a singleton.

### Procedure

1. Click the **Toolbox** icon  and drag **Singleton** to the report.

An empty data container is created.

2. Click the **Data** icon , and from the **Source** tab , drag a data item into the **Singleton** container.

**Tip:** To create a singleton, you can also drag a data item anywhere in your report layout.

3. To change the query associated to the singleton object, select the singleton, click the **Show properties** icon , and in the **Properties** pane, double-click the **Query** property and make changes.

### Results

When the report is run, the first row value for the data item is retrieved.

## Validating a report

Validate your report to ensure that it contains no errors.

When you open a report created in a previous version, it is automatically upgraded and validated.

### Procedure

1. Click the **Pages** icon  or the **Queries** icon , right-click the **Report** icon , and click **Validate Report** .

A message box appears indicating whether any errors were found in the report.

2. If you require more detail from the validation process, click the **Show properties** icon , navigate to the report level, click the **Validate options** property, and do the following:
  - Click one of the following validation levels.

Validation level	Description
<b>Error</b>	Retrieves all errors returned from the query.
<b>Warning</b>	Retrieves all errors and warnings returned from the query. This is the default validation level.
<b>Key Transformation</b>	In addition to errors and warnings, retrieves informational messages describing important transformation steps from the report specification to the native query sent to the data source.  These messages can show the cause of errors and warnings returned from the query.
<b>Information</b>	Retrieves errors, warnings, key transformations, and other information related to query planning and execution.

**Tip:** Your administrator can change the default validation level. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

- Select the **Interactive data** check box to specify that no query optimization is to be used.

The **Interactive data** check box controls how queries will be processed during validation.

Clear the **Interactive data** check box to set the query property **Execution optimization** property to **All Rows**.

A message box appears indicating whether any errors were found in the report.

- To view messages that result from the conversion of your report to use the dynamic query mode instead of the compatible query mode, select the **Dynamic Query Migration** check box.

For more information about using the dynamic query mode, see the *IBM Cognos Analytics Administration and Security Guide*. For more information about managing the migration from the compatible query mode to the dynamic query mode, see the *IBM Cognos Lifecycle Manager Installation and User Guide*.

- Revalidate your report.

3. If you encounter validation errors and want Cognos Analytics - Reporting to identify incorrect objects in your report, right-click the **Report** icon and click **Auto Correct**.

Cognos Analytics - Reporting provides a list of such objects that you can remove individually to successfully run your report.

In some cases, the information or error message is linked to the location of the issue in your report. To go to the location of the issue, click the message, and then click **Select**. If only warnings and information appear in the dialog box, these will disappear when you click **OK**.

## Running a report

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Run your report to see the data that is retrieved. Save time by validating it first to check for errors.

You can also run a report or a group of reports in the IBM Cognos Analytics portal.

You can specify not to render a report page if it does not contain any data.

When you run a report in an export format such as PDF, delimited text (CSV), Microsoft Excel spreadsheet software (XLS), the IBM Cognos report name is used as the exported file name.

If you run a report that uses functions or features not supported by the data source, an error message appears. We recommend that you periodically test your reports while you author them in IBM Cognos Analytics - Reporting to ensure that you do not encounter multiple error messages when you run the report.

### Procedure

1. Open a report.
2. If you want to clear parameter values stored on the IBM Cognos Analytics server, click the **More** icon  and click **Clear all parameters**.

Parameter values stored by the IBM Cognos Analytics server include signon, validation, and prompt information. For example, if you define two data source connections in the Cognos Analytics portal that point to the same data source, you are prompted to choose one when you run a report. This information is stored so that you are not prompted each time you run the report.

3. If you want to view only the tabular data for a query, do the following:

- a) Click the **Queries** icon .
- b) Right-click the query.
- c) Click **View tabular data**.

Use this command to ensure that the right results appear. For example, you create a calculation and you want to ensure it is giving you the results you want.

4. If you want to set run options, click the **Run options** icon  and click **Show run options** property.

**Note:** The run options that you set apply only to the current session. When you close Cognos Analytics - Reporting, the options return to the default settings.

5. Change any values for the current session.

Option	Description
<b>Paper size</b>	Specify only if the output format is PDF.
<b>Paper orientation</b>	Specify only if the output format is PDF.
<b>Data mode</b>	<p>Specify how much data is returned:</p> <ul style="list-style-type: none"> <li>• <b>All Data</b> returns all data.</li> <li>• <b>Limited Data</b> limits the amount of data returned based on design mode filters defined in the package.</li> <li>• <b>No Data</b> returns artificial data instead of actual data from the data source.</li> </ul> <p>For more information about design mode filters, see the <i>IBM Cognos Framework Manager User Guide</i>.</p>
<b>Language</b>	The content language sets the preferred language for the data, IBM Cognos Viewer, dates, and so on.
<b>Rows per page</b>	<p>Specifies the number of rows to appear on each page.</p> <p>A <b>Rows Per Page</b> property exists in the <b>Properties</b> pane for lists and crosstabs. If you set this property, the setting overrides the same-named run option. This property applies to both HTML and PDF outputs. For more information about this property, see “<a href="#">Controlling the Rows Per Page for Multiple Containers in HTML and PDF</a>” on page <a href="#">25</a>.</p>
<b>Prompt</b>	<p>Select to be prompted for each prompt defined unless the prompt is defined in a report page.</p> <p>If you clear the <b>Prompt</b> check box, you are prompted only if the report cannot run without user intervention. For example, if a report has a single parameterized filter that is optional, you are not prompted when you run the report.</p>
<b>Include accessibility features</b>	<p>Specifies whether accessibility features, such as alternate text on images and charts and summary text in tables, are included in the report output.</p> <p>This option is also used for conditional layouts in Reporting. When the option is selected, you can specify that a crosstab is rendered as an accessible alternate to a chart.</p>
<b>Enable bidirectional support</b>	<p>Specifies whether to enable bidirectional support in the report output.</p> <p><b>Tip:</b> You can also enable bidirectional support in Cognos Analytics portal by modifying your user preferences (<b>My Preferences</b> link). If you enable bidirectional support in Cognos Analytics portal, this run option will be automatically selected.</p>

Option	Description
<b>Include performance details</b>	<p>Specifies whether to include performance details.</p> <p>The option <b>Include performance details</b> is designed for authors that want to interactively view the performance of their reports. You can use <b>Include performance details</b> while you are designing your page by running as HTML or by using the preview mode within the authoring mode.</p>

6. Click the **Run options** icon and click one of the format options.

You can produce a report in HTML, PDF, CSV, and various Microsoft Excel formats. You cannot produce a report in CSV format if you have more than one query defined in the report, unless the additional queries are used for prompts.

**Restriction:** The formats that are available depend on the capabilities set by the administrator for each user. You may not be able to run reports in all formats. For more information, see the *IBM Cognos Analytics Administration and Security Guide* or contact your administrator.

## Results

The report runs in the report viewer. Once the report has finished running, you can run the report again in the same format or in a different format. If you run the report again in CSV or XLS format, the report will appear in a new browser window.

**Note:** Cognos Analytics - Reporting, HTML viewers, and reports use standard HTML. Because reports have moved from quirks to standard HTML, there might be small differences in item sizes. These differences do not have an impact on the majority of reports that were created in previous Cognos versions. However, minor changes might be required in a small number of existing reports, such as reports that are printed on forms.

### Related concepts

[Running a Report Against a Dimensional Data Source](#)

## Limited and fully interactive reports

Reports can run in limited interactivity or full interactivity mode.

You specify the interactivity mode by setting the report property **Run with full interactivity**.

When a report is set to run with limited interactivity, the report runs in the IBM Cognos Business Intelligence Viewer, also known as the IBM Cognos Viewer. Report consumers can drill up, drill down, and drill through. Any JavaScript or prompt API that is contained in the report is run. By default, Cognos BI reports run with limited interactivity.

When a report is set to run with full interactivity, the report runs in the IBM Cognos Analytics interactive viewer. By default, reports that are created in Cognos Analytics are set to run with full interactivity. By clicking various icons in the report object toolbar that appears when an object is selected, report consumers can do the following in the Cognos Analytics interactive viewer:

- Sort data 
- In lists, group data 
- Summarize data 
- Convert a list or crosstab to a chart, or change a chart to a different chart type 
- In crosstabs and charts, suppress columns or rows  or swap columns and rows 
- Drill through to another report.

- **11.0.5** Add calculated members 
- **11.0.5** Drill up, drill down, and perform dimensional operations, such as top/bottom filtering 
- **11.0.5** Run the report as Excel or CSV output.
- **11.0.5** Select and interact with the elements of a chart, such as the bars in a bar chart.
- **11.0.6** View lineage information for a data item 
- **11.0.6** Access a business glossary, such as the IBM InfoSphere® Information Governance Catalog, for a data item 
- **11.0.6** Create, edit or remove filters 
- **11.0.6** Share or embed report output, preserving the context of the current view of the report, such as prompt values.

To share or embed report output, click the **More** icon  and then click **Share or Embed**.

- **11.0.6** Run a report as the report owner or with the capabilities granted to the owner.

In the Cognos Analytics portal, access the **Properties** slideout of the report, click the **Report** tab, and then open the **Advanced** section.

Report consumers can also save changes that are made to a report as a new report.

**11.0.5** You can also start the Cognos Analytics interactive viewer by using URLs. You can open reports and pass parameters to a report. For more information, see the *Getting Started Guide*.

**Note:** JavaScript in HTML items is removed when the report is run with full interactivity. Instead, you can use the **Custom control** tool to add JavaScript.

#### Related tasks

[Adding JavaScript to a report](#)

## Specify Not to Render a Page If It Does Not Contain Data

You can specify not to render a report page if the page does not contain any data when the report is run.

#### Procedure

1. In the report page, click a data container.
2. Click the **Show properties** icon , click the **Select ancestor** icon , and click the data container type.  
For example, if the data container is a list, click **List**.  
**Tip:** You can also click the container selector (three orange dots) of the container to select it.
3. Set the **Render Page when Empty** property to **No**.
4. Repeat steps 1 to 3 for all other data containers in the page and any table of contents objects.

#### Results

When you run the report, if no data is produced in all data containers and table of contents objects in a page, the page is not rendered. The page is not rendered even if the page contains other objects, such as text items or images.

## Controlling the Rows Per Page for Multiple Containers in HTML and PDF

If you have more than one data container in a report, such as a list and a crosstab, you can control how the report is rendered in HTML and PDF by setting the **Rows Per Page** property for each container.

For HTML output, the report property option **Page break by data container for interactive HTML** controls whether the default number of rows is rendered for each data container on each page.

IBM Cognos Analytics uses the following rules when rendering reports in HTML and PDF:

- If the **Rows Per Page** property is not set for any of the data containers, 20 rows per page are rendered in HTML and each page is completely filled in PDF. The first data container is rendered until there is no more data, followed by the next container, and so on.

**Tip:** The number of rows that appear on a PDF page depends on the font size set in the report.

- If the **Rows Per Page** property is set for each data container, the specified numbers of rows are rendered in HTML and PDF on each page until there is no more data.
- If the property is set for only some of the containers, the specified numbers of rows are rendered in HTML and PDF on each page until there is no more data. For the remaining containers, 20 rows per page are rendered on each page in HTML and each page is completely filled in PDF.

For example, you have two lists, List1 and List2. You set the **Rows Per Page** property to 5 for List1. When you run the report in HTML, the first page contains the first 5 rows from List1 followed by the first 15 rows of List2.

- If no data is returned for a data container, an empty container is rendered.

## Producing a Report in CSV Format

IBM Cognos Analytics can produce reports in CSV format so you can open them in other applications, such as Microsoft Excel spreadsheet software.

Reports saved in CSV format

- support Unicode data across many client operating systems
- are UTF-16 Little Endian data encoded
- include a BOM (Byte Order Mark) at the beginning of the file
- are tab-delimited
- do not enclose strings in quotation marks
- use a new line character to delimit rows

You can open reports saved in CSV format using a variety of spreadsheet software applications. By default, reports produced in CSV format will appear in the application associated with the .csv file type.

You cannot produce the following in CSV format:

- maps
- charts that do not have at least one category or series
- reports that have more than one query defined in the report, unless the additional queries are used for prompts

In the IBM Cognos Analytics portal, you can configure the CSV output to suit your environment. For example, you can specify the character used to delimit fields. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

## Producing a Report in Microsoft Excel Format

You can export your report output to several different Microsoft Excel spreadsheet software formats.

**Excel** and **Excel data** formats render report output in native Excel XML format, also known as XLSX. This format provides a fast way to deliver native Excel spreadsheets to Microsoft Excel 2002, Microsoft Excel 2003, and Microsoft Excel 2007. Users of Microsoft Excel 2002 and Microsoft Excel 2003 must install the Microsoft Office Compatibility Pack, which provides file open and save capabilities for the new format.

**Excel** provides fully formatted reports for use in Microsoft Excel version 2007.

The output is similar to other Excel formats, with the following exceptions:

- Charts are rendered as static images.
- Row height can change in the rendered report to achieve greater fidelity.
- Column widths that are explicitly specified in reports are ignored in Microsoft Excel 2007.
- Merged cells are used to improve the appearance of reports.
- The default size of worksheets is 65 536 rows by 256 columns.

Your IBM Cognos administrator can enable larger worksheets and change the maximum number of rows in a worksheet, up to a maximum of 16,384 columns by 1,048,576 rows, by using advanced server properties. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

**Excel data** provides data for use in Microsoft Excel version 2007. These reports only contain minimal formatting. Default data formatting is applied to the data based on data type and assumes that each column has a single data type.

The output is similar to other Excel formats, with the following exceptions:

- The generated output includes only the first list query in the report. Other queries are ignored. If a report contains only multi-dimensional queries for crosstabs or charts, an error message is displayed when the report runs.
- Nested frames and master-detail links are not supported.
- Cells in the Microsoft Excel file have a default width and height. You must adjust the column width and height if the data is larger than the default size.
- Style specifications are not rendered, including color, background color, and fonts.
- Borders are not rendered.
- User-specified data formatting in the report specification are not applied, including exception highlighting and color rules for negative numbers.

#### Related concepts

[Limitations When Producing Reports in Microsoft Excel Format](#)

## Producing a Report in XML Format

XML report outputs save the report data in a format that conforms to an internal schema, `xmldata.xsd`.

You can find this schema file in `installation_location\bin`.

This format consists of a dataset element, which contains a metadata element and a data element. The metadata element contains the data item information in item elements. The data element contains all the row and value elements.

You can create models from reports and other data that conform to the `xmldata.xsd` schema. This is useful if you want to use a report as a data source for another report, or if you use a database that cannot be read by IBM Cognos Framework Manager. In this case, export the data from the data source to an XML file, in conformance with the `xmldata` schema, and then open the XML file in Framework Manager.

For more information, see the *Framework Manager User Guide*.

You cannot produce the following in XML format:

- maps
- charts that do not have at least one category or series
- reports that have more than one query defined in the report, unless the additional queries are used for prompts

If a report contains more than one data container, such as a crosstab and a list, and both containers use the same query, only the output for the list is produced. If a report contains multiple lists, only the output for the first list is produced. If a report contains multiple crosstabs and multiple lists, only the output for the first list is produced.

## Viewing performance details

With the option **Include performance details**, you can view query and rendering performance on report objects in IBM Cognos Analytics.

The option **Include performance details** is designed for authors that want to interactively view the performance of their reports. You can use this option while you are designing your page by running as HTML or by using the preview mode within the authoring mode.

The following illustration shows the performance details for a crosstab.



The **Execution Time** in milliseconds is displayed for each data container, including prompt controls, in the report. When you hover over the information icon a flyout shows the following information:

- **Render:** The amount of time to generate the query, process any data that is returned from the database and generate the data container report objects. It does not include query time.
- **Query:** The amount of time that is required to plan the query, run it and retrieve the data.

The **Total Execution Time** is displayed at the end of the report. The total execution time is the time to

render logic layout of the report, excluding the device time. When you hover over the information icon a flyout shows the following information:

- **Host:** The name of the server where the report ran.
- **Process ID:** The process ID of the BIBusTKServerMain that rendered the report.
- **Session ID:** The client's unique identifier for his IBM Cognos session, from login to logout.
- **Request ID:** The report session's unique identifier through the duration of the report execution.
- **Hop Count:** The number of service nodes that the request communicated with during the report execution.

**Note:** To get additional information on why the report object is working the way that it is, your Cognos Administrator can use the Request ID as a search parameter within the logs.

Objects that use the same query show different execution times. The last run of performance details on an object uses cached information and does not have to rerun a query.

IBM Cognos Analytics retrieves rows as they are required in the interactively run HTML reports. Because of this, you will not see an accurate representation of the runtime of the report, when you scroll to the bottom of a long report, as you would see when you schedule it.

If you want to see the actual runtime by using performance details, then set the rows per page for your report object to a high enough number to retrieve all rows for the object. Click the object, such as a list, and then click **Show Properties**. The **Rows per page** option is in the **DATA** section.

Performance details are not available for the following output formats:

- XLS
- PDF
- Scheduled reports
- Active reports

## View Lineage Information for a Data Item

View lineage information of a data item to see what the item represents.

## Before you begin

Before you can access lineage information for a report, your administrator must configure lineage in IBM Cognos Administration. Also, the administrator must enable the lineage capability and grant read permission for you on the report.

**Note:** The IBM Cognos Analytics lineage tool shows lineage on a report at its highest level. The lineage does not change after you drill down on a report. Because the selection context used to launch lineage can be affected by drill-down operations, we recommend that you always launch lineage at the highest report level before drilling down on the report. Otherwise, the lineage may not start properly.

## About this task

Lineage information traces the metadata of an item back through the package and the data sources used by the package. Lineage also displays any data item filters that were added by the report author or that were defined in the data model. Viewing lineage information ensures that you add the correct data items to a report. For example, you can view the lineage information of a model calculation to see how it was created.

**Note:** Lineage is available only after your administrator has configured it. In addition, lineage is not supported in reports that are not linked to packages.

You can use the lineage tool that comes with IBM Cognos Analytics, or you can use another lineage tool by specifying the URL to the tool in IBM Cognos Administration. Note that if the URL source is secured, the source must be able to prompt users for a password because IBM Cognos Analytics does not pass security information. IBM Cognos Analytics also supports the IBM Metadata Workbench as a lineage tool.

You cannot use lineage information to troubleshoot queries. For example, lineage information will not explain why a data item is double counted. Also, you cannot view lineage information when running a report from a mobile device.

There are several ways in which you can view lineage information.

- You can view lineage information for a data item before you add it to a report.
- You can view lineage information in IBM Cognos Viewer after you run a report.

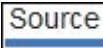
For example, you can click a cell in a crosstab to see how the cell value was calculated.

- **11.0.6** You can view lineage information in the Cognos Analytics interactive viewer after you run a report.
- **11.0.6** In the page preview view, you can view lineage information for a data item that was added to a report.

## Procedure

1. To view lineage information for a data item before you add it to a report:

a) Click the **Data** icon .

b) From the **Source** tab , right-click the data item and click **Lineage**.

2. To view lineage information in IBM Cognos Viewer, right-click an item in the report and then click **Lineage**.

3. To view lineage information in the Cognos Analytics interactive viewer or in the page preview view, select an item in the report, and in the report object toolbar, click the **Explore** icon  and then click **Lineage**.

## Results

The lineage tool opens showing the lineage information of the selected data item.

## The IBM Cognos Analytics lineage tool

The IBM Cognos Analytics lineage tool includes two views: the business view and the technical view.

The business view displays high-level textual information that describes the data item and the package from which it comes. This information is taken from IBM Cognos Analytics portal and the IBM Cognos Framework Manager model.

The technical view is a graphical representation of the lineage of the selected data item. The lineage traces the data item from the package to the data sources used by the package.

When you click an item, its properties appear below it. If you click an item in the **Package** area, you see the model properties of the item. If you click an item in the **Data Sources** area, you see the data source properties of the item.

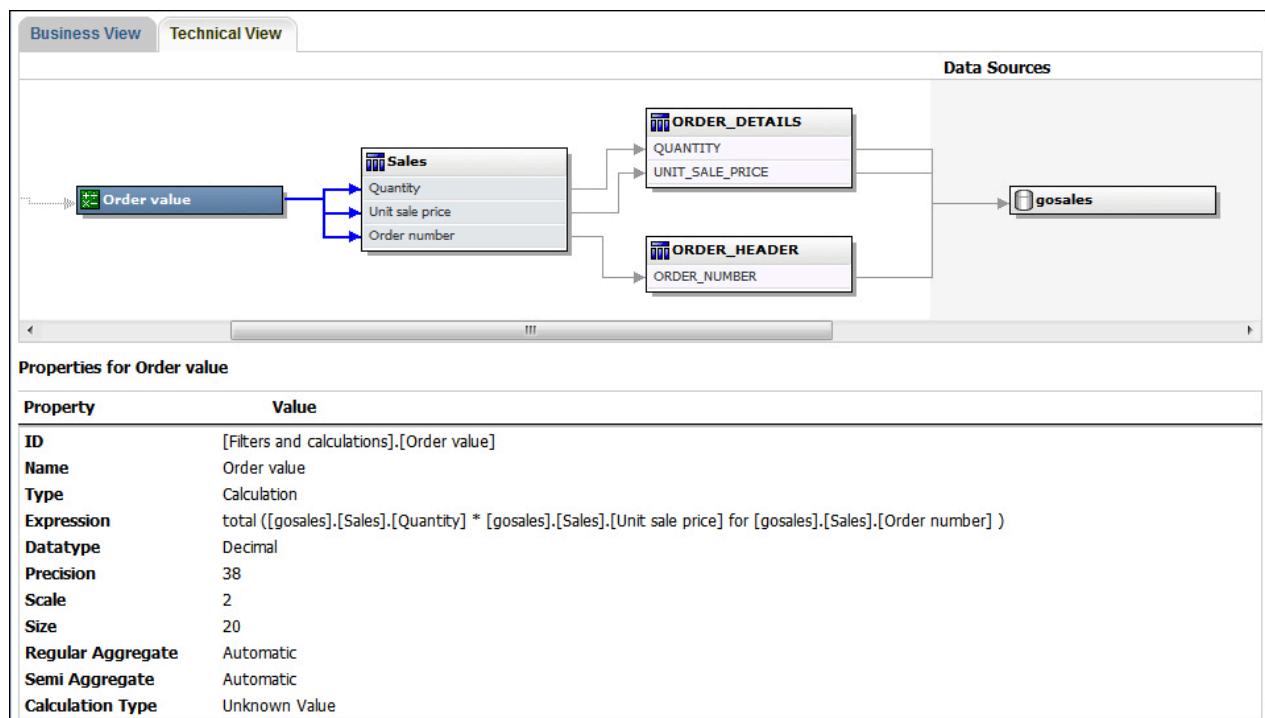


Figure 1. The technical view in the IBM Cognos Analytics lineage tool

If you or an administrator runs a saved report with the IBM Cognos Analytics lineage tool, both the business view and the technical view are visible. Report consumers can see only the business view. In addition to the **Package** and **Data Sources** areas, a **Report** area exists when looking at the technical view.

## Access the IBM InfoSphere Information Governance Catalog

If you use the IBM InfoSphere Information Governance Catalog, you can access the catalog from various data objects in a report.

### Before you begin

To access the IBM InfoSphere Information Governance Catalog, your Cognos administrator must specify the URI of the Catalog web page in Cognos Administration. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

### About this task

Business glossaries help you manage and share an enterprise vocabulary and classification system.

If you use the IBM InfoSphere Information Governance Catalog, you can access the catalog from any of the following data objects:

- Query subject

- Query item
- Measure
- Dimension
- Hierarchy
- Level
- Property or attribute
- Top node member
- Member
- Level item

### Procedure

1. Open an HTML report or report view in the IBM Cognos Viewer or in the Cognos Analytics interactive viewer.
2. If you are in the IBM Cognos Viewer, right-click the data item and click **Glossary**.
3. **11.0.6** If you are in the Cognos Analytics interactive viewer, select the data item, and in the report object toolbar, click the **Explore** icon  and then click **Glossary**.

### Results

The IBM InfoSphere Information Governance Catalog appears.

#### Related concepts

[Limited and fully interactive reports](#)

Reports can run in limited interactivity or full interactivity mode.

## Support for bidirectional languages

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You can author reports that support bidirectional languages. You can specify base text direction, digit shaping, and container direction.

Arabic, Hebrew, Urdu, and Farsi are languages written from right to left, using the Arabic or Hebrew scripts. However, numbers in those languages, as well as embedded segments of Latin, Cyrillic, or Greek text, are written from left to right. Using the bidirectional settings in IBM Cognos Analytics - Reporting, you can control the direction in this type of text in reports.

#### Report formats

Bidirectional languages are supported for reports produced in HTML, PDF, and Microsoft Excel. IBM Cognos Active Report also supports bidirectional languages.

#### Enabling bidirectional support

To enable support for bidirectional languages when a report is run, in the IBM Cognos Analytics portal, users must open their **My Preferences** page and select the **Bidirectional language support** check box.

To enable support for bidirectional languages when a report is run from Cognos Analytics - Reporting, select the **Enable bidirectional support** check box in the **Run options** window.

**Tip:** If you enable bidirectional support in the Cognos Analytics portal and you then start Cognos Analytics - Reporting, the bidirectional support run option in Cognos Analytics - Reporting is selected. If you disable bidirectional support in the Cognos Analytics portal and you then start Cognos Analytics - Reporting, the run option in Cognos Analytics - Reporting is cleared.

## Base text direction

Base text direction sets the text direction as left-to-right or right-to-left. You can specify the base text direction for any text object in a report. You specify the base text direction for text by clicking the **Direction & justification** property for the text or for the object that contains the text, such as a list column.

A contextual option also exists in the **Direction & justification** property that sets the text direction based on the first letter in the text.

For compound objects that contain text, you specify the base text direction of the text contained in the object by clicking the **Contained text direction** property for the object. Examples of compound objects are charts, prompts, and active reports.

## Digit shaping

Digit shaping allows users to consume reports with numbers that they can read after they select the content language in the Cognos Analytics portal. You can specify digit shaping at the following levels:

- Report
- Container (except for charts and maps)
- Text
- Number

You specify digit shaping for an object by clicking the **Data format** property for the object. To specify digit shaping at the report level, click the report property **Data formats**.

**Tip:** Digit shaping has no impact on reports produced in Excel format, since the shaping of digits in Excel depends on Windows regional settings.

## Container direction

Container direction sets the direction of container objects in a report as left to right or right to left. You specify container direction for an object by clicking the **Direction & justification** property for the object.

**Tip:** Container direction is not supported in reports produced in Excel format. Excel spreadsheets do not natively support mirroring at the container level.

### Related concepts

[Digit shaping in charts and maps](#)

### Related tasks

[Running a report](#)

[Specify text and container direction](#)

[Set the default data formats](#)

[Specify the data format for an object](#)

## Reports for workspaces in Cognos Workspace

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When building a workspace in IBM Cognos Workspace, business users can insert an entire IBM Cognos Analytics - Reporting report or insert only individual objects from within a report.

To create effective reports for use in workspaces in Cognos Workspace:

- Ensure that all the objects and pages within the report have meaningful names.

For some objects, such as data containers, Reporting gives the object in a report a default name such as List 1, List2, and so on. In Cognos Workspace, these names appear in the **Content** tree. To help business users recognize the report objects, rename them to something more meaningful (**Properties** pane, **Name** property).

If you do not want an object to be added in a workspace, clear the **Name** property for that object. The object will not appear in the **Content** tree. However, you cannot clear the name of data containers. Reporting requires that data containers have names.

**Note:** Cognos Workspace does not support tables and blocks. Unsupported objects do not appear in the **Content** tree in Cognos Workspace, even if you specify a name for the object.

- Create a container report that includes all the report objects that workspace users might want to add in a report. Such a report is not meant to be run and does not need to show report objects in a proper layout. It is only used as a container for the various report parts. Each page of a report appears as a folder within the Cognos Workspace **Content** pane.

For example, on one page named Prompts you can insert all the possible prompts that users might want to add to a workspace, and give each prompt a useful business name, such as Value Prompt for Region. On a second page named Charts, you can insert a number of charts useful for workspaces.

- Ensure that the titles and labels used in your report are understandable by business users.
- Ensure that you use report objects that are well suited for dashboards. They convey the most information in as little space as possible. For example, if you include a chart, use bullet charts, microcharts, line charts, or column and bar charts. Use conditional blocks to show business indicators.
- If your report includes charts, customize the font sizes so that the charts appear correctly in a dashboard. You may need to reduce the font sizes.
- If your report includes embedded objects, such as a list with an embedded chart and crosstab, the embedded objects do not appear in the Cognos Workspace **Content** pane, unless the embedded objects are in a table object. When you insert an object that contains embedded objects, the embedded objects will be inserted in the workspace.

When embedded objects are in a table object, the embedded objects appear in the **Content** pane. Table objects do not appear in the **Content** pane because Cognos Workspace does not support Cognos Analytics - Reporting table objects. Consequently, you can insert the embedded objects in a workspace, but not the table.

- If your report includes a map, customize the colors of the map in Reporting so that they match the color palette of the dashboard. You cannot edit the color palette of a map from within a workspace in Cognos Workspace.
- If your report is using a dimensional data source and you enable drill-up and drill-down, in the **Drill Behavior** window, specify that the column title uses member caption values.

Cognos Workspace does not support drill up and drill down with level label values as the column titles. Cognos Workspace always uses member captions.

#### Related tasks

[Create a drill-up and drill-down report](#)

## Prompts in workspaces in Cognos Workspace

A prompt control, when assigned a **Name** property in IBM Cognos Analytics - Reporting, appears as an object that you can insert from the **Content** pane in a workspace in IBM Cognos Workspace.

If a workspace includes reports and report parts from the same model, prompts automatically filter the appropriate data item in all the widgets in the dashboard. For example, a prompt filters on Product Line. Any widget in the dashboard that includes the Product Line data item is filtered when you select a value from this prompt control. If you do not want a prompt to control a widget in the dashboard, you can disable communication between the two widgets.

If a dashboard includes prompted reports or report parts from different models, ensure that the prompts use the same parameter names. For example, a year prompt should use the same parameter **p\_Years** in reports from both models. Otherwise, the prompt control is unable to control reports from another package.

## Enable filters in workspaces in Cognos Workspace

You can include a data item in the query of the report, but not show that data item in the actual report. This is useful for creating calculations and filters. If you want IBM Cognos Workspace users to filter content in a workspace based on a data item that is not visible in the report, you must include this data item in its own query and name it **\_BusinessInsight\_** within the IBM Cognos Analytics - Reporting report. Therefore, the data item must exist in both the query used for the data container (such as the list, crosstab, or chart) and in this separate query.

For example, a chart shows the revenue for the product lines for each region. You want to filter the chart to show only data for the year 2012. When you author the report, in addition to including Year in the Query1 used for the chart data container, you create a new query named **\_BusinessInsight\_** that includes Year.

### Procedure

1. Click the **Queries** icon , and then click **Queries**.
2. Click the **Toolbox** icon , and drag a **Query** object to the work area.
3. Click the **Query** object, click the **Show properties** icon , and in the **Properties** pane, in the **Name** box, type **\_BusinessInsight\_**.
4. Double-click the **Query** object, click the **Data** icon , and from the **Source** tab , add the data item to use as a filter.

Ensure that the same data item also exists in the query used for the data container.

## Creating Reports for IBM Cognos for Microsoft Office

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IBM Cognos for Microsoft Office provides an integrated environment for IBM Cognos products and Microsoft Office. You can use IBM Cognos for Microsoft Office to select pieces of reports to embed in Microsoft Excel workbooks, Microsoft Word documents, or Microsoft PowerPoint presentations, including data, metadata, headers, footers, and charts. You can use predefined reports or you can create new content using IBM Cognos PowerPlay® Web, IBM Cognos Query Studio, or IBM Cognos Analytics - Reporting.

**Note:** Note that to access PowerPlay content, your administrator must configure PowerPlay to work with IBM Cognos Analytics. PowerPlay content that is published only to Upfront is not available to IBM Cognos for Microsoft Office.

Because IBM Cognos for Microsoft Office cannot fully convert highly formatted reports into Excel or other Microsoft document output types, you may not get the results that you want.

To create effective reports for IBM Cognos for Microsoft Office, follow these recommendations:

- Create content to meet specific Microsoft Office integration needs.

For example, in IBM Cognos Analytics, many options are available to format data. Use less formatting to make data more accessible to Office applications.

- Organize reports.

You can publish workbooks to the Cognos Analytics portal and organize them with your reports in **Team content** or **My content**. For more information, see the *IBM Cognos Analytics Getting Started Guide*. By organizing your content, you can quickly retrieve the information that you want.

**Tip:** Workbooks, documents, and presentations that are enabled for IBM Cognos for Microsoft Office are identified by their own unique icons, helping you to distinguish them from other types of files.

- Optimize report templates for Microsoft Office.

If you rely on IT personnel or other report authors to create content, request report templates that are optimized for your Microsoft Office integration needs. You may want to request only the data elements or queries that you need and request minimal formatting so that you can more easily use Microsoft Office formatting capabilities with the IBM Cognos content. For example, reports authored in Cognos Analytics - Reporting can contain list objects embedded within list objects with specific formatting applied. When converted to the tabular representation available in Excel, these reports may not be rendered in the same way in which they appear in IBM Cognos Analytics.

- Format elements in the Office application.

Instead of formatting objects in IBM Cognos Analytics, add the formatting in the Office application. By applying less formatting in IBM Cognos Analytics, you can import more data into the desired locations.

- Label report elements using descriptive names.

This practice makes them more easier to find after you import them. Examples of report elements include lists, crosstabs, and charts.

- Do not nest report objects.

If you nested report objects, some objects may not appear in the correct location, or they may not appear at all. In addition, nesting report objects may cause the following error message to appear:

*RDS-ERR-1000 Report Data Service could not process from the content provider.*

For example, this error occurs if a repeater or repeater table is inside a block or table. It also appears when layout objects, such as lists, crosstabs, and charts, are in a conditional block that is inside another block or table.

- Keep table sizes small.

For example, because of the size of slides, the maximum number of rows and columns that you can have in Microsoft PowerPoint tables is 25. Although Word and Excel permit larger tables, it takes more time to download and render them.

- Use images with transparent backgrounds.

The background will show through the image in the Office application, making the image look like part of the presentation. If you want, you can then supply your own background color.

- Specify the height and width of images in a list.

This practice ensures that the image appears in the correct size in the Office application.

- Remember that graphs and charts are imported as images.

Images in IBM Cognos Analytics have image maps associated with them to enable tooltips and hotspots. IBM Cognos Analytics for Microsoft Office cannot import tooltips and hotspots into Office applications.

- Consider the additional limitations that exist when producing reports in Excel format.

## Creating Reports for Mobile Devices

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You can send IBM Cognos Analytics - Reporting reports to mobile devices that have IBM Cognos Mobile installed, or that are using the IBM Cognos Mobile Web portal.

## The IBM Cognos Software Development Kit

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When you create a report, you are creating a report specification.

A report specification is an XML file that you can view (**Pages** icon  or the **Queries** icon , right-click the **Report** icon , and click **Show Specification** ).

You can also programmatically create or modify reports by using an editing tool to work with report specifications. You then use the IBM Cognos Software Development Kit to implement the reports in your IBM Cognos Analytics environment. This is useful if, for example, you must make the same modification in many reports. Rather than opening each report and making the change, you can automate the process using the Software Development Kit, thereby saving you time. For more information about the Software Development Kit, contact your local sales office.

### Tips

- When you are viewing the report specification, you cannot modify or copy parts of it.
- You can also modify the XML code in a report specification by saving the report specification on your computer.

# Chapter 3. Lists

Use lists to show detailed information from your database, such as product lists and customer lists.

A list shows data in rows and columns. Each column shows all the values for a data item in the database or a calculation based on data items in the database.

Product line	Quantity
Camping Equipment	27,301,149
Golf Equipment	5,113,701
Mountaineering Equipment	9,900,091
Outdoor Protection	12,014,445
Personal Accessories	34,907,705
<b>Overall - Summary</b>	<b>89,237,091</b>

You can specify whether to automatically add an overall aggregate summary in the list footer and a summary for any groups in the list by selecting **Automatic group and summary behavior for lists** in the IBM Cognos Analytics - Reporting [options](#). The default aggregation as specified in your enterprise data source is used.

**Tip:** The Order Invoices - Donald Chow, Sales Person sample report in the GO Sales (query) package includes a list.

## Related tasks

[Change a List into a Crosstab](#)

## Set list properties

Format lists to give them the appearance you want. You can specify formatting for individual column titles or bodies or for all columns in a list. When you specify formatting for all columns in a list, the formatting is automatically applied to new columns you subsequently add.

You can also quickly format lists by applying table styles.

Formatting for specific columns overrides formatting for entire columns. For example, you specify red as the background color for a specific column body and green as the background color for all columns. When you run the report, the specific column body is red and the remaining columns in the list are green. New columns added to the list will be green.

## Procedure

1. To format an individual column, do the following:

a) Click the column title or column body.

b) To format the text in the column title or the data in the column body, click the **More** icon  , click the **Locked** icon  and then click the title or body.

c) To format the whole column, click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **List column**.

d) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background color** and choose the color.

2. To format all columns, do the following:

- a) Click a column in the list.
- b) To format list column bodies, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns body style**.
- c) To format list column titles, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns title style**.
- d) To format entire columns, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns**.
- e) To format the entire list, click the select ancestor button in the title bar of the **Properties** pane and click **List**.

**Tip:** You can also click the container selector (three orange dots) of the list to select it.

- f) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background color** and choose the color.

#### Related concepts

[Laying Out a Report](#)

## Hide columns in list reports

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You can hide columns from the output of list reports. If you select to hide a column, the query for that column is still executed.

#### Procedure

1. Select the column that you want to hide.
2. Click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **List column**.
3. Set the **Render** property to **No**.

#### Results

When you run your report, the column is hidden in the report output.

## Creating a scrollable list

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**11.0.6**

Create a scrollable list so that column headings remain visible when the list contains many rows of data.

#### Procedure

1. Select the entire list by clicking the container selector (three orange dots) of the list.
2. In the IBM Cognos Analytics toolbar, click the **Show properties** icon .
3. In the properties sheet of the list, specify the height of the scrollable area, in pixels, that you want by typing a value in the **Scrollable area height** property.

## Using Repeaters

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Use repeaters to repeat items when you run the report. For example, you can use repeaters to create mailing labels, including customer names and addresses.

To build a repeater, drag the **Repeater** or **Repeater table** object from the **Toolbox** tab to the work area. Use repeaters to repeat items across a single row without a particular structure. For example, you want to create a list that contains Year, and Product line. For each year, you want all product lines to appear in a

single row. To do this, create a list with Year as a column and with a repeater as a second column. Then insert Product line into the repeater. Use repeater tables to repeat items in a table structure. Drop the items in the repeater, and modify the properties of the repeater to obtain the results you want. For example, you can specify how many frames appear per page in a repeater table by typing values in the **Across** and **Down** properties.

Horizontal pagination is not supported for data containers, such as lists or crosstabs, that are nested in repeater tables.



# Chapter 4. Crosstabs

Use crosstab reports, also known as matrix reports, to show the relationships between three or more query items. Crosstab reports show data in rows and columns with information summarized at the intersection points.

For example, the following crosstab shows the gross profit and revenue by product line for each year.

		2013			2012
		Gross profit	Revenue	Cost of Goods Sold	Gross profit
Mountaineering Equipment	Climbing Accessories	\$15,110,667.58	\$29,483,205.87	\$14,372,538.29	\$15,286,177.75
	Tools	\$18,683,965.74	\$44,578,458.74	\$25,894,493.00	\$21,981,831.82
	Rope	\$12,487,333.44	\$39,444,903.89	\$26,957,570.45	\$14,677,667.24
	Safety	\$10,436,847.43	\$28,014,081.20	\$17,577,233.77	\$12,287,850.59
Outdoor Protection	First Aid	\$450,357.59	\$846,984.93	\$396,627.34	\$923,995.66
	Sunscreen	\$930,913.91	\$1,561,978.22	\$631,064.31	\$2,006,172.66

**Tip:** The Same Month Prior Year sample report in the Sales and Marketing (cube) package includes a crosstab.

## Related tasks

[Insert a Microchart into a Crosstab](#)

## Crosstab Nodes and Crosstab Node Members

When you add data items to crosstabs, you create crosstab nodes and crosstab node members. These objects allow you to easily create crosstabs, by dragging data items to crosstabs.

Crosstabs are dimensional objects that have row edges and column edges. Each edge is composed of a set of crosstab nodes. Each crosstab node contains the following:

- One or more crosstab node members.
- Zero or one nested crosstab node, which contains one or more crosstab node members or nested crosstab nodes.

Each crosstab node member refers to a data item that contains an expression to define the members in the crosstab.

The following crosstab contains four crosstab nodes.

(4)

Revenue		<#Year#>		<#Year#>	
		<#Month#>	Total	<#Month#>	Total
(1)	Total	<#1234#>	<#1234#>	<#1234#>	<#1234#>
(2)	<#Product line#>	<#Product type#>	<#1234#>	<#1234#>	<#1234#>
		<#Product type#>	<#1234#>	<#1234#>	<#1234#>
(3)	Average	<#1234#>	<#1234#>	<#1234#>	<#1234#>

- Crosstab node 1 contains a single node member for the total. This node refers to the data item Total(Product line).
- Crosstab node 2 contains a crosstab node member that refers to the data item Product line. This member has a nested crosstab node containing a crosstab node member that refers to the data item Product type.
- Crosstab node 3 contains a single node member for the average. This node refers to the data item Average(Product line).
- Crosstab node 4 contains a crosstab node member that refers to the data item Order year. This member has two nested crosstab nodes. The first node contains a crosstab node member that refers to the data item Order month. The second node contains a crosstab node member for the total. This node refers to the data item Total(Order month).

**Tip:** Nodes are also created when you add data items to charts.

### Moving Crosstab Nodes

Crosstab nodes can be placed anywhere in the crosstab. For example, in the previous diagram, you can drag **Order month** under **Average** to create a row edge.

To move nested items from one edge to another, ensure that you select the crosstab node and not the crosstab node member. For example, in the previous diagram, you want to move **Product line** and **Product type** to the column edge. To do this, click **Product line** and, in the **Properties** pane, click the select ancestor button  and click **Crosstab Node**. Both **Product line** and **Product type** are selected.

### Crosstab Node Creation Option

The IBM Cognos Analytics - Reporting option **Allow crosstab nesting beside individual items** () affects the drag-and-drop behavior in crosstabs. When the option is turned on and you add a data item to a crosstab, the item is created as a crosstab node. In addition, you can nest items under individual items instead of only on the entire crosstab edge. If the option is turned off, the item is created as a crosstab node member to an existing crosstab node.

For example, in the previous diagram, if the option is turned on and you drag **Country or Region** from the  to beneath **Product line**, **Country or Region** becomes a new peer node to **Product line**. If the option is turned off, **Country or Region** becomes a new peer node to **Product line** and has **Product type** as a nested crosstab node. This happens because instead of adding a new node, you are adding a new member to the existing node that already contains **Product line**.

**Tip:** To create discontinuous crosstabs, turn the option on. If you want the items on the edges of crosstabs to be related (contain the same nested items), turn the option off.

## Set Crosstab Properties

---

Format crosstabs to give them the appearance you want. You can specify formatting for rows, columns, and fact cells in a crosstab or for the entire crosstab. When you specify formatting for all rows, columns, fact cells, or the crosstab, the formatting is automatically applied to any new items you add.

If you apply the same styles, such as font color, to crosstab rows, columns, and crosstab intersections, the styles are applied in the following order:

1. crosstab fact cells
2. fact cells in the outermost rows
3. fact cells in the innermost rows
4. fact cells in the outermost columns
5. fact cells in the innermost columns
6. crosstab intersections

The style applied to the last object in the list overrides styles applied to previous objects. In addition, class styles are applied before styles that you apply manually.

You can also quickly format crosstabs by applying table styles and add white space to a crosstab by inserting crosstab space objects.

**Tip:** In cases where fact cell formatting applied to rows conflicts with fact cell formatting applied to columns, you can set the **Fact Cells Precedence** property in the **Properties** pane to determine whether the row formatting or the column formatting has precedence. To set this property, click anywhere in the crosstab, click the **Select ancestor** icon in the title bar of the **Properties** pane, and click **Crosstab**. Or you can click the container selector (three orange dots) of the crosstab to select it.

### Procedure

1. To format the entire crosstab, do the following:
  - a) Click anywhere in the crosstab.
  - b) Click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **Crosstab**.
  - c) In the **Properties** pane, set the property value.  
For example, to specify a background color, click **Background Color** and choose a color.
2. To format all rows, columns, or fact cells, click a row, column, or fact cell in the crosstab and then do the following:
  - a) If you clicked a row, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Rows**.
  - b) If you clicked a column, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Columns**.
  - c) If you clicked a fact cell, click the select ancestor button in the title bar of the **Properties** pane and click **Crosstab Fact Cells**.
  - d) In the **Properties** pane, set the property value.  
For example, to specify a background color, click **Background Color** and choose the color.
- Tip:** You can also right-click the row or column and click **Select Fact Cells**.
3. To format all crosstab cells for a specific row or column, do the following:
  - a) Click the row or column.
  - b) Click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Member Fact Cells**.
  - Tip:** You can also right-click the row or column and click **Select Member Fact Cells**.
  - c) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background Color** and choose the color.

4. To format all row or column titles, do the following:

a) Click a row or column title.

b) Click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Rows** or **Crosstab Columns**.

c) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background Color** and choose the color.

5. To format an individual row, column, or intersection, do the following:

a) Click the row, column, or intersection.

**Tip:** To format the data in a row, column, or intersection, click the **More** icon  click the **Locked** icon , and then click the text item to format.

b) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background Color** and choose the color.

### Related concepts

[Laying Out a Report](#)

## Create a Single-Edge Crosstab

Create a single-edge crosstab report to show data in a list-like form. For example, to show the quantity of products sold for each year and for each order method, you could create a crosstab with **Order Year** and **Order Method** as rows and **Quantity** as the measure.

### Procedure

1. Click the **Toolbox** icon , and drag a crosstab object to the work area.

2. From the **Source** tab , drag data items to the **Rows** or **Columns** drop zone.

A black bar indicates where you can drop the data item.

3. Repeat step 2 to insert additional data items:

- If you dragged the data item in step 2 to the **Rows** drop zone, drag the additional items above or below the first item.

- If you dragged the data item in step 2 to the **Columns** drop zone, drag the additional items to the left or right of the first item.

4. To add measures to the crosstab, drag the measures to the **Measures** drop zone.

### Results

When you run the report, a crosstab is produced that has only one edge.

## Create a Nested Crosstab

Nest data in a crosstab report to compare information by using more than one data item in a column or row. For example, a report shows the number of sales by product line for the past fiscal year. You decide to add a data item to further break down the number of sales by quarter.

When nesting columns in a crosstab report, there are four distinct drop zones where you can insert a new data item. The drop zone you choose will define the relationship between the data item and the column.

The following relationships are created when you insert a data item as a row:

- Inserting a data item to the left or right of a column creates a parent-child relationship between them.

When you insert a data item to the left of a column, the data item becomes a parent to the column.

When you insert a data item to the right of a column, the data item becomes a child of the column.

- Inserting a data item above or below a column creates a union relationship between them.

The following relationships are created when you insert a data item as a column:

- Inserting a data item to the left or right of a column creates a union relationship between them.

- Inserting a data item above or below a column creates a parent-child relationship between them.

When you insert a data item above a column, the data item becomes a parent to the column. When you insert a data item below a column, the data item becomes a child of the column.

For example, you have a crosstab with Product line as rows and Quantity and Revenue as nested rows.

For columns, you have Order method with Country or Region as a nested column. In this crosstab,

- Product line is a parent to Quantity and Revenue.
- Quantity and Revenue are peers.
- Order method is a parent to Country or Region.

### Procedure

1. From the **Source** tab , click the data item to add.
2. Drag the data item to the report as a nested column or nested row.  
A black bar indicates where you can drop the data item.
3. Repeat steps 1 to 2 to add other nested columns or rows.

**Tip:** If you add more than one measure to a crosstab, all measures appear as columns. You cannot have one measure appear as a row and another as a column. To make all measures appear as rows, swap columns and rows.

## Creating headers automatically for sets in crosstabs

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You can automatically add header labels on columns and rows when working with sets in a crosstab that uses a dimensional data source. The headers help consumers of the report to understand where the data is in the hierarchy.

Header labels are added only when you add new sets to your crosstab. The labels are not added to existing sets. After you enable this option, it remains on until you disable it, and applies to any new crosstabs that you create.

### Procedure

1. Click the **More** icon , click **Options**, then click the **Report** tab.
2. Select **Automatically create crosstab headers for sets**.
3. Click **OK**.

### Results

Header labels are created in the rows and columns in a crosstab.

## Showing crosstab values as percentages

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When you work with dimensional data sources, you can show crosstab values as a percentage of a summary instead of the actual values. When you show values as a percentage, you can compare the contribution of an item to the whole.

### About this task

You can show crosstab values as a percentage of a summary on the rows, the columns, or the rows and columns. For example, a crosstab has Product line as rows, Year as columns, and Revenue as the measure. You can show the following crosstab values:

- The actual values of Revenue
- A percentage of a summary on Product line
- A percentage of a summary on Year
- A percentage of a summary on Product line, Year

By default, the summary type that is used to calculate the percentages is Automatic summary.

When you show values as a percentage, a percentage measure data item is created.

You can also create a custom percentage calculation. For example, you can show values as a percentage of an intersection (tuple). Or you can show values as a percentage of a different summary type, such as Maximum.

When you show values as a percentage, the fact cells are formatted with the percent data format. When you show the actual values, the fact cells are formatted with the number format. If you modify the data format of the actual values, the change is lost when you switch between showing the actual values and percentage values.

You can show values as a percentage only in crosstabs. If you insert a chart, you cannot fill the chart with data from a crosstab that shows values as a percentage. If you create a chart from a crosstab that shows values as percentages, an empty chart is created in the report.

### Procedure

1. Select the measure for which you want to show values as a percentage.

If there is only one measure in the crosstab, click the crosstab corner.

2. From the report object toolbar, click the **More** icon , click **Show Value As**, and click the percentage values that you want to show.

3. If you click **Custom**, provide the information that is required to calculate the percentage values.

- a) To change the default name of the percentage data item that you are creating, type the new name in the **Name** field.

- b) In the **Percentage based on** box, choose to build the percentage data item based on a summary of sets in the crosstab or based on an intersection (tuple).

- c) If you choose to build the percentage data item based on a summary of sets, in the **Choose sets** box, click the sets that you want to use. Then, click **Summary type** and select the summary that you want to use to calculate the percentage values.

If there is more than one data item on the crosstab edge that you chose for the sets, select which data item that you want to use.

- d) If you choose to build the percentage data item based on an intersection (tuple), click the ellipsis and select the items that you want to use to create the intersection.

- e) Click **OK**.

4. To edit a measure percentage data item, follow these steps.

- a) Select the measure.

- b) From the report object toolbar, click the **More** icon, click **Show Value As > Edit**.
- c) Modify the information for the data item as described in step 3.
- d) If you replaced a set in the crosstab with a different set, in the **Choose sets** box, click **Existing sets** when you want to base the percentage values on the set that you replaced.

#### **Related tasks**

[Create an Intersection \(Tuple\)](#)

## **Specify the Default Measure**

---

You can specify the default measure for crosstabs and certain chart types. Specify the default measure to be used when the measures cannot be determined by what is on the edges. For example, you create a crosstab with Order method as rows and Product line as columns. You add Quantity and Revenue as nested rows, making Order method their parent. You then add Country or Region under Order method. Since there is no measure specified for Country or Region, you specify the default measure so that data is returned for each country or region.

**Note:** In crosstabs, IBM Cognos Analytics - Reporting automatically sets the default measure when you insert a measure into the crosstab cells.

#### **Procedure**

1. To specify the default measure for a crosstab, do the following:
  - Click any part of the crosstab, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.
  - Click **Crosstab**.

**Tip:** You can also click the container selector (three orange dots) of the crosstab to select it.

  - Set the **Default Measure** property to the default measure.
2. To specify the default measure for a chart, drag the measure to the **Default measure** box in the chart.

## **Swap Columns and Rows**

---

Swap columns and rows to look at information from a different perspective. This may help you discover high and low points in the data that you hadn't previously noted.

You can only swap columns and rows in a crosstab or chart. In a chart, you swap the x- and y-axes.

#### **Procedure**

From the toolbar, click the swap rows and columns button .

#### **Results**

In the report, the rows become the columns and the columns become the rows.

## **Indent Data**

---

You can indent crosstab node members to set them apart from surrounding data.

When you insert a hierarchy in rows, all members are automatically indented according to their level. By default, the first member in a set is not indented. If you insert a hierarchy in columns, the members are not automatically indented. You can change the indentation properties of members in the report.

Relative indentation means that the member will shift by one tab when the member's level increases relative to the previous member in the hierarchy.

Indenting based on the level in the hierarchy means that the member will shift the number of tabs equivalent to the level in the hierarchy.

You can also indent objects by applying padding.

#### **Procedure**

1. Click the crosstab node member to indent.
2. In the **Properties** pane, set the **Level Indentation** property to your indentation type, length, and direction.

## **Change a List into a Crosstab**

---

Change a list into a crosstab to view your data from a different perspective.

#### **Procedure**

1. Click the columns to appear as columns or nested columns in the crosstab.
2. From the report object toolbar, click the **Pivot List to Crosstab** icon.

#### **Results**

The list becomes a crosstab with the columns you selected in step 2 appearing as columns and nested columns. The unselected columns, except for measures, appear as rows and nested rows. If you have one measure, it becomes the cells of the crosstab. If you have more than one measure, they appear as columns.

**Tip:** To make all measures appear as rows, swap columns and rows.

# Chapter 5. Charts

You can use IBM Cognos Analytics - Reporting to create many chart types, such as column, bar, area, and line charts.

## Current Default Charts and Legacy Charts

IBM Cognos Analytics - Reporting has a new default chart technology as of version 10.1.0.

You will find procedures in this chapter for using both the legacy charts and the current default charts. To use the legacy chart type, set the **Use legacy chart authoring** option (**More > Options > Advanced** tab).

### Related concepts

[Limitations When Converting Legacy Charts](#)

### Related tasks

[Convert Legacy Charts to Current Default Charts](#)

## Creating Charts

Before creating charts, review the available chart types to select the best chart for your needs. Also review the chart objects that make up charts.

**Tip:** [11.0.5](#) To view the available chart types, add a **Visualization** object from the **Toolbox** pane  to an existing report. In the **Visualization gallery** window, click the **Filter** icon , and select **Charts**.

To create charts, drag data items from the **Source** tab  to the measures, data series and categories drop zones.

**Note:** When you are working with dimensional data sources, do not insert member properties in the series or categories of a chart. By default, IBM Cognos Analytics - Reporting groups items that are inserted in these areas. Grouping member properties produces a warning when you validate the report.

To help you when creating charts, you can do the following:

- Preview your chart style changes.

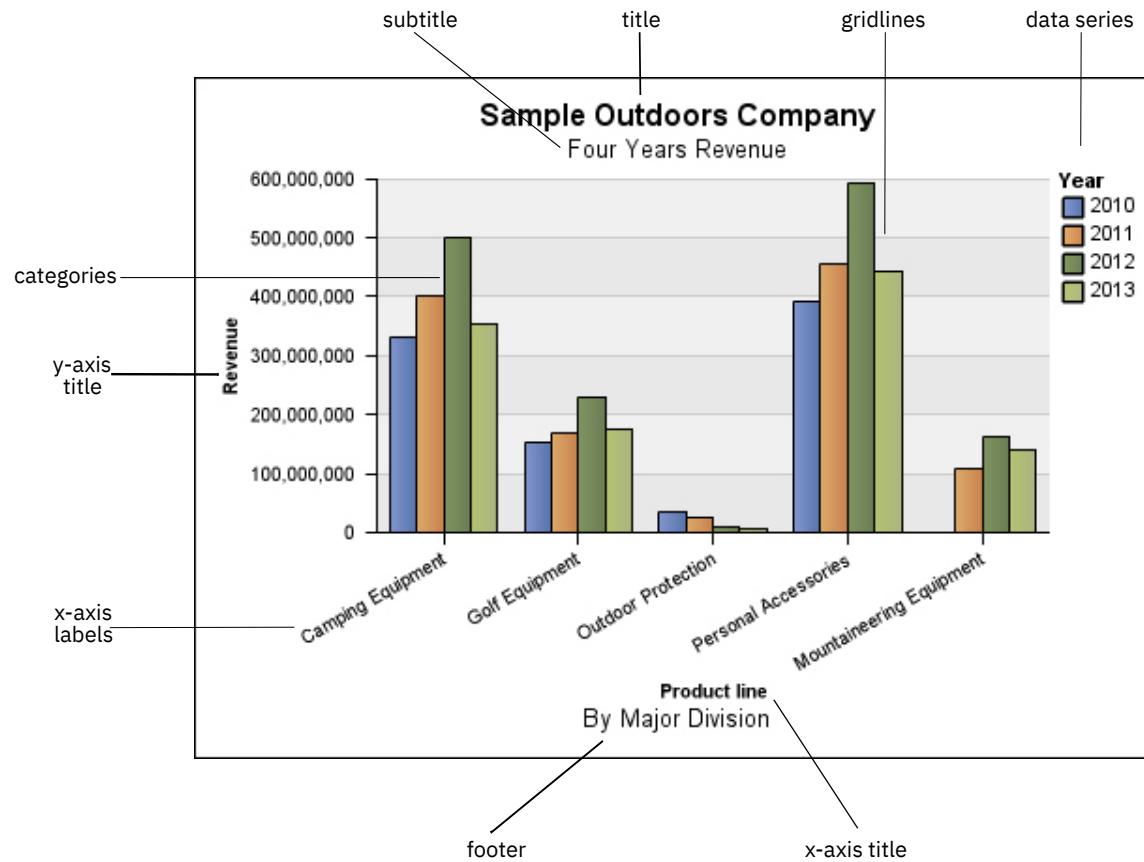
As you author your chart and edit the chart properties, IBM Cognos Analytics - Reporting provides you with a preview of your chart, using simulated data. This allows you to view your style changes without running your report. You need to run your report to see the chart with your actual data. You can disable the chart preview in the options.

- Resize your charts.
- Move the chart drop zones into flyouts so that they appear only when you pause your pointer over the chart.

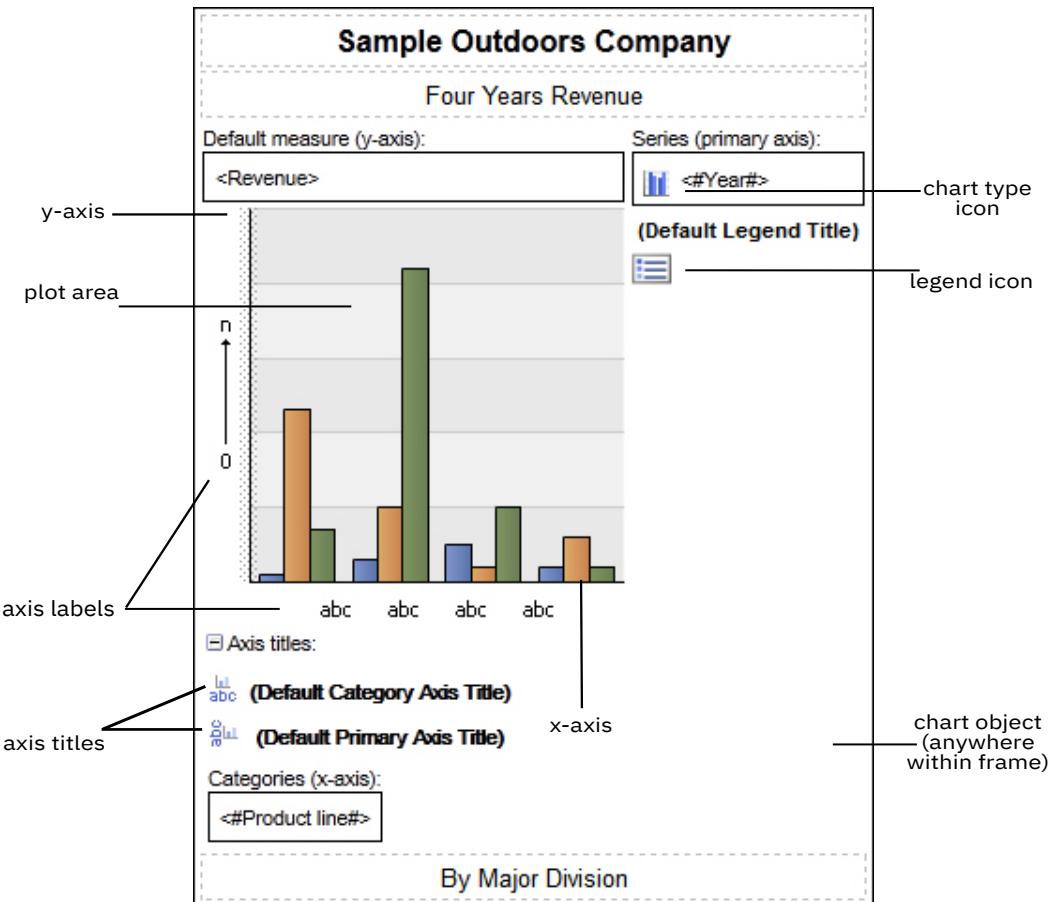
After you create a basic chart, modify the various chart objects to customize your chart.

## Chart Objects

The following shows the most common chart objects as they appear in your report output in IBM Cognos Viewer.



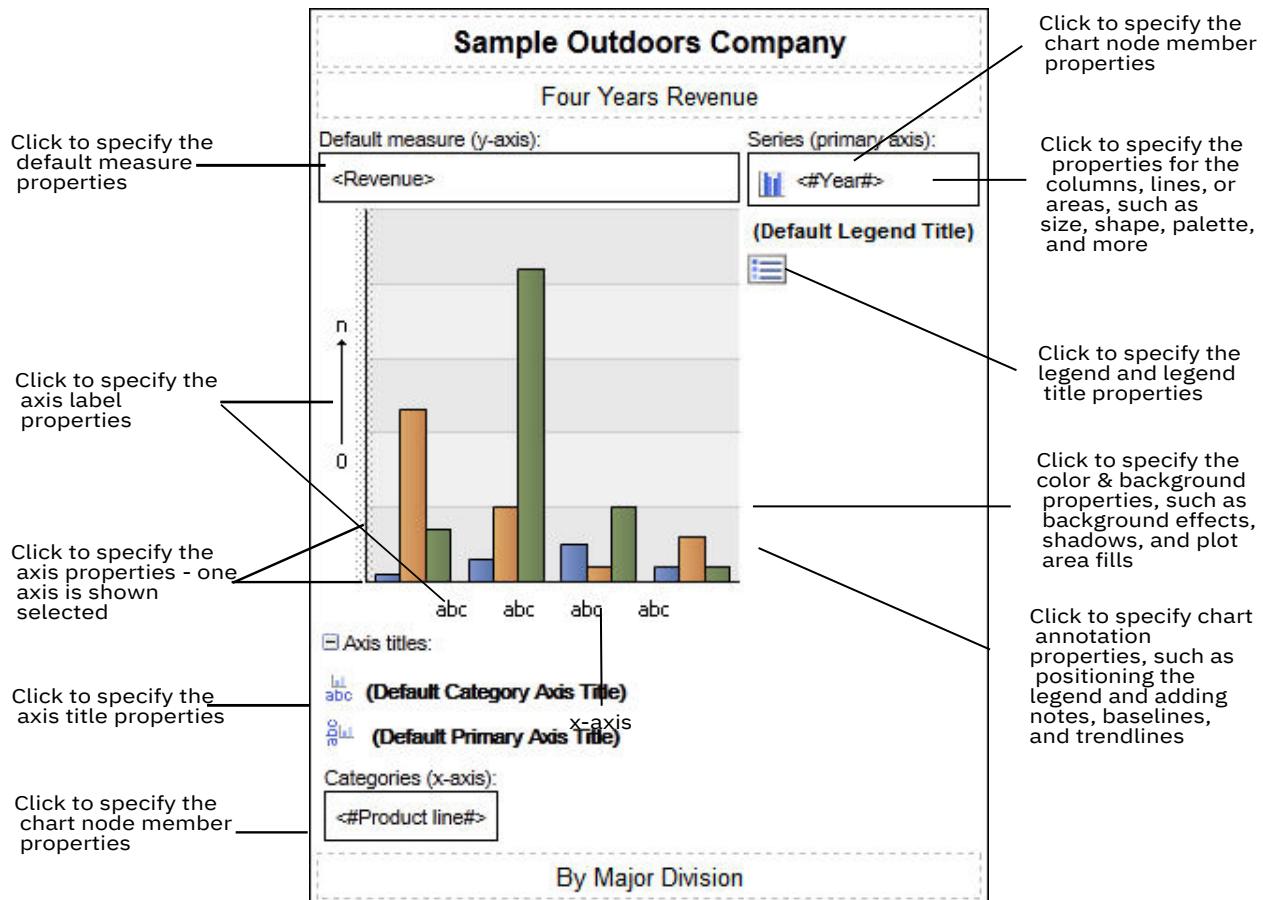
The following shows the same chart as it appears in the IBM Cognos Analytics - Reporting user interface. The Y-axis is selected, and the axis titles are displayed.



### Click chart objects to specify properties

The default charts have more properties that allow you to customize more aspects of the chart than in earlier versions. You can click in different areas of the chart to get access to different properties.

For example, by clicking the axis, you can customize the color, style, weight, and transparency of chart axis lines and specify where to display major and minor gridlines on the chart.



## Data Series

A data series is a group of related data points that are plotted in a chart. Each series has a unique color or pattern and is described in the legend. You can plot one or more data series in a chart; pie charts have only one data series.

In the example chart, the data series are order years 2010, 2011, 2012, and 2013.

## Categories

Categories are groups of related data from the data series that are plotted on the X-axis. Categories of multiple data series are shown together using clustered and stacked data markers.

In the example chart, the categories are the product lines of The Sample Outdoors Company in clustered columns.

## Axes

Axes are lines that provide references for measurement or comparison.

The primary axis (or Y-axis) refers to measures of quantitative data, such as sales figures or quantities. Charts can have more than one primary axis.

The category axis (X-axis or ordinal axis) plots qualitative data, such as products or regions. It runs horizontally, except in bar charts.

The z-axis is the vertical axis in a 3-D chart.

Major gridlines extend from the tick marks on an axis and run behind the data markers.

## Related concepts

[Customizing the Axes of a Chart](#)

## **Legend**

A legend is a key to the patterns or colors assigned to the data series or categories in a chart.

## **Columns, Lines, and Areas**

Charts use graphical elements such as columns, horizontal bars, points, bubbles, lines, and areas as visual representations of data points.

# **Chart Types**

---

IBM Cognos Analytics - Reporting provides many types of charts for presenting your data in a way that is meaningful for your users.

You can select from a variety of chart types (such as pie, bar, line, gauge, scatter, and so on) and you can select from a variety of chart configurations (such as stacked columns, 3-D pies). Combination charts allow you to use more than one chart type within your chart.

Some chart types are not supported for Microsoft Excel output or appear differently in Excel. For more information, see [Appendix C, “Limitations When Producing Reports in Microsoft Excel Format,” on page 399.](#)

## **Choosing a Chart Type and Configuration**

To choose a chart type, consider what you want the chart to illustrate. Different chart types and configurations emphasize different things.

Purpose	Chart type or configuration
Show contributions of parts to a whole	<a href="#">Bar Charts</a> <a href="#">Pie Charts</a> <a href="#">Stacked Charts</a> , when you want to display measures of the whole, as well as the parts <a href="#">100 Percent Stacked Charts</a>
Show trends in time or contrast values across different categories	<a href="#">Line Charts</a> <a href="#">Area Charts</a> <a href="#">Bar Charts</a> <a href="#">Column Charts</a> Always place time in the horizontal axis.
Compare groups of related information against actual values	<a href="#">Bar Charts</a> <a href="#">Radar Charts</a>
Compare different kinds of quantitative information	<a href="#">Combination Charts</a>
Rank values in descending or ascending order	<a href="#">Bar Charts</a> <a href="#">Column Charts</a>
Show correlation between two sets of measures	<a href="#">Point Charts</a>
Show key performance indicators in an executive dashboard report	<a href="#">Gauge Charts</a> <a href="#">Bullet Charts</a>

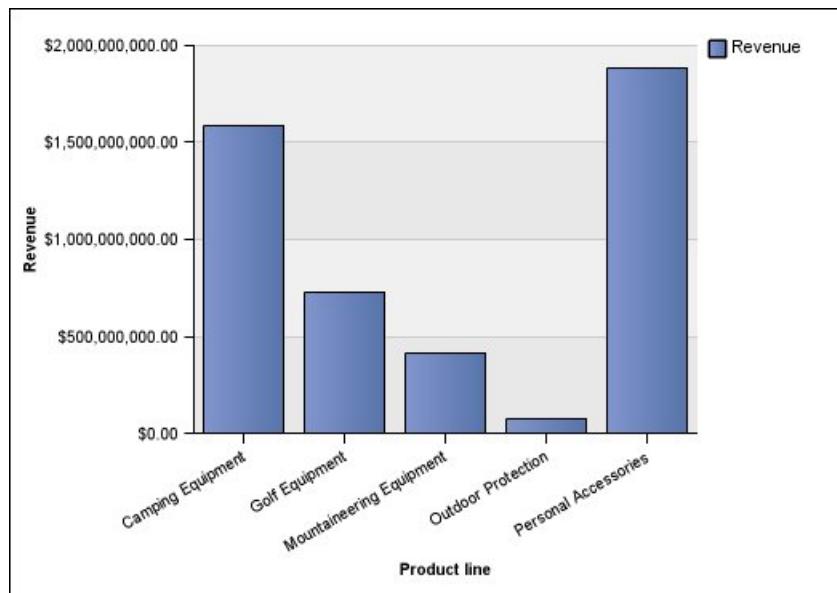
## Column Charts

Column charts are useful for comparing discrete data or showing trends over time.

Column charts use vertical data markers to compare individual values.

**Note:** The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes a column chart.

The following example shows the revenue for each product line.



Column charts can plot data using [standard](#), [stacked](#), [100 percent stacked](#), and [three-dimensional](#) configurations.

## Line Charts

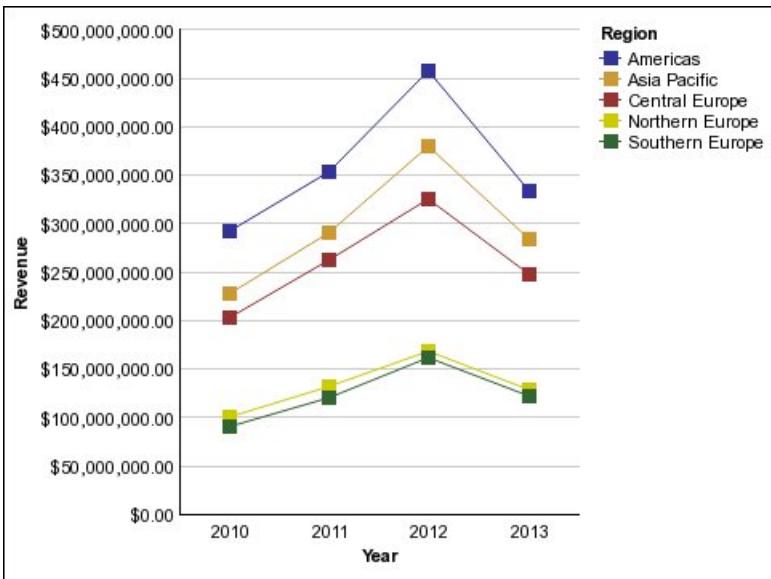
Line charts are useful for showing trends over time and comparing many data series.

Line charts plot data at regular points that are connected by lines.

Line charts can plot data by using [standard](#), [stacked](#), [100 percent stacked](#), and [three-dimensional](#) configurations. It is best not to use stacked line charts because they are difficult to distinguish from unstacked line charts with multiple data series.

**Note:** Line charts support a maximum of 32767 data points.

The following example shows a revenue trend that peaked in 2012 in every territory.



**Note:** The Top Retailers by Country or Region sample report in the Sales and Marketing (cube) package includes a line chart.

## Pie Charts

Pie charts are useful for highlighting proportions.

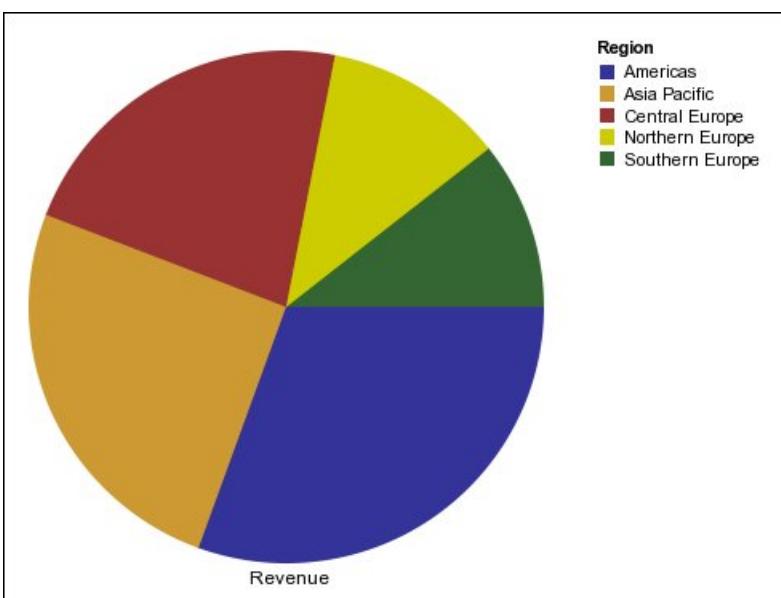
They use segments of a circle to show the relationship of parts to the whole. To highlight actual values, use another chart type, such as a stacked chart.

Pie charts plot a single data series. If you need to plot multiple data series, use a 100 percent stacked chart.

Reports in PDF or HTML format show a maximum of 16 pies or gauges per chart.

**Note:** The Returns by Failed Orders in 2012 sample report in the GO Data Warehouse (analysis) package includes a pie chart.

The following example shows that the largest proportion of revenue comes from the Americas, followed by the Asia Pacific region.



Pie charts can plot data using [standard](#), [100 percent](#), and [three-dimensional](#) configurations.

### Related tasks

[Set the Position of the First Slice in a Current Default Pie Chart](#)

[Creating a Donut Chart from a Current Default Pie Chart](#)

[Pull Out Pie Slices in a Current Default Pie Chart](#)

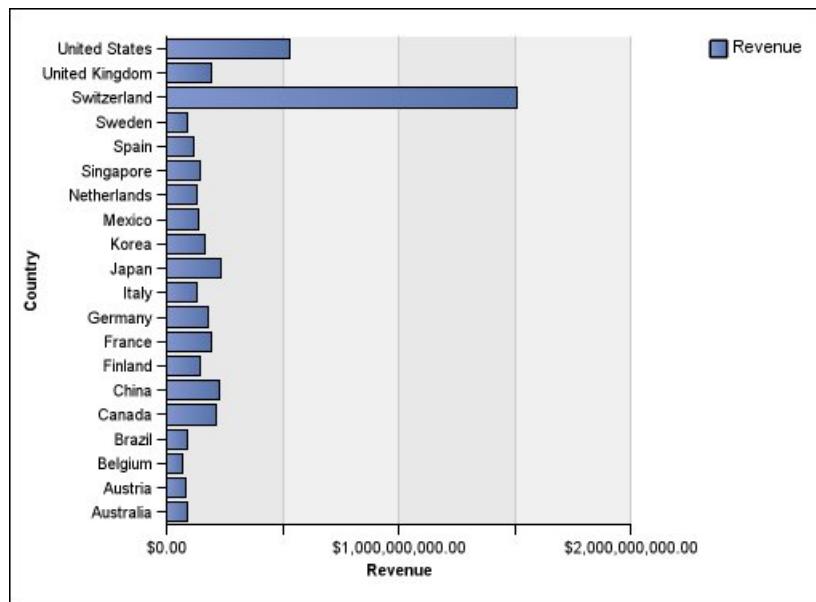
## Bar Charts

Bar charts are useful for showing trends over time and plotting many data series.

Bar charts use horizontal data markers to compare individual values.

**Note:** The Manager Profile sample report in the GO Data Warehouse (analysis) package includes a bar chart.

The following example shows revenue for every country or region.



*Figure 2. Bar chart*

Bar charts can plot data using [standard](#), [stacked](#), and [100 percent stacked](#) configurations.

## Area Charts

Area charts are useful for emphasizing the magnitude of change over time. Stacked area charts are also used to show the relationship of parts to the whole.

Area charts are like line charts, but the areas below the lines are filled with colors or patterns.

Do not use standard area charts to show multiple data series because it is possible for areas with lower values to be covered by others. For multiple data series, use a stacked area chart.

The following example is a stacked area chart that shows the quantity of products that were sold over a four-year period in multiple territories.

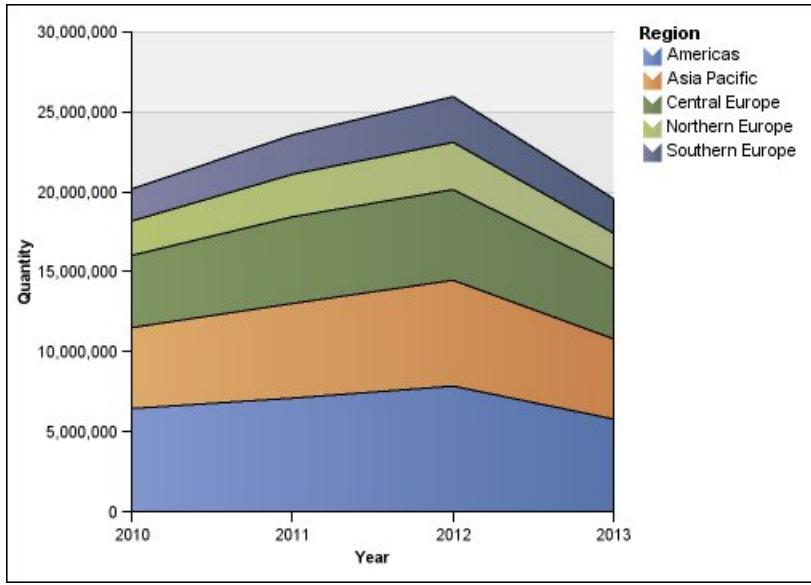


Figure 3. An example area chart

Area charts can plot data using standard, stacked, 100 percent stacked, and three-dimensional configurations.

## Point Charts

Point charts are useful for showing quantitative data in an uncluttered fashion.

Point charts use multiple points to plot data along an ordinal axis. A point chart is the same as a line chart without the lines. Only the data points are shown.

The following example shows the revenue for each product line.

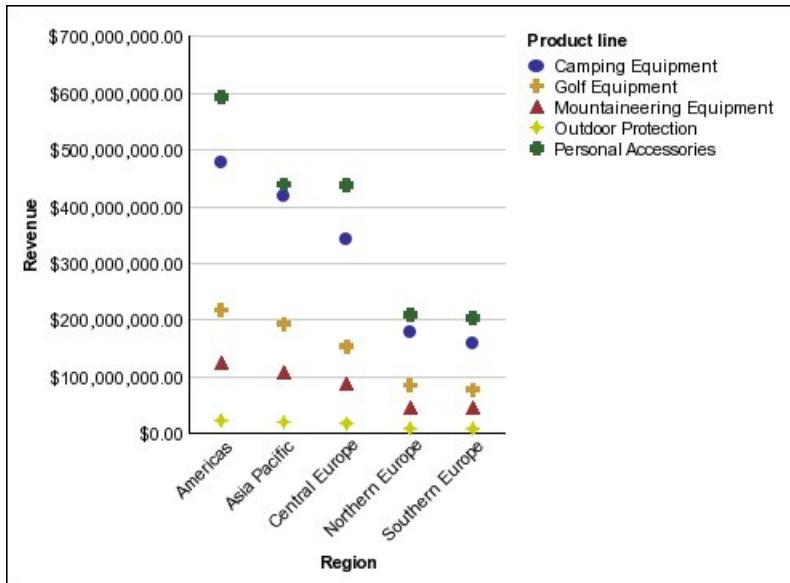


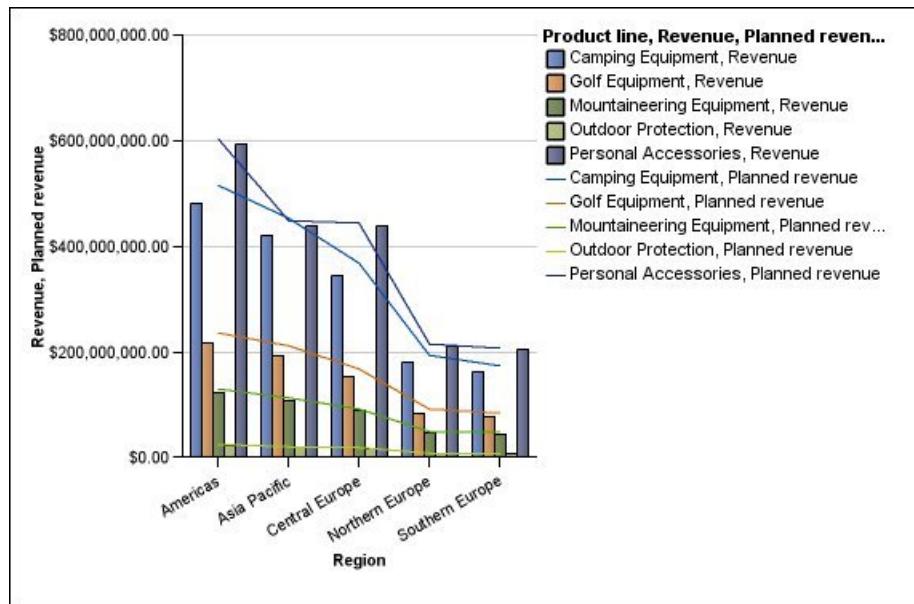
Figure 4. An example point chart

## Combination Charts

Combination charts plot multiple data series by using combinations of columns, areas, and lines within one chart. They are useful for highlighting relationships between the various data series.

**Note:** The Quantity Sold vs. Shipped and Inventory sample report in the GO Data Warehouse (analysis) package includes a combination chart.

The following example shows a combination chart that includes planned revenue as a line chart and actual revenue as a column chart.



Combination charts can plot data using [standard](#), [stacked](#), [100 percent stacked](#), and [three-dimensional](#) configurations.

## Scatter Charts

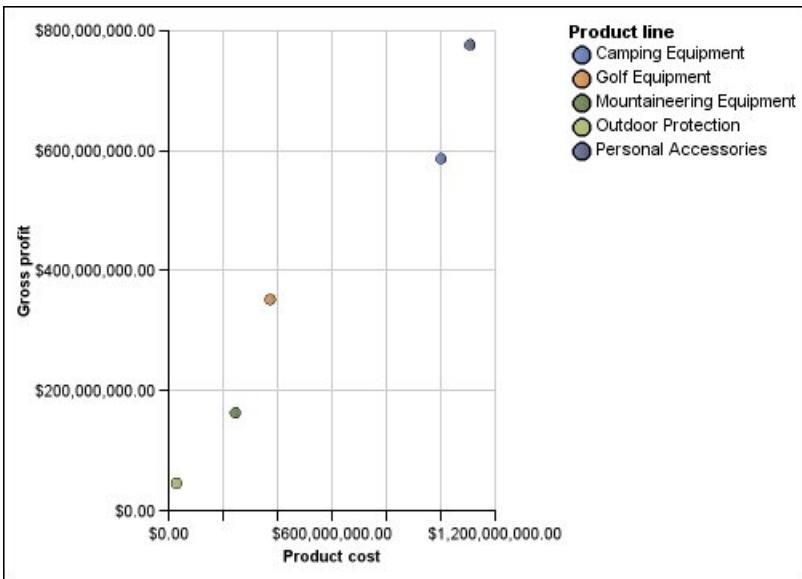
Scatter charts use data points to plot two measures anywhere along a scale, not only at regular tick marks.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure” on page 47](#).

Scatter charts are useful for exploring correlations between different sets of data.

**Note:** The Employee Satisfaction 2012 sample report in the GO Data Warehouse (analysis) package includes a scatter chart.

The following example shows the correlation between production cost and gross profit for each product line.



### Related tasks

[Defining color by value in current default scatter or bubble charts](#)

## Bubble Charts

Bubble charts, like scatter charts, use data points and bubbles to plot measures anywhere along a scale. The size of the bubble represents a third measure.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure” on page 47](#).

Bubble charts are useful for representing financial data. These charts are not supported for Microsoft Excel output.

The following example plots quantity and revenue by product line. The size of the bubble represents the amount of gross profit.

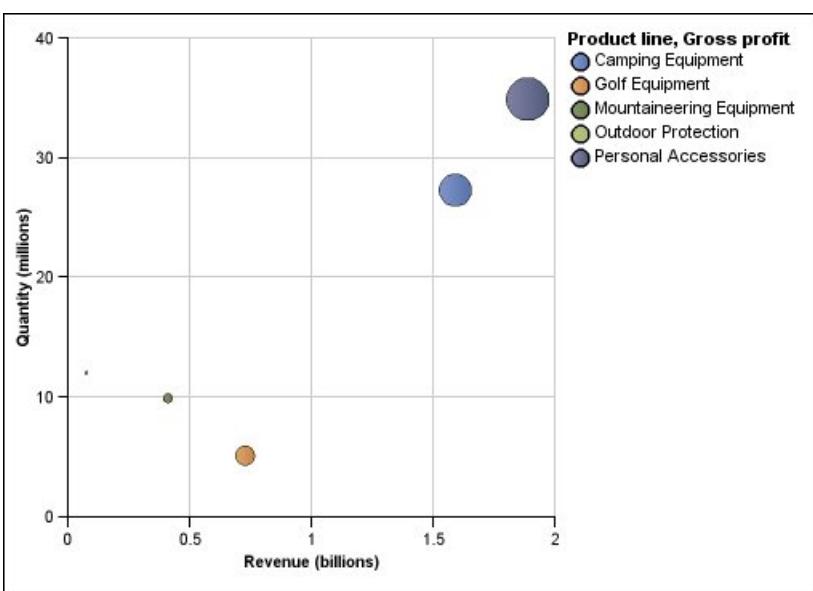


Figure 5. Bubble chart

### Related tasks

[Defining color by value in current default scatter or bubble charts](#)

## Specify the Bubble Size in a Current Default Bubble Chart

### Quadrant Charts

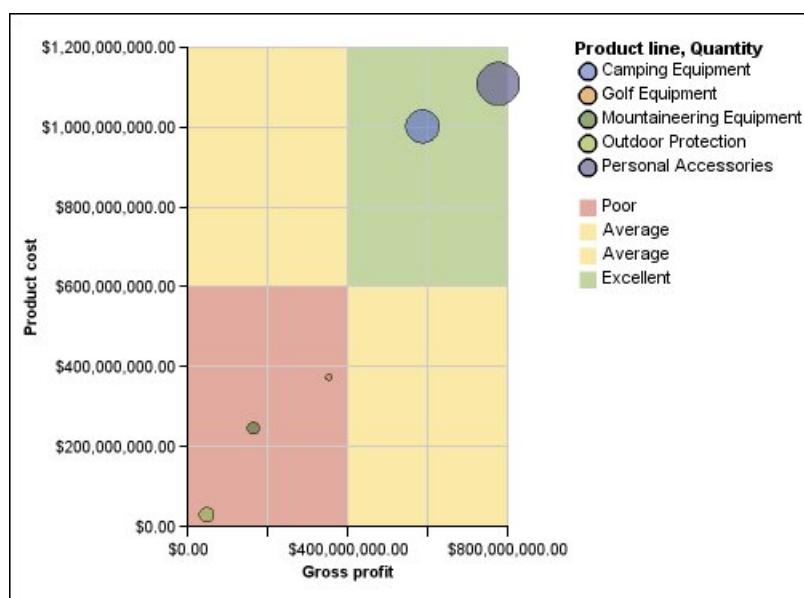
Quadrant charts are bubble charts with a background that is divided into four equal sections. Quadrant charts are useful for plotting data that contains three measures using an X-axis, a Y-axis, and a bubble size that represents the value of the third measure.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure” on page 47](#).

Legacy quadrant charts use baselines to create the quadrants. Current default charts use colored regions.

Use a quadrant chart to present data that can be categorized into quadrants, such as a SWOT (strengths, weaknesses, opportunities, and threats) analysis.

The following example shows the relationship between production cost and gross profit. The size of the bubble represents the quantity of units sold.



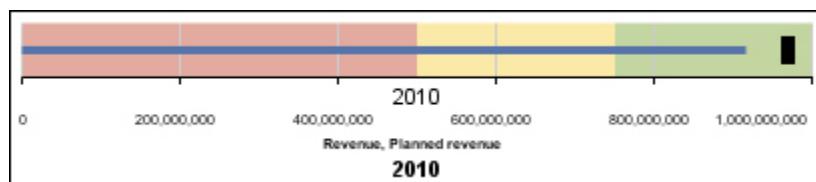
### Bullet Charts

Bullet charts are a variation of bar charts. They compare a featured measure (the bullet) to a targeted measure (the target). They also relate the compared measures against colored regions in the background that provide additional qualitative measurements, such as good, satisfactory, and poor.

Bullet charts are often used instead of gauge charts in executive dashboards. Bullet charts can be horizontal or vertical.

**Note:** This chart type applies only to the current default charts, and does not apply to the legacy charts.

The following figure is an example of a bullet chart.



*Figure 6. An example bullet chart*

A bullet chart contains the following components:

- A bullet measure.

The bullet measure, Revenue, appears as the blue bar in the example.

- A target measure.

The target measure, Planned revenue, appears as the black indicator in the example.

- From zero to five colored regions along the numeric scale to provide information about the featured measures' qualitative state.

The example contains three colored regions, 0-50%, 50-75%, and 75-100%.

- A label that identifies the measures.

- A numeric scale.

#### **Related tasks**

[Customize a Current Default Bullet Chart](#)

## **Gauge Charts**

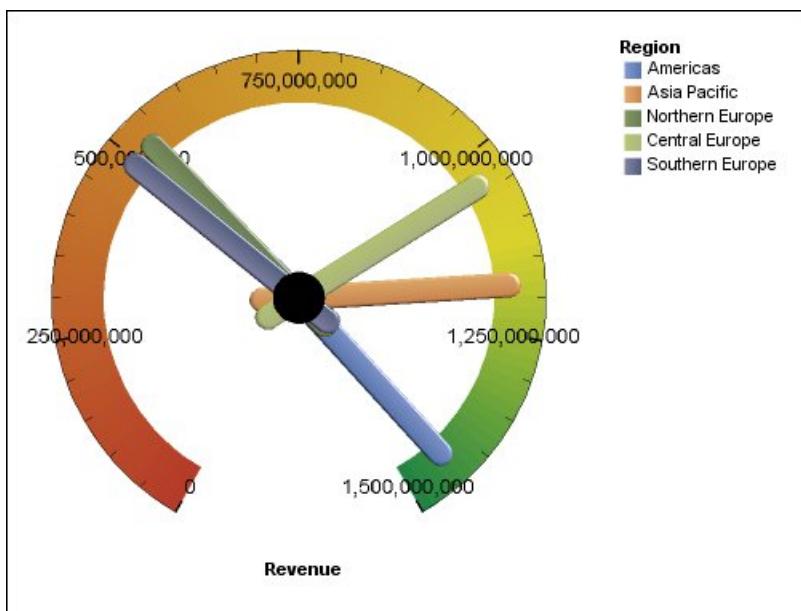
Gauge charts, also known as dial charts or speedometer charts, use needles to show information as a reading on a dial.

On a gauge chart, the value for each needle is read against the colored data range or chart axis. This chart type is often used in executive dashboard reports to show key business indicators.

Gauge charts are useful for comparing values between a small number of variables either by using multiple needles on the same gauge or by using multiple gauges.

Reports in PDF or HTML format are limited to show a maximum of 16 pies or gauges per chart. These charts are not supported for Microsoft Excel output.

A gauge chart consists of a gauge axis (which contains the data range, color ranges, and intervals markers), needles, and a center pivot point. The following example shows a basic gauge chart with default attributes. It is a degree dial chart with two axes.



*Figure 7. An example gauge chart*

#### **Related tasks**

[Customize a Current Default Gauge Chart](#)

[Customize a Legacy Gauge Chart](#)

## Pareto Charts

Pareto charts help you to improve processes by identifying the primary causes of an event. They rank categories from the most frequent to the least frequent. These charts are frequently used for quality control data, so that you can identify and reduce the primary cause of problems.

Pareto charts include a cumulation line, which shows the percentage of the accumulated total of all the columns or bars.

You can create before and after comparisons of Pareto charts to show the impact of corrective actions. These charts are not supported for Microsoft Excel output.

The following example shows that the most frequent reason for product returns is unsatisfactory product.

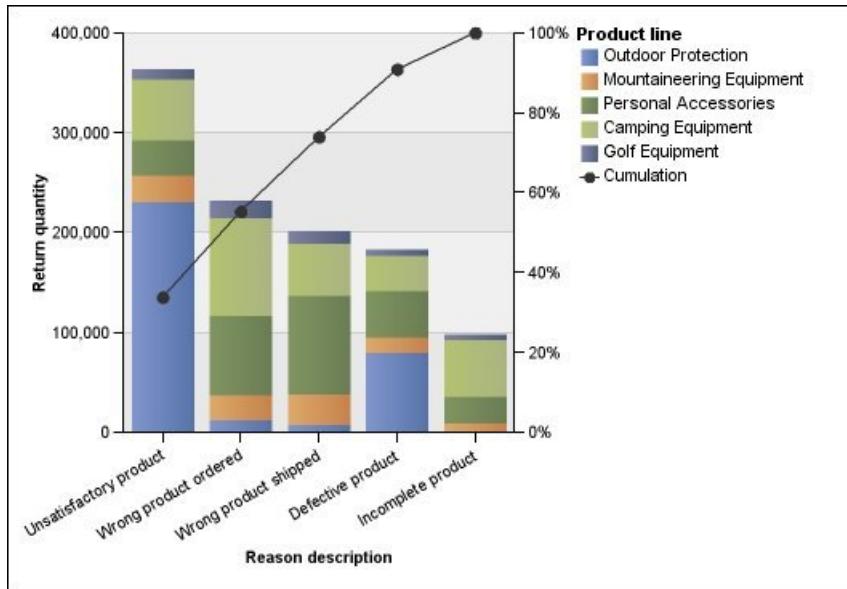


Figure 8. An example pareto chart

You can also create Pareto charts using horizontal bars.

### Related tasks

[Define the Cumulation Line in a Current Default Pareto Chart](#)

[Define the Cumulation Line in a Legacy Pareto Chart](#)

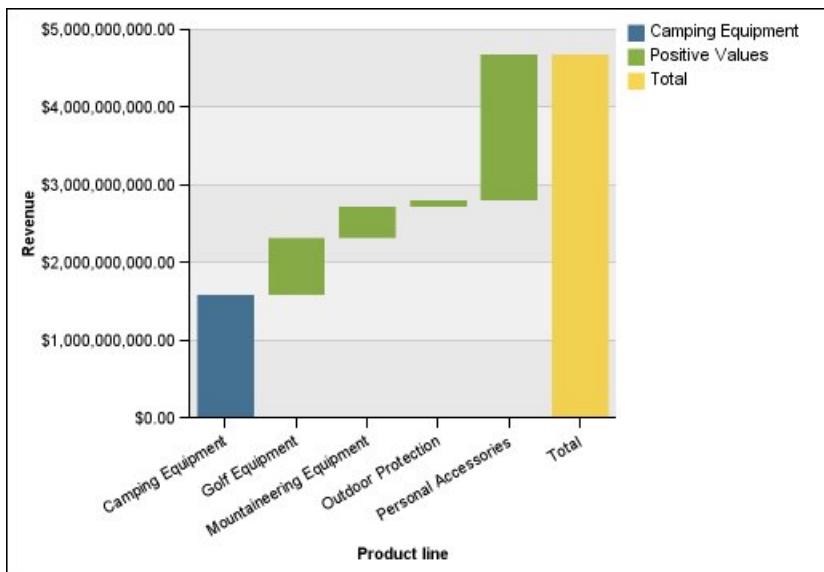
## Progressive Column Charts

Progressive column charts, also known as waterfall charts, are like stacked charts with each segment of a single stack displaced vertically from the next segment.

Progressive column charts are useful for emphasizing the contribution of the individual segments to the whole.

These charts are not supported for Microsoft Excel output.

The following example analyzes the contribution of each product line to revenue.



*Figure 9. An example progressive column chart*

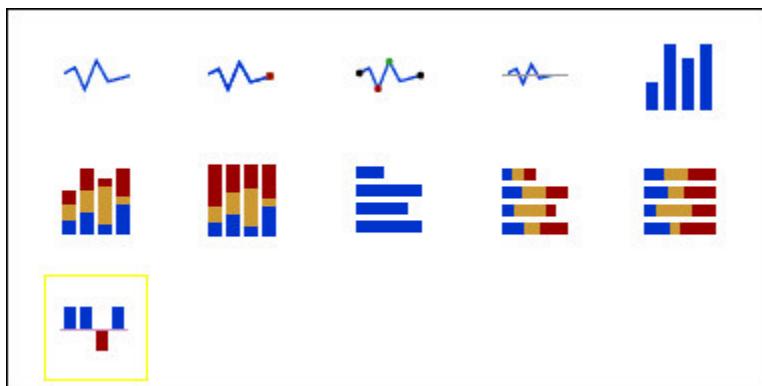
Progressive column charts can plot data using [standard](#) and [three-dimensional](#) configurations. You can also create progressive charts using horizontal bars.

## Microcharts

Microcharts are smaller versions of column charts, bar charts, and line charts that you can use in crosstabs and dashboards. Microcharts include column microcharts and bar microcharts, which are available in stacked and 100 percent stacked configurations, and win-loss charts and modified line charts that contain the following:

- A closing value marker.
- Opening, closing, high, and low value markers.
- A reference line.

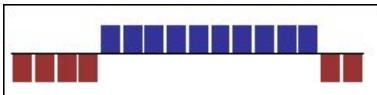
**Note:** If you specify custom labels for a microchart, the custom labels appear in the tooltips, not on the chart itself. For more information about custom labels, see [“Specify Custom Label Text” on page 82](#).



Win-loss charts are microcharts in which the value of each column is either 1 or -1, often denoting a win or loss.

Win-loss charts use two measures (the default and the win-loss measure) and no series. The win-loss measure is the measure or calculation that you define. You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure” on page 47](#).

The following example shows the quarters that have a margin of less than 10,000 in red.



## Marimekko Charts

Marimekko charts are 100 percent stacked charts in which the width of a column is proportional to the total of the column's values. Individual segment height is a percentage of the respective column total value.

The following example shows the contribution of revenues for product lines in different regions.

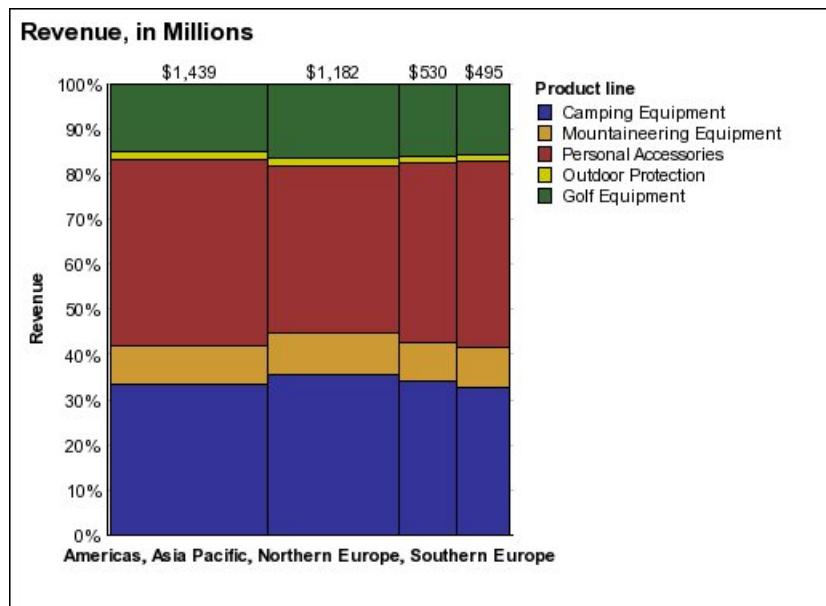


Figure 10. An example Marimekko chart

## Radar Charts

Radar charts integrate multiple axes into a single radial figure. For each figure, data is plotted along a separate axis that starts at the center of the chart.

The following example shows the revenue from multiple retailer types in multiple territories.

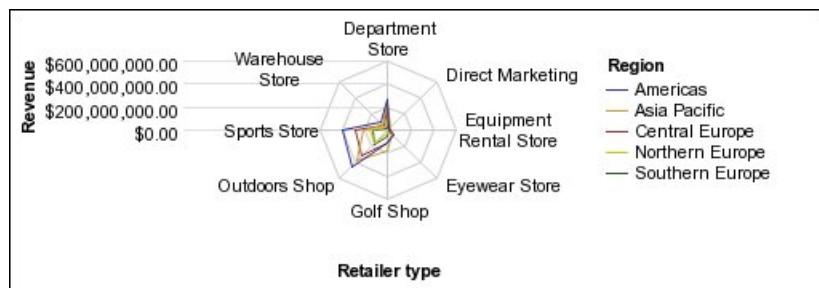


Figure 11. An example radar chart

Radar charts can plot data using standard and stacked configurations.

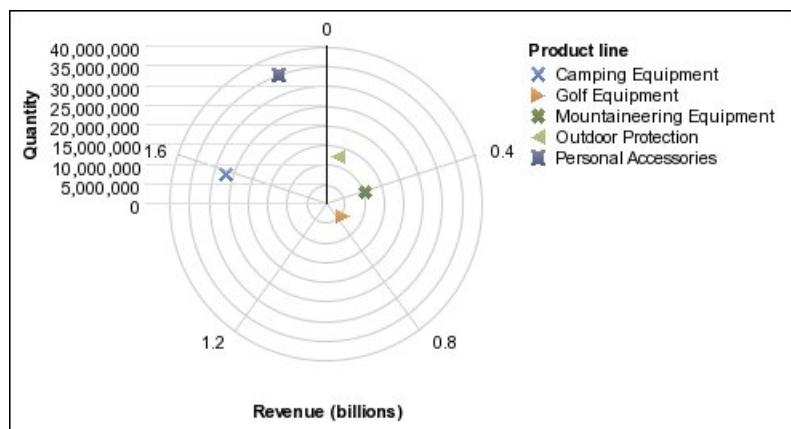
## Polar Charts

Polar charts are useful for showing scientific data.

They are circular charts that use values and angles to show information as polar coordinates.

You can specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see “Specify the Default Measure” on page 47.

The following example shows the revenue and quantity for each product line. The distance along the radial axis represents quantity, and the angle around the polar axis represents revenue.

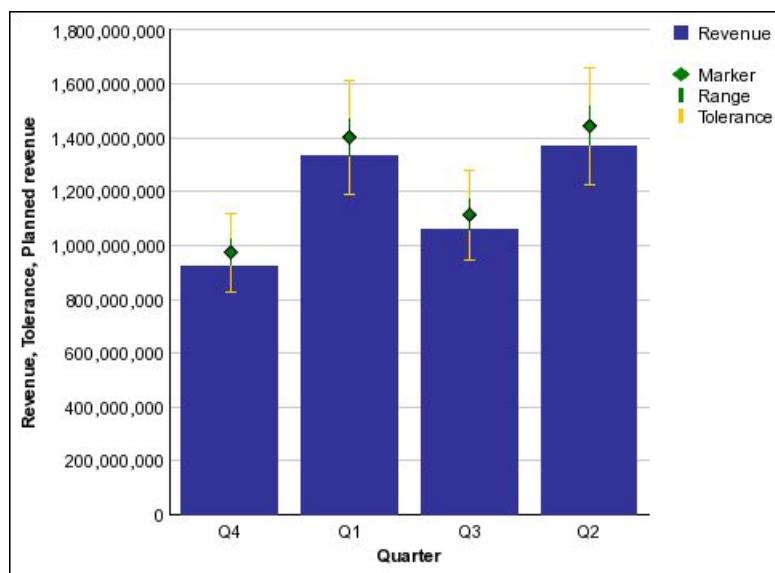


## Range Indicator Charts

Range indicator, or metrics range, charts are useful for showing a target range and a tolerance range.

A range indicator chart adds a target and range marker to a column, line, or area chart.

The following example shows actual revenue versus planned revenue. The markers indicate the planned revenue, and the range and tolerance lines are defined by the chart author.



## Chart Configurations

Chart configurations specify the grouping type of the columns, bars, lines, and areas in a chart. Some examples are standard, stacked, and 100 percent stacked charts.

### Standard Charts

Standard or absolute charts are useful for comparing specific values and for representing discrete data, such as data for different regions or individual employees. For example, a standard column chart that plots regional sales emphasizes the actual value that each region achieves in sales.

Standard charts plot the actual value of each data series from a common axis.

When you create charts using multiple data series, you can distinguish each series by the color or pattern of its data marker. Related data series are shown together in clusters for easy comparison.

In standard area and radar charts that have multiple data series, the colored areas that represent lower values might be covered by the larger colored areas that represent higher values. Use the stacked configuration for area and radar charts with multiple data series.

The following example shows the revenue values for each product line within each territory.

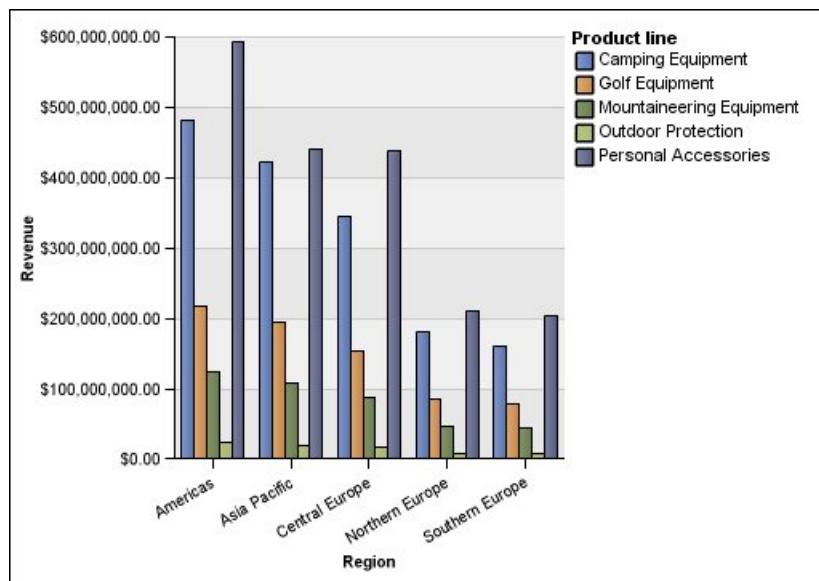


Figure 12. An example standard chart that compares specific values

### Stacked Charts

Stacked charts are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total. For example, a stacked column chart that plots product line sales will emphasize the proportion that each product line contributes to the total in each territory.

You can distinguish each data series by the color or pattern of its section in the stack. The top of each stack represents the accumulated totals for each category.

Do not use the stacked configuration in line charts that have multiple data series because it is difficult to distinguish between unstacked and stacked configurations, and your chart consumers might misunderstand your data.

The following example shows that camping equipment contributed a large proportion of the actual revenue in most sales territories.

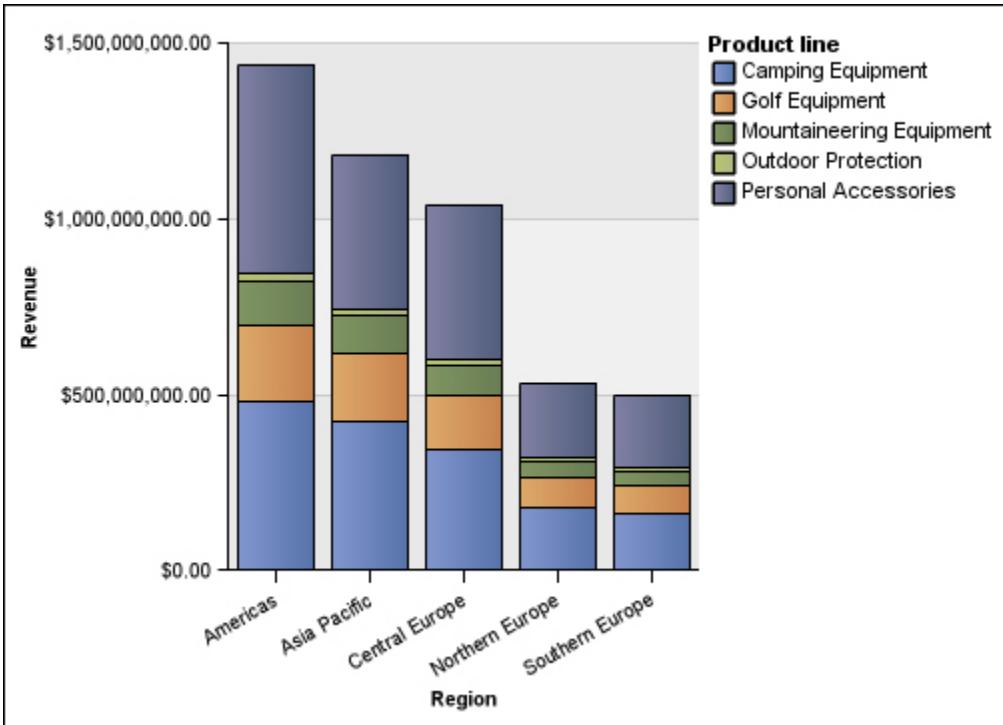


Figure 13. An example stacked chart

### 100 Percent Stacked Charts

100 percent stacked charts are useful for comparing proportional contributions across all categories. They plot the relative contribution of each data series to the total as a percentage. For example, a 100 percent stacked column chart that plots product line sales emphasizes the percentage within each region without referring to actual values.

You can distinguish each data series by the color or pattern of its section in the stack. Each stack represents 100 percent.

100 percent stacked charts highlight proportions. When actual values are important, use another chart configuration.

The following example shows the percentage of sales for each product line in each region.

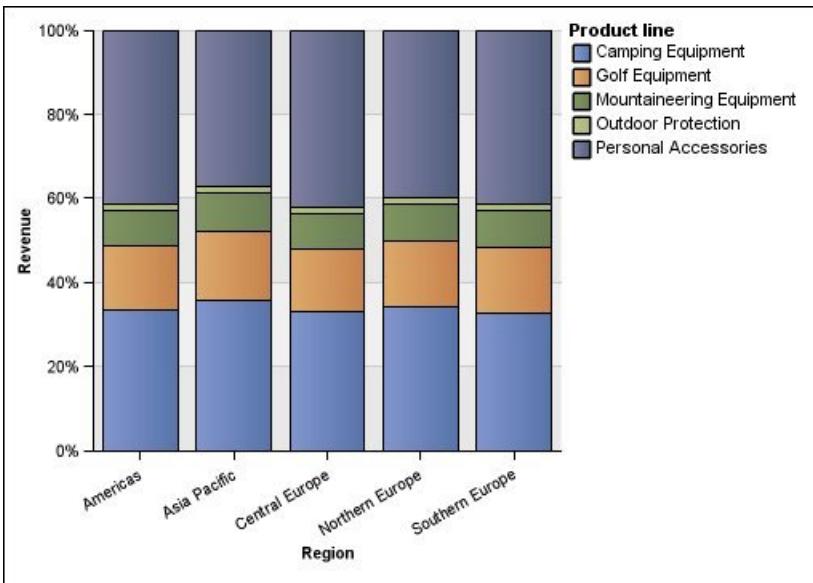


Figure 14. An example 100 percent stacked chart

### Three-dimensional Charts

Three-dimensional charts provide a visually effective display that is suitable for presentations.

Three-dimensional column, bar, line, and area charts plot data by using three axes.

Three-dimensional pie charts have a three-dimensional visual effect.

Do not use three-dimensional charts when you need to show exact values, such as for control or monitoring purposes. The distortion in three-dimensional charts can make them difficult to read accurately. For example, the following chart shows actual revenue for each product line in each territory, but some data labels are omitted because there is not enough room to display them all.

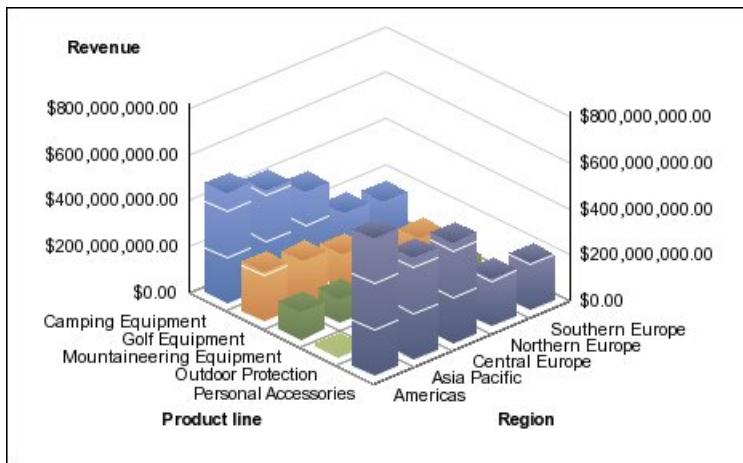


Figure 15. An example three-dimensional chart

## Convert Charts From One Type to Another

You can convert a chart from one type (for example, a bar chart) to another type (for example, a line chart).

When you convert an existing chart to a new chart type, IBM Cognos Analytics - Reporting keeps the properties from the existing chart if those properties exist in the new chart type. For example, if you convert a pie chart to a bar chart, Reporting maps your chart palette to the new chart, but does not map the exploding slices, because the exploding slices property does not exist in a bar chart.

**Note:** Reporting converts legacy charts to the current default chart types automatically if you change the chart type unless you select the **Use legacy chart authoring** option. You can convert legacy charts to current default charts, but you cannot convert current default charts back to legacy charts.

### Procedure

1. Click a chart and, from the report object toolbar, click the **Change chart type** icon .
2. From the list, select a new chart type.

If some chart properties cannot be converted, the **Chart Property Changes** dialog box appears notifying you of the properties that cannot be converted.

## Convert Legacy Charts to Current Default Charts

---

You can convert charts from the legacy charts to the current default charts. When you convert a legacy chart, select the template that most closely matches your legacy chart in order to preserve as many settings as possible.

**Note:** You can convert legacy charts to current default charts, but you cannot convert current default charts back to legacy charts.

### Procedure

1. Click the **More** icon , click **Options**.
2. From the **Advanced** tab, clear the **Use legacy chart authoring** check box.
3. Click the legacy chart, and in the report object toolbar, click the **Change chart type** icon .
4. From the list, select a new chart type.

If some chart properties cannot be converted, the **Chart Property Changes** dialog box appears notifying you of the properties that cannot be converted.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Limitations When Converting Legacy Charts

When you convert a legacy chart to the current default chart, some chart types or chart properties might not be migrated properly. For example, clustered area charts and 100% stacked line charts are not available in the current default charts. If your exact chart configuration is not available, select the closest matching template.

The following legacy chart properties are not migrated to the current default charts:

- **Conditional Palette**
- **Style Variable**
- **Visual Angle**
- **Rotate Values**
- **Conditional Style, Style Variable, and Drill-Through Definitions** on pie labels and gauge labels
- **Connecting Lines** on combination charts
- line styles; only four line styles are supported in the current default charts

The following table outlines some behavior differences between legacy charts and the current default charts.

Legacy Charts	Current Default Charts
Combination charts are always ordered from back to front - area, bar, and line.	Combination charts support any order.
In bar charts, multiple bar definitions for the Y1-axis are placed side-by-side.	In bar charts, multiple bars are placed on top of one another and you can control the width of the bars.
In combination charts, the color palette is continued over multiple bars, lines, and areas.	In combination charts, color palettes are restarted for each bar, line, and area.

Legacy Charts	Current Default Charts
The legend order respects the order in which bars, lines, and areas are specified. For example, bars can appear before areas in the legend.	The legend order is the same as the order specified in the chart.

The following chart types continue to use the legacy chart technology and therefore cannot be upgraded to the current default chart technology. If you want to convert these chart types to the current default charts, upgrade them to a different chart type, such as a column or line chart.

- Win loss
- Radar
- Polar
- 3-D Bar, 3-D Line, 3-D Area, and 3-D Combination
- 3-D Scatter
- Metrics range
- Marimekko

#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Customizing chart properties

After you create a chart, you can customize it by changing its properties.

You select the chart object in IBM Cognos Analytics - Reporting to view its properties. Some properties are dependent on the existence of other properties.

If you are familiar with using conditional variables, you can customize the chart to change its appearance or provide information in response to expressions or conditions.

As you edit the chart properties, Reporting provides you with a preview of your chart, using simulated data. This allows you to view your style changes without running the report. You can disable the chart preview in the options.

The following table shows some of the properties you can change in charts. These properties are available when you select the chart object unless specified otherwise in the **Action to perform in the Properties pane** column.

Goal	Action to perform in the Properties pane
Hide or show the title, subtitle, or footer	Select the chart. Under <b>Chart Titles</b> , set the <b>Title</b> , <b>Subtitle</b> , or <b>Footer</b> property.
Hide or show the legend	Select the chart. Under <b>Chart Annotations</b> , set the <b>Legend</b> property. For more information, see <a href="#">“Customize the Legend in a Current Default Chart” on page 87</a> .
Hide or show baselines	Select the chart. Under <b>Chart Annotations</b> , set the <b>Baselines</b> property. For more information, see <a href="#">“Add a Baseline to a Current Default Chart” on page 92</a> .

Goal	Action to perform in the Properties pane
Increase the contrast of the labels	Select the chart. In the <b>Properties</b> pane, under <b>Label</b> , select <b>Contrast label color</b> .
Add a shadow to the labels to increase the visibility.	Select the chart. In the <b>Properties</b> pane, under <b>Label</b> , select <b>Label shadow</b> .
Hide or show trendlines or regression lines	<p>Select the chart. Under <b>Chart Annotations</b>, set the <b>Trendlines</b> or <b>Regression Line</b> property.</p> <p>For more information, see <a href="#">“Display Trendlines in Current Default Charts” on page 95</a> or <a href="#">“Display Regression Lines in Legacy Scatter or Bubble Charts” on page 96</a>.</p>
Hide or show markers	<p>Select the chart. Under <b>Chart Annotations</b>, set the <b>Markers</b> property.</p> <p>For more information, see <a href="#">“Add a Marker to a Current Default Chart” on page 94</a>.</p>
Hide or show notes	<p>Select the chart. Under <b>Chart Annotations</b>, set the <b>Notes</b> property.</p> <p>For more information, see <a href="#">“Add a Note to a Current Default Chart” on page 89</a>.</p>
Hide or show the axes	<p>Select the chart. Under <b>Axes</b>, set the <b>Y1 Axis</b>, <b>Y2 Axis</b>, or <b>Category Axis</b> property.</p> <p>For more information, see <a href="#">“Customize the Axes of a Current Default Chart” on page 83</a>.</p>
Hide or show the axis title or axis line	<p>Select the axis. Under <b>General</b>, set the <b>Axis Line</b> or <b>Axis Title</b> property.</p> <p>For more information, see <a href="#">“Customize the Axes of a Current Default Chart” on page 83</a>.</p>
Change an axis title	<p>Select the axis title. Under <b>General</b>, set the <b>Default Title</b> property to <b>No</b>, and then double-click the axis title and type a new title.</p> <p><b>Tip:</b> You can use the <b>Properties</b> pane to change the axis title properties, such as font, positioning, color, and so on.</p> <p>For more information, see <a href="#">“Customize the Axes of a Current Default Chart” on page 83</a>.</p>
Change axis properties, such as range, scale interval, and so on	<p>Select the numeric axis. Under <b>General</b>, set the <b>Minimum Value</b>, <b>Maximum Value</b>, <b>Scale Interval</b>, or <b>Scale</b> property.</p> <p>For more information, see <a href="#">“Change the axis scale of a current default chart” on page 84</a>.</p>

Goal	Action to perform in the Properties pane
Hide or show the tooltips	<p>Select the chart. Under <b>Chart Labels</b>, set the <b>Toolips</b> property.</p> <p>When you pause your pointer over a data marker in the report output, the corresponding absolute or cumulative value appears in a tooltip.</p> <p>Tooltips are not supported in PDF output.</p>
Change the data format	Select the numeric axis. Under <b>Data</b> , set the <b>Data Format</b> property.
Change the white space around the chart	<p>Select the chart. Under <b>Box</b>, set the <b>Padding</b> or <b>Margin</b> property.</p> <p>For more information, see “<a href="#">Apply Padding to an Object</a>” on page 264 and “<a href="#">Set Margins for an Object</a>” on page 264.</p>
Change the color or pattern in the palette for columns, lines, and areas	<p>Select the chart object. Under <b>Color &amp; Background</b>, set the <b>Palette</b> or <b>Conditional Palette</b> property.</p> <p>For more information, see “<a href="#">Customizing the Color Palette of a Chart</a>” on page 74 and “<a href="#">Create a Simple Conditional Palette for a Current Default Chart</a>” on page 77.</p>
Change the chart orientation	Select the chart. In the <b>Properties</b> pane, under <b>Chart Orientation</b> , select <b>Vertical</b> or <b>Horizontal</b> .
Change the default color or font for all chart objects	<p>Select the chart. Under <b>Color &amp; Background</b>, set the <b>Background Color</b>, <b>Foreground Color</b>, or <b>Fill Effects</b> property.</p> <p>For more information, see “<a href="#">Change a Chart Background in a Legacy Chart</a>” on page 80.</p> <p>Under <b>Font &amp; Text</b>, set the <b>Font</b> or <b>Relative Alignment</b> property.</p> <p><b>Tip:</b> The 2011 Quarterly Sales Forecast sample report in the GO Sales (analysis) package includes text alignment.</p>
Override the default font or color for axes and chart values	  <p>Click the <b>More</b> icon  <p>72 IBM Cognos Analytics - Reporting Version 11.0 : User Guide</p> </p>

Goal	Action to perform in the Properties pane
Change the three-dimensional appearance of a chart	<p>Select the chart. Under <b>General</b>, set the <b>Depth</b> or <b>Visual Angle</b> property.</p> <p>For example, for a pie chart, a <b>Depth</b> value of <b>0</b> (zero) leaves the pie flat, or two-dimensional. A value of <b>100</b> raises the pie almost to a sphere.</p> <p><b>Tip:</b> You can select a value from the <b>Depth</b> list or type a value that is not listed.</p>
Insert a background image or watermark in the chart body.	<p>Click the lock button in the toolbar to unlock the chart object, select the chart body by clicking between the axes.</p> <p>Under <b>Color &amp; Background</b>, set the <b>Background Image</b> property.</p> <p>For more information, see “<a href="#">Change a Chart Background in a Legacy Chart</a>” on page 80.</p>
Go to another report	<p>Select the chart. Under <b>Data</b>, set the <b>Drill-Through Definitions</b> property.</p> <p>For more information, see Chapter 18, “<a href="#">Using drill-through access</a>,” on page 325.</p>
Specify which labels and values to use when generating the text shown on the chart	<p>Select the chart. Under <b>Chart Labels</b>, set the <b>Values</b> property.</p> <p><b>Note:</b> When you show all the labels and values on some chart types, such as scatter charts, bubble charts, and polar charts, the text shown might be too long.</p>

## Resize a Current Default Chart

You can change the size of a current default chart by dragging the resize handle in the lower right corner of the chart.

### Procedure

1. Select the [chart object](#).

2. Click the resize handle in the lower right corner of the chart .

Use Shift+drag to maintain the aspect ratio of the chart.

3. To see the actual size of the chart as it will appear in the report output, collapse the chart objects with the minus (-) button in the upper left corner of the chart.

### Results

The new chart size appears in the **Size & Overflow** property. You can also edit the chart size with this property.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Resize a Legacy Chart

You can resize a legacy chart by defining the height and width in the **Size & Overflow** property.

The options available with this property are detailed in “[Specify the Height and Width of an Object](#)” on page 269.

### Procedure

1. Select the [chart object](#).
2. In the **Properties** pane, double-click the **Size & Overflow** property and specify the height and width.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Customizing the Color Palette of a Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart. For example, if "Telephone" is the first in a data series of order methods, and you want it to appear in blue, use the palette to make the first item in the series blue.

You can customize the color palette for area, bar, bubble, gauge, Pareto, pie, and scatter charts.

You can also apply background effects to chart objects or change the colors of specific chart elements.

**Note:** Your administrator can create custom palettes. For more information, see [Create Custom Palettes in IBM Cognos 10 Report Studio](#). Although this document refers to Cognos BI 10.2.2, the information also applies to Cognos Analytics 11. The only difference is that, in Cognos 11, the location `install_location\webcontent\pat` has changed to `install_location\webcontent\bi\pat`.

### Related tasks

[Add background effects to a chart object in a legacy chart](#)

### Customize the Color Palette of a Current Default Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart.

Progressive charts and legacy charts have different steps.

If specified, the default color is used for outputs that do not support the palette definition. For example, if the palette is defined to use a radial rectangle gradient and you run the report as PDF output, the default color is used because radial rectangle gradients are not supported in PDF output.

### Procedure

1. Select the [chart object](#). For combination charts, select the bar, line, or area objects.
2. To choose a preset color palette, click the chart palette presets button  on the style toolbar, and then click a palette.
3. To change the existing color palette:
  - In the **Properties** pane, under **Color & Background**, double-click the **Palette** property.
  - On the **Entries** tab, click the palette entry that you want to change.
  - Under **Fill**, select fill type, color, transparency, and other fill settings. The options in the **Fill type** list depend on the chart type you are using.

**Linear Gradient** displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.

**Radial Line Gradient** displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.

**Radial Rectangle Gradient** displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.

**Pattern** displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.

**Color** displays a solid color. You can specify the transparency.

**Image** displays an image. You can specify the image to use.

- To change the color of this palette definition, click the color in the **Colors** list, click **Color**, specify the color properties, and click **OK**.

4. Under **Style**, depending on the chart type you are customizing and the fill type you chose in step 2, you can change the marker shape, line style, default color, and line weight.

5. To add a new palette entry, click the **New** icon  and specify the new palette settings.
6. To change the order in which the colors, gradients, or patterns appear in the chart, use the arrow buttons under the **Palette** box to change their position.
7. To copy and paste a palette, open the palette dialog box and press Ctrl+C to copy the palette to the clipboard. Close the palette dialog box. Select another chart, open the palette dialog box, and press Ctrl+V to paste the palette from the clipboard.
8. To customize the data markers, on the **Properties** tab, depending on the chart type you are customizing and the fill type you chose in step 2, you can specify whether data markers are shown and change their color and size.

### Related concepts

[Current Default Charts and Legacy Charts](#)

### Customize the Color Palette of a Current Default Progressive Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart.

Legacy charts and other types of current default charts have different steps.

If specified, the default color is used for outputs that do not support the palette definition. For example, if the palette is defined to use a radial rectangle gradient and you run the report as PDF output, the default color is used because radial rectangle gradients are not supported in PDF output.

### Procedure

1. Select the progressive chart object.
2. In the **Properties** pane, double-click the **Progressive Palette** property.

You can specify the following:

- **Positive value fill** defines the appearance of the positive bars or columns on the chart.
- **Negative value fill** defines the appearance of the negative bars or columns on the chart.
- **First value fill** defines the appearance of the first bar or column on the chart.
- **Total value fill** defines the appearance of the total bar or column on the chart, if a total bar or column is present.

3. To change the appearance of a fill:

- Click the colored box beside the fill name.
- Click a fill type from the **Fill type** list.

**Linear Gradient** displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.

**Radial Line Gradient** displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.

**Radial Rectangle Gradient** displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.

**Pattern** displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.

**Color** displays a solid color. You can specify the transparency.

**Image** displays an image. You can specify the image to use.

- To change the color of this fill, click the color in the **Colors** list, click **Color**, specify the color properties, and click **OK**.

4. To change the text of the label that appears next to a bar, double-click the text box beside the fill name and specify the text.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

#### Customize the Color Palette of a Legacy Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart.

Current default charts have different steps.

#### Procedure

1. Select the [chart object](#).
2. In the **Color & Background** section of the **Properties** pane, double-click the **Palette** property.
3. In the **Palette** dialog box, click the new palette entry button to define a new palette entry:
  - To apply color, click **Color**, specify the color properties, and click **OK**.
  - To apply a gradient, click **Gradient**, specify the **Direction**, **From color**, and **To color** properties, and click **OK**.
  - To apply a pattern, click **Pattern**, specify the **Pattern**, **Foreground color**, and **Background color** properties, and click **OK**.

**Tip:** You can also select a predefined palette from the **Palettes** box.

4. To change the order in which the colors, gradients, or patterns appear in the chart, use the arrow buttons under the **Palette** box to change their position.
5. To copy and paste a palette, open the palette dialog box and press **Ctrl+C** to copy the palette to the clipboard. Close the palette dialog box. Select another chart, open the palette dialog box, and press **Ctrl+V** to paste the palette from the clipboard.
6. Repeat step 3 for each chart series.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

#### Creating a Conditional Color Palette in a Chart

You can create a conditional palette to color data items in your chart in different ways depending on a condition. For example, in a column chart that shows revenue per month, you want to make the columns for the months that have a revenue greater than \$1000000 green.

You can also use conditional styles to highlight exceptional data and use conditions to control the layout of your report.

## Related concepts

### Using conditions

#### Create a Simple Conditional Palette for a Current Default Chart

You can create a simple conditional palette based on a string data item or a numeric data item. For example, if you want to create a condition to display only Revenues over one million dollars, you can create a numeric condition; whereas, if you want to create a condition to display only product codes with the letter A in them, you can create a string condition.

#### Procedure

1. Select the chart series to which you want to apply the conditional palette.
2. In the **Properties** pane, under **Color & Background**, double-click the **Conditional Palette** property.
3. Click the **New** icon  and click **New Condition**.
4. If you want to create a conditional palette based on a string, do the following:
  - a) Select the string data item to determine the condition.
  - b) In the **Type of conditional style** list, click **String**, and click **OK**.
  - c) Click the new button and select how to define the condition:
    - To select more than one individual value, click **Select Multiple Values** and click the values.
    - To type specific values, click **Enter Values** and type the values.
    - To specify your own criteria, such as values that begin with the letter A, click **Enter String Criteria** and specify the condition.
  - d) Under **Palette Entry**, beside the new condition, click the edit button .
  - e) Define the palette entry fill type, colors, and angle, and click **OK**.
5. If you want to create a conditional palette based on a numeric range, date/time range, interval range, date range, or time range, do the following:
  - a) Select a numeric data item to determine the condition.
  - b) In the **Type of conditional style** list, click the type of condition you want to create, and click **OK**.
  - c) Click the new button and type a value to define a threshold.  
The value appears in the **Range** column, and two ranges are created.
  - d) For each range, under **Style**, click the edit button to define the palette entry fill type, colors, and angle, and then click **OK**.
  - e) Repeat the previous substeps to add other conditions.



**Tip:** Under **Style**, pause the pointer over each range  to see the condition produced for that range.

- f) If you want to use the default palette for the lowest range instead of specifying a conditional palette select the **Use default palette for lowest range** check box.
  - g) To move a value above or below a threshold, click the arrow button  next to the value.  
For example, you insert a threshold value of five million. By default, the ranges are less than or equal to five million and greater than five million. Moving the five million value above the threshold changes the ranges to less than five million and greater than or equal to five million.
6. To customize the label for a conditional palette, do the following:
    - a) Click **Label** beside the palette entry.
    - b) In the **Conditional Palette Entry Label** dialog box, click **Specified text** and click the ellipsis button.
    - c) Type the default label text in the **Label** text box.

- d) To add customized labels for other languages, click the **Add** icon  select the other languages, and click the language to define the customized label for that language.
7. Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

### Create an Advanced Conditional Palette for Current Default Charts

Advanced conditions allow you to use a calculations or expression to evaluate the condition. If multiple advanced conditions are met, only the first conditional style is applied.

#### Procedure

1. Select the chart series to which you want to apply the conditional palette.
2. In the **Properties** pane, under **Color & Background**, double-click the **Conditional Palette** property.
3. Click the **Add** icon  and click **Advanced Condition**.
4. Click the new advanced condition icon  and specify the expression that defines the condition.

The new advanced condition appears in the **Conditional Palette - Advanced** dialog box.

5. Under **Palette Entry**, beside the new advanced condition, click the edit button .
6. Define the palette entry fill type, colors, and angle, and click **OK**.
7. Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

### Create a Conditional Color Palette for a Legacy Chart

You can create a color palette that appears differently depending on a yes or no answer, an expression or calculation, or the report language.

#### Procedure

1. Click the chart object.
2. In the **Properties** pane, under **Color & Background**, double-click the **Conditional Palette** property.
3. If you want to create a variable that has only two possible values, **Yes** and **No**, do the following:
  - a) Under **Variable**, click **New boolean variable**.
  - b) In the **New Variable** dialog box, type a name for the variable.
  - c) In the **Expression Definition** box, define the condition and click **OK**.

For example, the following expression returns the value **Yes** if revenue is less than one million and the value **No** if revenue is greater than or equal to one million:

[Revenue]<1000000

- d) In the **Value** box, select whether the expression evaluates to **Yes** or **No**.
- e) Under **Effects**, specify the color palette to use for the condition.
4. If you want to create a variable whose values are string-based, do the following:
  - a) Under **Variable**, select **New string variable**.

b) In the **Expression Definition** box, define the condition and click **OK**.

For example, the following expression returns the value **high** if revenue is greater than one million and the value **low** if revenue is less than or equal to one million:

```
if ([Revenue]>1000000) then ('high') else ('low')
```

For information about creating expressions, see “[Using relational calculations](#)” on page 182 or “[Using Dimensional Calculations](#)” on page 227.

c) Click the **Add** icon  in the **Values** pane.

d) For each value that the variable can assume, type the name of the value that corresponds with the possible outcomes defined in the expression.

For example, in the previous expression, you must create two values for the variable, high and low.

**Tip:** You can create a group by clicking two or more values and then clicking the group values button . For example, you can create a group that includes the available French languages.

5. If you want to create a variable whose values are different languages, do the following:

a) Under **Variable**, select **Report Language Variable**.

b) In the **Languages** dialog box, select the languages to support.

6. Click **OK** to close the expression editor and leave the **Conditional Palette** dialog box open.

7. Under **Effect**, click **Pattern**.

8. Under **Pattern**, select a pattern and click **OK**.

9. In the **Box** section of the **Properties** pane, set the **Borders** property to **Show**.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Change a Chart Background in a Current Default Chart

You can use a gradient, pattern, color, or image to customize the chart background.

#### Procedure

1. Click the [chart object](#).

2. Click the **More** icon , click the **Locked** icon , select the chart body by clicking between the axes, and, in the **Properties** pane, under **Color & Background**, double-click the **Plot Area Fill** property.

3. Click a fill type from the **Fill type** list.

- **Linear Gradient** displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.
- **Radial Line Gradient** displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.
- **Radial Rectangle Gradient** displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.
- **Pattern** displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.
- **Color** displays a solid color. You can specify the transparency.
- **Image** displays an image. You can specify the image to use.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Change a Chart Background in a Legacy Chart

You can use a solid color, a pattern, or a gradient fill effect to customize the chart background.

You can also use an image as a background for a chart.

### Procedure

1. Click the chart object.
2. Click the **More** icon  , click the **Locked** icon , select the chart body by clicking between the axes, and, in the **Properties** pane, under **Color & Background**, double-click the **Fill Effects** property.
3. In the **Effect** box, choose a color, a gradient fill effect, or a pattern:
  - To apply a color, click **Color** and specify the color properties.
  - To apply a gradient fill effect, click **Gradient** and then specify the **Direction**, **From color**, and **To color** properties.
  - To apply a pattern effect, click **Pattern** and specify the **Pattern**, **Foreground Color**, and **Background Color** properties.The foreground color is the color of the selected pattern. The background color is the color of the area behind the pattern.
4. To remove a background fill effect, click **None**.

### Related concepts

[Current Default Charts and Legacy Charts](#)

### Related tasks

[Insert a Background Image in an Object](#)

## Add background effects to a chart object in a legacy chart

You can change the look of certain charts and chart objects by applying visual effects such as drop shadows, borders, and fills.

### Procedure

1. Select the chart object.
2. To apply a preset background fill effect, from the report object toolbar, click the **Background effects**  **presets** icon .
3. To add a custom fill effect and border do the following:
  - a) In the **Properties** pane, under **Color & Background**, double-click the **Background effects** property.
  - b) Click **Border** and specify settings for border style, width, color, corner radius for rounded rectangles, and transparency.  
If the object also includes a fill with a transparency setting, select the **Allow transparent bleed** check box to apply the same transparency to the border.
  - c) Click **Fill** and specify the settings.  
The fill effect can either be a solid color, a gradient, or a pattern.
4. To add a drop shadow, do the following:
  - a) In the **Properties** pane, under **Color & Background**, double-click the **Background effects** property.
  - b) Select the **Drop shadow** check box.
  - c) From the **Shadow color** list, click a color.
  - d) Under **Blur**, click an intensity to set the drop shadow's blur.
  - e) Under **Offset**, enter a value and a unit to define the width and height of the drop shadow.

f) Under **Transparency**, type a percentage to determine the transparency of the shadow.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

[Customizing the Color Palette of a Chart](#)

#### Related tasks

[Add color to an object](#)

## Add Colored Regions in a Current Default Chart

You can define colored regions in the body of a chart. For example, you can divide the background of a scatter chart into quadrants and color each quadrant.

You can add colored regions to bubble, bullet, combination, Pareto, progressive column, and scatter charts.

In bullet charts, colored regions are automatically added.

You can use the following criteria to position the colored regions.

Option	Position
<b>Percent on Axis (%)</b>	Uses a percentage of the full range of the axis. For example, if the axis range is -500 to 1100, a Percent on Axis value of 25% puts the baseline at -100 (25% of the range, 1600).
<b>Numeric Value</b>	Uses a static numeric value.
<b>Mean</b>	Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis.
<b>Percentile (%)</b>	Uses a specified percentile.
<b>Statistical Maximum</b>	Uses the following expression: $25\text{th percentile value} - 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [2.5 -1.5(5) = -5].
<b>Statistical Minimum</b>	Uses the following expression: $75\text{th percentile value} + 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [7.5 +1.5(5) = 15].
<b>Query Calculation</b>	Uses a query calculation from the same query or from a different query. For more information, see <a href="#">“Using relational calculations” on page 182</a> .
<b>Layout Calculation</b>	Uses a layout calculation. For more information, see <a href="#">“Using relational calculations” on page 182</a> .

Option	Position
<b>Category Index</b>	<p>Specifies a position based on the index value of the data item in the categories axis. The value must be between 0 and 100.</p> <p>For example, a <b>Category index</b> value of 1 indicates that the position is located at the first data item. This is the default.</p>

You can also combine colored regions with gridlines.

#### Procedure

1. Click the [chart object](#).
2. In the **Properties** pane, under **Color & Background**, double-click the **Colored Regions** property.
3. Click the **New** icon .
4. Under **Region label**, type a name for the region.
5. Under **Label location**, specify whether the label should appear in the legend or in the chart.
6. If your chart includes multiple charts, such as in a combination chart, under **Based on**, select the chart to which the colored regions apply.
7. Under **Region fill**, click the color box to specify the color and fill effects.
8. Specify the start and end of the category and numeric positions.
9. If you want to add more colored regions, repeat steps 3 to 5.
10. If you add more than one colored region, specify their order using the up and down arrows.

The regions are drawn in the same order that they appear in this list. The first region is drawn first, on the bottom, and the last region is drawn on top of the other regions.

**Tip:** To delete a colored region, click the colored region icon and text and click the delete button .

#### Results

The new region appears in the **Colored regions** box.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Specify Custom Label Text

By default, chart labels use the name of the underlying data item label. You can change the label text to make it more meaningful. For example, you can rename a chart item labeled **ISO\_3\_Letter\_Code** to **Country or Region**.

If you specify custom labels for a microchart or win-loss charts, the custom labels appear in the tooltips, not on the chart itself.

#### Procedure

1. Click the chart node member or measure.
2. In the **Properties** pane, under the **Chart Labels**, set the **Custom Label** property to **Show**.

A new chart text item appears above the default measure or below the chart node member.

3. Do one of the following:

- To change the text of the label, double-click the chart text item and type the text.

- To change the source of the label text, select the new chart text item. In the **Text Source** section of the **Properties** pane, set the **Source Type** property.

If nothing is specified in the new chart text item, the label appears blank.

**Tip:** To remove a custom label, set the **Custom Label** property to **Hide**.

## Customizing the Axes of a Chart

Chart axes are lines that border the chart area and provide a reference for measurements. They act as a vehicle for tick marks and scales and form a frame around the chart. The Y-axis is usually the vertical axis and contains data. The X-axis is usually the horizontal axis and contains categories.

To make your chart data easier to understand, you can do the following to customize each axis:

- show or hide the axis labels (data values)
- show or hide the axis line
- change the color, style, and weight of the axis line
- show or hide major and minor tick marks and specify where to display them

In HTML/PDF, if you have a report with a line chart, you can use the **Include Zero For Auto Scale** property to adjust the scale of the Y-axis of the chart. If the difference between your measure's maximum/minimum values is much less than the difference between your measure's minimum value and zero, using this property will make the chart Y-axis begin at something closer to your measure's minimum value, making the line utilize all of the chart's vertical space. In some cases this is significant in improving the readability of the chart.

### Related concepts

[Axes](#)

#### Customize the Axes of a Current Default Chart

You can customize the axis labels, axis lines, and minor and major tick marks.

You can change the scale for the major and minor tick mark using the **Axis Range** property.

### Procedure

1. Select the Y-axis or the X-axis of the chart.
2. To show or hide the axis labels, in the **Properties** pane, set the **Axis Label** property.
3. If your chart includes nested categories, to change how the category axis labels are displayed, set the **Nested Label Display** property.
4. To show or hide axis lines, in the **Properties** pane, double-click the **Axis Line** property, and select or clear the **Axis line** check box.
5. To change the color, style, and weight of the axis line, in the **Properties** pane, set the **Axis Line** property.
6. To show or hide minor and major tick marks and specify their location, in the **Properties** pane, set the **Axis Line** property.

### Related concepts

[Current Default Charts and Legacy Charts](#)

### Related tasks

[Change the axis scale of a current default chart](#)

#### Customize the Axes of a Legacy Chart

You can customize the axis labels and axis line.

### Procedure

1. Select the Y-axis or the X-axis of the chart.

2. To show or hide the axis labels, in the **Properties** pane, set the **Axis Label** property.
3. Select the **Axis line** check box.
4. Click **Line color** and choose a color for this axis line.
5. To show or hide axis lines, in the **Properties** pane, double-click the **Axis Line** property, and select or clear the **Axis line** check box.
6. To change the color, style, and weight of the axis line, in the **Properties** pane, double-click the **Axis Line** property.

#### **Change the axis scale of a current default chart**

By default, IBM Cognos Analytics - Reporting automatically determines the minimum and maximum scale values for the numeric axes in a chart. For example, a Y-axis showing revenue values might have an axis range of zero dollars to one million dollars. You can customize the axis scale, or range, to make your chart easier to understand.

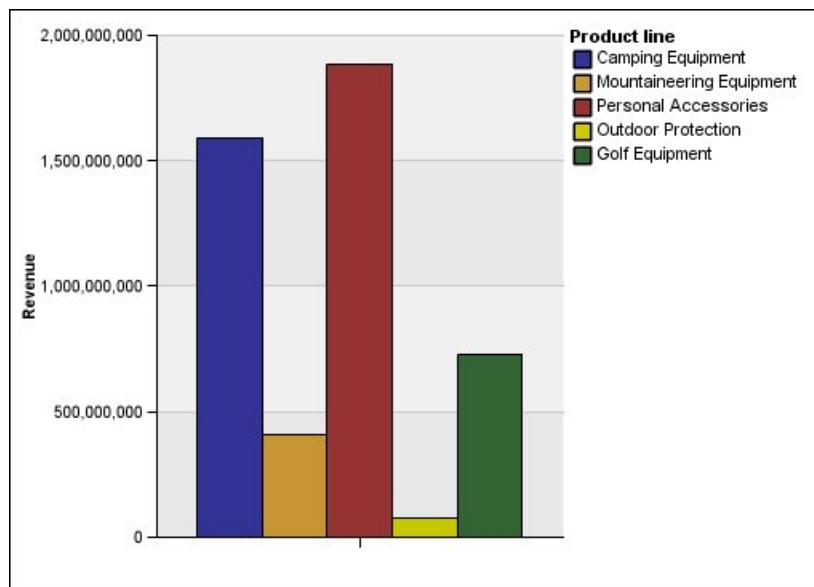
You can specify the following for each numeric axis:

- the maximum and minimum values of the range
- whether to include zero in an automatic axis range
- whether to use a logarithmic scale, if the values in the chart cover a very large range
- how often major and minor gridlines appear

Logarithmic scales can be useful when some of the data you are displaying is much less or much more than the rest of the data or when the percentage or ratio differences between values are important.

A logarithmic scale in Reporting shows the base value of 10 raised to the power of a value. For example, 10 has a logarithm of 1 because 10 raised to the power of 1 is 10, 100 has a logarithm of 2 because 10 raised to the power of 2 is 100, and so on.

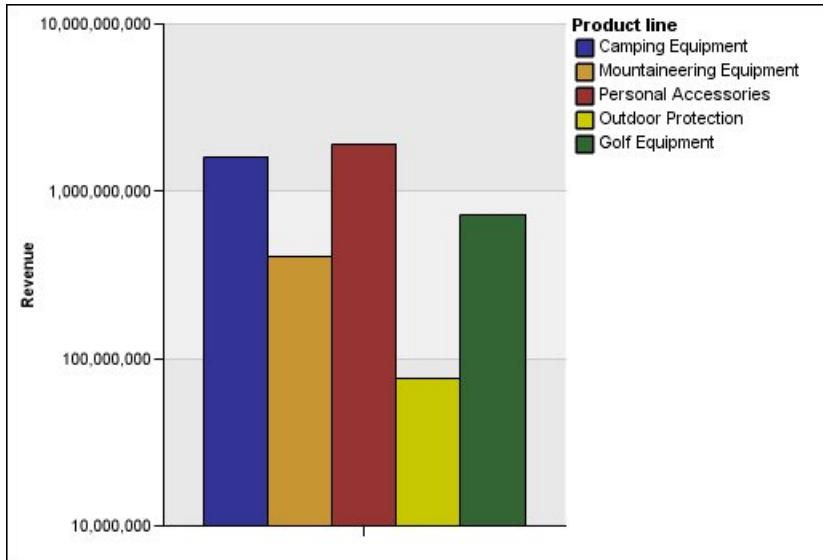
For example, the following chart is using a normal scale:



*Figure 16. Chart with a normal axis range*

In this chart, the Y-axis shows values up to 2,000,000,000 with evenly spaced intervals of 400,000,000. However, the Outdoor Protection column is so much less than the other columns that it is difficult to compare them.

The following is the same chart using a logarithmic scale:



*Figure 17. Chart with a logarithmic axis range*

In this chart, the Y-axis still shows the same revenue values, but the intervals reflect a logarithmic scale, which increases exponentially. You can now compare all the product lines because none of the product lines have much higher or much lower values than the others.

Logarithmic scales can also be useful when the percentage or ratio differences between values are important. For example, if the logarithmic scale chart above represents data from 2011, and you add data from 2012 as a second set of colored bars, you could see the differences between the 2011 revenue and 2012 revenue. In a logarithmic scale, differences between values on the Y-axis represent the same percentage for each bar. So if the 2011 and 2012 data differs by the same distance for each product line, you could deduce that your revenue went up by the same percentage for each product line. This would not be clear on a normal scale.

### Procedure

1. Select the Y-axis or the X-axis of the chart.
2. In the **Properties** pane, under **General**, double-click the **Axis Range** property.
3. To set a maximum value for this axis, under **Maximum**, click **Manual**, and then type a maximum value in the **Manual** box.

**Note:** You can use either a positive or negative value as the maximum value.

4. To set a minimum value for this axis, under **Minimum**, click **Manual**, and then type a minimum value in the **Manual** box.

**Note:** You can use either a positive or negative value as the minimum value.

5. To include zero on this axis, select the **Include zero** check box.
6. To use a logarithmic scale for this axis, select the **Logarithmic scale** check box.

**Note:** If you choose to use a logarithmic scale, ensure that your chart consumers know that the scale is logarithmic by including that information in the axis title or in a note on the chart.

7. To set the position of major gridlines and tick marks, under **Major interval**, click **Manual**, and then type the distance between major gridlines and tick marks in the **Manual** box.

The distance between major gridlines and tick marks is measured in the units of that axis. For example, if the axis is revenue in dollars, type the dollar value in the **Manual** box.

8. To add minor gridlines, type the number of minor gridlines that you want to see between each major gridline in the **Number of minor intervals** box.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Showing Gridlines in a Chart

To make the data in a chart that includes axes easier to read, you can show horizontal and vertical gridlines. You can show gridlines for the major or minor intervals on the axes.

You cannot show gridlines for chart types that do not display axes, such as pie and donut charts.

### Show Gridlines in a Current Default Chart

You can also show alternating bands of color in the chart background that correspond to your axis gridlines.

You can change the scale for the major and minor gridlines using the **Axis Range** property.

#### Procedure

1. Select the Y-axis or the X-axis of the chart.
2. To show alternating bands of color as your chart background, do the following:
  - a) In the **Properties** pane, double-click the **Gridlines** property.
  - b) Select the **Show alternating color bands** check box.
  - c) Set the color and transparency of the first and second colors.
3. To show major gridlines as your chart background, do the following:
  - a) In the **Properties** pane, double-click the **Gridlines** property.
  - b) Select the **Show major gridlines** check box.
  - c) Set the color, style, and weight of the major gridlines.
  - d) If you are working with a gauge chart, specify the length of the gridline.
4. To show minor gridlines as your chart background, do the following:
  - a) In the **Properties** pane, double-click the **Minor gridlines** property.
  - b) Select the **Show minor gridlines** check box.
  - c) Set the color, style, and weight of the minor gridlines.
  - d) If you are working with a gauge chart, specify the length of the gridline.
  - e) To specify by how many minor intervals to divide the major intervals, in the **Properties** pane, type a number in the **Number of Minor Intervals** property.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

#### Related tasks

[Change the axis scale of a current default chart](#)

### Show Gridlines in a Legacy Chart

Gridlines are the lines on a chart that show the intervals along the axes.

#### Procedure

1. Select the Y-axis or the X-axis of the chart.
2. In the **Properties** pane, under **General**, double-click the **Gridlines** property.
3. To specify the color, style, and weight of major gridlines do the following:
  - a) Select the **Show major gridlines** check box.
  - b) Click **Line color** and choose a color for the major gridlines.
  - c) To specify the thickness of the gridlines, click **Point size** and select a line weight from the list.
  - d) Click a line style in the **Line style** list.
4. To specify the color, style, and weight of minor gridlines:
  - a) In the **Properties** pane, under **General**, double-click the **Minor Gridlines** property.

- b) Select the **Show minor gridlines** check box.
- c) Click **Line color** and choose a color for the minor gridlines.
- d) To specify the thickness of the gridlines, click **Point size** and select a line weight from the list.
- e) Click a line style in the **Line style** list.
- f) To change the transparency of the gridlines, type a percentage in the **Transparency** box.

#### **Related concepts**

[Current Default Charts and Legacy Charts](#)

## **Customize the Legend in a Current Default Chart**

You can hide or show the legend and change its position relative to the chart area, chart body, or a data item. For example, in a bar chart showing revenue for each product line by country or region, you could use the expression [Country or Region] = 'Canada' to position the legend relative to the Canada bar.

**Note:** When you choose a preset legend position, that position appears inside any padding that you have added to the chart object. Customized legend positions do not include any chart padding.

#### **Procedure**

1. Select the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Legend** property.
3. To show the legend on the chart, select the **Show Legend** check box.
4. To choose a preset legend position, click **Preset** and click a position from the diagram.
5. To choose a customized legend position, do the following:
  - a) Click **Advanced** and click the ellipsis button.
  - b) To display the legend at a set distance from the sides of the chart area, from the **Anchor** list, click **Relative to Chart**.
  - c) To display the legend at a set distance from the sides of the chart body, from the **Anchor** list, click **Relative to Chart Body**.
  - d) To display the legend at a set distance from a data item, such as a specific pie slice in a pie chart, from the **Anchor** list, click **Report Expression**, click the ellipsis button beside **Expression**, and enter an expression in the **Report Expression** dialog box.
  - e) Set the horizontal and vertical distances from the anchor.

#### **Related concepts**

[Current Default Charts and Legacy Charts](#)

## **Customize the Items in the Legend of a Current Default Chart**

If your legend includes items that are too long, you can truncate long legend items at a specific number of characters.

For example, if you want an ellipsis to appear at the end of each truncated legend item, type ... in the **Truncation text** box.

You can also show the values of the data items in your legend.

#### **Procedure**

1. Select the legend.
2. To truncate the legend
  - a) In the **Properties** pane, under **General**, double-click the **Text Truncation** property.
  - b) To specify the number of characters at which the legend items are truncated, click **Manual** and type the number of characters in the **Maximum characters** box.

- c) To shrink the font of the legend item text until all the text fits in the legend, select the **Shrink font as needed** check box.
  - d) To specify some text to appear at the end of truncated legend items, in the **Truncation text** box, type the text that you want to appear at the end of truncated items.
3. To show the values of legend items within the legend
- a) In the **Properties** pane, under **General**, set the **Show Values** property.
- First Value** and **Last Value** refer to the first and last item in the child set under the legend data item. **Minimum Value** and **Maximum Value** refer to the lowest and highest value in the child set under the legend data item.
- b) If you want to change the separator between the legend item and value, type a new separator in the **Legend Separator** property.
4. To customize the title of the legend
- a) Click the default legend title area in the work area.
  - b) In the **Properties** pane, under **General**, set the **Default Title** property to **No**.
  - c) Double-click the default legend title area in the work area and type the new title.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

### Customize the Items in the Legend of a Legacy Chart

If your legend includes items that are too long, you can truncate long legend items at a specific number of characters. For example, if you want an ellipsis to appear at the end of each truncated legend item, type . . . in the **Truncation text** box.

You can also show the values of the data items in your legend and customize the legend title.

#### Procedure

1. Select the legend.
2. To truncate the legend text, do the following:
  - a) In the **Properties** pane, under **General**, set the **Auto Truncation** property to **Yes**.
  - b) In the **Properties** pane, under **General**, set the **Auto Truncation** property to **Yes**.
  - c) In the **Maximum Characters** property, type the number of characters to appear before the text is truncated.
  - d) In the **Truncation Text** property, type the characters to append when the text is truncated.
  - e) To shrink the font of the legend item text until all the text fits in the legend, select the **Shrink font as needed** check box.
  - f) To specify text to appear at the end of truncated legend items, type it in the **Truncation text** box.
3. To show the values of legend items within the legend, do the following:
  - a) In the **Properties** pane, under **General**, set the **Show Legend Values** property.

**First Value** and **Last Value** refer to the first and last item in the child set under the legend data item. **Minimum Value** and **Maximum Value** refer to the lowest and highest value in the child set under the legend data item.

  - b) If you show multiple values and want to change the separator between the values, type a new separator in the **Separator** property.
4. To customize the title of the legend, do the following:
  - a) Click the default legend title area in the work area.
  - b) In the **Properties** pane, under **General**, set the **Default Title** property to **No**.
  - c) Double-click the default legend title area in the work area and type the new title.

## Related concepts

[Current Default Charts and Legacy Charts](#)

## Adding a note to a chart

Add a note to a chart to provide additional detail. Notes appear as text in a chart.

By default, notes are aligned in the first part of the chart object. When you add a note to a chart, you can set the note's position relative to the sides of the chart area or chart body. You can also use a report expression to position the note next to a data item within the chart. For example, in a bar chart showing revenue for each product line by country or region, you could type [Country or Region]='Canada' to position the note relative to the Canada bar.

Notes overwrite whatever is under them so you must position them properly.

If you apply more than one note, ensure that each note has a different position in the report so that they do not overwrite each other. You can also specify the order that they should be drawn in when the report runs. If you have two notes with the same coordinates, the first one in the list is drawn first and the next one is drawn before the first.

**Tip:** The Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package includes a note.

### Add a Note to a Current Default Chart

You can add and position multiple notes on your chart.

#### Procedure

1. Select the [chart object](#).
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Notes** property.  

3. Click the **New** icon .
4. Type the note text in the **Text** box and click **OK**.

**Tips:** To delete a note, click the note and click the delete button . To move a note up or down in the list, click the up or down arrows.

5. In the **Notes** dialog box, click **OK**.
6. To position the note, do the following:
  - a) Click the note icon  in the list of notes.
  - b) In the **Properties** pane, under **Positioning**, double-click the **Position** property.
  - c) To align the note horizontally, click the left, center, or right alignment button.
  - d) To align the note vertically, click the top, middle, or bottom alignment button.
  - e) To set the margins around the chart body, type margin values and choose margin units.
  - f) To display the note at a set distance from the sides of the chart area, from the **Anchor** list, click **Relative to Chart**.
  - g) To display the note at a set distance from the sides of the chart body, from the **Anchor** list, click **Relative to Chart Body**.
  - h) To display the note at a set distance from a data item, from the **Anchor** list, click **Report Expression**, click the ellipsis button beside **Expression**, and enter an expression in the **Report Expression** dialog box.
7. To edit the text, double-click the text next to the note object  in the chart.

## Related concepts

[Current Default Charts and Legacy Charts](#)

## Add a Note to a Legacy Chart

You can add and position multiple notes on your chart.

### Procedure

1. Click the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Notes** property.
3. Click the **New** icon .
4. Type the note text in the **Text** box and click **OK**.

**Tip:** To delete a note, click the note and click the delete button . To move a note up or down in the list, click the up or down arrows.

5. In the **Notes** dialog box, click **OK**.

6. Click the note icon  and set the note position, size, and border in the **Properties** pane.

You set the location of the note by defining number of pixels from the bottom left corner of the chart area.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Adding a baseline to a chart

Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. For example, you can add a baseline to show a sales quota or break-even point.

Each baseline represents a value on an axis.

Depending on the type of chart, you can use the following options to position the baseline.

Option	Description
<b>Numeric Value</b>	Uses a static numeric value.
<b>Query Calculation</b>	Uses a query calculation from the chart query or from a different query. For more information, see <a href="#">“Using relational calculations” on page 182</a> .
<b>Layout Calculation</b>	Uses a layout calculation. For more information, see <a href="#">“Using relational calculations” on page 182</a> .
<b>Category Index</b>	Uses the index value of the data item in the categories axis.  For example, a <b>Category index</b> value of 1 indicates that the baseline is located at the first data item. This is the default.  <b>Note:</b> This option applies only to the current default charts, and does not apply to the legacy charts.

Option	Description
<b>Member Value</b>	When working with dimensional data sources, uses a position relative to a member. For example, a member calculation that uses an expression similar to [Query1].[Current year]=2011 places the baseline in the middle of the chart object that represents 2011. To place the baseline between 2011 and 2012 on the chart, a half member width after, set the <b>Member Offset</b> property to 50%. To place the baseline between 2010 and 2011, set the <b>Member Offset</b> property to -50%. You can also type in 100, -200, and so on to place the baseline on the chart.
<b>Statistical Limit</b>	<p><b>Statistical maximum</b> uses the following expression:</p> $25\text{th percentile value} - 1.5 * (\text{75th percentile value} - \text{25th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [<math>2.5 - 1.5(5) = -5</math>].</p> <p><b>Statistical minimum</b> uses the following expression:</p> $\text{75th percentile value} + 1.5 * (\text{75th percentile value} - \text{25th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [<math>7.5 + 1.5(5) = 15</math>].</p> <p><b>Statistical minimum</b> and <b>Statistical maximum</b> use percentiles to determine values, so the baseline might not appear on the chart if its value is off the axis.</p>
<b>Mean</b>	Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis.
<b>Percentile (%)</b>	Uses a specified percentile.
<b>Percent on Axis (%)</b>	Uses a percentage of the full range of the axis. For example, if the axis range is -500 to 1100, a Percent on Axis value of 25% puts the baseline at -100 (25% of the range, 1600).

If you apply more than one baseline, you can specify the order in which they should be drawn when the report runs. If you have two baselines with the same coordinates, the first one in the list is drawn first and the next one is drawn before the first one.

By default, the baseline and its label appear in the legend.

Baselines do not support color transparency.

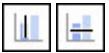
**Tip:** The Positions to Fill sample report in the GO Data Warehouse (analysis) package includes a baseline.

## Add a Baseline to a Current Default Chart

When working with current default charts, you can define baselines by values on the numeric axis or the category axis.

### Procedure

1. Click the chart object.
2. Depending on your chart and the type of baseline you want to add, in the **Properties** pane, under **Chart Annotations**, double-click the **Numeric Baselines** or **Category Baselines** property.

3. Click the **New** icon  and choose the type of baseline from the list.
4. Specify the necessary criteria for the baseline position
5. Under **Baseline Properties**, type a label for the baseline and specify the line style.  
**Tip:** To remove the baseline from the legend, delete the label.
6. If you add more than one baseline, specify their order using the up and down arrows.  
The new baselines appear in the **Markers, notes, baselines, and trendlines** box.
7. To change the label that appears next to the baseline, under the **Markers, notes, baselines, and trendlines** box, double-click the placeholder text next to the baseline icon  and type your text.
8. To change the line style, select the chart and in the **Properties** pane, under **Chart Annotations**, double-click the **Baselines**, **Numeric Baselines**, or **Category Baselines** property.
9. To delete a baseline, select the baseline icon  and click the delete button .

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Add a Baseline to a Legacy Chart

When working with legacy charts, you can define baselines by the values on the numeric axis.

### Procedure

1. Click the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Baselines** property.
3. Click the **New** icon  and choose the type of baseline from the list.
4. Specify the necessary criteria for the baseline position.  
If you use a calculation to determine the baseline, define an expression.
5. If you add more than one baseline, specify their order using the up and down arrows.
6. Click **OK**.

A baseline icon appears in the **Markers, notes, and baselines** box.

7. To define the line style, click the baseline icon  and set the **Line Styles** property.
8. To define the text style, click the baseline text and make changes in the **Properties** pane.
9. To delete a baseline, click its baseline icon and click the delete button .

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Adding markers to charts

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

For example, you might want to add a marker to designate the time when a significant event happened, such as the date when a new product was launched.

You can add a marker to combination, progressive column, Pareto, scatter, and bubble charts.

When you define the position of the marker, you define the X- and Y-axes coordinates for the placement of the symbol. You can position the marker in the chart using the following options.

Option	Position
<b>Numeric Value</b>	Uses a static numeric value.
<b>Query Calculation</b>	Uses a query calculation from the same query or from a different query. For more information, see <a href="#">"Using relational calculations" on page 182</a> .
<b>Layout Calculation</b>	Uses a layout calculation. For more information, see <a href="#">"Using relational calculations" on page 182</a> .
<b>Statistical Minimum</b>	<p>Uses the following expression:</p> $25\text{th percentile value} - 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [2.5 -1.5(5) = -5].</p> <p>Statistical minimum uses percentiles to determine values, and might not always appear in the chart if the values are off the axis.</p>
<b>Statistical Maximum</b>	<p>Uses the following expression:</p> $75\text{th percentile value} + 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [7.5 +1.5(5) = 15]. Statistical maximum uses percentiles to determine values, so the marker might not always appear on the chart if its value is off the axis.</p>
<b>Mean</b>	Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis.
<b>Percentile</b>	Uses a specified percentile.
<b>Percent on Axis</b>	Uses a percentage of the maximum axis value.

If you apply more than one marker, you can specify the order in which they should be drawn when the report runs. If you have two markers with the same coordinates, the first one in the list is drawn first and the next one is drawn after the first.

## Add a Marker to a Current Default Chart

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

**Note:** Current default scatter charts have a different set of steps.

### Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Markers** property.  
 3. Click the **New** icon 

The new markers appear in the **Markers, notes, and baselines** box.

**Tip:** To delete a marker, click the marker icon and text and click the delete button .

11. Run the report.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Add a Marker to a Current Default Scatter Chart

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

### Procedure

1. Select the scatter chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Markers** property.  
 3. Click the **New** icon 

The new markers appear in the **Markers, notes, and baselines** box.

**Tip:** To delete a marker, click the marker icon and text and click the delete button .

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Add a Marker to a Legacy Chart

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

## Procedure

1. Select the **chart object**.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Markers** property.
3. Click the **New** icon  , and then set the **Numeric position type**, **Marker label**, **Marker shape**, **Numeric value**, and **Color** properties.
4. If you add more than one marker, specify their order by using the up and down arrows.

The new markers appear in the **Markers, notes, and baselines** box.

**Tip:** To delete a marker, click the marker icon or marker label and click the delete button .

## Related concepts

[Current Default Charts and Legacy Charts](#)

## Display Trendlines in Current Default Charts

You can display or hide trendlines in the current default bar, line, area, bubble, or scatter charts.

Trendlines, also known as lines of best fit or regression lines, graphically illustrate trends in data series and are commonly used when charting predictions. A trendline is typically a line or curve that connects or passes through two or more points in the series, showing a trend.

You can specify the following types of trendlines:

- **Linear**

Use a linear trendline when your data increases or decreases along a straight line at a constant rate. For example, if your chart displays a steady increase in revenue by product line over time, you could use a linear trendline.

- **Exponential**

Use an exponential trendline when your data values increase or decrease exponentially, or at an increasingly higher or lower rate. For example, if your chart displays an exponential increase in revenue by product line over time, you could use an exponential trendline.

- **Polynomial**

Use a polynomial trendline when your data values both increase and decrease. For example, if your chart displays both increases and decreases in revenue by product line over time, you could use a polynomial trendline.

- **Logarithm or Natural Logarithm**

Use a logarithmic trendline when your data values increase or decrease rapidly and then level out. For example, if your chart displays a rapid decrease in revenue by product line over time and then a plateau, you could use a logarithmic trendline.

- **Power**

Use a power trendline when your data values increase or decrease in a curve at a steady rate. For example, if your chart displays a steady increase in revenue by product line over time and your data points will fit a curved line, you could use a power trendline.

- **Moving Average**

Use a moving average trendline when your data values fluctuate and you want to smooth out the exceptions to see trends. For example, if your chart displays wild fluctuations in revenue by product line over time, but you know that some data points are exceptions, you could use a moving average trendline.

If you are not sure which trendline type to use, try each type to see which one best fits most of your data points. For example, a linear trendline will not fit most points on a scatter chart with widely spread data points.

Trendlines do not support color transparency.

## Procedure

1. Select the **chart object**.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Trendlines** property.
3. Click the **New** icon  and click a trendline type.
4. Define the trendline by specifying the following options. The options that are available depend on the type of trendline you chose.
  - To set the order, or degree, of a polynomial trendline, in the **Order** box, type a value between 2 and 6.
  - To set the number of periods to go back in a moving average trendline, in the **Periods** box, type a value.
  - If you have more than one series on your chart, in the **Based on** list, click the data you want to use for the trendline.
  - Click either **One trendline for all series items** or **A trendline for each series item**.
  - To customize the style of the trendlines, click **Line Styles** and customize the line color, weight, and style.
  - To customize the trendline labels in the legend, click **Label** and choose **None**, **Automatic**, or **Custom**.
  - To display the trendline equation, click **Show equation**, and then click **Show in legend** or **Show on chart**, and then click **Position** to define the equation's position on the chart.
  - To display the R-squared value of the trendline, click **Show R-squared value**, and then click **Show in legend** or click **Show on chart** and then click **Position** to define the position of the value on the chart.

## Related concepts

[Current Default Charts and Legacy Charts](#)

## Display Regression Lines in Legacy Scatter or Bubble Charts

When using legacy charts, you can display or hide regression lines on scatter charts and bubble charts. Regression lines, also known as lines of best fit or trend lines, graphically illustrate trends in data series. Regression lines are commonly used when charting predictions. A regression line is typically a line or curve that connects or passes through two or more points in the series, showing a trend. Legacy scatter and bubble regression lines are calculated using a numerical algorithm that isn't guaranteed to be optimal. Regressions may or may not match current default chart regressions.

You can specify the following types of regression lines to determine the position and slope of the line:

- **Linear**

Use a linear regression line when your data increases or decreases at a consistent rate. For example, if your chart displays a steady increase in revenue by product line over time, you could use a linear regression line.

- **Common Log or Natural Log**

Use a logarithmic regression line when your data increases or decreases rapidly and then levels out. For example, if your chart displays a rapid decrease in revenue by product line over time and then a plateau, you could use a logarithmic regression line.

- **Exponential**

Use an exponential regression line when your data increases or decreases exponentially, or at steadily increasing or decreasing rate. For example, if your chart displays an exponential increase in revenue by product line over time, you could use an exponential regression line.

- **Polynomial Fit**

Use a polynomial fit regression line when your data both increases and decreases. For example, if your chart displays both increases and decreases in revenue by product line over time, you could use a polynomial fit regression line.

If you are not sure which regression line type to use, try each type to see which one best fits most of your data points. For example, a linear regression line is not going to fit most points on a scatter chart with widely spread data points.

#### Procedure

1. Select the scatter or bubble chart.
2. In the **Properties** pane, under **Chart Annotations**, set the **Regression Line** property to **Show**.



3. Click the regression line icon in the report layout.
4. In the **Properties** pane, under **General**, set the **Line Styles**, **Regression Type**, and **Number of Regression Lines** properties.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Showing data labels or values in current default charts

You can show the data labels or data values within the chart so that the data values are clearer.

For example, you can display the data values above each column in a column chart to show the exact height of each column.

#### Procedure

1. For a bar, column, line, or area chart, under **Series**, select the chart type icon.
2. For a bubble, scatter, Pareto, or progressive chart, click the chart.
3. In the **Properties** pane, under **Chart Labels**, double-click the **Show Values** property.
4. For bar, column, line, area, Pareto, or progressive charts, to specify the data label format, in the **Values** list, select what values to display.
  - **None** does not display data values.
  - **Values** displays the non-cumulative value of the data.
  - **Cumulative values** displays the cumulative value of the data.
5. For bubble or scatter charts, to specify the data label format, in the **Show** box, select whether to show values or values and labels for the category, series, and measure.
6. For bar, column, line, area, Pareto, or progressive charts, to show lines that point from data labels to data marker they apply to, select the **Show leader lines** check box.
7. For bubble or scatter charts, to show lines that point from data labels to data marker they apply to, select the **Leader lines** check box.
8. To specify where values and labels are to be rendered in the chart, click the **Value Location** list and choose the location that you want.
9. To specify how to display the labels if their positions on the chart overlap, in the **Collision Mode** list, click one of the following modes:
  - **None** specifies that labels appear in default positions and might overlap.
  - **Normal** (for pie and donut charts) specifies that labels are placed just above their corresponding data markers or chart objects. There is no collision detection, so labels can overlap.
  - **Coarse Stagger** specifies that labels are placed close to their data markers and staggered so that they do not overlap. This collision mode takes less time to render than **Fine Stagger** but might result in labels that are farther away from their corresponding data markers.

- **Fine Stagger** specifies that labels are staggered so that they do not overlap. The labels are as close to the data markers as possible without overlapping. This collision mode takes more time to render than **Coarse Stagger** but might result in labels that are closer to their corresponding data markers.

## Showing data values in current default pie and donut charts

You can show the data labels or data values within the chart so that the data values are more clear.

For example, in a pie chart, show the data values within each pie slice, so that you know the exact size of each pie slice.

### Procedure

1. Select the chart object.
2. In the **Properties** pane, double-click the **Show values** property.
3. To display data labels for each slice of the pie, under **Show**, select the **Slice names** check box.
4. To show lines pointing from data labels to the slices they apply to, select the **Show leader lines** check box.
5. To specify the data label format, in the **Values** list, select what values to display.
  - **Hide** does not display data values.
  - **Absolute** displays the absolute value of the data.
  - **Percentage** displays the slice's percentage of the whole pie.
  - **Absolute and Percentage** displays the slice's percentage of the whole pie as an absolute value.
6. In the **Position** list, select the placement of data labels.

## Define Query Context When Customizing Legend Entries, Legend Titles, or Axis Labels

You want to use a revenue expression as a chart legend title. If you get an error message saying that the query context of a layout object cannot be determined, you must define the property list for the item to which it refers. You must first add the desired data item to the query before you can define its property list.

### Procedure

1. Open the chart to customize.
2. Click the **Queries** icon  and click the query.
3. Click the **Data** icon , and from the **Source** tab, drag the desired item to the **Data Items** window to add it to the query.
4. Click the **Pages** icon , and click the chart page.
5. Click the **Data** icon , and from the **Data items** tab, drag the desired item to the layout object.
6. In the **Properties** pane, under **Data**, double-click the **Properties** property.
7. Select the check box for the data item to define.

### Related tasks

[Specify a List of Data Items for an Object](#)

## Summarize Small Slices, Bars, or Columns in Current Default Charts

You can summarize the smaller slices or bars in charts to avoid having many tiny slices or bars. For example, if your pie chart shows revenue by product and 10 of your products have less than 1% of the pie, you can summarize these 10 slices into one larger slice and name that slice Other.

Similarly, you can summarize small items in a column, bar, area, and line chart.

You cannot summarize small slices or items in charts that have matrix edges or in charts that have multiple numeric axes.

### Procedure

1. Select the [chart object](#).
2. In the **Properties** pane, under **General**, double-click the **Summarize Small Slices** or **Summarize Small Items** property.
3. To summarize small slices or items up to a maximum number, select the **Maximum number of slices** or **Maximum number of items** check box and type the maximum number.
4. To summarize all the slices or bars that are smaller than a specific value, select the **Summarize slices smaller than a value** or **Summarize items smaller than a value** check box, type a value that represents the upper size limit, and choose whether the value is a percentage or absolute.
5. Under **Small slice summarization type** or **Small item summarization type**, choose whether to summarize the slices or items as a **Total** or **Average**.  
**Note:** Averages are calculated using only the summarized items in the report.
6. Under **Slice label** or **Item label**, type a label for the one large slice, bar, area, or line that summarizes the smaller ones.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Customizing lines and data points in a line chart

You can customize the lines in a line chart to show only lines, only data points, or both. Data points represent series values for each category on the Y-axis. You can show special data markers that represent statistically significant values, such as open, high, low, and close values.

You can also add markers at other positions on the chart. For more information, see “[Add a Marker to a Current Default Chart](#)” on page 94.

You can also change the path of the line that connects the data points to one of the following:

- **Point to Point** shows data points connected by straight lines.
- **Step at Point** shows data points connected by steps that start and end at the data points.
- **Step Between Points** shows data points connected by steps that start and end between the data points.
- **Smooth** shows data points connected by smooth curves.

### Related tasks

[Add a Marker to a Current Default Chart](#)

### Customize Lines and Data Points in a Current Default Line Chart

You can change the color and shape of the line or data markers in a line chart. You can also show or hide data labels, the line, and data markers.

You cannot show value markers when the **Data points** option is selected or when the configuration of the line chart is stacked or 100 percent stacked.

### Procedure

1. Select the [chart object](#).
2. In the chart area, under **Series**, click the line chart icon to view the line properties.
3. To select whether to show only the line, the line and data markers, or only the data markers, in the **Properties** pane, select an option from the **Line and Markers** list.
4. To show special data markers, double-click the **Value Markers** property. Select the check box for the special data markers that you want to add and for each marker, specify the color and shape.

The options you specify in **Value Markers** overwrite the options for **Line and Markers**.

5. To change the shape of the line that connects data markers, select an option from the **Line Shape** list.
6. To show data labels for the data points, double-click the **Data Labels** property.
7. To change the color of the lines, double-click the **Palette** property.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

[Customizing the Color Palette of a Chart](#)

#### Customize Lines and Data Points in a Legacy Line Chart

You can change the color and shape or the line or data markers in a line chart. You can also show or hide data labels, the line, and data markers.

You cannot show value markers under the following conditions:

- The **Data points** option is selected.
- The configuration of the line chart is stacked or 100 percent stacked.
- The **Show line** property is set to **No**, creating a point chart.

#### Procedure

1. Select the [chart object](#).
2. In the chart area, under **Series**, click the line chart icon to view the line properties.
3. To select whether to show only the line, the line and data markers, or only the data markers, in the **Properties** pane, under **General**, select an option from the **Line Type** list.
4. To show or hide the line, select an option from the **Show line** list.
5. To show data points or value markers, double-click the **Show Data Points** property:
  - To show or format data points, click **Data points** and specify the point shape and point size.  
The point color is defined by the chart palette.
  - To show or format value markers, click **Value markers** and specify the markers to show. For each marker, specify the shape and marker size. Click **Color** to change the marker color.

**Tip:** To remove all data points and value markers, in the **Show Data Points** dialog box, select **None**.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

[Customizing the Color Palette of a Chart](#)

#### Customize a Current Default Combination Chart

Combination charts show data series using two or more types of charts - area, bar, and line. The different charts are overlaid on top of each other. You can customize the order in which the charts appear along with the type of charts and their configurations.

You can also customize which numeric axes to show and which chart to show on each axes.

#### Procedure

1. Select the combination [chart object](#).
  2. In the **Properties** pane, under **General**, double-click the **Combinations** property.
  3. Under **Numeric axes**, select which axes to show.
  4. Under **Combinations**, add  or remove  data series.
  5. If you want to change the order in which the series appear, use the up and down arrows.
- The series appear in the order they are listed. Each chart appears in the foreground of any previous charts.

6. If you want to change the configuration type of the series, such as changing clustered bars to stacked bars, under **Combinations**, select the series, click the edit button  and select the type.
7. If you use the same data series for multiple charts and want to synchronize the data marker colors, under **Color & Background**, set the **Series Color** property to **Match**.

### Related concepts

[Current Default Charts and Legacy Charts](#)

## Create a Matrix of Current Default Charts

You can view a complex chart that includes nested series or categories into a matrix, or crosstab, that shows multiple small charts arranged in rows and columns.

The charts in the rows represent the outer nested levels of the series and categories and, the charts in the columns represent the categories. Each data item in the outer nested levels of the series and categories becomes a separate chart. The numeric scale of all the charts is the same so that you can easily compare.

When working with pie, gauge, and bullet charts, if you include a data item in the categories, you automatically create a matrix of charts. One chart appears for each data item in the category. When working with progressive and bullet charts, if you include a data item in the series, you also automatically create a matrix of charts.

For example, the following column chart shows the revenue for each year (in the categories or X-axis) for all the regions and product lines (in the series or Y-axis). This chart is very complex and difficult to understand.

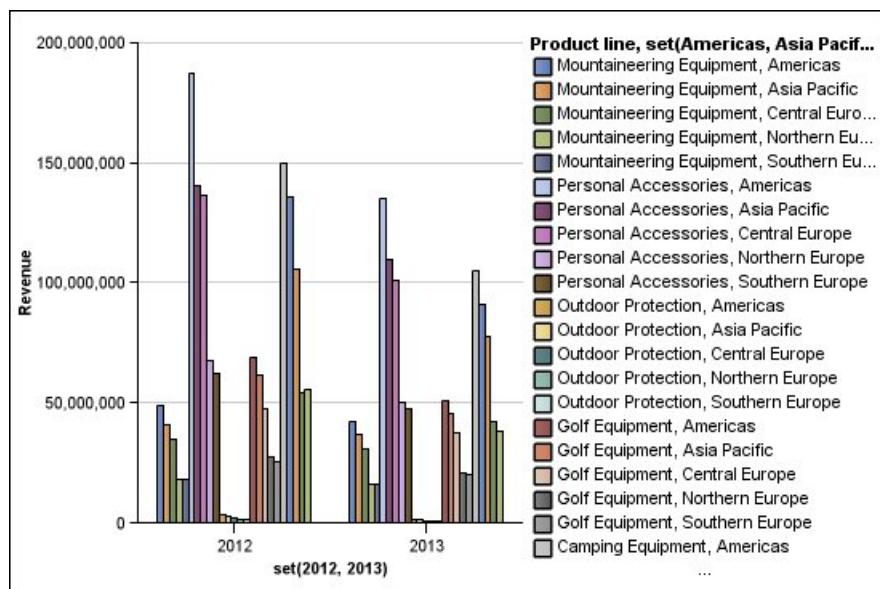


Figure 18. Complex column chart

The following chart contains the same series and categories. However, when converted to a matrix of charts, the information is much easier to analyze. The columns show charts for each year and the rows show charts for each the product lines. The bars represent the revenue for each region.

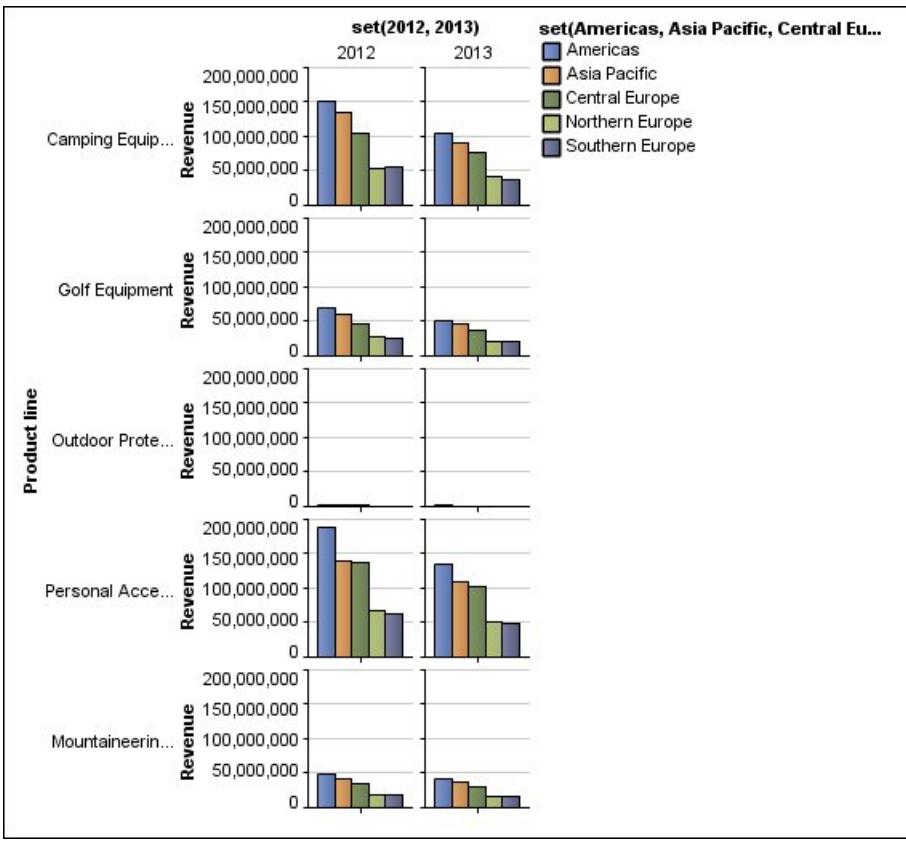


Figure 19. Matrix chart

## Procedure

1. Select the chart object.
2. In the **Properties** pane, under **General**, double-click the **Matrix rows and columns** property.
3. Select the **Show outer nested series as matrix rows** or **Show outer nested categories as matrix columns** check boxes (or both).
4. In the **Matrix levels** box, select the number of nested levels to include in the matrix columns or rows.

The remaining nested levels are represented in the chart bodies in the matrix if the chart supports additional categories. The pie, gauge, and bullet charts do not support additional categories. The bullet and progressive column charts do not support additional series.

For example, in the above chart, Regions are nested under Product Line. In the matrix chart, a **Matrix level** of 1 is specified. Therefore, Product Line appears as the matrix rows (series) and Regions appear within the chart bodies.

5. If you want labels for the matrix rows and columns to appear on each chart, select the **Show row labels** or **Show column labels** check box.
6. In the **Labels location** list, select where the nested labels should appear on each chart.  
The default position is on the left for rows and on the bottom for columns.
7. If the labels are too long, click **Truncation** and specify where to truncate text or select the **Size fonts automatically** check box to resize the text to fit.
8. To change the font, color, and data format of the labels, click **Style**.
9. To show the title in the row or column axis, select the **Show row title** or **Show column title** check box.
10. If you want to hide or show the axes, select the axis object, and in the **Properties** pane, under **Miscellaneous**, set the **Show in Matrix** property.

11. If your matrix chart includes only rows or columns, and you want them to wrap, select the **Wrap rows or columns if possible** check box.
12. If you want to show the axes and axis labels for each small chart in the matrix, select the **Repeat row and column axis labels** check box.

When this option is cleared, axes and axis labels appear only along the outer edge of the matrix.

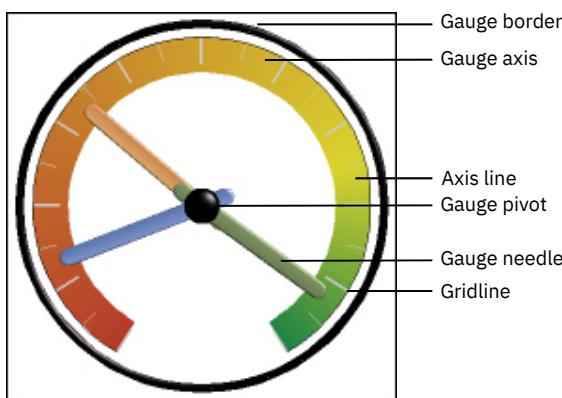
#### Related concepts

[Current Default Charts and Legacy Charts](#)

## Customize a Current Default Gauge Chart

When you create a gauge chart, you can choose from a variety of chart templates, which offer different shape, axis, and border options.

You can customize the following aspects of your gauge chart. As you modify properties, the chart preview shows you what your chart will look like.



Unless indicated in the user interface, all sizes are a percentage of the maximum allowed.

If your gauge chart includes a border, long axis labels, such as 250,000,000, may overlap the gauge border and be difficult to read. To avoid this problem, customize the data format of your gauge chart measure and reduce the scale so that less zeros are displayed. Or change the gauge border color or size or remove the border.

### Procedure

1. Click the gauge chart object.
2. If you want to change the shape of the gauge, modify the start and end angles of the gauge axes and border, as follows:
  - a) In the **Properties** pane, under **General**, double-click the **Gauge Axes** property and specify the start and end angles and the direction of the axes.
  - b) Double-click the **Gauge Border** property and specify the style and the start and end angles of the border.

For example, a border start angle of 0 degrees and end angle of 180 degrees produces a semi-circular gauge.
3. If you want to add an additional axes to a gauge chart, do the following:
  - a) In the **Properties** pane, under **General**, double-click the **Gauge Axes** property.
  - b) Click the new icon and specify the start and end angles and the direction of the new axis.
4. If you want to change the size, shape, and color of the center pivot point, double-click the **Gauge Pivot** property and specify the style.

5. If you want to change the indicators in the gauge axis, click the **Gauge Axis** object in the chart and do the following:
  - a) To change the needle, under **Axes**, double-click the **Gauge Needle** property and specify the style.
  - b) To change, add, or remove color bands that indicate the data range positions, under **Color & Background**, double-click the **Gauge Axis Colors** property and specify the color palette.
  - c) If you want to change the size or thickness of the gauge axis and color bands, under **Axes**, specify a percentage size for the **Gauge Axis Inner Radius** and **Gauge Axis Outer Radius** properties.
  - d) If you want to change the gridlines, under **General**, double-click the **Gridlines** or **Minor Gridlines** properties and specify the style.
  - e) If you want to change the appearance of the gauge axis line, under **General**, double-click **Axis Line**.

#### **Related concepts**

[Current Default Charts and Legacy Charts](#)

[Gauge Charts](#)

## **Customize a Legacy Gauge Chart**

You can customize the colors and threshold boundaries of the gauge axis areas and whether they use numbers instead of percentages. You can also change the colors of the gauge face and outline and hide gauge labels. By default, the legacy gauge chart uses a band divided into thirds that runs from green to red.

#### **Procedure**

1. Click the gauge chart object.
2. If you want to customize the color of the gauge face or outline, in the **General** section of the **Properties** pane, double-click the **Face Color** or **Dial Outline Color** property.
3. If you want to hide the gauge labels, in the **Chart Labels** section of the **Properties** pane, set the **Gauge Labels** property to **Hide**.
4. If you want to customize the colors and boundaries of the gauge areas, do the following:
  - a) In the **Color & Background** section of the **Properties** pane, double-click the **Gauge Palette** property.
  - b) To change the color of a boundary area, under **Palette**, select the color, click **Color**, specify the color properties, and click **OK**.
  - c) To change the value of a boundary area, under **Palette**, select the boundary value, and type a new value.
  - d) To add a new boundary area, click the new icon .
  - e) To choose a pre-defined threshold style, click the **Palette** drop-down menu.

You can choose whether to use discrete colors or continuous colors.

To use a number instead of a percentage as a boundary, clear the **Percentage** check box, and then type a number in the **Numeric boundary** box.

#### **Related concepts**

[Current Default Charts and Legacy Charts](#)

[Gauge Charts](#)

## **Defining color by value in current default scatter or bubble charts**

In a scatter or bubble chart you can specify that data points or bubbles appear in different colors that are based on an additional measure or fact. The color of the points or bubbles helps you to see relationships in large amounts of data.

For example, the following bubble chart shows the relationship between the unit cost and unit sale price. The size of the bubbles shows the gross profit and the color of the bubbles shows whether the quantity sold is above (yellow) or below (green) 1,000,000 units.

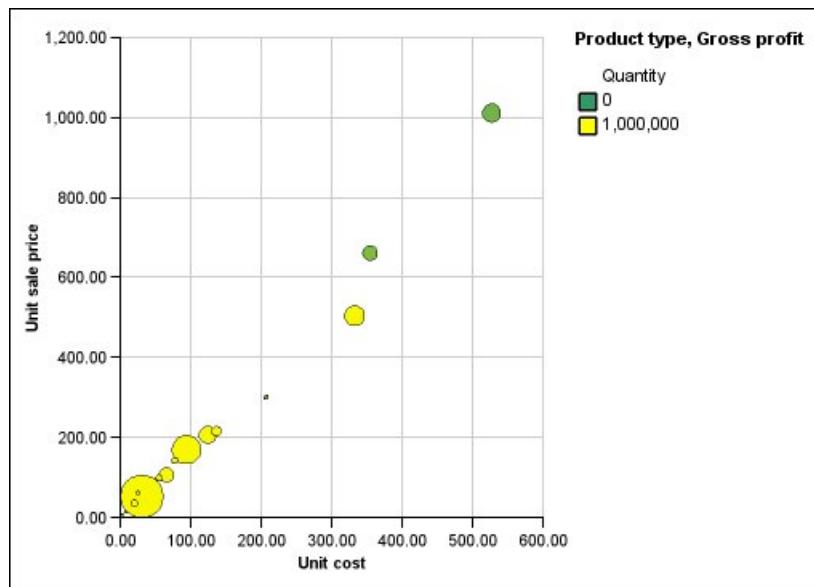


Figure 20. Example of a bubble chart that shows values in different colors

In a bubble chart, you can combine the color by value and bubble size to create a more meaningful chart.

### Procedure

1. Drag a measure to the **Color** drop zone under **Measures** and then select the measure.
2. In the **Properties** pane, under **Color & Background**, double-click the **Color by Value** property.
3. To define the colors by percentages instead of actual values, select the **Percentage** check box.

For example, if you select the **Percentage** check box and your values range from 25 (red) to 50 (green), the bottom 25 percent of values are red and the top 50 percent of values are green. The values between 25 percent and 50 percent are an interpolated color, such as yellow.

4. If you want to use a preset color palette, click **Palette**, and select the palette that you want to use.
5. If you want to customize a palette color or boundary value, select the palette entry in the **Palette** box and specify the color, transparency, and type a new boundary value.
6. To add a palette entry, select the palette entry below which you want to add the new entry, click the new palette entry icon , and click **Color**.
7. If your chart has lines or markers, under **Style**, set the marker shape, line style, and line weight.
8. To choose a color and transparency for missing or null values, under **Missing Values**, click **Color** and type a value in the **Transparency** box.

### Related concepts

[Current Default Charts and Legacy Charts](#)

[Scatter Charts](#)

[Bubble Charts](#)

## Specify the Bubble Size in a Current Default Bubble Chart

In a bubble chart, you use a measure or fact to determine the size of the bubbles.

You can use the **Bubble Measure** in the **Measures** drop zone of the chart to specify bubble size. You can then specify the size range of the bubbles in the chart. You can also specify what value the smallest bubbles represent. For example, your bubble measure is revenue, and you set the minimum and

maximum bubble size to 5 pt and 20 pt, respectively. You set the smallest bubble to represent the value zero. All the bubbles on your chart will be between 5 and 20 pts and any bubbles between 0 and 5 pts on this scale will appear at 5 pt.

You can combine bubble size with colors by value to create a chart that shows multiple dimensions.

### Procedure

1. Select the chart object.
  2. In **Properties** pane, under **General**, double-click the **Bubble Size** property.
  3. Under **Smallest bubble**, select what value the smallest bubbles represent:
    - To show data items with a value of zero at the minimum bubble size, click **Zero**.  
**Tip:** This setting is consistent with Microsoft Excel 2003.
    - To show data items with a value of zero at the minimum bubble size and show negative bubbles as hollow, select the **Zero. Negatives shown as hollow** check box.  
**Tip:** This setting is consistent with Microsoft Excel 2007.
    - To set the minimum bubble size to the minimum data value, click **Minimum data value**, and type a size for the minimum and maximum bubble size.
- Note:** The minimum data value can be positive or negative.

### Related concepts

- [Current Default Charts and Legacy Charts](#)  
[Bubble Charts](#)

## Set the Position of the First Slice in a Current Default Pie Chart

You can specify the angle in a pie chart where the first pie slice starts. You can also change the direction of the slices so they appear clockwise or counter-clockwise.

The default starting position of the first slice is **90**, which displays the first slice beginning at the 12 o'clock position. By default, the slices appear clockwise around the pie, so a starting position of **90** displays the first slice at the 12 o'clock position, a starting position of **180** displays the first slice at the 9 o'clock position, and so on.

### Procedure

1. Select the pie chart object.
2. In the **Properties** pane, under **General**, beside the **First Slice Angle** property, enter the angle at which you want the first slice to appear.
3. To change the directions in which slices appear, change the **Slice Direction** property.

### Related concepts

- [Current Default Charts and Legacy Charts](#)  
[Pie Charts](#)

## Creating a Donut Chart from a Current Default Pie Chart

You can add a hole to the middle of your pie chart to create a donut chart.

### About this task

You can display something in the hole of donut charts, such as a company logo or the legend.

### Procedure

1. Select the pie chart object.

2. In the **Properties** pane, under **General**, set the **Hole size (%)** property to the percentage of the pie that you want the hole to take up.

**Tip:** You can select a value from the **Hole size (%)** list or type a value that is not listed.

3. To display the legend in the donut hole, do the following steps:

- a) Select the chart.
- b) In the **Properties** window, double-click the **Legend** property.
- c) In the **Position** box, click the **Advanced** radio button and then click the ellipsis button.
- d) In the **Position** box, click the **Center** and **Middle** icons.
- e) In the **Anchor** box, click the menu and select **Relative to Chart Body**.
- f) Click **OK** twice.

4. To display an image in the donut hole, do the following steps:

- a) To unlock the report, click the **More** icon  , click the **Locked** icon .
- b) Click the chart body.

In the **Properties** window, **Properties - Chart Body** appears.

- c) Double-click the **Background Effects** property.
- d) Select the **Images** check box.
- e) Under URL, click **Browse** and select the image that you want to display in the donut hole.
- f) Under **Position**, click the **Align Middle Center** icon.
- g) Click **OK**.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

[Pie Charts](#)

### Pull Out Pie Slices in a Current Default Pie Chart

You can highlight pie slices by pulling them out from the rest of the pie. For example, the following chart shows revenue by product line with slices of less than 1,000,000,000 in revenue pulled out by 25%.

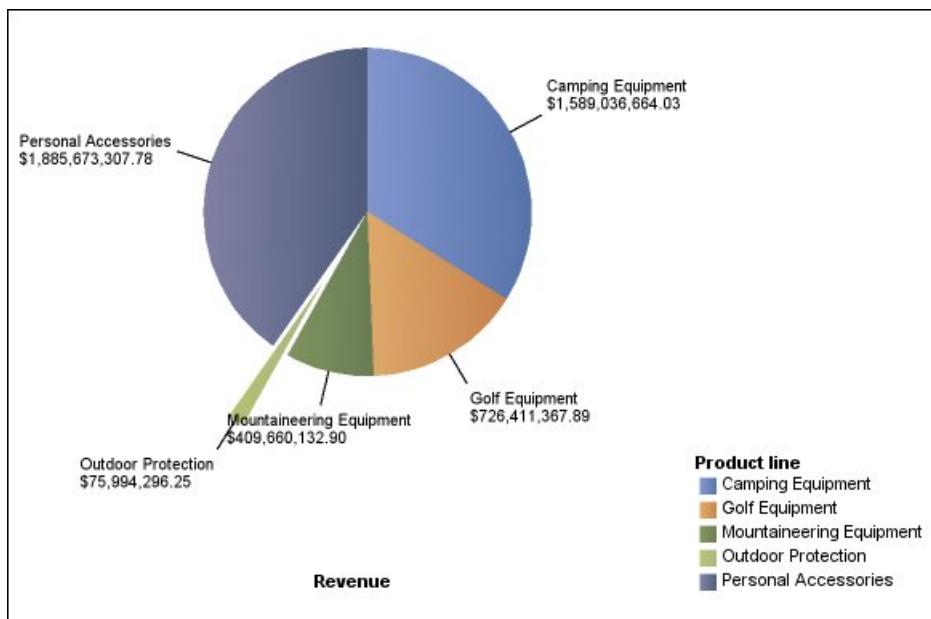


Figure 21. Exploding slices in a pie chart

## Procedure

1. Select the pie chart object.
2. In the **Properties** pane, under **General**, double-click the **Exploded Slices** property.
3. In the **Exploded Slice** dialog box, click the new button .
4. In the **Exploded amount** box, type the percentage by which the slice should appear away from the rest of the pie.  
**0%** displays the pie slice in the pie; **100%** displays the pie slice as far out from the rest of the pie as possible.
5. Define which slice to pull out:

- To select a slice to pull out using its slice index, under **Exploded slice**, click **Slice number** and type the slice number.

The slice number refers to the order of the slice in the legend. In the previous example, Camping Equipment has a slice number of 1 and Personal Accessories has a slice number of 5.

- To select a slice to pull out using a calculation, under **Exploded slice**, click **Expression** and click the ellipsis beside the **Expression** box to define an expression.

In the previous example, the expression that defines which slices to pull out is as follows:  
**[Query1].[Revenue] < 100000000**.

The slice definitions appear in the **Exploded Slices** list.

6. To pull out other slices, repeat steps 3 to 5.

## Related concepts

[Current Default Charts and Legacy Charts](#)

[Pie Charts](#)

## Define the Cumulation Line in a Current Default Pareto Chart

The cumulation line on a Pareto chart displays the percentage of the accumulated total of all the columns or bars. For example, if your chart displays revenue by product line by year, the cumulation line at the second year's column would be the total revenue of the first and second years.

You can customize the appearance of the cumulation line and its data points.

## Procedure

1. Select the Pareto chart.
2. To hide or show the cumulation line, in the **Properties** pane, under **Chart Annotations**, set the **Cumulation Line** property.
3. To customize the cumulation line, click the cumulation line icon , and in the **Properties** pane, under **General**, set the following properties:
  - **Line Styles** defines the cumulation line color, style, and weight.
  - **Cumulation Label** defines the label in the legend for the cumulation line. You can use the default label from the data source or type a custom label. The color and marker shape of the cumulation line still appears in the legend when this property is set to **None**.
  - **Data Points** defines whether to show or hide data points along the cumulation line, whether to show or hide data point borders, the color of data point borders, and the data point size and shape.
  - **Data Labels** specifies whether to show or hide the labels for the data points along the cumulation line.

## Related concepts

[Current Default Charts and Legacy Charts](#)

## Pareto Charts

### Define the Cumulation Line in a Legacy Pareto Chart

The cumulation line on a Pareto chart displays the percentage of the accumulated total of all the columns or bars. For example, if your chart displays revenue by product line by year, the cumulation line at the second year's column would be the total revenue of the first and second years.

You can customize the appearance of the cumulation line and its data points.

#### **Procedure**

1. Select the Pareto chart.
2. To hide or show the cumulation line, in the **Properties** pane, under **Chart Annotations**, set the **Cumulative Line** property to **Show**.
3. To customize the cumulation line, click the cumulation line icon  and in the **Properties** pane, under **General**, set the following properties:
  - **Cumulation Axis** displays or hides the cumulation line's axis on the right of the Pareto chart.
  - **Cumulation Label** displays or hides the cumulation line label in the legend. The color and marker shape of the cumulation line still appears in the legend when this property is set to **No**.
  - **Line Styles** defines the cumulation line color, style, and weight.
  - **Marker Size (pt)** defines the size of the markers along the cumulation line in points.
  - **Marker Shape** defines the shape of the markers along the cumulation line.
  - **Values** specifies whether to show or hide the values for the markers along the cumulation line.
  - **Value Location** defines the location of the marker values.

#### **Related concepts**

[Current Default Charts and Legacy Charts](#)

[Pareto Charts](#)

### Insert a Microchart into a Crosstab

You can use microcharts to improve the visualization of data in crosstabs.

#### **Procedure**

1. Select a crosstab row or column.
2. From the right-click menu, click **Insert Chart for Row Data** or **Insert Chart for Column Data**.
3. From the **Insert Chart** dialog box, select a chart and click **OK**.
4. Specify the data to plot in the microchart.

The chart automatically plots the data in the specified rows or columns. You can change this if necessary.

### Customize a Current Default Bullet Chart

After you create a bullet chart, you can customize the shape, color, and size of the bullet and target indicators.

By default, the bullet chart includes three gray colored regions in the background. You can edit the colored regions (**Properties** pane, **Colored Regions**).

#### **Procedure**

1. Select the bullet chart object.
2. To change the shape, color, and size of the bullet or target, do the following:

- a) In the **Properties** pane, under **General**, double-click the **Bullet Indicators** property.
  - b) Under **Bullet**, specify how to show the bullet.

The **Bar width** setting specifies the width of the bullet bar as a percentage of the space available. For example, if you specify 50 percent, the bar uses half of the space available. If you specify 100 percent, the bar uses all the available space.
  - c) Under **Target**, specify how to show the target.
3. To change the chart orientation, in the **Properties** pane, under **General**, set the **Chart Orientation** property.

#### Related concepts

[Current Default Charts and Legacy Charts](#)

[Bullet Charts](#)

#### Related tasks

[Add Colored Regions in a Current Default Chart](#)

## Changing the number of hotspots in a chart

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To improve performance, you can limit the number of hotspots that are generated for Reporting charts.

#### About this task

A hotspot in a chart appears when you pause a pointer over it. For example, a hotspot on a drill-down symbol or a tooltip gives details about the column, line, or pie slice. The browser response time increases with the number of hotspots. When charts with many members are generated, the hotspots can become an additional burden for the system resources, which can freeze the browser.

When you limit the number of hotspots, priority is given to items such as axis labels and legend labels before individual graphical elements such as bars, pie slices, and so on. Depending on the number of items in a chart and the setting for maximum number of hotspots, some axis items may have hotspots while other axis items and all graphical elements do not, or all axis items and some graphical elements may have hotspots while other graphical elements do not.

The maximum hotspot setting in Reporting overrides the default set by the administrator. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

#### Procedure

1. Select the [chart object](#).
2. In the **Properties** pane, under **Miscellaneous**, specify a number for the **Maximum Hotspots** property.

## Create a drill-up and drill-down chart

---

If you use a dimensionally-modeled data source, you can create a chart that allows you to drill down to lower-level data or drill up to higher-level data.

Drilling up and down allows you to view more general or more detailed information on your data within a predefined dimensional hierarchy.

This is an example of a dimensional hierarchy:

Years - Year - Quarter - Month

#### Before you begin

Before you begin, ensure that you are using a dimensionally-modeled data source.

## Procedure

1. Open a chart that uses a dimensionally-modeled data source.
2. Click the **Show properties** icon  , click the select ancestor icon  , click Report, and then, in the **DATA** section, double-click **Advanced drill behavior**.
3. On the **Basic** tab, in the **Report output drill capabilities** section, select the **Allow drill-up and drill-down** check box.

By default, the system determines which items can be drilled on based on the dimensional structure.

On the **Basic** tab, you can make drilling unavailable for any data item by selecting the item in either the **Disable drill-up for** box or the **Disable drill-down for** box.

On the **Advanced** tab, you can change the drill-up or drill-down behavior for any parameter by selecting the parameter and then choosing one of the desired behaviors.

## Results

The chart generates links for any item that can be drilled down on.

You can drill down or drill up by right-clicking and choosing the action from the context menu. The menu items are unavailable if an item cannot be drilled up or down on.

## Related tasks

[Create a drill-up and drill-down report](#)



# Chapter 6. Extensible visualizations

You can use extensible visualizations in IBM Cognos reports to visualize data.

Visualizations are available from the IBM Cognos Analytics blog [Custom visualizations used in the samples](https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2016/10/06/ibm-cognos-analytics-custom-visualizations-used-in-the-samples) (<https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2016/10/06/ibm-cognos-analytics-custom-visualizations-used-in-the-samples>). For more information about administration and visualizations, see the *IBM Cognos Analytics Administration and Security Guide*.

**Tip:** IBM Cognos Analytics samples include visualizations.

Because visualizations are extensible, they can be customized by an author with the necessary skills. You can create client-side visualizations that report consumers can run when they are not connected to the web. You can also use visualizations on mobile devices.

Some of the visualizations that you can add to your reports are treemaps, heatmaps, packed bubble visualizations, and network diagrams.

You can set properties that are available for each visualization type. These properties are determined by the visualization definition. Typically, you can set such properties as width, height, animation effect, and fixed-axis scaling.

Extensible visualizations support all Active Report interactivity. For example, you can use Active Report controls to dynamically filter visualizations to view only the data that you want to analyze.

## Adding a visualization to a report

You can add a visualization to a report to efficiently represent your data.

### About this task

You add data to a visualization by inserting data items in drop zones.

When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

### Procedure

1. Create a new report or open an existing report.
2. Click the **Toolbox** icon , and drag a **Visualization** icon  to the work area.
3. In the **Visualization gallery** window, click the **Filter** icon , and select one of the following choices:
  - **11.0.5** To choose one of the new visualizations that is included in IBM Cognos Analytics 11.0.5, select **New Visualizations**.
  - To choose a visualization from previous Cognos Analytics releases, select **Legacy Visualizations**.
4. Select a visualization and click **OK**.

## Source

5. From the **Source** tab, drag items to the appropriate location in the data container.
6. Run the visualization.

### Example - Adding a treemap visualization

You can use a treemap visualization in reports to identify patterns and exceptions.

Treemaps show relationships among large numbers of components by using size and color coding in a set of nested rectangles.

A treemap that is colored by category identifies the level 1 category by color. The sizes of the rectangles represent the values. In a treemap that is colored by value, the sizes of the rectangles represent one of the values and the color represents a second set of values.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

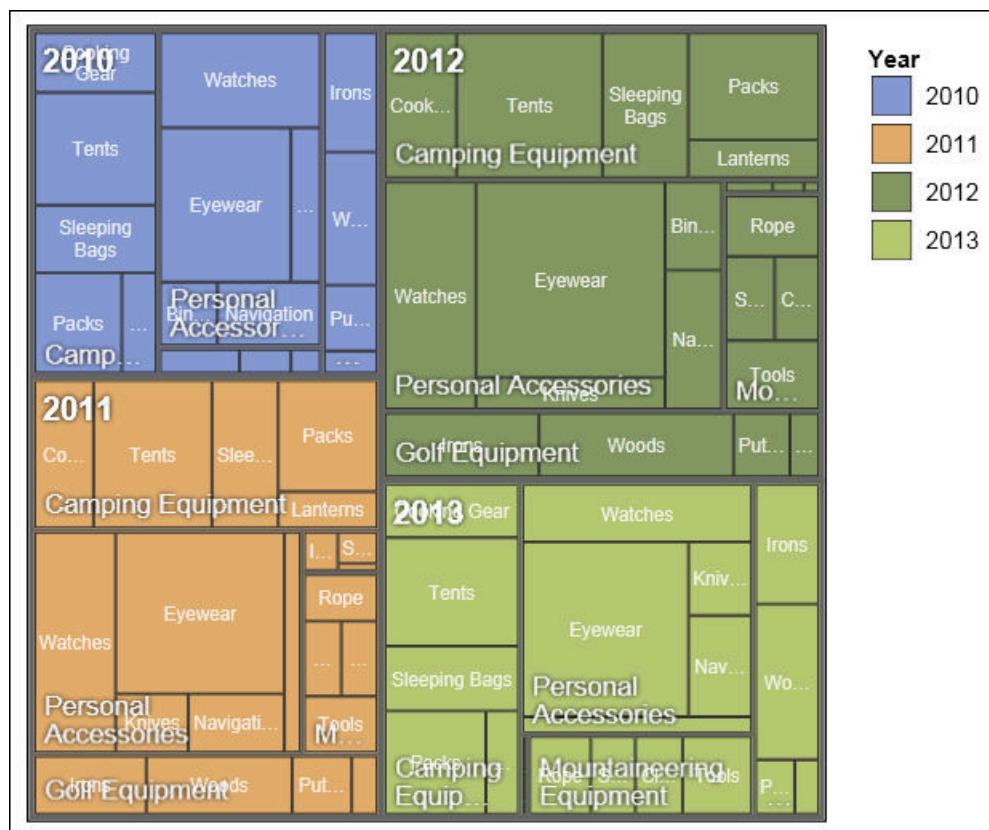


Figure 22. A treemap visualization

### Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

If you use Microsoft Internet Explorer to view visualizations, you must have Microsoft Silverlight 5 installed on your computer. Firefox or iPad users do not need Silverlight.

### About this task

You add data to a visualization by inserting data items in drop zones.

When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You

can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

### Procedure

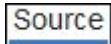


1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.

2. From the **Visualization Gallery**, select a Treemap icon:

- If you are plotting a single measure, select a treemap colored by category.
- If you are plotting two measures, select a treemap colored by value.

3. Click **OK**.



4. From the **Source** tab , drag items to the appropriate location in the data container:

- a) Under **Values**, drag items to define the size and color of the rectangles to **Size** and **Color**.
- b) Under **Categories**, drag items to the different levels. Each level represents the category within which the subsequent levels are nested.  
For example, the levels might be Year, Product Line, and Product Type.

### Example - Adding a heatmap visualization

Heatmaps use colors to represent the individual values that are contained in a matrix.

Similar to treemaps, you can use heatmaps to identify patterns and exceptions. Unlike treemaps, the sizes of the rectangles are not proportionate to values.

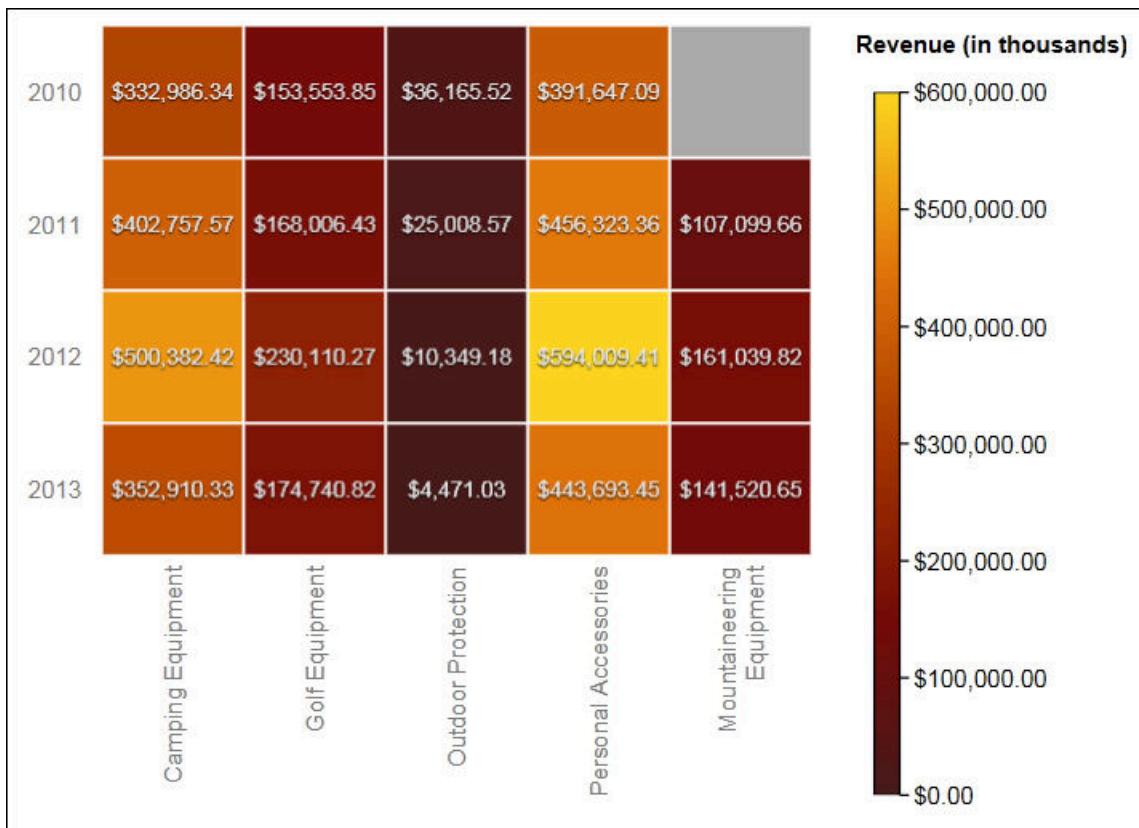


Figure 23. A heatmap visualization

### Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

If you use Microsoft Internet Explorer to view visualizations, you must have Microsoft Silverlight 5 installed on your computer. Firefox or iPad users do not need Silverlight.

### About this task

You add data to a visualization by inserting data items in drop zones.

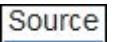
When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

### Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select the **Heatmap** icon and click **OK**.
3. From the **Source** tab , drag items to the appropriate location in the data container:

- a) Under **Values**, drag a measure or a single value to define the color shading of the rectangles.
- b) Under **Categories**, drag items to the Y Category and X Category.

**Tip:** Ensure that the items in the Y Category and X Category come from different dimensions.

### Example - Adding a packed bubble visualization

A packed bubble visualization is similar to a bubble chart in which the bubbles are tightly packed rather than spread over a grid. You can use a packed bubble visualization to display a large amount of data in a small space.

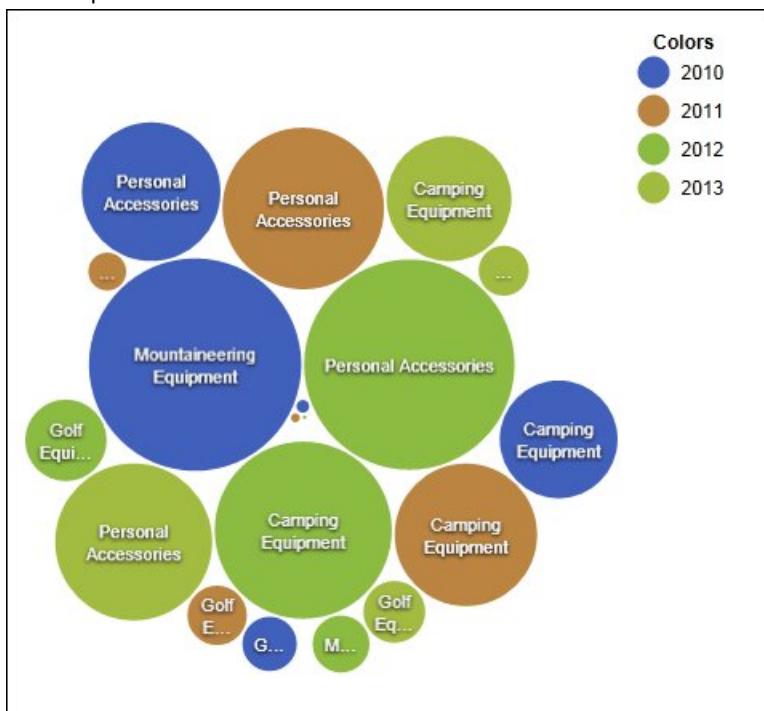


Figure 24. A packed bubble visualization

#### Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

If you use Microsoft Internet Explorer to view visualizations, you must have Microsoft Silverlight 5 installed on your computer. Firefox or iPad users do not need Silverlight.

#### About this task

You add data to a visualization by inserting data items in drop zones.

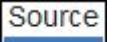
When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When you work with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

## Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select the **Packed Bubble** icon and click **OK**.
3. From the **Source** tab , drag items to the appropriate location in the data container:
  - a) Drag a measure or a single value to the data container, under **Values**.
  - b) Under **Categories**, drag an item to plot as the bubbles.
  - c) Under **Series**, drag an item to apply as a category. Each item in the category gets a different color from the color palette.

## Example - Adding a network diagram

You can create a network diagram in reports. The nodes data container defines the items that you want to link together. The links data container defines relationship between the items that you want to link together.

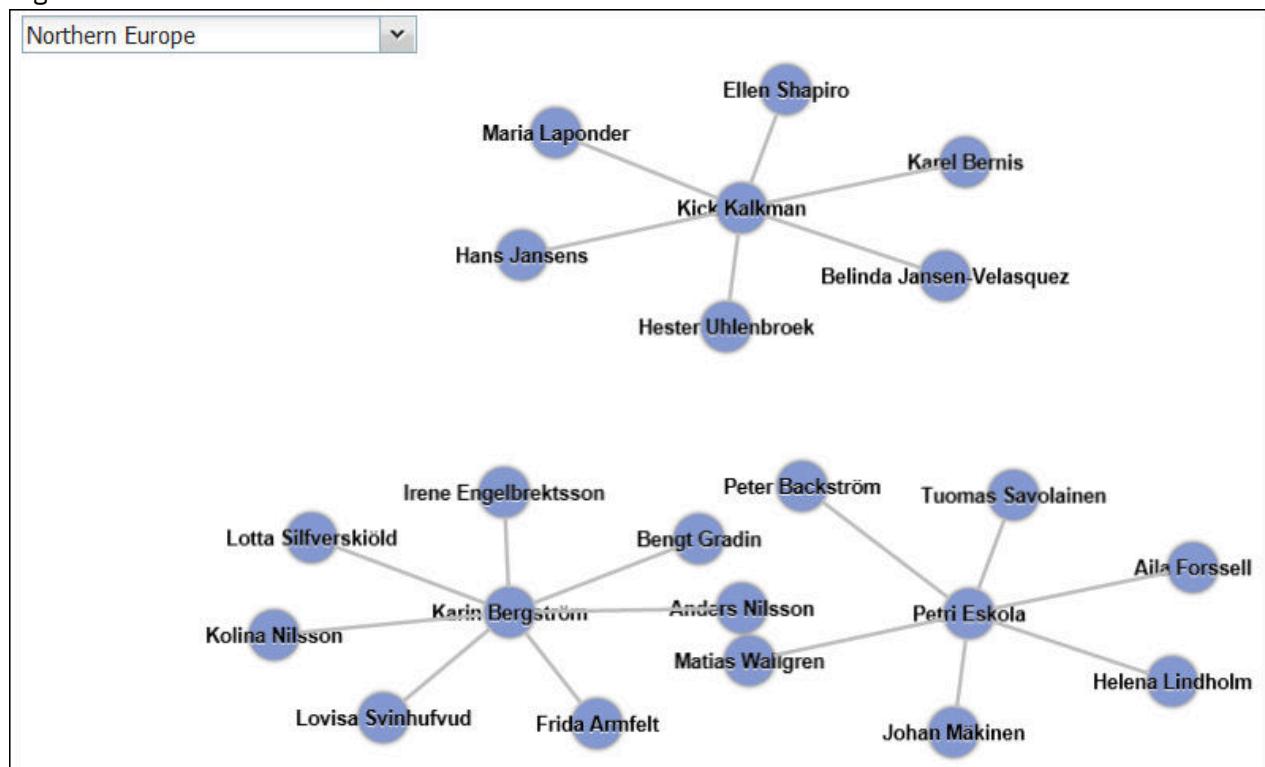


Figure 25. A network diagram in an active report showing employees by region

## Before you begin

Network node drop zones only take numeric data items. Not all data sources have the appropriate data to create a network diagram.

Your administrator must make the visualizations available in the **Visualization Gallery**.

If you use Microsoft Internet Explorer to view visualizations, you must have Microsoft Silverlight 5 installed on your computer. Firefox or iPad users do not need Silverlight.

## About this task

You add data to a visualization by inserting data items in drop zones.

When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional

drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



**Attention:** The supported properties for a visualization are determined by the visualization definition.

### Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select the Network diagram icon and click **OK**.
3. From the **Source** tab , drag items to the appropriate location in the data container:
  - a) In the **Nodes1** data container, drag items to **Node (Numeric)** and **Name**.  
The nodes data container defines the items that you want to link together, such as Employees, defined by an employee code.
  - b) In the **Links1** data container, drag items to **From node (Numeric)** and **To node (Numeric)**.  
The links data container defines relationship between the items that you want to link together, such as Employees and Managers.

## Visualization properties

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The properties that you can set for each visualization affect how you work with visualizations that are inserted in a report.

All extensible visualizations have properties in common and properties that are specific to each visualization. Properties that are specific to a visualization are defined by the visualization author in the visualization definition. By default, properties that are defined by the visualization author appear in a group that is named **Custom** in the **Properties** window, unless the author created property groups in the visualization definition.

To set properties for multiple visualizations, press Ctrl while you click the visualizations in the report. When multiple visualizations are selected, only the common properties appear in the **Properties** window.

## Choosing where visualizations are rendered

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When you add a visualization to an IBM Cognos Active Report, you can choose to render the visualization on the IBM Cognos server or on the client.

### About this task

Visualizations that are added to regular reports are always rendered on the Cognos server. Visualizations that are rendered on the Cognos server are rendered as static images. Client-side visualizations are rendered as JavaScript code. Report size and performance are affected by whether visualizations are rendered on the server or on the client. For example, static images might increase the report size when there are many of them, but performance might be better.

Some visualization properties are available for only one of the render methods, and other properties are modified when you change the render method. For example, the **Container Filter** property, extra values drop zones, and extra categories drop zones are not supported when you choose to render visualizations on the Cognos server.

If you want to enable client-side filtering in the visualization, you must choose to render the visualization on the client.

**Note:** In the visualization definition, visualization authors can specify to render a visualization only as JavaScript or only as a static image. When a visualization supports only one output type, the visualization property **Render Method** is not available. In addition, visualizations that can be rendered only in JavaScript do not appear in the Visualization Gallery when you author regular reports.

### Procedure

1. In the active report, select the visualization.
2. In the **Properties** window, click the **Render Method** property and choose the render method that you want.

## Resizing a visualization

---

You can change the size of a visualization.

### Procedure

1. Click and drag the lower right corner of the visualization.
2. To maintain the aspect ratio, press the Shift key while you resize the visualization.

You can view the changing height and width of the resized visualization in the **Properties** pane, under **Positioning**.

## Changing the nesting order

---

When you create a visualization in an IBM Cognos Active Report, you can change the nesting order so that extra items are ordered properly in the query. If the items are not ordered properly in the query, the report might not run.

### About this task

Extra items are data items that are used for filtering or setting variables. These items are not visible in the visualization. By default, extra categories are nested below other categories, so as not to affect sorting. However, if the extra categories are from the same dimension as a category, they must be in the correct hierarchical order: Years, Quarters, and Months. You can change the nesting order.

For example, you have Quarters and Months as categories. You then add Years as an extra category. You add an Active Report control and connect to Years as a filter. You might have to change the nesting order of the data items for the report to run.

**Note:** Extra items are available only when you choose to render the visualization on the client. You cannot add extra items to a visualization when you choose to render the visualization on the IBM Cognos server.

### Procedure

1. Select the data container that contains the data set in which you want to change the nesting order.
2. From the **Properties** pane, under **General**, click **Change Nesting Order**.
3. In the **Change Nesting Order** window, select the extra category and use the arrow icon to reorder it.

**Tip:** You can click **Show Data Container** to view the new nesting order when the report is run.

### Related tasks

[Sorting a category field by a measure in visualizations](#)

You can sort a category field by a measure in visualizations that are inserted in IBM Cognos Active Report.

## Specifying the range values that are displayed

---

You can specify the range of values that you want to display in a visualization.

### About this task

You can specify the range of values and categorical data that is displayed in visualizations. Some of the options that are available depend on whether you choose to render the visualization on the IBM Cognos server or on the client. When the visualization is rendered on the Cognos server, more choices are available when the visualization is in a master-detail relationship.

To control the range of values that is displayed, the following choices are available to calculate the minimum and maximum values of the range.

- All data

With this choice, minimum and maximum values are calculated to span the values of the inserted measure.

When the visualization is added to an active report, the values are calculated to span the values of all controls that are connected to the visualization.

**Note:** In visualizations that are added to active reports, the aggregation method that is specified in the **Rollup Method** property also affects the range of values.

- All detail data

This choice is available only when the visualization is in a master-detail relationship and is rendered on the Cognos server. With this choice, the range of data that is displayed is the same in each detail visualization.

- Filtered data

This choice is available only when the visualization is rendered on the client. With this choice, minimum and maximum values are calculated from values that users select in Active Report controls that are connected to the visualization.

- Specified values

With this choice, you specify the minimum and maximum values that you want to display in the visualization.

**Note:** The minimum and maximum values that are displayed in the visualization might differ from the values that you specify. For example, if you specify a range of 0 to 195, IBM Cognos Analytics might display a range of 0 to 200.

To specify the categorical data that is displayed, the following choices are available.

- All data

This choice is available only when the visualization is rendered on the client. With this choice, all categorical data that spans the values of all Active Report controls that are connected to the visualization is displayed.

- Filtered data

This choice is available only when the visualization is rendered on the client. With this choice, only the filtered data is shown in the legend and on axes.

The choice that you make for displaying categorical data can affect elements in the visualization, such as the legend and axes. For example, when all data is selected, all legend items are always shown in the visualization, and the color of each legend item stays the same in the visualization. When a category is inserted on an axis, space is reserved on the axis for all data. When filtered data is selected, the color of each legend item can change when users select different values in a control that is linked to the

visualization. When a category is inserted on an axis, the axis shows only the values that are selected in the control.

### Procedure

1. To specify the categorical data that is displayed, follow these steps.
  - a) In the visualization data container, select the category that you want.
  - b) In the **Properties** pane, click the **Category Range** property and select the choice that you want.
2. To specify the range of values that is displayed, follow these steps.
  - a) In the visualization data container, click the data item in the **Values** section that represents the values in the visualization.  
For example, in a packed bubble visualization, click the data item that is inserted in the **Size** box.
  - b) In the **Properties** pane, double-click the **Value Range** property.
  - c) In the **Range type** box, click one of the available choices.
  - d) If you clicked **All data**, **Filtered data**, or **All detail data**, and you want the range of values to include zero, select the **Range includes zero** check box.
  - e) If you clicked **Specified**, type the minimum and maximum values of the range in the **Minimum** and **Maximum** boxes.

### Related tasks

[Choosing where visualizations are rendered](#)

When you add a visualization to an IBM Cognos Active Report, you can choose to render the visualization on the IBM Cognos server or on the client.

[Sorting a category field by a measure in visualizations](#)

You can sort a category field by a measure in visualizations that are inserted in IBM Cognos Active Report.

## Summarizing data in a visualization

---

When a visualization is added to an IBM Cognos Active Report, you can specify how the data is summarized when users select multiple values in a control that filters the data in the visualization.

### About this task

You can specify how data is summarized in a visualization only when you choose to render the visualization on the client. The **Rollup Method** property is not available when you choose to render a visualization on the IBM Cognos server.

In addition to summarizing data, the aggregation method that you choose affects the range of values that is displayed. For example, if the visualization is filtered by a single select control, Maximum is usually the appropriate aggregation method. With this choice, the range of values is based on the maximum of all values across the filtered items.

Set the aggregation method to the aggregation type of the data item. For example, if the data item is Margin, set the aggregation method to Average. When you are using an OLAP data source, IBM Cognos Analytics cannot retrieve the aggregation type of a measure. As a result, IBM Cognos Analytics sets the aggregation method to Total by default.

### Procedure

1. In the visualization data container, in the **Values** section, click the box that represents the data values in the visualization.  
For example, in a heatmap, click the **Color** box.
2. In the **Properties** pane, click the **Rollup Method** property and select the aggregation method that you want to use to summarize data in the visualization.

## Populating a visualization with data from the visualization definition

---

In IBM Cognos Analytics - Reporting, you can populate a visualization with data that is specified in the visualization definition instead of adding data items from a package.

### About this task

You can use data that is specified in the visualization definition to test a visualization before you add your own data. Using data from the visualization definition is also a way to bring external data into a visualization.

### Procedure

1. Select the visualization.
2. In the **Properties** pane, double-click the **Use Embedded Data** property.
3. Select the check box of the data container for which you want to use data that is defined in the visualization specification.

**Tip:** Some visualizations have more than one data container.

### Results

The data container is removed from the visualization. The data container is not required when the visualization is using data from the visualization definition.

## Updating visualizations

---

Update visualizations when a change was made to the visualization definition.

### About this task

You can update the visualizations in a report by opening the report in a new IBM Cognos Analytics - Reporting window.

If any part of a visualization is invalidated by changes that were made to the visualization definition, the invalidated part is removed. For example, if a field is renamed, the data items in the field are removed. You must add the data items to the renamed field for the visualization to run.

For visualizations that are rendered on the client, if you do not update visualizations when the visualization definition is changed, the old visualization definition is used when you run the report. Visualizations that are rendered on the IBM Cognos server always use the latest visualization definition. As a result, server-side visualizations might not run if they are not updated.

### Procedure

Open the report that contains the visualizations that you want to update in a new Cognos Analytics - Reporting window.

## Converting visualizations from one type to another

---

You can convert a visualization from one type to another type.

### About this task

The following list describes the conversion process.

- Data items are mapped to fields with the same name.

- If no field with the same name exists, the first field of the same type is used. Value fields are mapped to value fields. Category fields are mapped to category fields. Category fields that are ID fields are only mapped to other category fields that are also ID fields.
- In active reports, for visualizations that are rendered on the client, extra values and category items are used to fill any empty fields in the converted visualization.

If you convert to a visualization that has fewer fields than the original visualization, the extra data items are kept as extra values or category items.

- Common properties that are not specific to visualizations, such as **Data format**, are preserved.
- No warnings appear for properties that are dropped during the conversion.

When you convert a visualization to a new visualization type, you can preserve properties that have the same ID and the same type. Or you can choose to use only the default properties of the new visualization.

If you convert a visualization to a visualization type that has more fields than the original visualization, you must populate the empty fields in the converted visualization. For example, if you convert a column chart to a combination chart that has columns and lines, there are empty fields for the line data container.

You cannot convert a visualization to a current default chart and vice versa.

### **Procedure**

1. Select the visualization that you want to convert, and in the report object toolbar, click the **More** icon  and then click **Convert Visualization**.
2. Select a new visualization type.
3. To preserve properties that have the same ID and the same type, under **Visualization properties**, click the **Preserve existing visualization properties** radio button.
4. To use only the default properties of the visualization type that you are converting to, under **Visualization properties**, click the **Use new visualization default properties** radio button.
5. Click **OK**.

## **Sorting a category field by a measure in visualizations**

---

You can sort a category field by a measure in visualizations that are inserted in IBM Cognos Active Report.

### **About this task**

In visualizations, you can sort a data item by the overall totals or by the totals in the context of an extra category. While Cognos Active Report supports client-side filtering for visualizations, sorting always occurs on the Cognos server. As a result, you must construct the visualization so that the underlying crosstab reflects your filtering options and provides the correct sorting. As you construct the visualization, you can view the underlying crosstab by right-clicking the visualization data container and clicking **Show Container Data**.

This task describes how to maintain the sorting of a category by a measure when the visualization is filtered by a single selection control. For example, an active report contains a data drop-down list control with Quarter as the data item, and a clustered bar visualization that shows quantity that is sold by retailer type. In the visualization, Retailer type appears as the series, Quantity appears as the measure, and no data item is specified for the categories. You want to sort the visualization by quantity that is sold, and filter by quarter. To have the sorting applied for each quarter, place Quarter on the same edge as Retailer type in the underlying crosstab, which is accomplished by inserting the Quarter data item as an extra category for the series. In addition, Quarter must be nested outside of Retailer type in the underlying crosstab. Otherwise, Retailer type is sorted according to the quantity that is sold for all quarters.

This technique does not work when a visualization is filtered by multiple controls, or by a control that accepts multiple selections, such as a check box group control.

## Procedure

1. In the visualization, select the category field that you want to sort.  
In the preceding example, select Retailer type.
2. In the **Properties** pane, set the **Category Range** property to **Filtered Data**.
3. Double-click the **Sorting** property.
4. In the **Data Items** box, drag the measure that you want to sort the category by to the **Sort List** box.  
In the preceding example, drag Quantity.
5. To specify the sort order, click the **Sort Order** icon.
6. Click **OK**.  
A warning message appears that informs you that sorting is applied when the report is run, and does not reflect client-side filtering.
7. Click **OK**.
8. Select the clustered bar data container.
9. In the **Properties** pane, double-click the **Nesting Order** property, and change the nesting order of the extra category as needed.  
In the preceding example, for the series, move Quarter above Retailer type.
10. Optional: To view the data in the underlying crosstab, click **Show Container Data**.  
The data in the crosstab is sorted by the sort order that you specified in step 5.
11. Click **OK**.

## Related tasks

[Specifying the range values that are displayed](#)

You can specify the range of values that you want to display in a visualization.

[Changing the nesting order](#)



# Chapter 7. Maps

Maps help you to do geographic analysis of data by using locations such as states, regions, and postal codes.

Over 200,000 administrative boundaries in over 245 countries are supported.

Data is mapped by matching the location name on the map with a location in your data.

## Adding a map to a report

When you use a map in a report, you can show data for two location measures, one by filled regions and one by points.

### Before you begin

You must have access to the IBM Cognos samples. This procedure uses the IBM Cognos GO Sales sample data. If your administrator installed these samples, they are in **Team content > Samples > Models > GO Sales (query)**.

### About this task

This procedure shows you how to create a map that shows revenue by region and gross profit as points.

**Note:** Other names for a map are *polygon*, *filled region*, and *choropleth*.

### Procedure

Create the map and add revenue by region.

1. Click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. On the canvas, click the **Data** icon , and then click **Visualization**.
4. In the **Visualization gallery**, click **Map**, and then click **OK**.
5. In the left pane, click the **Add report data** icon , select **Team content > Samples > Models > GO Sales (query)** and click **Open**.
6. Expand **Sales (query) > Sales**, and drag **Revenue** to the **Color** data slot.
7. Expand **Branch** and drag **Country** to the **Location** data slot.
8. Click **Run options > Run HTML**.

The map is populated but an warning message **Not all location data was resolved** displays.

**Tip:** Zoom in and zoom out of the map to see more or less detail. Click and drag to move around the map.

9. Click the warning message.

A window displays the unresolved locations information. There are two types of unresolved locations: multiple locations with the same name or no locations are found for the name. To resolve the first problem, add one or more categories to refine the locations. For example, add **City** and **Province or state** to the **Location** data slot. To resolve the second problem, cleanse your data by renaming the locations.

10. Click **Close**.

**Note:** You can hide the location warning message. Make sure that the map visualization is selected, click the **Show properties** icon, and change the **Hide Location Warnings** field to **Yes**.

Add gross revenue as points on the map.

11. At the top of the data slot pane, click the down arrow and select **Points**.
12. From **Sales (query) > Sales**, drag **Gross profit** to the **Color** data slot.
13. Drag **Revenue** to the **Color** data slot.
14. Drag **Province or state** to the **Location** data slot.
15. Click **Run > Run HTML**.

Resolve the unresolved locations warning the same way you did for regions.

16. Save the report when you're done.

## Using latitude and longitude location information in a map

---

When you use a map in a report, you can show data for one location, either as a filled region, a point, latitude/longitude point, or a combination of these locations.

### Before you begin

To use longitude/latitude as location measures in your map, use a data source that contains longitude and latitude data. For example:

Table 6. Example table with latitude and longitude data				
City	Longitude	Latitude	Rating	Surveys
Antwerp	4.402771	51.260197	7	30.000
Brussels	4.355607	50.878899	9	76.000

At the top of the data slot pane, click the down arrow and select **Latitude/Longitude**.

**Note:** The format of the longitude and latitude data must be as follows: Lat 51.260197 , Long 4.402771. The format 51° 26' 01.97'' N , 4° 40' 2.771'' E is not supported.

### Procedure

1. Click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. On the canvas, click the **Data** icon  , and then click **Visualization**.
4. In the **Visualization gallery**, click **Map**, and then click **OK**.
5. In the left pane, click the **Add report data** icon  , select report data that contains latitude/longitude data.
6. At the top of the data slot pane , click the down arrow and select **Longitude/Longitude**.
7. In the left pane, expand your data items and drag latitude and longitude to the **Latitude** and **Longitude** data slots.
8. Drag City to the **Label** data slot. The latitude, longitude, name of the city will appear when you hover over the data points.
9. Drag rating to the **Size** data slot and drag Surveys to the **Color** data slot.
10. Click **Run options > Run HTML**.
11. Click **Close**.

## Setting up Mapbox to work with IBM Cognos Analytics

---

IBM Cognos Analytics supports the use of custom polygons in partnership with Mapbox.

Create a free Mapbox account with 5 GB of space. When you have created your Mapbox account, upload your geoJSON custom polygon file to Mapbox as a tileset. A tileset is a compiled set of geoJSON that is optimized to render fast on a browser. For more information, see <https://www.mapbox.com/pricing/>.

If your geoJSON is less than 5 MB, then you can edit the geoJSON directly as a data set in Mapbox. After you edit the geoJSON files, export them into a tileset.

Make sure that each polygon has at least one uniquely identifying property as a string value.

Custom polygons in formats such as .shp and KML can be converted to geoJSON, by using for example QGIS.

### Retrieving the necessary data from Mapbox

When you have your tileset that is created in Mapbox, copy the following three keys from the tileset page:

- MapID
- Layer name
- Unique identifier

You need these keys when you want to use Mapbox data in your map visualization.

For more information, see *Using custom point or region information from Mapbox in a map visualization in a report* in the *IBM Cognos Analytics Dashboards and Stories user guide* and *Using custom point or region information from Mapbox in a map visualization in a report*.

### Best practices

- For increased performance and to make sure that polygons appear at zoom level 0 (world view), compress geoJSON files to less than 10 MB. A tool that can compress geoJSON files is <http://mapshaper.org/>.

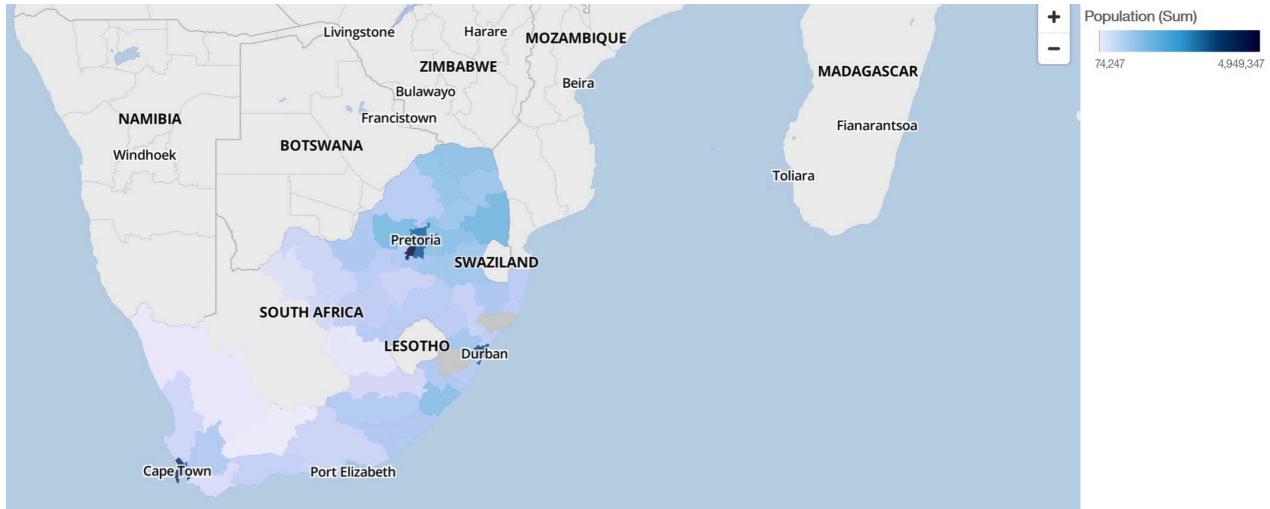
If your geoJSON files are larger than 10 MB, then Mapbox sets the default zoom to not start at worldview 0. If you want to manually change the zoom extents, there are few ways to do so:

- Tippecanoe APIs, which are available on Linux and Apple MacOs.
- Download Mapbox studio classic on your Microsoft Windows computer and change the minimum and maximum zoom levels.

For more information, see <https://www.mapbox.com/help/adjust-tileset-zoom-extent/>.

- To ensure that auto-zoom works in IBM Cognos Analytics - Reporting set the unique polygon identifier as a string value.
- If you work with custom polygons in small areas, for example at postcode level, turning off auto zoom after the initial data loads. This results in a better experience when you filter because the map does not reset zoom and zoom in multiple times.
- Keep the Mapbox keys confidential.

Example of custom regions



Example of custom points



## Using custom point or region information from Mapbox in a map visualization in a report

When you use a map in a report, you can use custom point or region information from Mapbox in a map visualization. You can use an extra layer on a map to display additional information. For example, a time-zone layer.

### Before you begin

To use the vector maps from Mapbox as location measures in your map visualization, use a data source that contains region or point data. An example of a table with point or region data is the following table:

Table 7. Table with point and region data

City	Population	Timezone	Timezone offset	TZ
Andorra la Vella	20430	Europe/Andorra	1	UTC+01:00
Abu Dhabi	603492	Asia/Dubai	4	UTC+04:00

The tileset that Mapbox generates has the following properties:

- Custom map ID
- Custom layer name
- Custom property name

### Procedure

1. Create a Mapbox account.
2. Upload your geoJSON file to Mapbox.

**Important:** Before you upload any geoJSON file, ensure that its polygon properties do not contain any sensitive information.

3. In Mapbox, create a tileset based on the geoJSON file.
4. In IBM Cognos Analytics click **New** and then click **Report**.
5. In the **Templates and themes** window, click **Blank** and then click **OK**.
6. On the canvas, click the **Data** icon  , and then click **Visualization**.
7. In the **Visualization gallery**, click **Map**, and then click **OK**.
8. In the left pane, click the **Add report data** icon  , select report data that contains region or point data.
9. On the data slot pane, click the down arrow and select:
  - **Regions**, if you want to use region data from Mapbox.
  - **Points**, if you want to use point data from Mapbox.
10. In the left pane, expand your data items and drag either point or region data to the **Location** data slot.
11. **Note:** Make sure you use the correct casing for the Mapbox properties.

Depending on whether you want to use Mapbox region or point data, specify the following properties. These properties are part of the Mapbox map. You must obtain the values of the properties from the Mapbox map creator.

From the **Properties** pane under **REGIONS**, specify the following properties:

Option	Description
<b>Region custom map id</b>	The Mapbox unique map ID.
<b>Region custom layer name</b>	The layer name that is used in the Mapbox map.
<b>Region custom property name</b>	The custom property name that you want to use from the Map box map.

From the **Properties** pane under **POINTS**, specify the following properties:

Option	Description
<b>Point custom map id</b>	The Mapbox unique map ID.
<b>Point custom layer name</b>	The layer name that is used in the Mapbox map.

Option	Description
<b>Point custom property name</b>	The custom property name that you want to use from the Map box map.

12. Drag measurable data to the **Color** data slot.

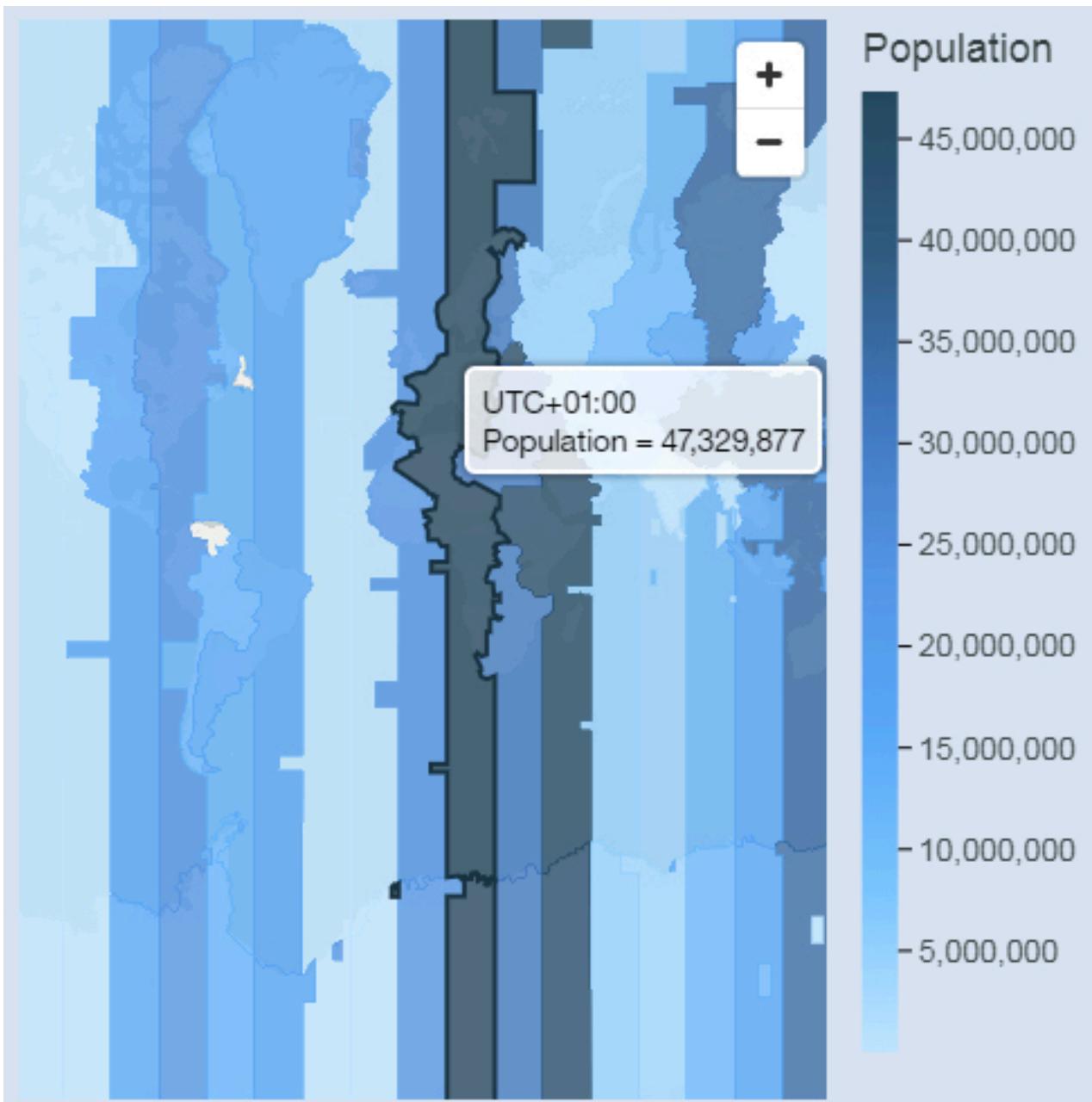
For example, use population.

13. Click **Run options > Run HTML**.

14. Click **Close**.

### Example

An example of a map visualization with a region layer that shows the population for each time-zone. The layout of the time-zones is defined in a Mapbox map.



## Geospatial data

---

To use a map, your data set must contain geographical data, such as countries, states, or provinces.

To determine whether a column can be used in a map, Cognos Analytics analyzes a sample of 2000 values in the location column, looking for recognizable place names. If 80% or more are recognized as map values, Cognos Analytics produces a map.

For example, you have four countries in your location column and one country is misspelled: Brazil, China, India, and Russia. The typo for India means that only 75% of the values are recognizable place names and you cannot see a map as a starting point. However, if you have five countries and one has a typo in it, you see a map.

If you don't see a map as a recommended starting point for your data, look at your location column to see whether it contains ambiguous data.

## Ambiguous data

---

Ambiguous data in your data set can lead to misleading, inaccurate, or incomplete maps in your dashboard or report.

Here are some tips for locating and correcting ambiguous data:

- If the column heading for the location column is misleading, such as a location column called Employee Name, it cannot be used for mapping your data.
- Look at the values in your data. Misspellings cause problems.
- Check for and resolve ambiguous locations in your data file and then replace the data in the data set. For example, Georgia is the name of a country and the name of a state in the United States.
  - If Georgia appears in a column that contains American states, a map of the United States is displayed.
  - If Georgia appears in a column that contains countries, a world map or a map of Asia is displayed, depending on the other values in the column.
  - If Georgia is in a column that contains both states and countries, no map is displayed. To avoid this problem, split the column into two, one for countries and one for states. Make sure that the state appears as US Georgia.
- Unmatched values occur when the location on your data cannot be matched by name to a supported admin boundary or postal code. For admin boundaries, if the location is under a different name, you must correct your data.
  - Cognos Analytics does not support U.S. of America, but it does support USA. Create a calculation to change the unsupported value to a supported one.
  - Lakes or other bodies of water are not supported locations.
- For postal codes, you must understand the postal code system for the country that is mapped. You must include both the country and the postal code data items. If Cognos Analytics cannot map the data, there are several possible causes.
  - You are trying to map a full or extended postal code. In Canada, the first 3 characters of the postal code are supported (forward sortation area).
  - For the United States of America, the 5-digit postal code is supported, not the extended postal code.
  - Many countries use a 5-digit postal code so your data must include the country.
  - Countries are constantly updating their postal codes. Cognos Analytics updates the list of supported postal codes once a year.

A map is not displayed in the following cases:

- The data contains both countries and provinces, countries and states, or regions and parts of a region. For example, US, Texas, Florida; UK, Scotland, England; Europe, France, Germany; Florida, Miami-Dade, Broward, Sarasota.
- The data contains abbreviations that can be both countries or states. For example, AL, AR, CA, DE can be Alabama, Arkansas, California, Delaware, Albania, Argentina, Canada, or Germany.

# Chapter 8. Active Reports

---

You can use IBM Cognos Analytics - Reporting to create active reports. IBM Cognos Active Report is a report output type that provides a highly interactive and easy-to-use managed report. Active reports are built for business users, allowing them to explore their data and derive additional insight.

Active reports make business intelligence easier for the casual user. Report authors build reports targeted at their users' needs, keeping the user experience simple and engaging. Active reports can be consumed by users who are offline, making them an ideal solution for remote users such as the sales force.

Active reports are an extension of the traditional IBM Cognos report. You can leverage existing reports and convert them to active reports by adding interactive behavior, providing end users with an easy-to-consume interface.

Like existing IBM Cognos reports, you can execute active reports from the Cognos Analytics portal as well as schedule and burst them to users.

You build active reports with the same objects that you use to build other report types. However, there are objects that are specific to active reports. These objects fall into two categories:

- active report controls
- active report variables

For tips about building active reports, see the [Business analytics proven practices page](http://www.ibm.com/developerworks/analytics/practices.html) (<http://www.ibm.com/developerworks/analytics/practices.html>).

**Note:** Cognos Active Report does not support JavaScript.

## Active Report Controls

---

You use active report controls to create the layout of an active report as well as filter, sort, and navigate through data in the report.

### Layout

The following controls are used to build the layout of an active report:

- Tab controls, which are used for grouping similar report items.
- Decks of cards, which are used for layering report items.
- Hiding or showing list columns, which allows users to control the data they see by using check boxes.
- Row numbers, which show the number of rows of data in a control.

### Filtering and Sorting

To help report authors deliver the content in the most consumable way possible, IBM Cognos Analytics - Reporting provides several new filtering controls:

- List and drop-down list controls
- Interactions with charts

For example, clicking a category in a chart filters the data in a list.

- Radial buttons
- Check boxes
- Toggle buttons
- Push button controls

## Navigation

To help users navigate through data in a report, report authors can add the following controls:

- Iterators
- Sliders

## Data Containers

Data containers, such as lists, crosstabs, charts, visualizations, and repeater tables, are also considered controls in an active report, as you can add interactive behavior to them.

## Related concepts

[Adding Controls to a Report](#)

# Active Report Variables

Active report variables work in conjunction with active report controls to add interactivity to a report.

Actions performed on a control, such as selecting an item in a control or selecting a control itself, can set the value of a variable. In turn, controls can respond to changes in the value of a variable, such as filtering data in a control.

## Related tasks

[Create and Manage Active Report Variables](#)

# Convert an Existing Report to an Active Report

You can leverage existing reports by converting them to active reports.

## Procedure

1. Open the report that you want to convert.
2. Click the **Save** icon  and click **Convert to Active Report**.

## Results

IBM Cognos Active Report commands, objects, and properties become available in IBM Cognos Analytics - Reporting. Objects in the report that are not supported in active reports, such as prompt controls in report pages, are removed.

# Specify Active Report Properties

You can specify properties for active reports, such as the text that appears in the browser window title bar, the maximum number of rows that a report can contain, and an access code that users must enter to view a report.

## Procedure

1. Click the **Show properties** icon , click the **Select ancestor** icon , and then click **Report**.
2. Double-click the **Active reports** property.
3. To specify the title that will appear in the browser window title bar when the report is viewed, under **Window Title**, type the title that you want.
4. If you want to specify the window title in other languages, do the following:
  - Under **Window Title**, click the ellipsis button.

- Click the add button .

• Select the languages that you want.

• In the **Language** column, click one of the languages that you selected.

- Click the edit button  and type the window title for that language.

5. In the **Window Startup Size** box, choose among the available options to specify the size of the browser window when an active report is viewed.

6. In the **Maximum query rows** box, specify the maximum number of rows of data that the report can contain.

If the number of rows of data returned when the report is run exceeds this value, an error message appears, and users will not be able to view the report.

7. If you do not want to compress the MHT file that is produced when the active report is run, clear the **Compress the active report output** check box.

Compressing the output reduces the size of MHT files so that active reports can support more data and load faster in browsers and mobile devices.

8. If you made changes to the **Window Startup Size**, **Maximum query rows**, or **Compress the active report output** properties and you want those changes to become the default values when you create new active reports, click **Change defaults**.

9. To specify an access code that users will have to enter to view the report, enter the code in the **Access code** box.

You can use any Unicode character in the access code, and there is no limit to the number of characters an access code can contain.

The access code will not be hidden or treated like a password when entered (\* will not appear as the code is entered). Users will have three attempts to enter the correct code, after which the active report will shut down. To try again, users have to reopen report.

**Note:** The access code is a tool to help prevent the unauthorized consumption of an active report within an organization. It is not an enterprise grade security solution.

## Adding Interactivity to a Report

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You create an active report by adding interactive behavior to controls in the report. Adding interactive behavior links controls to each other, allowing an action performed on a control to change the state of another control.

### Create and Manage Active Report Variables

Create active report variables to allow controls in a report to interact with each other. Active report variables pass information from one control to another control.

#### About this task

You can also create active report variables when you define connections between controls. However, you may want to modify these variables, such as changing the name or defining default values.

In addition, active report variables allow active reports inserted in a workspace in IBM Cognos Workspace to interact with each other. For example, selecting a product line in one active report causes another active report to show the data for the selected product line. In addition, variables allow check boxes and sliders in a workspace in Cognos Workspace to drive active reports in the workspace.

To work in Cognos Workspace, active report variables must meet the following criteria:

- The variables must be public.

When you make a public variable, the variable can be consumed in other IBM Cognos products.

- For active reports to listen to each other in a workspace, each report must have a public variable with the same name.
- For a Cognos Workspace slider to drive an active report, a range variable must be defined in the active report.

The data item of the slider and the range variable in the active report must have the same name.

Two variables are used to define the minimum and maximum values of the range variable. The two variables are used to define the minimum and maximum values of the slider.

## Procedure

1. Click the **Queries** icon  and then click the **Active Report variables** icon .
2. Create a variable by following these steps:
  - a) Click **Create a new variable**.
  - b) In the **Name** box, type the name of the variable.
  - c) Click the **Data Type** drop-down menu and click the type of variable that you want to create.
  - d) To make the variable public, select the **Public (External)** check box.
  - e) If you want to specify a default value for the variable, click **Set default values** and define or specify the values that you want.

If you have added a control to the active report, the **Variable Values Source** drop-down menu becomes active.

To define your own default values, in the **Variable Values Source** list, click **Enter Value(s)**, and then click the new icon .

To specify default values that come from a data item in a control, in the **Variable Values Source** list, click **Select Value(s)**. Specify the control and the data item from which you want to select default values, and then select the values that you want from the **Values** box.

**Tip:** Define multiple default values when you want more than one item selected in a control that allows multiple selections, such as a check box group.

3. To modify an existing variable, right-click the variable and click **Edit variable**.
4. To add a default value, click **Set default values**.

To change a default value, click the name of the current default value specified for the variable.

5. Create a range variable by following these steps:

- a) Create the variables that will define the minimum and maximum values of the Cognos Workspace slider.

The variables must have the number data type.

**Tip:** Range variables are automatically set as public variables. Do not make the variables that are used to define the minimum and maximum values of the slider public.

- b) Click **Manage ranges**.

- c) Click the new icon .

- d) In the **Name** box, type the name of the range variable.

- e) Click the **Minimum Variable** list and select the variable that will be used to set the minimum value of the slider.

- f) Click the **Maximum Variable** list and select the variable that will be used to set the maximum value of the slider, and then click **OK** twice.

**Note:** If you later delete the minimum or maximum variable, the range variable is also deleted.

## Related tasks

[Define a Connection Between Controls](#)

## Adding Controls to a Report

IBM Cognos Active Report offers several active report controls. For many controls, two different versions are available, a static version and a data-driven version.

Use the static version of a control when you want to manually define the values that the control can contain. Use the data-driven version of a control when you want the values that the control can contain to come from a data item. You can find active report controls by clicking the **Toolbox** icon .

When you add a control to an active report, you can convert the control to another type of control that is compatible. Select the control, click the **More** icon , and click **Convert Control**. For example, you can convert a data drop-down list control to a data iterator control.

## Variable Text Items

Use variable text items  to insert active report variables in a report. Variable text items are useful to show the value of a variable when an item in another control is selected. For example, you can use a variable text item as a title for a list that is linked to a drop-down list control. When an item is selected from the drop-down list, the item appears as the title of the list.

## Row numbers

The active report row number tool  adds row numbers that reflect the visible row number in the report. This is different from the report row number tool, which reflects the server calculated row number.

## Static repeater tables

Use static repeater tables and data repeater tables to build a repeating structure of content. Repeater table controls allow you to create button bars or grids of custom content to control the content that appears in other controls. In data repeater table controls, the content that appears in the repeater table is driven by a data item that you insert in the control.

The following image shows a static repeater table when it is inserted in an active report.

Value 1	Value 2
Value 3	

Figure 26. Static repeater table control

The data repeater table is the repeater table data container that is available for all report types. The static repeater table is available in the **Toolbox** tab only when you are authoring an active report.

## Decks and Data Decks

Use decks and data decks to show different objects and different data respectively based on a selection in another control. For example, in a deck, clicking a radio button in a radio button group control shows a list object while clicking a different radio button shows a chart object.

The following image shows a deck control when it is inserted in an active report.



Figure 27. Deck control

Decks are composed of cards. In static decks, you define the number of cards in the deck and you insert the objects that you want in each card. This allows you to create cards that can contain different objects, such as pie chart in one card and a crosstab in another card. In data decks, the cards are defined by a data container or data items inserted in the deck, and a data item determines which card appears.

### Tab Controls and Data Tab Controls

Use tab controls and data tab controls to define multiple pages for the same area of a report. In data tab controls, the tabs are driven by a data item that you insert in the control.

The following image shows a tab control when it is inserted in an active report.



Figure 28. Tab control

### Button Bars and Data Button Bars

Use button bars and data button bars to add a group of push buttons. In data button bars, the buttons are driven by a data item that you insert in the control.

The following image shows a button bar control when it is inserted in an active report.

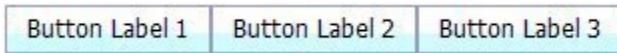


Figure 29. Button bar control

In reports, users can click only one button at a time.

### Toggle Button Bars and Data Toggle Button Bars

Use toggle button bars and data toggle button bars to add a group of buttons that change appearance when pressed. In data toggle button bars, the buttons are driven by a data item that you insert in the control.

The following image shows a toggle button bar control when it is inserted in an active report.



Figure 30. Toggle button bar control

In reports, users can click one or more buttons simultaneously.

### Radio Button Groups and Data Radio Button Groups

Use radio button groups and data radio button groups to group a set of buttons that have a common purpose. In data radio button groups, the radio buttons are driven by a data item that you insert in the control.

The following image shows a radio button group control when it is inserted in an active report.

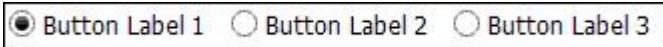


Figure 31. Radio button group control

In reports, users can click only one radio button at a time.

### Check Box Groups and Data Check Box Groups

Use check box groups and data check box groups to group a set of check boxes. In data check box groups, the check boxes are driven by a data item that you insert in the control.

The following image shows a check box group control when it is inserted in an active report.



Figure 32. Check box group control

In reports, users can select one or more check boxes simultaneously.

### Drop-Down Lists and Data Drop-Down Lists

Use drop-down lists and data drop-down lists to provide a list of items that users can choose from. In data drop-down lists, the lists are driven by a data item that you insert in the control.

The following image shows a drop-down list control when it is inserted in an active report.



Figure 33. Drop-down list control

In reports, users can select only one item at a time.

### List Boxes and Data List Boxes

Use list boxes and data list boxes to provide a list of items that users can choose from. In data list boxes, the lists are driven by a data item that you insert in the control.

The following image shows a list box control when it is inserted in an active report.

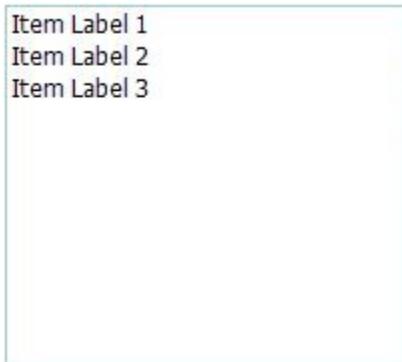


Figure 34. List box control

In reports, users can select one or more items in a list box.

### Iterators and data iterators

Use these controls to allow users to navigate or filter values in a control by clicking buttons such as previous and next. In data iterators, the iterations are driven by a data item that you insert in the control.

The following image shows an iterator control when it is inserted in an active report.



Figure 35. Iterator control

### Discrete values sliders, continuous values sliders, and data discrete values sliders

These controls allow users to navigate or filter data using a slider bar. Discrete and data discrete values sliders allow users to slide between individual values, such as months. In data discrete values sliders, the values are driven by a data item that you insert in the control. With continuous values sliders, users slide through numeric values between minimum and maximum values that you define, such as 0 and 100.

The following image shows a discrete value slider control when it is inserted in an active report.



Figure 36. Discrete values slider control

### Buttons

Use buttons to add individual push buttons to a report.

The following image shows a button control when it is inserted in an active report.



Figure 37. Button control

### Report prompts and iFrames

With these tools, you can use an active report as a prompt to launch and filter target reports, or to launch external web pages. Similar to drill-through, links are created from the active report to other reports or external web pages. Target reports and external web pages can appear in an iFrame in the current window, or in a separate window or browser tab.

The **Report prompts** tool opens a window where you specify the target report that you want to open. IBM Cognos Analytics - Reporting creates the necessary controls and variables.

If you insert an **iFrame** tool, you must create the necessary controls and variables to launch a target report or external web page.

### Data Containers

Lists, crosstabs, charts, maps, visualizations, and repeater tables are also controls in an active report, as you can add interactive behavior to them.

In addition, a list container called a data list is available when you are authoring an active report. Data lists offer better performance than regular lists, because they are run on the client workstation or device instead of on the Cognos server. Data lists are scrollable and have pinned headers. Other features include applying a sequence of colors to the list rows, and replacing column values with a microchart.

### Related tasks

[Creating a data list](#)

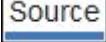
## Add Data to a Control

For every control that you insert in a report, you must add the data that you want to appear in the control.

### Add data to a data-driven control

For data-driven controls, you insert data items from the package.

#### Procedure

1. Click the **Data** icon , and on the **Source** tab , drag query subjects or query items to the control.
2. To add an image to the data in the control, drag the appropriate data item to the **Icon** box.
3. If the data that will appear in the control depends on other data that you do not want to show, drag the appropriate data item to the **Extra Items** box.

For example, you add Product type to a data list box control and you want to filter the product types that appear in the control based on a product line selected in another control. To filter the data, you must drag Product line to the **Extra Items** box.

**Tip:** IBM Cognos Analytics - Reporting can automatically copy data items from other controls when you create connections between controls.

4. If the control is a data deck and you want to create a default card that will appear when no other card matches the variable value passed to the deck, select the deck, click the **Show properties** icon , and navigate to the properties of the deck. Click **Yes** for the **Show Default Card** property, and then click the **Current Card** property and select **(Default)**. Insert the objects that you want to appear on the default card.

#### Related tasks

[Define a Connection Between Controls](#)

### Add data to a static control

For static value driven controls, you manually define the data in a data table.

#### Procedure

1. In the report, click the definition icon  of the control.

**Tip:** The definition icon is visible only when the visual aid **Show Interactive Object Controls** is enabled.

2. To add a new object, such as a card in a deck or a button in a button bar, under **Data Table**, click the new button.
3. In **Data Table**, define the values that you want to appear in the control.

Values are organized by data item. In addition to the default data item (Label) and values provided, you can create your own data items and values. For example, to add an icon to each value, you must create a data item for the icons.

- To define a new data item, click the new button  and type the name of the data item that you want to create.
- Click inside each table row and type the name of the value.
- To add translations for the values, to support users in multiple languages, click the ellipsis button, , choose the languages that you want to support by clicking the add button , and type the translated text for each language added.
- If you created new data items, in the **Definition** box, click the **Label** drop-down list and select the data item that you want to use in the control.

- To add an icon to each value, select the **Icon** check box, click the drop-down list, and select the data item that contains the icons that you want to use.

You cannot add an icon to values in static decks and discrete values sliders. To add an icon to values in a static repeater table, insert the **Image** object from the **Toolbox** pane . Then specify the data item for the icons by referencing the data item in the **Properties** pane.

4. Optional: If you want to copy all data values to another static control, click the copy control definition icon .

After you have copied the data values of the control, click the definition icon of another static control, and then click the paste control definition icon to copy the data values.

**Tip:** You can also drag data items from one control and drop them in another control. This action moves the data item from one control to another control instead of copying the item. You can drag and drop data items only to static controls that can contain objects, such as a deck, tab control, and repeater table. In addition, the data table of the target control must contain a data item with the same name as the data item you are moving, such as Label.

5. If the control is a deck, click the arrows to navigate to each card of the deck and insert the objects that you want to appear on each card.

To create a default card that will appear when no other card matches the variable value passed to the deck, click the **Show properties** icon , and navigate to the properties of the deck. Click **Yes** for the **Default Card** property, and then click the **Current Card** property and select **(Default)**. Insert the objects that you want to appear on the default card.

## Related tasks

[Referencing data items defined in a static control](#)

### Referencing data items defined in a static control

If you insert an object in a static control, such as an image in a static repeater table, you can use a data item in the control to populate the object.

## Before you begin

You must create the data item in the data table of the control before you can reference the item.

## About this task

You can reference data items only for text items, images, hyperlinks, and HTML items inserted in decks, tab controls, and repeater tables.

## Procedure

1. In the static control, click the object for which you want to reference a data item.
2. Click the **Show properties** icon , and in the **Properties** pane, click the **Source type** property and choose **Control data item value**.  
The **Control data item value** property appears.
3. Click the **Control data item value** property and select the data item that you want to reference.

**Tip:** If the object is a hyperlink, you can specify the data item to be used to populate the hyperlink text as well as the data item to be used to populate the URL of each link.

## Related tasks

[Add data to a static control](#)

## Define a Connection Between Controls

Define a connection between controls to link them together. When you link controls, an action performed on one control affects the behavior of the other control.

### Procedure

1. Click the create a new connection icon  of a control that you added to the report.

**Tip:** The create a new connection icon is visible only when the visual aid **Show Interactive Object Controls** is enabled.

2. In the **Source Control** drop-down list, select the source control for which you want to define a connection.
3. Click the **Data Item** drop-down list under the source control and select the data item that will drive the behavior of the target control.
4. In the **Target Control** drop-down list, select the target control for which you want to define a connection.

If the target control is a visualization, select a visualization data container.

5. Click the **Data Item** drop-down list under the target control and select the data item that will determine what appears in the target control.

If the data item that you want to use is not in the query of the target control, and the source control is a data-driven control, select **Copy Data Item from Source** to copy the source data item specified in the previous step to the target control query. If the source control is a static control, select **Use Source Definition**.

If the target control is a data container, the copied data item appears shaded in the container to indicate that the column visibility property for the item is set to **Hidden**.

6. Click the **Behavior** drop-down list between the source and target controls and specify the type of relationship that you want to define between the two controls:
  - To select data in the target control based on what will be selected in the source control, click **Select**.
  - To filter data in the target control based on what will be selected in the source control, select **Filter**.
7. Below the **Behavior** area, click the active variable drop-down list and choose to create a new variable for the connection or use an existing variable.

**Tip:** If there are no variables defined in the report, you cannot click the active variable drop-down list.

  - a) If you create a new variable, type a name for the variable and specify its data type. You can also specify its default values.
  - b) If you choose to use an existing variable, choose the variable that you want. You can also specify its default values.
8. Click **Connect**.

### Results

When a connection is defined, IBM Cognos Analytics - Reporting creates the appropriate conditions for the selection behavior and reaction behavior of the source and target controls.

**Tip:** The interactive behavior icon  of a control changes to indicate that a connection was defined. Click the **Queries** icon , and then click the **Active Report controls** icon  to see the controls and variables inserted in a report and their relationships to one another. You can click a control in this tab to quickly locate the control in the report as well as set default values for variables.

### Related tasks

[Show or Hide a Column or Row](#)

[Add data to a data-driven control](#)

[Add data to a static control](#)

## Specify the Selection Behavior of a Control

Specify the selection behavior of a control to determine what interactive behavior should occur when the control is clicked or when an object in the control, such as a button, check box, or data item, is selected.

Specifying the selection behavior of a control sets the value of active report variables defined in the report. The active report variable values are then used to specify the reaction behavior of controls. For example, you add two drop-down list controls to a report and you create a connection between them. The first drop-down list shows product lines and the second drop-down list shows product types. When a product line is selected in the first drop-down list box, you want to pass that information to the second drop-down list box so that it shows only the product types of the selected product line.

You can specify a selection behavior for any control, except for decks and data decks.

IBM Cognos Analytics - Reporting automatically sets active report variable values when you define a connection between controls. However, you may need to set the value of other variables to specify additional interactive behavior.

### Procedure

1. Click the interactive behavior icon  of the source control.

**Tip:** The interactive behavior icon is visible only when the visual aid **Show Interactive Object Controls** is enabled.

The **Report behavior** box shows the relationship between the source and target controls when you defined a connection between the controls. You can specify default values for the variable associated with the control by clicking **Set default values**.

2. In the **Behavior on select** box, click inside the **Set variable values** box and then click the edit button  that appears.
3. For each active report variable that you want to set as part of the selection behavior of the control, click the **Value** drop-down list and select one of the following choices:
  - If you want to clear the current value of the variable, click **Set to empty**.

**Tip:** Clearing the current value of a variable is useful when you have cascading controls. For example, if the parent control is reset to a default value, you want to reset the child control to a default value as well.

  - If you want to specify your own value, click **Type in a value** and type the value that you want to use.
  - If you want the variable values to be driven by a data item in the report, click the data item that you want to use.
  - If you do not want the variable to be used for the control, click **Do not set**.
4. To create a new active report variable, click **Create a new variable**.

### Related tasks

[Specify the Reaction Behavior of a Control](#)

## Specify the Reaction Behavior of a Control

Specify the reaction behavior of a control to determine how a control will react when another control, or an object in the control, is selected.

### About this task

You can specify the following reaction behaviors:

- Select an item in a control.

You can specify this reaction behavior for any control, except for single button controls.

For example, you specify a default value for a variable, and the variable drives a drop-down list control. When the report is run, you want the default value to appear in the control.

You can also specify to select the first or last item in a control by default. For example, an active report contains two data radio button groups that are connected to each other. The first data button group is driven by Product line and the second data button group is driven by Product type. When a user clicks on a product line, the product types that belong to the selected product line appear in the second radio button group, and you want the first or last radio button in the product type radio button group to be selected.

- Filter data in a control.

For example, you want to filter the product types in a drop-down list control based on the product line selected in another drop-down list control.

You can specify this reaction behavior for drop-down lists, data drop-down lists, list boxes, data list boxes, radio button groups, data radio button groups, check box groups, data check box groups, lists, and crosstabs.

- Enable a control.

For example, you want to make a control interactive only when a selection is first made in another control.

You can specify this reaction behavior for any control, except for decks, data decks, tabs, data tabs, lists, crosstabs, charts, and maps.

In addition to these behaviors, you can specify the item to appear when nothing is selected in a list control, hide or show a column, and whether to allow data to be sorted in a list.

IBM Cognos Analytics - Reporting automatically sets the reaction behavior when you define a connection between controls. However, you may want to change the reaction behavior or specify additional interactive behavior.

## Procedure

1. Click the interactive behavior icon  of the control.
2. If you want to specify the select an item in a control reaction behavior, and you want to specify to select the first item or the last item in the control by default, click the **Auto Select** menu and choose **First Item or Last Item**.
3. In the **Reaction behavior** box, click the reaction behavior box that you want, such as **Container selection**, and click the edit button  that appears.

If a condition is not yet defined, two dialog boxes appear. The second dialog box prompts you to define the condition expression that you want to use to specify the reaction behavior.

**Note:** If the reaction behavior that you are setting is **Container selection**, and you previously clicked an option other than **None** in the **Auto Select** menu, defining a condition sets the **Auto Select** menu to **None**. Similarly, if you define a condition in the **Container selection** box, and you then set the **Auto Select** menu to an option other than **None**, the condition is deleted.

4. In the first **Item** box, define the left side of the condition expression.
  - To use a data item, click the **Data Item** radio button and then click the item that you want to use. The data items that are available in the drop-down list depend on the data items that you inserted into the control.
  - To use a static item, click the **Value** radio button, type the value that you want to use, and then specify the value's data type.
- The value must be defined as a value of the selected active report variable in the next step.
- If you want to set the value of an active report variable to null, click the **Empty Variable** radio button.
5. Click the **Operator** drop-down list and select the operator that you want to use.

6. In the second **Item** box, define the right side of the condition expression.

- To use a value in an active report variable, click the **Active Report Variable** radio button and then click the variable that you want to use.

The variables that are available in the drop-down list depend on the variables that you defined in the report.

- To use a static item, click the **Value** radio button, type the value that you want to use, and then specify the value's data type.
- To use null as the value, click the **Empty Data Item** radio button.

Use null as the value to specify the reaction behavior when no data exists for the value selected in the source control.

7. If you want to apply the condition when no item is selected in the source control, clear the **Drop this condition if the variable is empty** check box.

Clearing the check box can improve performance and prompt users to perform an action. For example, a report contains a list with many rows of data, and the list is filtered by another control. When the check box is cleared, no data will appear in the list until an item is selected in the other control.

### Related concepts

[Recommendation - use master detail relationships when authoring decks](#)

### Related tasks

[Specify the Selection Behavior of a Control](#)

[Set the No Value List Item](#)

[Show or Hide a Column or Row](#)

[Sort Data in a List](#)

## Set the No Value List Item

Set the no value list item to show a specific item in a control when no value is selected.

For example, a report contains a drop-down list control that contains product lines. You create a no value list item named (All) to show all product lines when the report is initially viewed.

### Procedure

1. Select the control.



2. Click the **Show properties** icon , and for the **No Value List Item** property, click **Show**.

A text item representing the no value list item appears in the control.

3. In the **Properties** pane for the no value list item, double-click the **Label** property.

4. In the **Default text** box, type the name of the no value list item.

5. To specify the text for other languages, do the following:

- Click the add button .

- Select the languages that you want.

- In the **Language** column, click one of the languages that you selected.



- Click the edit button and type the name of the no value list item for that language.

- Repeat for all remaining languages.

6. In the **Properties** pane for the no value list item, click the **Position in List** property and specify where you want the no value list item to appear in the control.

## Show or Hide a Column or Row

You can show or hide a column in a list or a column or row in a crosstab when the report is viewed.

## Procedure

1. Click the title of the column or row that you want to show or hide.
2. If the data container is a crosstab, click the **Show properties** icon  , click the **Visible** property and click **Yes** or **No**.
3. If the data container is a list, click the **Show properties** icon  and double-click the **Column Visibility** property.
4. To make the list column visible when the report is viewed, click the **Visible** radio button.
5. To hide the list column when the report is viewed, click the **Hidden** radio button.
6. To make the list column visible based on a condition, click the **Visible based on condition** radio button, click the edit condition button  , and specify the condition.
  - If you want to specify a value to use for the condition, click the **Value** radio button, type the value, and in the **Data Type** drop-down list, select the value's data type.
  - If you want to use null as the value for the condition, click the **Empty Variable** radio button instead.
  - Click the **Operator** drop-down list and select the operator that you want to use for the condition.
  - In the **Active Report Variable** drop-down list, select the active report variable that you want to use for the condition.
  - If you want to apply the condition when no item is selected in a control that is connected to the list, clear the **Drop this condition if the variable is empty** check box.

## Sort Data in a List

You can specify whether users can sort data in a list in the report output.

## Procedure

1. Select the column that you want users to be able to sort.
2. Click the **Show properties** icon  , and for the **Allow Sorting** property, click **Yes**.

## Recommendation - use master detail relationships when authoring decks

When authoring deck controls in active reports, use master detail relationships to improve performance.

Decks offer greater flexibility in active reports by allowing you to show different objects in each card of a deck. In data decks, the number of cards that are created depends on data items inserted in the deck. As a result, a data deck can contain many cards, which may reduce performance when the report is run and viewed. For example, if a data deck contains Product line and Years, there can be up to 20 cards in the deck (five different product lines multiplied by four different years). In addition, filtering data in a data deck can affect performance when there are many rows of data in the deck.

To improve performance, use a master detail relationship to filter data in a data container inserted in a data deck control. A master detail relationship defined between a data deck and a data container inserted in the deck results in a specific number of cards generated for the deck, which serves as a way to filter the data in the data container. For example, a data deck contains a list object that has many rows of data, and you want to filter the list by product line. Creating a master detail relationship between the deck and the list using Product line produces five cards in the deck, one for each product line. When you filter by product line, the appropriate card appears in the data deck.

In addition, specify **Select** as the behavior instead of **Filter** when defining the connection between the data deck control and the control you want to use to filter the data in the deck.

**Tip:** If the data container in the data deck is a chart, you must use a master detail relationship if you want to filter data in the chart.

## Creating a data list

---

11.0.3

Create a data list to provide better performance in active reports that contain a large data set that is presented in a list format.

### About this task

Data lists provide better performance than regular lists because they are rendered on the client workstation or device and not on the IBM Cognos server. Data lists include the following features:

- The list headers are pinned.
- The list is scrollable.
- You can apply a sequence of colors to the rows.
- You can substitute numeric values in a column that are between -1 and 1 with a microchart.

You add or modify features by accessing the properties of the data list or a column in the list.

### Procedure

1. Click the **Toolbox** icon , expand the **Data Container** group, and drag **Data list** to the report.
2. Click the **Data** icon  and add the data items that you want to the list.  
The data items appear in the data list flyout, in the appropriate section (**Categories**, **Values**).
3. To add extra data items to the list, add the data items that you want to the **Extra Categories** or **Extra Values** sections in the flyout.

Extra items are items that are used for filtering or setting variables. Extra items do not appear in the data list.

**Tip:** You can move items from the data list flyout to the list. In the flyout, you can move items from one section to another section. For example, you can move an item in the **Categories** section to the **Extra Categories** section.

4. To modify data list properties, select the entire data list and click the **Show properties** icon .
5. To change the order of extra data items in the data list query, click the **Nesting order** property.  
You might have to change the nesting order so that extra items are ordered properly in the query. If the items are not ordered properly, the report might not run.
  - a) Change the order of items as needed.
  - b) If you want the order of items to correspond to the order of the list columns, select the **Keep list columns synchronized** check box.

6. To replace numeric values in a column with a microchart, select the column and click the **Microchart** property.

- a) Click the **Type** menu and select the type of microchart that you want to add.

The **Colored** option produces a microchart that shows a different color for positive, negative, or zero values. The **Sized** option produces a microchart of different colors and sizes, based on the column values. The **HTML** option shows HTML that you author.

**Note:** The **HTML** option is available only if you have the **HTML Items in Report** subcapability enabled. In IBM Cognos Administration, this subcapability is found within the **Report Studio** capability.

- b) If you selected the **Colored** or **Sized** option, select the check boxes of the values for which you want to show a microchart, and then specify the type of microchart that you want to show and the color.

- c) If you selected the **Sized** option, select the **Animate** check box to produce an animation effect when users interact with the list.
- 7. To specify a different label for a column, select the column heading and set the **Override Label** property to **Yes**, and then specify the label that you want in the **Label** property that appears.

## Formatting an active report in the preview view

---

IBM Cognos Active Report has a preview view that you can use to format an active report and immediately see the layout changes. You no longer have to run the report whenever you make a formatting change.

### About this task

In the Active Report preview view, you can toggle between two different modes. To format elements in the report, you must enter the edit mode. When you are in the edit mode, a dotted blue square appears when you hover over a selectable element in the report. You click an element to select it, after which you can format the element by modifying properties in the **Properties** pane. When you enter the Preview mode, you can test active report behavior by clicking elements in the report.

You can also make non-formatting changes to the report. When a non-formatting change is made, a message appears that notifies you that you must refresh the report. The report is refreshed when you click **OK**. You can also refresh the report by clicking the **Refresh** icon .

You can view the report in different screen sizes and orientation. Changing the screen size provides a guideline as to how the report will look on screens of various sizes. When you change the screen size, the Active Report preview view shows the report at the size that you specified. On a mobile device, the IBM Cognos Mobile application zooms out the report to fit the width of the mobile device screen, eliminating the need for horizontal scrollbars.

### Procedure

1. To enter the active report preview mode, click the **Page views** icon  and then click **Page preview**.
2. To enter the edit mode, in the toolbar, click the **Edit** icon.
3. In the edit mode, format the elements in the report that you want.
4. To enter the preview mode, in the toolbar, click the **Preview** icon.
5. To view the report in different screen sizes, in the toolbar, click the **Fit to screen** menu and choose one of the preset sizes, or click **Add custom size** to specify your own screen size.
6. If you specified a screen size in the previous step, click the **Orientation** menu to change the report orientation.

### Related concepts

[Work in design, structure, or preview view](#)

## Summarizing Data in the Active Report Output

---

You can add an output summary to a list or crosstab control that reflects the data that appears in the control when an active report is viewed.

### About this task

You can add two types of summaries to an active report. The summaries that you can add to regular reports are also available in active reports. Output summaries are specific to active reports. Output summary values are calculated from the data that users see in the output. For example, an active report contains a check box group control and a list control. You add two summaries to the list. The first summary is the aggregation method Total that is available in all reports. The second summary is the output summary Total that is available only in active reports. The data that users see in the list is filtered

by selecting items in the check box group control. The Total output summary value is calculated from the items that are selected in the check box group control. The value for the Total aggregation method that is available in all reports remains the same, regardless of what items are selected in the check box group control. This value is the total of all items in the list.

Only a subset of the aggregation methods that are available in all reports is available as output summaries.

### Procedure

1. In a list or crosstab, click the column or row for which you want to add an output summary.
2. In the report object toolbar, click the summarize button  and then, under **Summarize in Output**, choose the summary that you want to add to the active report output.  
**Tip:** After you add an output summary, you can specify a different aggregation method. Select the summary data item in the list or crosstab, click the **Show properties** icon , and for the **Output summary** property, choose the aggregation method that you want.

## Creating application links to other reports or external web pages

---

Create application links to use an active report to open other reports or external web pages in an iFrame.

### About this task

The following active report tools are used to create links.

- **Report links**
- **iFrame**

The **Report links** tool opens a window where you specify the target report that you want to open. The necessary controls and active report variables are then created by using parameters that are found in the target report. If you choose to open the target report in the current window, an iFrame is added to the report.

If you later want to change an application link or add a new link, select a control that was created, click the **Refresh application link** property, and choose one of the available options. When you edit an application link, you can modify Cognos Viewer settings or application parameters.

With the **iFrame** tool, you specify the target report or external web page that you want users to open. You must manually create the controls and variables that are needed to open the target report or web page.

When users run an active report that contains a report prompt or iFrame tool, they are prompted to select values in the controls that appear. The target report is then run, and the data in the target report is filtered by the selected values.

### Procedure

1. Click the **Toolbox** icon  and drag the **Report links** or the **iFrame** tool to the report.
2. Specify the target report that you want to link to the active report.  
**Note:** You cannot choose an active report as the target report.
3. If you inserted a report link, specify whether to open the target report in an iFrame in the current window, in a new window, or replace the current window.
4. Click **OK**.

## Run or Save an Active Report

---

You can run an active report in HTML format or save it as a MIME HTML (MHT) file so that you can send the report to your consumers. MHT files are viewable in the Microsoft Internet Explorer or Mozilla Firefox browsers.

### Before you begin

If you are using Microsoft Internet Explorer 6.0, you cannot open an active report in MHT format as a file. You can view the report only by using a URL.

If an active report contains an extensible visualization, and you are using Internet Explorer 9 or 10, you must have Microsoft Silverlight 5 installed on your computer.

### About this task

To assist you in resolving problems when you are authoring an active report, a run option that shows the state of active report variables in the report as you click various controls is available. By default, this option is enabled.

Active reports require the same web browser settings as regular reports.

### Procedure

1. To disable the run option that can show the state of active report variables when the report is viewed, click the **Run options** icon , click **Show run options**, and clear the **Enable right-click debug menu** check box.
2. To run a report, click the **Run options** icon and click **Run Active Report**.
3. To save a report, click the **Run options** icon and click **Download Active Report**, and when prompted, choose to save the report as an MHT file.

### Results

When running a report with the **Enable right-click debug menu** check box selected, right-clicking in the report output window allows you to choose to view the active report variables in the report, reset variables, or print the report.

**Tip:** The right-click debug menu is not available if you run the report from the IBM Cognos Analytics portal.

### Related concepts

[Web browser settings](#)

### Related tasks

[Drill-through links in active reports do not work](#)



# Chapter 9. Relational Reporting Style

The relational reporting style is recommended for relational data sources. Relational data is best represented by lists. This data is organized in IBM Cognos Analytics - Reporting by query items.

In relational reporting, you summarize data by using headers and footers in lists, summary functions, and within detail aggregation. You focus data in relational reporting with summary or detail filters.

IBM Cognos Query Studio is also available to work with relational data.

## Limitations when using data modules

IBM Cognos Analytics data modules can model multiple data sources, including relational data sources, other data modules, and uploaded files. The following limitations exist when you use data modules in relational reporting.

- Report bursting, package drill-through definitions, and query properties are not supported.
- Generated prompts do not use the metadata to generate the proper prompt. Instead, a text box is used.

For more information about data modules, see the *IBM Cognos Analytics Data Modeling Guide*.

## Add Relational Data to a Report

Select the data items to appear in the report.

**Note:** We recommend using relational data in the relational reporting style. However, if you are using dimensional data, see “[Add dimensional data to a report](#)” on page 187.

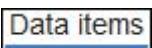
If you frequently use items from different query subjects or dimensions in the same reports, ask your modeler to organize these items into a folder or model query subject and then to republish the relevant package. For example, if you use the product code item in sales reports, the modeler can create a folder that contains the product code item and the sales items you need.

### Procedure

1. Click the **Data** icon , and from the **Source** tab , drag each query item to the report.

**Note:** A flashing black bar indicates where you can drop an item. Items inserted in the report appear on the **Data Items** tab .

Other ways to select data items are to double-click each item or to right-click each item and click **Insert**.

2. If you want to remove a data item from the report, select it, and in the report object toolbar, click the **More** icon  and then click the **Delete** option . To remove the data item from the report but keep it on the **Data Items** tab , click **Cut** instead.
3. For more information about a query item, right-click the item in the **Source** tab and click **Properties**. You can also obtain more information by clicking **Lineage**.

## Group Relational Data

---

Group data items in a list report to remove duplicate values. For example, you have a report that shows all the products purchased and their product type. You group the Product type column so that each product type cell spans the products purchased cells.

You can specify whether grouping a column automatically makes it the first column in the list by selecting the **Automatic group and summary behavior for lists** check box in the IBM Cognos Analytics - Reporting options. With this option selected, if the list contains any fact or measure columns, footers that show the summary values for the columns are automatically created for each group. Grouping a second column makes it the second column. When you ungroup a column, that column becomes the first column after the grouped column.

After a column is grouped, you can move it elsewhere in the report.

You can also group data items in repeaters and in page sets.

In addition to grouping, you can specify the sort order of data items. In lists, you can sort data items within groups as well as ungrouped items. In crosstabs, you can sort row and column items. For more information, see [“Perform Advanced Layout Sorting” on page 173](#).

**Tip:** The Succession Report sample report in the GO Data Warehouse (analysis) package includes grouping.

### Procedure

1. Click the column on which to group.

You can click either the column title or one of the column cells.

**Tip:** To perform multiple groupings at once, use Ctrl+click or Shift+click.

2. In the report object toolbar, click **Group/Ungroup** .

### Results

A symbol appears indicating that the column is grouped. You can control when its values appear by [setting the group span](#), and the column appears in the list of headers and footers that you can add to the report.

**Note:** Grouping all columns in a list is equivalent to creating a single-edge crosstab.

## Perform Advanced Grouping

You can perform more advanced groupings in a list to get the results you want.

For example, you can

- view the entire grouping structure and make changes to the grouping order
- group a data item that appears in a query but not in the layout
- specify a list of properties for a group

You can also perform advanced sorting.

### Procedure

1. Click a column in the list.

2. Click the **Show properties** icon , click the **Select ancestor** icon  in the title bar of the **Properties** pane, and click **List**.

**Tip:** You can also click the container selector (three orange dots) of the list to select it.

3. In the **Properties** pane, double-click the **Grouping & Sorting** property.

4. To change the grouping order, in the **Groups** pane, click the grouped item in the **Groups** folder and drag it to the grouping hierarchy.
5. To create a new grouping, in the **Data items** pane, click the data item and drag it to the **Groups** folder in the **Groups** pane.
6. To specify a list of data items for a group, do the following:
  - Click the group.

**Tip:** Click **Overall** to specify a list of data items for the overall group. The overall group is the grouping of all data into one group. You can specify a list of data items for the overall group to add overall totals to the list.

- Click the properties button 
- Select the appropriate check boxes.

## Creating relational custom groups

Create custom groups to classify existing data items into groups that are meaningful to you.

You can use custom groups to convert numeric values into broader categories. For example, you can break down sales results into low, medium, and high categories. Or you can reduce the number of values into a smaller, more meaningful groups. For example, you can change a list of employees into separate teams or departments.

When you create custom groups in a list, a new column is added to the report, with the name *data item* (Custom). You can use this new column to group or sort the report. If you want to show only the new groups, you can delete the original column.

### Procedure

1. Click the column that you want to group on and, and in the report object toolbar, click the **Insert calculation** icon  and then click **Define Custom Groups**.

**Tip:** You can click either the column heading or one of the column cells.

2. Click the **New Group Entry** icon .
3. To group by values that you select, click **New Select Values Group**, type a **New group name**, select the required values from the **Values** box, and move the values to the **Selected values** box.
4. To group by a range of values, click **New Range Group**, type a **New group name**, and enter the **From** and **To** values.
5. If you do not want a group name to appear for remaining values, select **Do not show remaining values**. Clicking this option will produce empty cells for remaining values.
6. If you want the group name for remaining values to match each value, select **Use each remaining value as a group name**.
7. If you want to specify your own group name for all remaining values, select **Group remaining values into a single group** and type the name that you want.
8. If you are adding custom groups in a list, under **New data item name**, select either the default data item name or type a new data item name.

## Set the Group Span for a Column

When columns are grouped, you can choose how often to show column names by changing the group spanning.

For example, when country or region and city are both grouped, you can choose to show the country or region name each time

- the country or region changes, by spanning Country or Region by Country or Region
- the city changes, by spanning Country or Region by City

- there is a new record, by specifying no spanning

Spanning one grouped column by another column is helpful if the second column contains many items.

### **Procedure**

1. Click the column that will span the other column(s).



2. Click the **Show properties** icon , and In the **Properties** pane, set the **Group span** property to the column to span.

## **Divide data into sections**

Create sections in a report to show a data item as the heading of a section. When you run the report, separate sections appear for each value.

Creating sections is similar to creating headers by grouping on a data item. The difference is that section headers appear outside the list, crosstab, chart, or repeater. In addition, you can group data items only in lists.

When working with dimensional data, you can also create page layers to show values on a separate page for each member.

### **Procedure**

1. Click the column to make a section heading.



2. In the report object toolbar, click the Section/subsection icon .

If the column is in a list or repeater, sections are created without creating a master detail relationship. This can improve performance when running the report.

If the column is in a crosstab or chart, sections are created by using a master detail relationship.

Sections are created, and a section header appears. The data container that contains the column used to create sections is embedded in a list.

3. To add or remove section headers and footers, from the report object toolbar, click the **More** icon , click **Headers & footers** > **List headers & footers**, and then select or clear the appropriate check boxes.

The section header and footer check boxes appear under **Overall header**.

### **Remove Sections**

You can remove sections and reinsert the data item that was used to create the sections in the data container.

### **Procedure**



1. Click the **Page views** icon and click **Page structure**.

2. Expand the page containing the data container with the section.

3. Expand **Page body** until you see the data container in which you added the section.

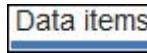
The data container is nested in the **List column body** object of the **List** object that is created when you add a section.

4. Drag the data container to **Page body**.

The data container appears as a node of **Page body**.

5. Delete the **List** object.

6. Click the **Page views** icon and click **Page design**.

7. Click the **Data** icon , click the **Data items** tab , and drag the data item that was used as a section header back into the data container.
8. If you created sections in a list, select the data item, and in the report object toolbar, click the **Group/Ungroup** icon  to ungroup the item.

## Summarizing Data Relationally

---

Summarize data in your reports to obtain totals, averages, and so on.

In a report, you can add both detail and summary aggregation. Detail aggregation, which is supported only for relational data sources, specifies how a data item is totaled at the lowest level in a report. In lists, detail aggregation specifies how the values that appear in the rows are totaled. In crosstabs, detail aggregation specifies how the values in the cells are totaled. For example, detail aggregation for a measure like Revenue might be Total in both lists and crosstabs. In the following list report, this means that the values you see for the Revenue column represent the total revenue for each product type.

Product line	Product type	Revenue
Camping Equipment	Cooking Gear	272,835,984.18
	Lanterns	126,925,660.64
	Packs	351,880,402.84
	Sleeping Bags	309,172,888.35
	Tents	528,221,728.02
Golf Equipment	Golf Accessories	51,514,343.88
	Irons	254,814,337.99
	Putters	106,184,271.37
	Woods	313,898,414.65

Figure 38. A list showing product line, product type, and revenue

Summaries, which are supported for all data sources, specify how data items are totaled in the headers and footers of a list and in the total rows and columns of a crosstab. For list reports, these summaries only summarize the data that is visible on that page of the report.

You can specify detail and summary aggregation in different ways by using any of the following:

- aggregation properties that are specified in the model
- the **Auto group & summarize** property
- the summarize icon in the report object toolbar
- aggregation properties for a data item
- summary functions in data item expressions
- the solve order of calculations

**Tip:** When you add a summary by clicking the summarize icon in the report object toolbar, a data item is created in the query for the summary. In lists, the data item that is created is called a list summary. In crosstabs and charts, the data item that is created is called an edge summary.

### Limitation

If a summary is applied to a report that contains binary large object (BLOB) data, such as images or multimedia objects, you cannot also perform grouping or sorting.

## The Type of Data

How data is aggregated also depends on the type of data that you are aggregating. Aggregation rules are applied differently to facts, identifiers, and attributes. For example, if you aggregate a data item that represents part numbers, the only aggregate rules that apply are count, count distinct, count non-zero, maximum, and minimum. For information about how to determine the type of data that a data item represents, see [“Add Relational Data to a Report” on page 155](#) and [“Add dimensional data to a report” on page 187](#).

## Add a Simple Summary

You can add simple summaries to the groups in a report by using the summarize icon in the report object toolbar. This icon provides a subset of the summary functions available in IBM Cognos Analytics - Reporting. For list reports, a **Custom** option is also available so that you can add your own summary function in the expression of the data item.

The summarize icon sets the rollup aggregate property for the data item to the selected summary, and places the data item into an appropriate footer. A footer is created for each group as well as an overall footer, unless they already exist.

In lists, the summary appears as a footer. If the column to which you added a summary is grouped, group and overall summaries appear. In crosstabs and charts, the summary appears as a node.

To change a summary, select it, click the **Show properties** icon , and in the **Properties** pane, under **Data Item**, click the **Summary** property and choose a different function.

In crosstabs, you can add multiple summaries at the same level. For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. For Product line, you can add the **Total** summary as a header, which will total all revenue for each order year. You can then add the **Average** summary as a footer, which will give the average revenue of all product lines for each order year.

For information about adding a rolling or moving average, see [“Rolling and Moving Averages” on page 203](#).

## Procedure

1. Click the column to which to add a summary.
2. In the report object toolbar, click the **Summarize** icon  and click a summary type.
3. To change the summary label, do the following:
  - Click the label.
  - Click the **Show properties** icon, and In the **Properties** pane, under **Text Source**, set the **Source type** property to the source type to define the label.  
For example, set it as **Data item value** to produce a dynamic label for the summary based on data item values.
  - Set the property under **Source type** to specify the label.

This property depends on the source type you chose. For example, if you chose **Data item value** as the source type, set the **Data item value** property to the data item to use to define the label.

## Set the Auto Group & Summarize Property

Set the **Auto group & summarize** query property to specify whether IBM Cognos Analytics - Reporting should group non-fact data items (identifiers and attributes) and apply aggregate functions to aggregate fact data items in lists.

If you are using an OLAP data source, data is always summarized regardless of how this property is set.

## Procedure

1. Click the **Queries** icon , and click a query.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Auto group & summarize** property:
  - To group non-aggregate fact data items and apply aggregate functions to aggregate fact data items in lists, set this property to **Yes**.
  - To render detail rows, set this property to **No**.

## Specify Detail or Summary Aggregation in the Model

When working with relational or dimensionally-modeled relational (DMR) data sources, you can use the aggregation properties specified for the query item in the IBM Cognos Framework Manager model instead of specifying detail or summary aggregation in the report. The model specifies the default summary function for each query item.

Aggregation functions are mapped between data sources, Framework Manager, and IBM Cognos Analytics - Reporting. For more information about specifying aggregation properties in Cognos Framework Manager, see *Modifying how query items are aggregated* in the *Framework Manager User Guide*.

## Specify Aggregation Properties for a Data Item

When working with relational data sources and list reports, for each data item in a report, you can specify detail and summary aggregation properties to manage summaries without having to create complex data item expressions.

## Procedure

1. Click the data item for which to set detail or summary aggregation.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Detail aggregation** or the **Summary aggregation** property to a function.

## Use Summary Functions in Data Item Expressions

You can use summary functions in data item expressions. The summary functions in the expression editor that have the same name as the summary functions available through the **Detail aggregation** and **Summary aggregation** properties operate the same way. For example, in a relational report, setting the **Detail aggregation** property to **Total** is the same as changing the expression of the data item to `total ([Revenue])`.

In general, report maintenance is easier if the **Detail aggregation** and **Summary aggregation** properties are used rather than adding summary functions to data item expressions. Use summary functions in expressions if the required summary is not supported as an aggregate or rollup aggregate property or if the complexity of the expression cannot be managed using the data item properties. Add a summary function to a data item expression if one of the following conditions applies:

- The underlying data source is relational, and you want to use database vendor-specific summary functions.
- You want to use summary functions that require more than one parameter, such as percentile.
- You require summary expressions that are not available in the aggregation properties, such as a `for` clause. You should use `for` clauses only in relational style reports (list reports).

For example, your report uses Product line, Product type, and Quantity. You want to calculate the percentage of the parent quantity that is represented by each product type. This requires you to compare the total quantity for each product type to the total quantity for the parent product line. In other words, your expression requires summaries at different group levels. You use summary functions, such as `aggregate`, in the data item expression with a `for` clause to specify the group level as follows:

[Quantity] / aggregate ([Quantity] for [Product line])

Product line	Product type	Quantity	% of Product Line
Camping Equipment	Cooking Gear	13,400,351	49%
	Lanterns	4,826,755	18%
	Packs	2,756,540	10%
	Sleeping Bags	3,153,218	12%
	Tents	3,164,285	12%
<b>Camping Equipment - Summary</b>		<b>27,301,149</b>	<b>100%</b>
Golf Equipment	Golf Accessories	3,119,747	61%
	Irons	391,445	8%
	Putters	1,284,570	25%
	Woods	317,939	6%
<b>Golf Equipment - Summary</b>		<b>5,113,701</b>	<b>100%</b>

In some cases, you may need a summary that is different from the default. For example, if the default summary for Quantity is total, you can calculate the average as follows:

[Quantity] / average (aggregate ([Quantity]) for [Product line])

Product line	Product type	Quantity	% of Product Line Average
Camping Equipment	Cooking Gear	13,400,351	245%
	Lanterns	4,826,755	88%
	Packs	2,756,540	50%
	Sleeping Bags	3,153,218	58%
	Tents	3,164,285	58%
<b>Camping Equipment - Summary</b>		<b>27,301,149</b>	<b>100%</b>
Golf Equipment	Golf Accessories	3,119,747	244%
	Irons	391,445	31%
	Putters	1,284,570	100%
	Woods	317,939	25%
<b>Golf Equipment - Summary</b>		<b>5,113,701</b>	<b>100%</b>

The inner summary gives you the expected Quantity values at the Product Type level, which are then averaged to the Product Line level. This two-stage aggregation is required for OLAP data sources and recommended for relational data sources also.

Why is this necessary? Here's what would happen if you simply averaged Quantity, as follows:

[Quantity] / average([Quantity] for [Product line])

Product line	Product type	Quantity	% of Product Line Average
Camping Equipment	Cooking Gear	13,400,351	2,538,352%
	Lanterns	4,826,755	914,305%
	Packs	2,756,540	522,156%
	Sleeping Bags	3,153,218	597,296%
	Tents	3,164,285	599,392%
<b>Camping Equipment - Summary</b>		<b>27,301,149</b>	<b>5,171,500%</b>
Golf Equipment	Golf Accessories	3,119,747	1,205,327%
	Irons	391,445	151,236%
	Putters	1,284,570	496,299%
	Woods	317,939	122,837%
<b>Golf Equipment - Summary</b>		<b>5,113,701</b>	<b>1,975,700%</b>

The denominator is now computed as the average of the detail Quantity rows in the underlying fact table. Since these values are much smaller than the pre-summarized Quantity values you see in the report, the resulting percentage is far too big, and not what we wanted.

**Tip:** The Total Revenue by Country or Region sample report in the GO Data Warehouse (query) package includes a total summary function.

### Procedure

1. Click a data item.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Expression** property and add summary functions to the expression for the data item.

### Related concepts

[Limitations When Using Clauses in Summary Functions](#)

## Summary Functions

This section describes the summary functions that are available in IBM Cognos Analytics - Reporting.

Some functions, such as **Custom**, are available only when you click the **Summarize** icon  in the report object toolbar. Additional summary functions are available in the expression editor.

### Default summary

Depending on the type of data item, applies the function **None**, **Summarize**, or **Calculated** based on the context in which the data item appears.

**Calculated** is applied if the data item expression

- contains a summary function
- is an if then else or case expression that contains a reference to at least a modeled measure in its condition
- contains a reference to a model calculation or to a measure that has the **Regular Aggregate** property set to a value other than **Unsupported**
- contains a reference to at least one data item that has the **Summary aggregation** property set to a value other than **None**

If the underlying data source is relational and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported, Summarize** is applied.

In all other contexts, **None** is applied.

For relational and dimensionally modeled relational (DMR) data sources, if this function is applied to a data item expression that has the average function, weighted averages are computed based on the lowest level detail values in the data source.

**Note:** This is the default function.

### Average

Adds all existing values and then divides by the count of existing values.

### Calculated

Specifies that all the terms within the expression for a data item are aggregated according to their own rollup rules, and then the results of those aggregations are computed within the overall expression.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Total**. You add a query calculation named Quantity Calculated. You define its expression as **Quantity + 100** and you set its **Detail aggregation** property to **Calculated**. When you run the report, the values for Quantity Calculated are computed by first adding all values for Quantity and then adding 100 to each value.

**Note:** In crosstabs, this function overrides any solve orders that are specified.

### Count

Counts all existing values.

If the underlying data source is dimensionally modeled relational (DMR), Count behaves as follows if it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

Object	Behavior
Level	Count distinct is used. A warning appears when you validate the report.
Member set	Count distinct is used. A warning appears when you validate the report.
Attribute	Supported.
Measure	Supported.

If you add the count summary to a non-fact column in a list and then group the column, the column will not be grouped when you run the report. To resolve this issue, group the column first before adding the count summary.

### Count Distinct

Returns the total number of unique non-null records.

If the underlying data source is dimensionally modeled relational (DMR), `count distinct` is supported for levels, member sets, attributes, and measures when it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

### **Custom**

Summarizes data based on an expression that you define.

### **Maximum**

Selects the largest existing value.

### **Median**

Returns the median value of the selected data item.

### **Minimum**

Selects the smallest existing value.

### **None**

Does not aggregate values.

If the underlying data source is relational, the data item is grouped when the query property **Auto group & summarize** is set to **Yes**.

### **Not applicable**

This function is available only for the **Detail aggregation** property. It specifies that the aggregate attribute is ignored. For example, the calculation will be applied after the data is aggregated.

This function differs from the **Calculated** function, which applies aggregation to the rows and then performs the calculation.

For example, for the `average ([Quantity]) + 5` expression, when the **Detail aggregation** property is set to **Not applicable**, five is added to the average of the single Quantity value. When the function is set to **Calculated**, five is added to the average of a set of numbers.

This setting should not be applied to a simple model reference.

This setting is relevant only for reports that are upgraded from IBM Cognos ReportNet 1.x.

### **Standard Deviation**

Returns the standard deviation of the selected data item.

**Note:** From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

### **Summarize**

Aggregates data based on model or data type information. This function can be thought of as a calculate and then aggregate rule. Data is aggregated using the following rules:

If the underlying data source type is relational and the data item or calculation is a reference to a single fact query item in the model that has the **Regular Aggregate** property set to **Sum**, **Maximum**, **Minimum**, **Average**, or **Count**, aggregate data using this function. Otherwise, data is aggregated according to the data type of the data item as follows:

- **Total** is applied for numeric and interval values.
- **Maximum** is applied for date, time, and date-time values.
- **Count** is applied for everything else.

The underlying data source type can be dimensional and the data item or calculation a reference to a single item in the model. In this case, if the **Regular Aggregate** property of the model item is not **unknown**, the summary function that corresponds to the **Regular Aggregate** property is applied. If the **Regular Aggregate** property is **unknown**, set the function to **Calculated**.

For example, a list contains the data item **Quantity** with the **Detail aggregation** property set to **Average**. You add a query calculation named **Quantity Summarize**. You define its expression as **Quantity + 100** and you set its **Detail aggregation** property to **Summarize**. When you run the report, the values for **Quantity Summarize** are computed by first adding 100 to each value for **Quantity** and then calculating the total. The total is calculated because **Quantity** contains numeric values and the expression for **Quantity Summarize** is not a simple data item reference. If **Quantity Summarize** is defined as **Quantity**, the function **Average** is applied to each value.

### **Total**

Adds all existing values.

### **Variance**

Returns the variance of the selected data item.

**Note:** From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

### **Mapping Aggregation Functions From Data Sources to Framework Manager and Reporting**

The summary functions available in IBM Cognos Framework Manager and IBM Cognos Analytics - Reporting reflect summary functions supported by relational and dimensional data sources. The following table shows how summary functions in data sources are mapped to Framework Manager and Reporting.

<b>Data source</b>	<b>Framework Manager</b>	<b>Reporting</b>
None specified, or none	<b>Unsupported</b>	<b>None</b>
average (avg)	<b>Average</b>	<b>Average</b>
count	<b>Count</b>	<b>Count</b>
count distinct	<b>Count Distinct</b>	<b>Count distinct</b>
maximum (max)	<b>Maximum</b>	<b>Maximum</b>
minimum (min)	<b>Minimum</b>	<b>Minimum</b>
median	<b>Median</b>	<b>Median</b>
standard deviation (stddev)	<b>Standard Deviation</b>	<b>Standard Deviation</b>

Data source	Framework Manager	Reporting
sum	<b>Sum</b>	<b>Total</b>
variance (var)	<b>Variance</b>	<b>Variance</b>
count non zero	<b>Count Non-Zero</b>	<b>Automatic</b>
average non zero	<b>unknown</b>	<b>Automatic</b>
external	<b>unknown</b>	<b>Automatic</b>
any	<b>unknown</b>	<b>Automatic</b>
calculated	<b>unknown</b>	<b>Automatic</b>
unknown	<b>unknown</b>	<b>Automatic</b>
first_period	<b>unknown</b>	<b>Automatic</b>
last_period	<b>unknown</b>	<b>Automatic</b>

The following summary functions exist only in either Framework Manager or Reporting. There is no corresponding summary function in data sources.

Framework Manager	Reporting
<b>Automatic</b>	<b>Automatic</b>
<b>Calculated</b>	<b>Calculated</b>
No corresponding summary function	<b>Summarize</b>
No corresponding summary function	<b>Not Applicable</b>

## Focusing Relational Data

You can limit the data in your report with filters or query parameters. The method you choose should depend on the capabilities of the data source, the performance requirements, the persistence of the dataset, and how complex you want the report to be.

In IBM Cognos Analytics - Reporting, summary and detail filters are best for list reports in the relational reporting style. Summary filters are applied to summaries and detail filters are applied to details. These filters remove rows and columns from your reports.

You can also use prompts, or prompt controls, to allow report users to provide input for the filter.

### Create a detail or summary filter

Add a filter expression to focus a report and minimize processing time by excluding unwanted data. For example, you can filter data to show only customers who placed purchase orders that were valued at over one thousand dollars during the past year. When you run the report, you see only the filtered data.

Detail filters are applied only to detail data items from the data source, and not to summary data items. Examples of detail data items include customer names, product numbers, and order numbers. Detail filters are Boolean expressions that apply one or more conditions and evaluate to either true or false. If

the conditions are true for a row of data, the row is retrieved from the data source and appears in your report. If the conditions are false, the row is not retrieved and does not appear in your report. You can specify whether detail filters are applied before or after summaries using the **Application** property.

**Tip:** The 2011 Sales Summary sample report in the GO Sales (analysis) package includes a detail filter.

Summary filters are applied to summary data items in a report. They are also Boolean expressions, however they are used to exclude specific groups of data items based on the group summaries. They are based on summary calculations.

You can combine multiple conditions using AND, OR, and NOT operators. By default, multiple conditions are combined with an AND operator, which means that all conditions must be met for the filter to take effect.

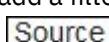
For relational data sources, if a filter expression is used in multiple reports or by different report authors, ask your modeler to create the filter as a standalone object in the model and include it in the relevant package. For information about creating filters in the package, see the IBM Cognos Framework Manager *User Guide*.

If you are filtering a multiple-fact query, you should understand the differences between using a detail filter and summary filter.

If you filter values that are floating-point numbers, you may encounter imprecise filtering results due to rounding or data truncation. Floating-point numbers may appear differently in the report than how they are stored in the data source. To ensure accurate results, your filter criteria should account for any rounding issues.

If you are working with a Microsoft SQL Server 2005 Analysis Services (SSAS) data source, we recommend that you not use OR filters in summaries. Doing so causes error characters (--) to appear in summaries instead of values.

## Procedure

1. To add a filter that was already created in the package, click the **Data** icon  and from the **Source** tab , drag the filter  to the report.

You must drag the filter to a data container object that is linked to a query, such as a list, crosstab, or chart.

2. To create your own filter, select the item in the report that you want to filter on, and in the toolbar that appears, click the **Filters** icon , and then click one of the following options.
  - To create a simple filter condition based on only one data item, click **Create Custom Filter**, and then go to step 6.
  - To create a more complex filter, click **Edit Filters**.

If more than one query is defined in the report, you must first select a data container object that is linked to a query.

**Tip:** You can also define filters in **Query explorer**. Click the **Queries** icon , and click a query.

3. In the **Filters** dialog box, decide what type of filter to create:
  - To add a filter that will apply to detail values, click the **Detail Filters** tab.
  - To add a filter that will apply to summary values, click the **Summary Filters** tab.
4. Click the add button .
5. In the **Create filter** dialog box, decide what conditions to include in the filter:
  - To create a simple filter condition based on only one data item, click **Custom based on data item**, select a data item from the query, and click **OK**.
  - To combine multiple filter conditions, click **Combined**, and click **OK**.

- To create a filter condition that uses advanced calculations, click **Advanced**, and click **OK**.
6. If you create a simple filter condition based on one data item, do the following:
- In the **Filter condition** window, select whether you want to keep or exclude the values that you are going to select.
  - In the values box, choose the values that you want to filter on.  
If you are filtering numeric values, click the **Comparison** tab to create a comparison filter, or click the **Range** tab to create a range filter.
  - If you want to allow report consumers to change the filter when the report is run, select the **Can be changed in the viewer** check box.  
**Note:** Report consumers can change the filter only if the report is fully interactive.
  - To include missing values, select the **Include missing values (NULL)** check box.
  - To apply the filter to individual records in the data source, select the **Apply to individual values in the data source** check box.
  - If you want to parameterize the filter so that users are prompted when they run the report, select the **Prompt for values when report is run in viewer** check box.  
**Tip:** If you leave the **Prompt for values** check box selected (the default) and run a report that contains the same parameter name that appears in your **My parameters** panel, you are not prompted to provide a value for the parameter. The system automatically uses the default values that were set for the user's role. Even if the parameter on the report is optional, the default value for the global parameter is passed.
  - Click **OK**.
7. If you create a **Combined** filter, do the following:
- In the **Create filter** dialog box, select the data item for the first filter condition and click **OK**.
  - In the **Filter condition** dialog box, specify the details for the first condition and click **OK**.
  - Click the new condition button  and, in the **Create filter** dialog box, select the data item for the second filter condition and click **OK**.
  - In the **Filter condition** dialog box, specify the details for the second condition and click **OK**.
  - In the **Combined filter** dialog box, use the AND, OR, and NOT operators to combine the filter conditions. Select the conditions that you want to combine, and click an operator. To change an operator, double-click the operator to toggle among available ones or select the operator and then select a different one from the list.
  - Click **OK**.
8. If you create an **Advanced** filter condition, in the **Filter expression** dialog box, define the filter expression:
- To add data items that are not shown in the report, on the **Source** tab , double-click data items.
  - To add data items that are in the report but not necessarily in the model (such as calculations), on the **Data items** tab , double-click data items.
  - To add data items from a specific query in the report, on the **Queries** tab , double-click data items.
  - To add functions, summaries, and operators, on the **Functions** tab , double-click elements.  
You can insert only functions that return a Boolean value (true or false). For example, you cannot insert the function `topCount` because it returns a set of data. Filter expressions must resolve to a Boolean in order to be valid.

- e) To add a value that is derived from a parameter, on the **Parameters** tab , double-click the parameter. Parameters define prompts, drill-through reports, and master detail relationships.
- f) To add a macro, on the **Macros** tab , double-click the parameter maps, session parameters, or macro functions you want to add to the macro expression.

**Tip:** Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.

- g) Click the **Validate** icon  and click **OK**.
- h) Click **OK**.

**Tip:** You can also type the filter expression directly in the **Expression Definition** box. When typing date values, use the YYYY-MM-DD format.

For more information about creating expressions, see “[Using relational calculations](#)” on page 182.

9. In the **Usage** box, specify whether the filter is required, optional, or not to be used.

10. If you create a detail filter, under **Application**, click one of the following options:

- To apply the filter to individual records in the data source, click **Before auto aggregation**.

For example, for a specific product type within a product line, you want to filter out individual orders that generated less than one thousand dollars in revenue.

- To apply the filter to data after the query has grouped and summarized at the lowest level of detail, click **After auto aggregation**.

For example, you want to filter out the product types that generated less than ten thousand dollars in revenue within a product line.

For example, you have a list that contains the data items Product line, Product type, and Revenue. The revenue values you see are aggregated to the product type level. If you create a detail filter on Revenue and you choose to filter values before auto aggregation, you are filtering non-aggregated revenue values. If you choose to filter values after auto aggregation, you are filtering revenue values aggregated to the product type level.

11. If you want to allow report consumers to change the detail filter when the report is run, select the **Can be changed in the viewer** check box.

12. If you create a summary filter, under **Scope**, click the ellipsis button and select the grouping level at which to apply the filter.

For example, a revenue report is grouped on product line and product type. You can choose to filter total revenue for either the product line or product type level.

If the query in which you are creating the summary filter is linked to more than one data container, the data item that you select as the grouping level must be grouped in all data containers linked to the query. Otherwise, the report will not run successfully.

**Tip:** To filter at the overall level, do not click a level. For example, if a report has an overall footer that shows the total revenue for all products, by not choosing a level you will apply the filter to the footer. In addition, if you are using a dimensional data source, excluding a parent level excludes its children, and excluding all children excludes the parent.

13. **11.0.3** To show filter text in a report, click a data container to which you added a filter, and in the toolbar that appears, click the **Filters** icon , and then click **Insert Filter Text**.

a) Click the filter text block that appears.

b) Click the **Show properties** icon .

c) To specify how to display filter text for detail filters, click the **Display detail filter text** property and choose one of the available options.

d) To specify how to display filter text for summary filters, click the **Display summary filter text** property and choose one of the available options.

14. Repeat step 12 to show filter text for other data containers that are linked to a different query.

#### Related concepts

[Limited and fully interactive reports](#)

Reports can run in limited interactivity or full interactivity mode.

## Edit or remove a filter

After you created filters, you can edit or remove them.

#### Procedure

1. Click a data container object that contains a filter.

2. To remove all filters from the object, in the report object toolbar, click the **Filters** icon  and click **Remove All Filters**.

3. To edit a filter or remove a single filter, in the report object toolbar, click the **Filters** icon  and click **Edit Filters**.

**Tip:** You can also edit filters from the **Query explorer**. Click the **Queries** icon , and click the query that contains your filter.

## Browse or Search the Values of a Data Item

When building expressions in the expression editor, you can browse the data of a data item. This is useful when you do not know how a particular value is stored in the database. For example, you want to filter a report so that it shows data for only New South Wales. The actual value in the database for New South Wales is NSW, and this is what you must insert in the filter expression to obtain the correct results.

#### Procedure

1. In the source, data items, or query tab, right-click the data item you want to browse.

2. If you want to insert a single value, click **Select Value** .

3. If you want to insert multiple values, click **Select Multiple Values** .

4. In the **Values** box, click the value you want to insert in the expression.

**Tip:** Use the **Keywords** box to search for specific values. If you select **Use Tab as keyword delimiter**, you can add a tab in the **Keywords** box only by copying and pasting a tab (or the string you want to search on with a tab in it), from another application, such as Notepad. If the data source is case sensitive and you want to perform a case insensitive search, click the **Search** arrow and then click **Case Insensitive**.

5. If you clicked multiple values, click the right arrow button  to add them to the **Selected values** box.

6. Click **Insert**.

**Tip:** To control where values appear in the **Expression Definition** box, you can click the copy button  if you selected a single value or the copy all button if you selected multiple values instead. The values are copied to the clipboard, and you can then paste them where you want.

#### Related concepts

[Searching for values might return unexpected results](#)

## Ignoring the Time Component in Date Columns

Database systems use Date, Time, and Timestamp to represent date and time values. While a timestamp type holds a date and time component, an application may allow the RDBMS to default the time component. When rows are inserted, updated, or queried, the application may specify only a date value and leave the RDBMS to extend the value to include a default time (usually 00:00:00.000).

The challenge with a timestamp is when the application has no immediate interest in the time component. For example, the business question How many orders were taken today? implies all orders taken irrespective of what time the order was booked. If the application defaulted the time component as it stored rows, the query that was used to answer the question returns the count of orders taken today. If the application stored the actual time component, the query likely returns no data, because the number of orders entered at midnight is probably zero.

Relying on the time defaults can be dangerous if the application changes and starts to capture actual times. To avoid this problem, you can

- truncate the time by creating a derived column
- convert the timestamp to a date
- create a hi-low filter

### Truncating the Time by Creating a Derived Column

In the IBM Cognos Framework Manager model, create a derived column using a calculated expression that truncates the time from a timestamp, and returns a timestamp containing the original date and a default time. For example, if you use an Oracle data source, the following expression creates the derived column DATEONLY from COL1, where COL1 contains the values as stored by the application while DATEONLY contains the dates with the default time of 12:00:00 AM:

```
Select COL1,trunc(COL1) as DATEONLY from [SCOTT_TIGER].DATES
```

**Tip:** You can change the data format of the column to show only the date value by setting the **Date Style** property to **Short**.

You can then apply filters to the DATEONLY column that would return the correct results. If you create a parameter in IBM Cognos Analytics - Reporting that filters on this column, the default prompt will present a date and time control because the data type is still a timestamp.

### Converting the Timestamp to a Date

In the IBM Cognos Framework Manager model, define a calculation that uses the cast function to convert the timestamp to a date. For example, the following expression converts the data type of the column COL1 to date:

```
cast ([SCOTT_TIGER].[DATES].[COL1],DATE)
```

If you create a parameter in IBM Cognos Analytics - Reporting that filters on this calculation, the default prompt presents a date control.

### Ignoring the Time by Creating a Hi-Low Filter

You can create a hi-low filter to ignore the time. In the IBM Cognos Framework Manager model, create a filter in the form date-column between date-lowtime and date-hightime. For example, the following expression returns all values between 00:00:00:000 and 23:59:59:000 for a given day:

```
[SCOTT_TIGER].[DATES].[COL1] between?p1? and cast(substring(?p1?,1,10), '23:59.59.000',timestamp)
```

## Sorting Relational Data

You can sort items to view them in your preferred order. By default, IBM Cognos Analytics - Reporting retrieves items in the order defined in the data source. OLAP data sources always have a defined order. Relational and dimensionally-modeled relational data sources may not always have a defined order. The data modeler defines the sorting options in the model.

For more information about data modeling, see the IBM Cognos Framework Manager *User Guide*. Sorting applied in Reporting applies only to the layout within the report.

You can sort items in a list in ascending or descending order based on a value or a label, such as revenue or employee name. You can also perform advanced sorting to sort columns within groups or to sort a row or column using another data item.

**Tip:** The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes sorting.

#### Procedure

1. Click the column or row on which to sort.

2. In the report object toolbar, click the **Sort** icon  and click **Ascending** or **Descending**.

An arrow appears beside the data item to indicate that a sort order was set.

When you specify a sort order for more than one column, the columns are sorted in the order in which they were inserted in the report. For example, you add columns A, B, and C to a report and specify a sort order for each. When you run the report, column A is sorted first, then column B, and then column C. You can change the order in which the columns are sorted in the **Edit Layout Sorting** options.

**Tip:** To remove a sort order, click **Don't Sort**.

### Perform Advanced Layout Sorting

If you use relational data, in a list, you can sort columns within groups and change the sort order of columns. In a crosstab, you can sort a row or column by another item, such as Order year by Revenue.

#### Procedure

1. Click a column.

In a crosstab, click the sorted row or column on which to perform advanced sorting.

2. In the report object toolbar, click the **Sort** icon  and click **Edit Layout Sorting**.

3. To sort a list column within a group, do the following:

- In the **Groups** pane, under the **Groups** folder, expand the folder of the grouped column.
- In the **Data items** pane, drag the data items to sort to the **Sort list** folder.

**Tip:** You can also drag data items from the **Detail Sort List** folder.

- Click the **Sort order** icon  to specify ascending or descending order.

4. To change the sort order of columns, in the **Groups** pane, change the order of columns in the **Sort list** folder of a group or in the **Detail Sort List** folder.

**Tip:** Add items to the **Detail Sort List** folder to sort items that are not groups.

5. If you are sorting a crosstab, do the following:

- From the **Data items** pane, drag the item on which to sort to the **Sort List** pane.

For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. To sort Order year by Revenue, drag Revenue to the **Sort List** pane.

- Click the **Sort order** icon to specify ascending or descending order.

### Working with Relational Queries

Queries specify what data appears in the report. In IBM Cognos Analytics - Reporting, you create and modify queries using **Query Explorer**.

**Query Explorer** provides an alternative way to modify existing reports or to author new reports. You can use **Query Explorer** to perform complex tasks and other tasks that are more difficult to do in the report layout. For example, use **Query Explorer** to

- improve performance by changing the order in which items are queried from the database, or by changing query properties to allow the report server to execute queries concurrently where possible

**Note:** Only queries that are referenced in the report layout can be executed concurrently. If a query is defined in Query Explorer by joining two or more existing queries, IBM Cognos Analytics cannot execute the source queries concurrently. By default, queries run sequentially. Your administrator must enable the concurrent query execution feature. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

- view or add filters and parameters and modify their properties
- view or add dimensions, levels, and facts
- incorporate SQL statements that come from other reports or reports that you write
- create complex queries using set operations and joins

#### Related concepts

##### [Queries](#)

## Specify a List of Data Items for an Object

Specify the list of data items for an object when you must reference a data item that is in a query but is not in the layout.

For example, you want to add a layout calculation to a list that uses a data item that is in the query definition. If the data item does not appear in the list, you must reference it in order to make the layout calculation work. You must also specify the list of data items if you apply conditional formatting that uses a data item that is not in the query.

#### Procedure

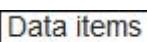
1. Click a layout object.
2. Click the **Show properties** icon  , and in the **Properties** pane, double-click the **Properties** property and select data items.

## Relate a Query to a Layout

Queries and layouts work together. After you decide the type of data that you need, you must create a layout in which to show the results. Each column of data must be both selected for the query and shown in a layout unless there are some columns that you do not want to show. The query and layout portions of a report must be linked to produce a valid report.

IBM Cognos Analytics - Reporting automatically links query and layout. For example, when you use Reporting and the list report layout, query and layout are automatically linked.

#### Procedure

1. Select a data container.
2. Click the **Show properties** icon  , and in the **Properties** pane, set the **Query** property to a query.
3. Click the **Data** icon  , click the **Data items** tab  , and drag data items from the query to the data container.

## Connecting Queries Between Different Data Sources

This section lists the data sources between which you can and cannot connect queries.

IBM Cognos Analytics supports the following:

- RDBMS to RDBMS joins
- set operations of any two queries
- master detail relationships between any two queries
- drill from any query to any other query

You cannot create the following types of joins:

- cube-to-cube (homogeneous)
- cube-to-cube (heterogeneous)
- cube-to-RDBMS
- cube-to-SAP BW
- SAP-BW-to-RDBMS

## Add a Query to a Relational Report

You can create multiple queries in **Query Explorer** to suit your particular needs. For example, you can create a separate query for each data container in a report to show different data.

**Tip:** The Briefing Book sample report in the GO Sales (analysis) package and the Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package include multiple queries.

### Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon  and drag one of the following objects to the work area.

Object	Description
<b>Query</b>	Adds a query.
<b>Join</b>	Adds a <u>join</u> relationship.
<b>Union</b>	Adds a <u>union operator</u> .
<b>Intersect</b>	Adds an intersect operator.
<b>Except</b>	Adds an except (minus) operator.
<b>SQL</b>	Adds <u>SQL</u> commands.

**Note:** When adding queries to the report

- right-click the work area and click **Show Package Sources** to see the queries that use data items from a package
- right-click the work area and click **Expand References** to see the relationships that exist between queries in the report, which is useful when you are creating complex queries

3. Click the **Show properties** icon , and In the **Properties** pane, set the object properties.

For example, if you added a join, set the **Join relationships** property to define the join.

4. Double-click a query.

5. Click the **Data** icon , and from the **Source** tab , drag data items to the **Data Items** pane.

**Tip:** You can add data items to the query that you do not want to appear in the layout. For example, to filter on Product line code and show Product line in the layout, you must add both data items to the query.

6. To create a new data item, click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
7. To add a filter, click the **Toolbox** icon, drag **Filter** to the **Detail Filters** or **Summary Filters** pane and define the filter expression.

**Tip:** You can also create a filter by clicking the **Data** icon, dragging a data item from the **Source** tab to one of the filters panes, and completing the filter expression.

## Create a Union Query

Create a union query to combine two or more queries into one result set.

You can combine queries that use different data sources. For example, you can combine a query that returns data from a dimensional data source with a query that returns data from a relational data source.

### Before you begin

To combine two queries, the following conditions must be met:

- The two queries must have the same number of data items.
- The data items must have compatible types and appear in the same order.

For numeric data types, integer, float, double, and decimal are compatible.

For string data types, char, varChar, and longVarChar are compatible.

For binary data types, binary and varBinary are compatible.

Date data types must match exactly.

### Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon , and do the following:
  - Drag **Query** to the work area.
  - Drag **Union**, **Intersect**, or **Except** to the right of the query.  
Two drop zones appear to the right of the operator.
  - Drag a **Query** object to each drop zone.  
Two queries are created in the work area, and a shortcut to each query appears in the drop zones.
3. Double-click each query that makes up the union query and add data items to the query.
4. Return to the Queries work area.
5. Click the set operator that you added in step 2.
6. Click the **Show properties** icon , and In the **Properties** pane, set the **Duplicates** property to remove or preserve duplicate rows.
7. Double-click the **Projection list** property.

The projection list shows the list of projected data items for the set operation.
8. To automatically produce the list of projected data items, click **Automatically generated**.

IBM Cognos Analytics - Reporting generates the projection list using only one of the two queries in the union.
9. To add, delete, move, or rename data items in the projection list, click **Manual** and make the changes.

10. Double-click the union query.

11. Click the **Data** icon  and from the **Source** tab , drag data items to the **Data Items** pane.

## Results

The union query is complete. You can now link the union query to a data container in the layout.

## Create a Join Relationship

You can create a join relationship to join two queries.

In general, join relationships should be created in the IBM Cognos Framework Manager model. Create a join relationship in IBM Cognos Analytics - Reporting if what you are trying to do cannot be modeled in Framework Manager.

## Procedure

1. Click the **Queries** icon , and click **Queries**.

2. Click the **Toolbox** icon  and do the following:

- Drag **Query** to the work area.
- Drag **Join** to the right of the query.

Two drop zones appear to the right of the operator.

- Drag a **Query** object to each drop zone.

Two queries are created in the work area, and a shortcut to each query appears in the drop zones.

3. Double-click each query that makes up the join query and add data items to the query.

4. Return to the Queries work area.

5. Click **Join**.

6. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Join relationships** property.

7. Click **New Link**.

8. To create the link, click a data item in the left query, and then click a data item in the right query.

9. For each query, click **Cardinality** and click a cardinality option.

10. Click **Operator** and click an operator.

11. To convert the join relationship to an expression, click **Convert to expression**.

Convert the join relationship to an expression to make changes to the join definition.

**Note:** After you convert the relationship to an expression, you cannot change it back to a relationship.

12. Double-click the join query.

13. Click the **Data** icon  and from the **Source** tab , drag data items to the **Data Items** pane.

## Results

The join query is complete. You can now link the join query to a data container in the layout.

## Reference a Package Item in a Child Query

When you create a child query in IBM Cognos Analytics - Reporting, you can only reference items from its parent or from other queries. For example, if you add a filter to a child query, the only items that you can insert into the expression are items that exist in other queries defined in the report. To add an item from the package, you must unlink the child query from its parent.

## Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Unlink the child query from its parent by selecting the parent query shortcut to the right of the child query and pressing the Delete key.
3. Double-click the child query.

Items are now available on the **Source** tab .

4. Add items.

For example, to create a detail filter that references a package item, click the **Toolbox** icon  drag the filter object to the **Detail Filters** pane, and then add the items in the **Expression Definition** box.

5. Recreate the link between the child query and the parent query by dragging the parent query to the right of the child query.
6. If necessary, double-click the child query to complete it.

For example, if you created a filter, you may need to complete the filter expression.

## Create a Master Detail Relationship

Create a master detail relationship to deliver information that would otherwise require two or more reports. For example, you can combine a list with a chart. The list can contain product lines and the chart can show details for each product line.

Master detail relationships must appear in nested frames to produce the correct results. You can create a master detail relationship in two ways:

- Use a parent frame for the master query and a nested frame for the detail query.
- Associate a report page with the master query and use a data container, such as a list or crosstab, for the detail query.

You cannot display parent data in the child frame or child data in the parent frame. Also, you cannot perform calculations across master detail queries.

You can use a master detail relationship to show data from separate data sources in a single report. However, the data sources must be contained in the same package.

With the dynamic query mode, master detail reports with a crosstab report object are optimized to use a single query whenever possible, rather than a separate query for each report object instance.

## Procedure

1. To use a parent frame for the master query and a nested frame for the detail query:

- Click the **Toolbox** icon  and drag a **List**, **Repeater Table**, or **Repeater** to the report.
- Add a second data container to the object you inserted.

You can insert a list, crosstab, chart, repeater table, or repeater into a list. You can add a list to a repeater table or repeater.

- Add data items to both data containers.

2. To associate a report page with the master query and use a data container for the detail query:

- Click anywhere in the report page.

- Click the **Show properties** icon , and In the **Properties** pane, click the **Select ancestor** icon  and click **Page**.
- Set the **Query** property.

- Click the **Toolbox** icon and drag a data container to the report.
- To link a data item in the master query to a parameter in the detail query instead of to another data item, create the parameter in the detail query.  
Use parameters to filter values at a lower level in the detail query.
    - Click the **Queries** icon , and double-click the detail query.
    - Click the **Toolbox** icon and drag the **Filter** object to the **Detail Filters** box.
    - In the **Expression Definition** box, create the parameter.
  - Click **Pages** icon , and click the report page.
  - Select the data container containing the details.
  - In the report object toolbar, click the **More** icon  and click **Master Detail Relationships**.
  - Click **New Link**.
  - In the **Master** box, click the data item that will provide the primary information.
  - To link the master query to a data item, in the **Detail** box, click the data item that will provide the detailed information.
  - To link the master query to a parameter, in the **Parameters** box, click the parameter that will provide the detailed information.

**Tip:** To delete a link, select the link and press the Delete key.

- If your detail query object is a chart, you can disconnect a chart title from the master query.
  - Click the chart title, and in the report object toolbar, click the **More** icon and click **Master Detail Relationships**.
  - Clear the **Use the master detail relationships from the chart** check box.
- If your master detail relationship includes a chart as the detail and you are using automatic axis ranges, you can set the same axis range for all the detail charts:
  - Select the axis.
  - In the **Properties** pane, under **General**, double-click the **Axis range** property.
  - Under **Maximum** and **Minimum**, click **Automatic**.

The master detail report option is only available with automatic axis ranges.

  - Under **Master detail reports**, select the **Same range for all instances of chart** check box.

For more information about axis ranges, see “[Change the axis scale of a current default chart](#)” on [page 84](#).

**Tip:** To avoid seeing the same data item twice in the report, click the data item in the data container driven by the detail query, click the **More** icon and click **Cut**. This removes the item from the report display but keeps it in the query.

#### **Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service**

When running a master detail or burst report that includes a chart or crosstab, disk space exhaustion may cause the report or other requests to fail. A large set of burst keys or master rows may produce one or more charts per detail, resulting in many master detail executions. This may cause the temp folder to accumulate many gigabytes of temporary files containing data required for successful chart rendering.

To avoid this issue, we recommend that you test large master detail or burst reports that include charts or crosstabs to determine the potential peak disk requirements for the report.

## **Working with Queries in SQL**

For each query in a report, you can work with the SQL that is executed when you run a report.

You can

- [view the SQL for an entire report or a query](#)
- [build a report using your own SQL](#)
- [convert a report to use SQL directly](#)
- [edit the SQL](#)

When working with a relational data source, the SQL that is produced by IBM Cognos Analytics - Reporting depends on the [report output selected](#).

**Note:** MDX is not available with relational or DMR data sources.

### **View the SQL for an Entire Report or a Query**

View the SQL to see what is passed to the database when you run a report.

#### **Procedure**

1. To view the SQL for the entire report, click the **Queries** icon , right-click the **Report** icon , and click **Show Generated SQL/MDX**.

This option shows the SQL that will be executed in the data source. The SQL is organized by query and by query result. If a query is used in more than one data container, a query result is generated for each data container.

2. To view the SQL for a specific query, do the following:

- Click the **Queries** icon, and click the query.
- Click the **Show properties** icon , and In the **Properties** pane, double-click the **Generated SQL** property.

The **Generated SQL** property shows the SQL that is executed when you view tabular data (right-click the query and click **View Tabular Data**). Tabular data shows the data that is produced by the query in the form of a list. You can use this property to help you build advanced queries.

#### **Results**

The SQL for the query appears in the **Generated SQL** dialog box. You can choose to view native SQL, which is the SQL that is passed to the database when you execute the query, or IBM Cognos SQL, which is a generic form of SQL that IBM Cognos Analytics - Reporting uses. Cognos SQL is converted to native SQL before the query is executed.

### **Build a Report Using Your Own SQL**

You can build a report by adding SQL from an external source, such as another report.

If you edit the SQL of a query, you must change the **Processing** property for that query to **Limited Local**.

#### **Procedure**

1. Create a new report and choose the **Blank** template.
  2. Click the **Queries** icon , and click **Queries**.
  3. Click the **Toolbox** icon  and drag **Query** to the work area.
  4. Click the **Toolbox** icon, and to build an SQL query, drag **SQL** to the right of the query.
- Tip:** You can drag **SQL** anywhere in the work area, and IBM Cognos Analytics - Reporting will automatically create a query.
5. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Data source** property and click a data source.
  6. If required, set the **Catalog** property to the name of the catalog.

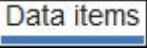
7. Double-click the **SQL** property and type the SQL.
8. Click **Validate** to check for errors.
9. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.
10. Double-click the query.

If the SQL is valid, the data items defined in the SQL appear in the **Data Items** pane.

11. Click the **Pages** icon , and click a report page.
12. Click the **Toolbox** icon and drag an object to the work area.  
For example, drag a list, crosstab, chart, or repeater.
13. Click the data container.
14. In the **Properties** pane, click the select ancestor button  and click the container you just created.  
For example, if you created a list, click **List**.

**Tip:** You can also click the container selector (three orange dots) of the container to select it.

15. Set the **Query** property to the query for the report type.

16. Click the **Data** icon , and from the **Data items** tab , drag the items from the query you chose in the previous step to the data container.

### Convert a Query to SQL

You can convert a query to SQL to edit it. You may want to do this to improve performance or to use SQL features that are not supported directly by IBM Cognos Analytics - Reporting.

Converting a query to SQL is an irreversible process.

### Procedure

1. Click the **Queries** icon  and click the query.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Generated SQL** property.
3. Click **Convert**.
4. Click **Validate** to check for errors.
5. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.

### Edit the SQL

You can edit the SQL for a query that has been created as an SQL query or that has been converted to SQL.

### Procedure

1. Click the **Queries** icon  and double-click the SQL item under the query.
2. Make changes in the **SQL** window.
3. Click **Validate** to check for errors.

### First-Rows Optimization

The SQL produced by IBM Cognos Analytics - Reporting depends on the report format you choose. For example, if you specify HTML format, first-rows optimization is requested. All-rows is requested if you specify PDF.

It is important for database administrators and programmers to remember that Reporting does not always use first-rows optimization. If you assume first-rows optimization is always requested, this can cause the RDBMS optimizer to process the query differently than you expect.

## Using relational calculations

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Insert a calculation to make your report more meaningful by deriving additional information from the data source. For example, you create an invoice report, and you want to see the total sale amount for each product ordered. Create a calculated column that multiplies the product price by the quantity ordered.

You build calculations in the expression editor using functions.

If a calculation is used in multiple reports, or by different report authors, ask your modeler to create the calculation as a standalone object in the model and include it in the relevant package.

You can add calculations to lists, crosstabs, and all other data containers. You can also add calculations directly to a page header, body, or footer. However, you must first associate a query to the page. For more information, see [“Add a page to a report” on page 337](#)

### Units of Measure

When creating calculations in IBM Cognos Analytics - Reporting and IBM Cognos Query Studio, you may encounter problems with the units of measure. For example, the calculation Cost\*Cost returns the unit of measure \* instead of a currency unit of measure. To avoid this problem, change the format of the corresponding column to obtain the desired unit of measure.

### Calculation Solve Order

When calculations in the rows and columns of a report intersect, calculations are performed in the following order: addition or subtraction, multiplication or division, aggregation (rollup), and then the remaining arithmetic functions.

The remaining functions are as follows:

- absolute, round, round down, average, minimum, maximum, medium, count
- percentage, % difference (growth) or % of total
- rank, quartile, quantile, or percentile

If both calculations have the same precedence, for example, if they are both business functions, then the row calculation takes precedence.

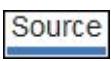
### Limitations of Calculations

You should use only the expressions and functions available in Reporting, and follow their syntax.

Minimal checking exists for calculations. If your calculation uses an invalid expression, your report results may contain unexpected values.

In addition, you should define member summaries as follows:

`summary_function (currentMeasure within set set_reference)`

where `set_reference` is a level or set inserted from the **Source** tab 

Unless otherwise required, `summary_function` should be the aggregate function. If you use an explicit summary function, you may encounter problems with measures and scenario or account dimension members (such as profit margin, distinct count, and so on) that have complex rollup rules, or members that do not roll up.

Know your data, and confirm with the owner of the cube where overriding the automatic aggregation is safe.

Because of these limitations, summaries of calculations may not provide reliable values. For convenience, you may have to build reports where row summaries and calculated member columns intersect. In such reports, these intersections may contain unexpected values. In contrast, row calculations intersecting with column aggregates using the aggregate function are safe because the calculation is performed on the reliably summarized values.

## Create a simple calculation

You can select items in your report and create simple calculations.

In addition to simple arithmetic calculations, you can perform the following calculations:

Calculation	Description
Rollup	Summarizes, or rolls up, all the values in a hierarchy.
%	Calculates the value of a selected item as a percentage of another item.
% Growth	Calculates the difference between two items as a percentage.
% Of Base	This calculation is only available if you select two members from different hierarchies, each from a different edge.  This calculation takes the first selected member from edge A and the second selected member from edge B. The calculation result of a percent of base should be such that all the values for member A will compare itself to the intersect value of member A and B.
Custom	Allows you to specify your own value when performing a simple arithmetic calculation. Also allows you to change the order of operands or type a custom name for the new calculated row or column.

### Procedure

1. Select the items in your report to calculate.
  2. From the report object toolbar, click the insert calculation button  and select the calculation to perform.
  3. To change the order of the operands, the name of the calculated item added to the report, or to create a custom calculation, click **Custom**.
- Tip:** Calculations that are not applicable to the items you selected are grayed out.

### Results

The calculation appears as a new row or column in your report.

## Insert a Query Calculation

Insert a query calculation into your report to add a new row or column with values that are based on a calculation.

For example, you create a query calculation named Euros that converts dollars to euros by multiplying an existing dollar measure by a conversion rate. Euros can then be displayed to end users in a separate row or column.

**Note:** When creating an expression that will be used in a double-byte environment, such as Japanese, the only special characters that will work are ASCII-7 and ~ -- || - \$ ¢ £ ¤.

Not all data sources support functions the same way. The data modeler can set a quality of service indicator on functions to give a visual clue about the behavior of the functions. Report authors can use the quality of service indicators to determine which functions to use in a report. The quality of service indicators are:

- not available (X)

The function is not available for any data source in the package.

- limited availability (!!)

The function is not available for some data sources in the package.

- limited support (!)

The function is available for all data sources in the package but is not naturally supported for that data source. IBM Cognos Analytics uses a local approximation for that function. Because an approximation is used, performance can be poor and the results may not be what you expect.

- unconstrained (check mark)

The function is available for all data sources.

When inserting literal strings in an expression, you must enclose the string in single quotation marks. If the string contains a quotation mark, it must be escaped. For example, if you want to insert the string ab'c, you must type 'ab"c'.

### Procedure

1. Click the **Toolbox** icon  and drag **Query calculation** to the report.
2. Type a meaningful name for your expression in the **Name** box.

For example, if you are calculating the difference between 2012 revenue and 2011 revenue, you could name your expression **2012 - 2011 Revenue**.

3. In the **Available Components** pane, define the calculation:

- To add data items that are not shown in the report, on the source tab , double-click the data items.
- To add data items that are in the report but not necessarily in the model, such as calculations, on the data items tab , double-click the data items.

- To add data items from a specific query, on the queries tab , double-click data items.
- To add functions, summaries, and operators, on the functions tab , double-click elements.
- To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.

Parameters define prompts, drill-through reports, and master detail relationships.

- To add a macro, on the macros tab , double-click the parameter maps, session parameters, or macro functions you want to add to the macro expression.

**Tip:** Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.

You can also type the calculation directly in the **Expression Definition** box.

When typing date values, ensure that the date format is correct for your database type.

To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .

4. Click the validate button .

Any validation errors appear on the **Errors** tab of the **Information** pane.

#### Related concepts

[Using query macros](#)

## Create a Layout Calculation

Create a layout calculation to add run-time information to your report, such as current date, current time, and user name.

When creating layout calculations, only report functions are available to you in the expression editor. These functions are executed in the report layout, as opposed to the other functions which are executed in the query.

#### Procedure

1. Click the **Toolbox** icon  and drag **Layout calculation** to the report.
2. In the **Available Components** box, define the calculation:
  - To add data items from a specific query, on the queries tab , double-click data items.
  - To add functions, summaries, and operators, on the functions tab , double-click elements.
  - To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.

Parameters define prompts, drill-through reports, and master detail relationships.

**Tip:** You can also type the expression directly in the **Expression Definition** box.

3. Click the validate button .



# Chapter 10. Dimensional Reporting Style

The dimensional reporting style is recommended for dimensionally-modeled relational (DMR) and Online Analytical Processing (OLAP) data sources. Dimensional data is best represented by crosstabs, maps, and charts. This data is shown in IBM Cognos Analytics - Reporting in dimensions, hierarchies, levels, and members.

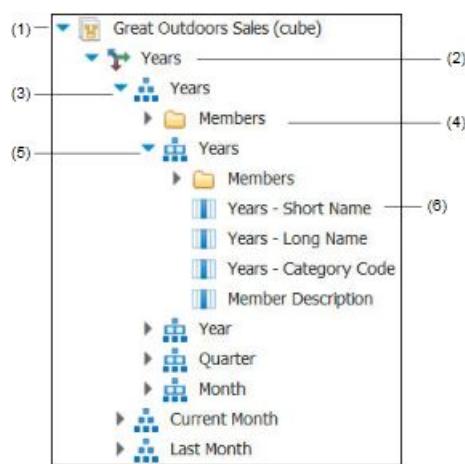
In dimensional reporting, you summarize data by using member summaries and within set aggregation. You focus data in dimensional reporting by adding only the relevant members to the edge of a crosstab or to the context filter. You can also enable drilling up and drilling down in dimensional reports.

## Add dimensional data to a report

For dimensional and mixed model data sources, you can view the full data tree by clicking the **Options** icon (Data icon , **Source** tab) and then clicking **View metadata tree**. You can switch to the dimensional-only data tree by clicking the **View members tree** option.

**Note:** Use dimensional data in the dimensional reporting style. However, if you are using relational data, see [“Add Relational Data to a Report” on page 155](#).

If you are working with a dimensional data source, data items are organized hierarchically. Dimensional data sources include OLAP and dimensionally-modeled relational (DMR) data sources. The **Source** tab shows a metadata-based view of the data.



**Note:** The names of levels and members in a dimension come from the model. It is the responsibility of the modeler to provide meaningful names.

### 1. Package

Packages are subsets of a model containing items that you can insert in a report.

### 2. Dimension

Dimensions are broad groupings of descriptive data about a major aspect of a business, such as products, dates, or markets.

### 3. Level hierarchy

Level hierarchies are more specific groupings within a dimension. For example, for the **Years** dimension, data can be organized into smaller groups, such as **Years**, **Current Month**, and **Last Month**.

### 4. Members folder

Members folders contain the available members for a hierarchy or level. For example, the **Members** folder for the **Years** level hierarchy contains everything found in the **Year**, **Quarter**, and **Month** levels.

## 5. Level

Levels are positions within the dimensional hierarchy that contain information at the same order of detail and have attributes in common. Multiple levels can exist within a level hierarchy, beginning with a root level. For example, the **Years** level hierarchy has the following related levels.

Level	Level name	Description
Root	<b>Years</b>	The root level.
First	<b>Year</b>	Years in the <b>Years</b> root level. For example, 2013, 2012, and 2011.
Second	<b>Quarter</b>	Quarters for each year in the <b>Year</b> level. For example, 2013 Q1, 2013 Q2, and 2013 Q3.
Third	<b>Month</b>	Months for each quarter in the <b>Quarter</b> level. For example, Jan., Feb., and Mar.

**Tip:** The **Measures** dimension contains the measures available in the data source.

## 6. Member property

Member properties are attributes that each member possesses. For example, gender could be a property for all employee members. For more information about member properties, see [“Insert a Member Property” on page 191](#).

### Related concepts

[Limited Support for Relational Functions When Used with OLAP Data Sources](#)

## Customize the Source Tree

When using dimensional data, you can customize how you see data in the source tree. You can select a full package tree view that shows dimensions, hierarchies, levels, an optional members folder, and member properties.

Or you can select a members-only tree view, such as the one in IBM Cognos Analysis Studio. This view allows you to add only members in your report.

### Procedure

1. Click the **Data** icon , click the **Source** tab , and then click the **Options** icon .
2. To view the members-only tree view, click **View members tree**.
3. To view the full package tree, click **View package tree**.
4. To change what is included in the tree, right-click a data item and click **Package Tree Settings**.

Use the **Preview** pane to choose the appropriate settings.

## Insert a member

By default, when you insert members from the source tree into your report with IBM Cognos Analytics - Reporting, single members are inserted without any details or children. You can change how members are inserted. For example, you may want to insert a member along with all its children or insert only the member's children. Or you may want to insert members as a set.

When you double-click a member that you have already inserted in your report, by default, its children are inserted after the parent member. You can control whether the children are inserted before or after,

nested, or not inserted at all: click the **More** icon  **Options**, and in the **Edit** tab, click a setting under **Double-click on member action**.

When inserting members into a crosstab, ensure that you insert members from the same hierarchy on only one of the crosstab edges. If you insert members from the same hierarchy on both edges of the crosstab, you may encounter unexpected results. For example, a report that uses members from years in the rows and Quarters in the columns is very difficult to read because the useful numbers are distributed over a large area of mostly blank cells.

Calculated members from the data source also appear in the source tree. However, calculated members in Microsoft SQL Server Analysis Services (SSAS) cubes do not appear in the list of descendants in the query. If you want these calculated members to appear in a report or a prompt, you must insert them explicitly.

### Procedure

1. Click the **Data** icon , click the **Source** tab , and then click the **Options** icon .
2. Under **Insert**, click **Individual Members**.
3. Under **Member Insert Options**, select how you want to insert members.
4. If you want to insert members within a set instead of inserting individual members, under **Insert**, click **Create sets**.
5. Do one of the following:
  - To insert a member above or below another member, drag the new member above or below a cell. A flashing black bar appears where you can drop the new member.
  - To replace a member, drag the new member to the cell with the member to replace. A flashing black box appears where you can drop the new member.

### Search for a Member

You can perform a member search to quickly find data.

You can control the number of members that are returned in a search by specifying a value for the

**Member display count limit (in source tree)** option (**More** icon  **Options**, **Advanced** tab).

### Procedure

1. Click the **Data** icon , and from the **Source** tab , select and then right-click a hierarchy  or level  and click **Search**.
2. In the **Keywords** box, type the words or characters for which to search.
3. Click the search parameter to use.
4. To search all descendants instead of just the immediate children, select the **Search all descendants** check box.

For example, when performing a search in a hierarchy, selecting this check box returns members found in all the levels of the hierarchy.
5. Click **Search**.

## Results

The search results appear in a hierarchical structure on the **Search** tab . You can browse the hierarchy to explore members at lower levels.

**Tip:** You can insert members directly from the **Search** tab into a report. This can save you time, because you do not have to define a filter. For example, instead of inserting **Product line** from the **Source** tab and adding a filter for **Camping Equipment**, you can insert **Camping Equipment** from the **Search** tab.

## Nest Members

When you insert members in your report, you may want to nest them in another row or column to make your report easier to use. You can nest members from different dimensions. You can also nest sets.

For example, in the following report, the quarters (Q1 to Q4) were selected from the Time dimension and nested only for the GO Americas member, which is from a different dimension.

Amount (year to date)	<#2010#>
<#GO Americas#>	<#Q1 2010#> <#Q2 2010#> <#Q3 2010#> <#Q4 2010#>
<#GO Consolidated corporate#>	<#1234#>
<#GO Consolidated eliminations#>	<#1234#>
<#GO CONSOLIDATED#>	<#1234#>
<#GO Asia Pacific#>	<#1234#>

Figure 39. Crosstab showing the year to date amount for all four quarters nested beside GO Americas

When you filter out children from nested sets, the parent set still appears in your report. To avoid this, filter only the top level set and nest only the complete set of descendants at the desired levels.

## Procedure

Click the **Data** icon , and from the **Source** tab , drag the members to the work area.

A flashing black bar indicates where you can drop an item.

## Insert a Hierarchy

You can quickly insert entire hierarchies in a report.

When using an IBM Cognos PowerCube, a SSAS cube, or a dimensionally-modeled relational data source, you can insert multiple hierarchies from the same dimension in a crosstab. For example, you can place one hierarchy from a dimension on an edge of the crosstab and nest another hierarchy from the same dimension on the same edge, on another edge, or in the **Context filter** area.

You can also perform arithmetic, percentage, and ranking calculations using multiple hierarchies.

Summary or analytic calculations that refer to different hierarchies from the same dimension, such as total, count, average, minimum, and maximum, are not supported. These calculations cause an OP-ERR-0250 error.

## Procedure

1. Click the **Data** icon , and from the **Source** tab , drag the hierarchy  to the report.
2. In the **Insert hierarchy** dialog box, choose which members to insert:
  - To insert only the root members of the hierarchy, click **Root members**.

- To insert all members of the hierarchy, click **All members**.

**Tip:** The default **Level indentation** property for all members is to show the hierarchical structure when the report is run.

## Insert a Member Property

You can insert member properties, which are attributes of a member, in your report. Member properties provide additional information about the member. For example, an employee level may have a property named gender.

### About this task

In the data tree of the **Source** tab , member properties are identified by the icon .

You can only insert properties. You cannot group them. Do not insert member properties in the series or categories of a chart because by default, IBM Cognos Analytics - Reporting groups items that are inserted in these areas. Grouping member properties produces a warning when you validate the report.

### Procedure

Click the **Data** icon , and from the **Source** tab , drag the member property  to the report.

## Create a Set of Members

Use sets to group members that are logically related for various actions, such as formatting, nesting, and sorting. Creating sets is also useful when members may be dynamic over time. For example, the child accounts of a total assets account may change from year to year. By creating a set, you do not have to modify the report each time accounts are added or removed.

After you create a set of members, you can add or remove members within the set.

You can perform operations on the set such as excluding specific members, moving members within the set, showing only the top or bottom members, filtering the set, and expanding or collapsing the members within a set. You can view the set definition to see and edit operations that are performed on the set.

### Procedure

1. Click the **Data** icon , click the **Source** tab , and then click the **Options** icon .
2. Under **Insert**, click **Create sets**.
3. From the **Source** tab, select the items to include in the set and drag them to the work area.
4. To add or remove members, select the set, click the **More** icon , and click **Edit Members**.

**Tip:** You can also select the set, click the **Show properties** icon , and in the **Properties** pane, double-click the **Members** property.

## Sharing sets between reports

When you are working with dimensional data, you can share a set to make it available for inclusion in multiple reports.

You must first create a set in a source crosstab report, create a shared set definition, then refer to it in a target report.

A shared set definition is copied from one report to another. As a result, the set definition must not depend on any context from the source report. For example, it must meet the following criteria:

- It cannot reference other shared sets.
- It cannot reference other data items.

- It cannot contain calculated members.

You cannot change the definition of a shared set from within the target report. However, you can carry out other set operations on it, such as excluding a member or creating a top 10 list.

### Procedure

1. In the source crosstab report, create a set that you want to share.
2. Select the set, click the **Show properties** icon , and in the **Properties** pane, in the **Sharing** property, enter a name and description for the set.
3. Save the report.
4. Click the **Data** icon , and in the **Source** tab , right-click the model. Click **Add shared set report**.
5. In the **Open** box, select the source report that contains the shared set definition.  
If it does not exist, a new folder that is called **Shared Sets** is created. It is displayed at the bottom of the source tree.
6. Optional: To add, delete, or change the order of reports in the **Shared Sets** folder, right-click the folder and click **Manage Shared Set Reports**.
7. Create or open a crosstab target report that you want to refer to the shared set definition.
8. In the **Source** tab , open the **Shared Sets** folder. Open the source report that contains the shared set definition that you want to use.
9. Add the shared set definition into your target report.
10. Select the shared set in the target report, click the **More** icon , and click **Edit Set**.
11. In the **Set definition** box, select the shared set.
12. Click **Edit** .

The **Set Reference Properties** window opens.

13. Set the **Inclusion** property.
  - a) Select **Run time** to retrieve the latest shared set definition every time that the report runs.
  - b) Select **Design time** to store the shared set definition in the target report.  
This definition is used until you refresh it.
14. Click **OK**, then save the report.

### Managing shared set references

After you share a set to make it available for inclusion in multiple reports, you can manage references to it. You can also copy it locally.

You can manage set references in the following ways:

- Create a copy of a shared set to be used in a report.  
Converting a shared set reference into a copy replaces the reference with a set definition that is stored in the report. The report does not reference the shared set from the source report. Any changes that are made to the shared set in the source report are not reflected in the target report. Instead of converting the reference to a copy, you can change the **Inclusion** property of the reference to **Design time**. Design time references use a static stored version of the shared set definition. However, you can later change the **Inclusion** property to be **Run time** to use the latest shared set definition.
- Modify the properties of a set reference in the target report, including its **Inclusion** property. You can also modify a set reference in the target report by changing the set definition it refers to.
- Refresh an existing set reference after a set changed in a source report and you want to use the updated set. To use the updated set if the **Inclusion** property is set to **Design time**, you must refresh its reference.

- Review problems with an existing set reference.

### Procedure

1. Open the target report that contains the reference to the shared set that you want to work with.
2. Click the **More** icon  and then click **Shared sets**.
3. To create a copy of a shared set to be used in a report, do the following steps:
  - a) Select the shared set reference that you want to copy.
  - b) Click **Convert Reference to Copy**.  
The **Confirm Convert** window is displayed.
  - c) If you want to convert the set reference into a copy that is stored in this report, click **Yes**. If you do not want to create a copy, click **No**.  
**Important:** If you convert the set reference into a copy, it is not updated when the set in the original report changes.
4. To modify an existing set reference in a target report, do the following steps:
  - a) Select the shared set reference that you want to modify.
  - b) Click **Edit Reference**.
  - c) To modify the set reference properties, select the reference, then click **Edit**   
The **Set Reference Properties** window opens. You can now modify the set reference properties.
  - d) To modify the definition of the set, click **New**   
The **Set Definition** window opens. You can now modify the set definition.
5. To refresh an existing set reference after a set changed in a source report, do the following steps:
  - a) Select the set reference that you want to refresh.
  - b) Click **Refresh Reference**.
6. To review problems with an existing set reference in a target report, do the following steps:
  - a) Select the set reference that is causing the problem.
  - b) Review and act upon the message that is displayed.
7. Save the report.

### Edit a Set

After you create a set, you can view its definition to see, change, add, or delete operations, such as the following, that are performed on the set:

- excluding a member
- moving members to the top or bottom of a set
- applying a top or bottom filter
- filtering the set
- expanding or collapsing members in a set

The definition of a set shows you, in the graphical tree, the history of all the operations that are performed on the set.

You can see and change the order in which the operations are performed. For example, you apply a top three filter and then exclude one member. Your set now contains only two members. You can choose to exclude the member before the top three filter so that your set still contains three members.

## Procedure

1. Select a set, click the **More** icon  and click **Edit Set**.

A graphical tree shows all the operations that are performed on the set of members.

2. To see the details of an operation, hover your mouse over an operation node.
3. To change the order of an operation, click the operation node, and click the right or left arrow.

4. To edit an operation, click the operation node and click the edit button .

5. To add a new operation, click the new button .

## Exclude Members from a Set

You can choose to remove individual items that are not needed in your analysis.

## Procedure

1. Select a set, click the **More** icon  and click **Edit Set**.

2. Click the new button  and click **Exclude**.

3. In the **Exclude** box, choose the members to exclude and use the right arrow to move them to the **Members** pane.

## Move Members Within a Set

You can move one or more members to the top or bottom of a set.

## Procedure

1. Select a set, click the **More** icon  and click **Edit Set**.

2. Click the new button  and click **Move to Top** or **Move to Bottom**.

3. In the **Available members** list, select the member to move to the top or bottom and click the right arrow.

The members appear in the order shown in the **Members** list.

## Limit Data to Top or Bottom Values

You want to focus your report on the items of greatest significance to your business question. For example, you want to identify your top 100 customers and what that group of customers is worth.

You can limit the data to the top or bottom values of a set. This keeps the amount of data shown in the work area small, even when using large data sources.

You can define a top or bottom rule by specifying

- a number, such as the 50 top or bottom performing sales people
- a percentage, such as customers who contribute to the top 10% of overall revenue
- a cumulative sum, such as customers who contribute to the first ten million dollars of overall revenue

If the selected set contains a user-defined filter, the top or bottom rule applies only to the included values. For example, if you apply a filter to show only retailers with revenue greater than one million dollars, the bottom rule applies to the lowest values within those results.

You can filter a set of members to show only those at the top or bottom and base the filter on the measure you are using and the set of members on the opposite edge. You can also specify a custom filter.

## Procedure

1. Select a set, click the **More** icon  and click **Edit Set**.
2. Click the new button  and click **Top** or **Bottom**.
3. Under **Type**, select whether to filter the **Top** or **Bottom** values.
4. To choose how and how much you want to filter, under **Number of items**, click **Count, Percent**, or **Sum** and type the number of data items to show, the percent of data items to show, or the value to sum.
5. Choose the intersection on which to base your filter by clicking the ellipsis button and selecting the members and measure for the intersection from either the **Source** tab  or the **Calculated members and measures** tab .

For more information, see “[Create an Intersection \(Tuple\)](#)” on page 231.

## Filter the Members Within a Set

You can remove members from within a set by specifying filter conditions so that only the members that you require remain. You can filter a set based on

- member captions

For example, your set includes employee names and you want to keep only the employees with names that begin with a specific letter.

- properties that are numeric or strings

For example, your set includes employee names and you want to filter employees using the gender property.

- intersection of values (tuple)

For example, you want to keep only the employees who used less than ten sick days for the year 2012.

If you want to create a more complex filter, you can combine multiple conditions using AND, OR, and NOT operators. By default, multiple conditions are combined with an AND operator, which means that all conditions must be met for the filter to take effect.

Filtering the members in a set is not the same as relation detail or summary filters.

## Procedure

1. Select a set, click the **More** icon  and click **Edit Set**.
2. Click the new button  and click **Set filter**.
3. Select how you want to filter.
  - If you want to filter the set using a caption, click **Caption**.
  - If you want to filter the set using a member property, click **Property** and select from the drop-down list.
  - If you want to filter the set using an intersection of members, or tuple, click **Intersection (tuple)** and click the ellipsis button. Then, from **Available members and measures**, select the desired items and click the right arrow to move them to the **Intersection members and measures** list.
4. Specify the **Operator** and **Value** to complete your condition and click **OK**.
5. To add additional conditions, click the new button.
6. If you include multiple conditions in your filter, use the AND, OR, and NOT operators to combine them.
  - To add an operator, select the conditions that you want to combine, and click an operator.

- To change an operator, double-click the operator to toggle among available ones or select the operator and then select a different one from the list.
- To remove an operator, select it in the condition string, and then click the delete button .

7. To change a condition, click the edit button .

### **Expand and Collapse a Member Within a Set**

You can expand a member to add its child members below it as new rows, and you can collapse expanded members to remove the expanded member's child members.

#### **Procedure**

1. Select a set, click the **More** icon , and click **Edit Set**.
2. Click the new button  and click **Expand** or **Collapse**.
3. In the **Available members** list, select the member to expand or collapse and click the right arrow to move it to the **Members** list.

### **Extended Data Items**

Extended data items differ from the traditional, expression-based text strings by enabling you to add children, view details, select sets, sort sets, and apply contextual calculations.

Extended data items are created when you insert data items from dimensional packages. Extended data items do not apply to relational packages or non-dimensionally modeled packages.

You can do the following with extended data items that are not available with traditional data items:

- Add an extended data item's child members  
You can double-click an extended data item to insert its child members beside it in the report object.
- View an extended data item's details  
You can select an extended data item and see where the data item appears in the package in the **Properties** pane under **Data Item**.
- Select member sets  
You can select a member in a set to highlight it as the primary selection and the other members as secondary selections.
- Sort sets

You can select an extended data item, click the sort button  in the report object toolbar, and click **Edit set sorting** to sort a set in ascending or descending order, to sort hierarchically, and to sort by caption, by a property, or by an intersection (tuple).

- Apply contextual calculations  
You can select an extended data item and then, from the report object toolbar, click the **Insert Calculation** icon  to see a contextual list of calculations that are available for this extended data item.

### **Tips for working with ragged or unbalanced hierarchies**

In ragged or unbalanced hierarchies, some members that are not at the lowest level of the hierarchy may have no descendants at one or more lower levels. Support for these hierarchy gaps in relational data sources is limited. More complete support is provided for OLAP data sources, but some reports may still result in unexpected behavior.

For example, the following may occur:

- Groups corresponding to missing members may appear or disappear when grouped list reports are pivoted to a crosstab. This happens with set expressions using the `filter` function, and detail filters on members.
- Ragged and unbalanced sections of the hierarchy are suppressed when set expressions in that hierarchy are used on an edge.
- When a crosstab is sectioned or is split into a master detail report, sections corresponding to missing members become empty.
- Cells that were suppressed may still appear in the report output for reports with ragged or unbalanced hierarchies.

Some of these behaviors may be corrected in a future release, while others may be codified as supported behavior. To avoid these behaviors, do not use levels from ragged or unbalanced hierarchies. Instead of using levels, use the descendants, children, or ancestors.

We consider the following scenarios to be safe:

- One or more nested level references on an edge with no modifying expression.
- A hierarchy reference on only one level of one edge.
- One or more explicit members or sets of explicit members as siblings on only one level of one edge.
- Summaries of the previous three scenarios.

In all cases, you should test reports based on ragged and unbalanced hierarchies to confirm that hierarchy gaps are handled correctly.

For more information about ragged or unbalanced hierarchies, see the IBM Cognos Framework Manager *User Guide*.

### Related concepts

[Creating Sections on Reports That Access SAP BW Data Sources](#)

## Creating dimensional custom groups

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Create custom groups to classify existing data items into groups that are meaningful to you.

You can reduce the number of values into smaller, more meaningful groups. For example, you can change a list of employees into my team and others.

When you are working with dimensional data and crosstabs or charts, you can create custom groups only on sets of members. After you create a custom group in a set, the members in the set are replaced by the custom groups.

When you create custom groups in a list, a new column is added to the report, with the name **data\_item (Custom)**. You can use this new column to group or sort the report. If you want to show only the new groups, you can delete the original column.

When you are creating custom groups on sets of members, consider the following constraints:

- Members included in a custom group must be from the same level in a hierarchy.
- If you insert a hierarchy that is used in a custom group elsewhere in the data container, it must be inserted as a sibling of the custom group.
- Automatic aggregation on a custom group might not work as expected. For example, you might encounter error cells (- -).

### Procedure

1. To add custom groups in a crosstab or chart that includes sets of members, do the following steps:

- a) Select a set, click the **More** icon , and click **Edit Set**.

- b) Click the **New** icon  and select **Custom Grouping**.
- c) In the **Custom grouping** window, click the **New Group Entry** icon .
- d) Type a name for the new group.
- e) Select members from the **Available members** list and move them to the **Members** list.
2. To add custom groups to a list, do the following steps:
- a) Click the column that you want to group on, click the **Show properties** icon , and in the **Properties** pane, double-click the **Set definition** property.
- Tip:** You can click either the column heading or one of the column cells.
- b) Click **New Group Entry** .
- c) To group by values that you select, click **New Select Values Group**, type a **New Group Name**, select the required values from the **Values** box, and move the values to the **Selected Values** box.
- d) To group by a range of values, click **New Range Group**, type a **New Group Name**, and enter the **From** and **To** values.
3. If you do not want a group name to be displayed for remaining values, select **Do not show remaining values**. Clicking this option produces empty cells for remaining values.
4. If you want the group name for remaining values to match each value, select **Use each remaining value as a group name**.
5. If you want to specify your own group name for all remaining values, select **Group remaining values into a single group** and type the name that you want.
6. If you are adding custom groups in a list, under **New data item name**, select either the default data item name or type a new data item name.

## Summarizing data dimensionally

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Summarize data in your reports to obtain totals, averages, and so on.

The summary options that you can use depend on the type of data source that you are using. If you are querying an OLAP data source, all measure values that appear in reports are pre-summarized because the data source contains rolled up values. The type of summary that is used is specified in the data source itself. As a result, we recommend that you use the Automatic summary when creating dimensional style reports. This ensures that the report always uses the type of summary that the data modeler specified in the data source.

For example, the modeler may have specified that the rollup for revenue is total and the rollup for stock prices is average.

If you use other types of summaries with dimensional style reports, you may encounter unexpected results.

You can also add summaries, which are supported for any data source. Summaries specify how data items are totaled in the headers and footers of a list and in the total rows and columns of a crosstab. For list reports, these summaries only summarize the data that is visible on that page of the report.

Revenue	2010	2011	2012	2013	Total
Camping Equipment	\$332,986,338.06	\$402,757,573.17	\$500,382,422.83	\$352,910,329.97	\$1,589,036,664.03
Personal Accessories	\$391,647,093.61	\$456,323,355.90	\$594,009,408.42	\$443,693,449.85	\$1,885,673,307.78
Outdoor Protection	\$36,165,521.07	\$25,008,574.08	\$10,349,175.84	\$4,471,025.26	\$75,994,296.25
Golf Equipment	\$153,553,850.98	\$168,006,427.07	\$230,110,270.55	\$174,740,819.29	\$726,411,367.89
Mountaineering Equipment		\$107,099,659.94	\$161,039,823.26	\$141,520,649.70	\$409,660,132.90
<b>Total</b>	<b>\$914,352,803.72</b>	<b>\$1,159,195,590.16</b>	<b>\$1,495,891,100.90</b>	<b>\$1,117,336,274.07</b>	<b>\$4,686,775,768.85</b>

Figure 40. Crosstab showing automatic summaries for rows and columns

You can specify summary aggregation in different ways by using any of the following:

- aggregation properties that are specified in the model
- the **Auto group & summarize** property
- the summarize button in the toolbar
- aggregation properties for a data item
- the solve order of calculations

**Tip:** When you add a summary by clicking the summarize button in the toolbar, a data item is created in the query for the summary. In lists, the data item that is created is called a list summary. In crosstabs and charts, the data item that is created is called a dimensional edge summary.

### Limitation

If a summary is applied to a report that contains binary large object (BLOB) data, such as images or multimedia objects, you cannot also perform grouping or sorting.

### The Type of Data

How data is summarized also depends on the type of data that you are summarizing. Summary rules are applied differently to facts, identifiers, and attributes. For example, if you summarize a data item that represents part numbers, the only summary rules that apply are count, count distinct, count non-zero, maximum, and minimum. For information about how to determine the type of data that a data item represents, see [“Add Relational Data to a Report” on page 155](#) and [“Add dimensional data to a report” on page 187](#).

For information about how null or missing values are handled in summaries, see [“Null \(Missing\) Values in Calculations and Summaries” on page 392](#).

### Limitations on Measure Rollups

For all OLAP data sources except IBM Cognos PowerCube and Microsoft SQL Server 2005 Analysis Services (SSAS), aggregation and re-aggregation are supported only for calculations and measures that use the following rollups: Sum (Total), Maximum, Minimum, First, Last, and Count.

All other types of rollup either fail or return error cells, which typically appear as two dash characters (--).

This problem occurs in, but is not limited to, the following:

- footers
- aggregate function
- context filters that select more than one member of a hierarchy that is used elsewhere on the report

### Summarizing Sets

When working with Microsoft SQL Server Analysis Services (SSAS) data sources, we recommend that you not summarize values for sets which contain members that are descendants of other members in the same set. If you do so, SSAS double-counts values for automatic summaries and all data sources double-counts values for explicit summaries.

### Related concepts

[Limitations When Summarizing Measures in DMR Data Sources](#)

## Add a Simple Summary

You can add simple summaries in a report by using the summarize button . This button provides a subset of the summary functions available in IBM Cognos Analytics - Reporting.

The summarize button sets the summary property for the data item to the selected summary, and places the data item into an appropriate footer. A footer is created for each set, hierarchy, or level.

In crosstabs and charts, the summary appears as a node.

In crosstabs, you can add multiple summaries at the same level. For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. For Product line, you can add the **Total** summary as a header, which will total all revenue for each order year. You can then add the **Average** summary as a footer, which will give the average revenue of all product lines for each order year.

For information about adding a rolling or moving average, see [“Rolling and Moving Averages” on page 203](#).

### Procedure

1. Select the item for which you want to add a summary.
2. In the report object toolbar, click the summarize button  and click a summary type.
3. To change the summary label, do the following:
  - Click the label.
  - Click the **Show properties** icon , and In the **Properties** pane, under **Text Source**, set the **Source type** property to the source type to define the label.  
For example, set it as **Data item value** to produce a dynamic label for the summary based on data item values.
  - Set the property under **Source type** to specify the label.  
This property depends on the source type you chose. For example, if you chose **Data item value** as the source type, set the **Data item value** property to the data item to use to define the label.
4. To change a summary, select it and, in the **Properties** pane, under **Data Item**, click **Summary** and choose a different function.

## Summarizing values in crosstabs

In crosstabs, summaries are calculated using two summary expressions.

The expressions used to summarize data are:

- `aggregate ([measure] within [set] [data item])` summarizes the member values from the data source within the current content.
- `aggregate ([measure] within [detail] [data item])` summarizes the lowest level of details in the report.

The expression that is used to calculate a summary is controlled by the summary's **Use set aggregation** property. For example, in the following crosstab, if you specified **Total** as the summary, the following aggregate expressions are produced when the **Use set aggregation** is set to **Yes** and **No** respectively:

:		<#Revenue#>
<#Quarter#>	<#Month#>	<#1234#>
	<#Month#>	<#1234#>
<#Total(Quarter)#>		<#1234#>

- Total ([Revenue] within set [Quarter])

This expression totals the quarter values from the data source at the intersecting product line. It totals the aggregate over all product lines for each quarter. The total appears after other values.

- Total ([Revenue] within detail [Quarter])

This expression totals the month values visible in the report at the intersecting product line. It totals all of the intersecting month - product line values visible in the report. The total appears after other values.

In simple cases, the members and values visible in the report and the aggregate rules in the report are the same as those in the data source and all of these expressions produce the same results.

For example, for the quarter and month values, if you are totaling the values for all months in all quarters, it makes no difference whether the visible values, the values in the cube, or the month and quarter values are used. The result is the same.

		Revenue
2005 Q 3	2005/Sep	\$5,300,599.08
2005 Q 4	2005/Oct	\$11,778,348.92
	2005/Nov	\$3,353,399.48
	2005/Dec	\$4,645,069.28
2006 Q 1	2006/Jan	\$3,119,227.22
	2006/Feb	\$3,045,478.88
	2006/Mar	\$6,867,919.18
2006 Q 2	2006/Apr	\$8,306,586.26
	2006/May	\$5,129,112.24
	2006/Jun	\$6,927,447.24
2006 Q 3	2006/Jul	\$5,078,789.96
	2006/Aug	\$5,180,166.38
	2006/Sep	\$4,892,742.38
2006 Q 4	2006/Oct	\$15,887,237.28
	2006/Nov	\$3,609,599.42
	2006/Dec	\$6,240,652.88
<b>Total(Quarter)</b>		<b>\$171,576,387.88</b>

**Tip:** The Total Revenue by Country or Region sample report in the GO Data Warehouse (query) package includes a **totalsummary** function.

Different results appear when you start filtering, changing aggregation types, or using set expressions or unions.

For example, the following crosstab shows the quantity of products sold across all product types for each product line. The crosstab has two summary values that show the average quantity of products sold by product line.

		Quantity
Camping Equipment	Cooking Gear	13,400,351.00
	Tents	3,164,285.00
	Sleeping Bags	3,153,218.00
	Packs	2,756,540.00
	Lanterns	4,826,755.00
Mountaineering Equipment	Rope	418,560.00
	Safety	1,135,194.00
	Climbing Accessories	5,850,251.00
	Tools	2,496,086.00
Personal Accessories	Watches	4,299,195.00
	Eyewear	20,311,396.00
	Knives	7,229,314.00
	Binoculars	1,075,087.00
	Navigation	1,992,713.00
Outdoor Protection	Insect Repellents	5,800,964.00
	Sunscreen	5,384,127.00
	First Aid	829,354.00
Golf Equipment	Irons	391,445.00
	Woods	317,939.00
	Putters	1,284,570.00
	Golf Accessories	3,119,747.00
<b>Average - within detail</b>		<b>4,249,385.29</b>
<b>Average - within set</b>		<b>17,847,418.20</b>

Each summary value uses a different expression that is set by the value specified for the **Use set aggregation** property.

- Average (Product line) - within detail

This summary is the average of the detail values in the crosstab.

- Average (Product line) - within set

This summary is the average of the product type values rolled up into sets at the Product line level. The values are obtained from the data source. If filters or slicers exist, the values are recomputed using the aggregation rules defined in the data source.

In most cases, you should use the `within detail` expression because the results are easiest to understand and the same as the results for footers in a grouped list report. The `within set` expression should be reserved for reports with a purely dimensional focus, such as when there are no detail or summary filters defined in the report.

## Summarizing Member Sets

When you work with dimensional data sources and you summarize member sets, if an explicit summary function such as **Total** is used and the set contains duplicates, the result is double-counted. If you are using an OLAP data source, the result produced for the automatic summary function depends on the data source.

For example, the following product line rows were defined using the expression

union ([Product line], [Camping Equipment], ALL)  
where [Product line] is the level that contains Camping Equipment.

	Revenue
Camping Equipment	1,589,036,664.03
Mountaineering Equipment	409,660,132.9
Personal Accessories	1,885,673,307.78
Outdoor Protection	75,994,296.25
Golf Equipment	726,411,367.89
Camping Equipment	1,589,036,664.03
<b>Summary</b>	<b>4,686,775,768.85</b>
<b>Total</b>	<b>6,275,812,432.88</b>

Figure 41. Crosstab showing revenue by product line with an aggregate row and a total row

For PowerCubes, Aggregate (Product line) is the sum of the product lines excluding duplicates. For more information about how the aggregate function is processed, see [“Summary Functions” on page 204](#).

## Rolling and Moving Averages

Use rolling and moving averages to analyze data for specific time series and to spot trends in that data. When viewing these averages on a line chart, use a longer period of time to reveal long-term trends.

In IBM Cognos Analytics - Reporting, to add a rolling or moving average, you must create summary and custom calculations using layout expressions [“Insert a Query Calculation” on page 228](#).

The Rolling and Moving Averages interactive sample report includes rolling and moving calculations.

### Rolling Average

A rolling average continuously updates the average of a data set to include all the data in the set until that point. For example, the rolling average of return quantities at March 2012 would be calculated by adding the return quantities in January, February, and March, and then dividing that sum by three.

**Tip:** The Historical Revenue sample report in the Sales and Marketing (Cube) package also includes a rolling average.

### Moving Average

A moving average calculates the average of a data set for a specified period. For example, the moving average of return quantities at March 2012 with a specified period of two would be calculated by adding the return quantities in February and March and then dividing that sum by two. In IBM Cognos Analytics - Reporting, you can use a prompt to specify the period.

## Show Data for Specific Time Periods

Show data for a specific time period to associate a report with a business time period rather than the execution time. For example, you have a monthly report that you run at the beginning of each month, and you want the last business day of the previous month to appear rather than the day on which you run the report.

If the report functions AsOfDate and AsOfTime are added to the report, they will return a value based on the results of the **As of Time Expression** object. If the **As of Time Expression** object is not added to the report, these two functions return the date and time at which the report is run.

If the **As of Time Expression** object is added more than once in the report, the first occurrence of the object in the layout that returns a valid value is used.

## Procedure

1. Click the **Toolbox** icon  and drag **As-of-time Expression** to the report.
2. Double-click **As-of-time Expression**.
3. In the **Expression Definition** box, type the expression.

The expression must return a date-time value.

**Tip:** You can drag a function that returns a constant from the **Constants** folder in the **Functions** tab . You can then change the constant to the value to use.

If you do not specify a time, the default time 12:00:00.000 AM is used.

## Summary Functions

This section describes the summary functions that are available in IBM Cognos Analytics - Reporting.

Some functions, such as **Custom**, are available only when you click the summarize button  on the report object toolbar. Additional summary functions are available in the expression editor.

### Automatic Summary

Depending on the type of data item, applies the function **None**, **Summarize**, or **Calculated** based on the context in which the data item appears.

**Calculated** is applied if the underlying data source is OLAP. It is also applied if the data item expression

- contains a summary function
- is an if then else or case expression that contains a reference to at least a modeled measure in its condition
- contains a reference to a model calculation or to a measure that has the **Regular Aggregate** property set to a value other than **Unsupported**
- contains a reference to at least one data item that has the **Summary aggregation** property set to a value other than **None**

If the underlying data source is relational and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported**, **Summarize** is applied.

If the underlying data source is OLAP and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported**, **Calculated** is applied.

If the underlying data source is SAP BW, reports containing aggregations and summaries run more efficiently if the aggregation applied to a query item matches the aggregation rule for the underlying key figure on the SAP BW server. In Cognos Analytics - Reporting, the easiest way to accomplish this is to change the value of the **Detail aggregation** property to **Automatic**.

In all other contexts, **None** is applied.

For relational and dimensionally modeled relational (DMR) data sources, if this function is applied to a data item expression that has the average function, weighted averages are computed based on the lowest level detail values in the data source.

**Note:** This is the default function.

### Average

Adds all existing values and then divides by the count of existing values.

## **Calculated**

Specifies that all the terms within the expression for a data item are aggregated according to their own rollup rules, and then the results of those aggregations are computed within the overall expression.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Total**. You add a query calculation named Quantity Calculated. You define its expression as Quantity + 100 and you set its **Detail aggregation** property to **Calculated**. When you run the report, the values for Quantity Calculated are computed by first adding all values for Quantity and then adding 100 to each value.

**Note:** In crosstabs, this function overrides any solve orders that are specified.

## **Count**

Counts all existing values.

If the underlying data source is OLAP, Count behaves as follows if it is specified in the **Summary Aggregation** property for a data item.

<b>Object</b>	<b>Behavior</b>
Level	Count distinct is used. A warning appears when you validate the report.
Member set	Count distinct is used. A warning appears when you validate the report.
Attribute	Not supported. An error is returned when you run the report.
Measure	Supported.

If the underlying data source is dimensionally modeled relational (DMR), Count behaves as follows if it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

<b>Object</b>	<b>Behavior</b>
Level	Count distinct is used. A warning appears when you validate the report.
Member set	Count distinct is used. A warning appears when you validate the report.
Attribute	Supported.
Measure	Supported.

If you add the count summary to a non-fact column in a list and then group the column, the column will not be grouped when you run the report. To resolve this issue, group the column first before adding the count summary.

## **Count Distinct**

Returns the total number of unique non-null records.

If the underlying data source is OLAP, `count distinct` behaves as follows if it is specified in the **Summary aggregation** property for a data item.

Object	Behavior
Level	Supported.
Member set	Supported.
Attribute	Not supported. An error is returned when you run the report.
Measure	Not supported. An error is returned when you run the report.

If the underlying data source is dimensionally modeled relational (DMR), `count distinct` is supported for levels, member sets, attributes, and measures when it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

### Custom

Summarizes data based on an expression that you define.

### Maximum

Selects the largest existing value.

### Median

Returns the median value of the selected data item.

### Minimum

Selects the smallest existing value.

### None

Does not aggregate values.

If the underlying data source is relational, the data item is grouped when the query property **Auto group & summarize** is set to **Yes**.

### Not Applicable

This function is available only for the **Detail aggregation** property. It specifies that the aggregate attribute is ignored. For example, the calculation will be applied after the data is aggregated.

This function differs from the **Calculated** function, which applies aggregation to the rows and then performs the calculation.

For example, for the `average ([Quantity]) + 5` expression, when the **Detail aggregation** property is set to **Not Applicable**, five is added to the average of the single Quantity value. When the function is set to **Calculated**, five is added to the average of a set of numbers.

This setting should not be applied to a simple model reference.

This setting is relevant only for reports that are upgraded from IBM Cognos ReportNet 1.x.

### Standard Deviation

Returns the standard deviation of the selected data item.

**Note:** From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

### Summarize

Aggregates data based on model or data type information. This function can be thought of as a calculate and then aggregate rule. Data is aggregated using the following rules:

If the underlying data source type is relational and the data item or calculation is a reference to a single fact query item in the model that has the **Regular Aggregate** property set to **Sum**, **Maximum**, **Minimum**, **Average**, or **Count**, aggregate data using this function. Otherwise, data is aggregated according to the data type of the data item as follows:

- **Total** is applied for numeric and interval values.
- **Maximum** is applied for date, time, and date-time values.
- **Count** is applied for everything else.

The underlying data source type can be dimensional and the data item or calculation a reference to a single item in the model. In this case, if the **Regular Aggregate** property of the model item is not **unknown**, the summary function that corresponds to the **Regular Aggregate** property is applied. If the **Regular Aggregate** property is **unknown**, set the function to **Calculated**.

For example, a list contains the data item **Quantity** with the **Detail aggregation** property set to **Average**. You add a query calculation named **Quantity Summarize**. You define its expression as **Quantity + 100** and you set its **Detail aggregation** property to **Summarize**. When you run the report, the values for **Quantity Summarize** are computed by first adding 100 to each value for **Quantity** and then calculating the total. The total is calculated because **Quantity** contains numeric values and the expression for **Quantity Summarize** is not a simple data item reference. If **Quantity Summarize** is defined as **Quantity**, the function **Average** is applied to each value.

### Total

Adds all existing values.

### Variance

Returns the variance of the selected data item.

**Note:** From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

### Mapping Summary Functions From Data Sources to Framework Manager and Reporting

The summary functions available in IBM Cognos Framework Manager and IBM Cognos Analytics - Reporting reflect summary functions supported by relational and dimensional data sources. The following table shows how summary functions in data sources are mapped to Framework Manager and Reporting.

Data source	Framework Manager	Reporting
None specified, or none	Unsupported	None

Data source	Framework Manager	Reporting
average (avg)	Average	Average
count	Count	Count
count distinct	Count Distinct	Count distinct
maximum (max)	Maximum	Maximum
minimum (min)	Minimum	Minimum
median	Median	Median
standard deviation (stddev)	Standard Deviation	Standard Deviation
sum	Sum	Total
variance (var)	Variance	Variance
count non zero	Count Non-Zero	Automatic
average non zero	unknown	Automatic
external	unknown	Automatic
any	unknown	Automatic
calculated	unknown	Automatic
unknown	unknown	Automatic
first_period	unknown	Automatic
last_period	unknown	Automatic

The following summary functions exist only in either Framework Manager or Reporting. There is no corresponding summary function in data sources.

Framework Manager	Reporting
Automatic	Automatic
Calculated	Calculated
No corresponding summary function	Summarize
No corresponding summary function	Not Applicable

## Focusing Dimensional Data

In IBM Cognos Analytics - Reporting, there are three approaches to focusing dimensional data in a crosstab:

- drag data items to the edges of your crosstab
- drag data items to the context filter area
- create set expressions on the edges of your crosstab that return members or sets of members, such as the `filter` function

**Note:** Summary and detail filters are recommended only for focusing data in relational reporting.

The approach you choose should depend on the capabilities of the data source, the performance requirements, the persistence of the dataset, and how complex you want the report to be.

If you filter values that are floating-point numbers, you may encounter imprecise filtering results due to rounding or data truncation. Floating-point numbers may appear differently in the report than how they are stored in the data source. To ensure accurate results, your filter criteria should account for any rounding issues.

Consider the limitations when filtering dimensional data and when filtering data from SAP BW data sources.

You can also use prompts, or prompt controls, to allow users to provide input for the filter.

### Related concepts

[Limitations when filtering dimensional data sources](#)

## Create a context filter

When working with dimensional data, you can use context filters, or slicer filters, to quickly focus your report on a particular view of the data.

For example, the following crosstab contains product lines in the rows, years in the columns, and revenue as the measure. We want to filter the values to show us the revenue for only Web orders from Asia Pacific. To change the context, you drag Asia Pacific and Web from the source tree to the **Context filter** section of the overview area. The crosstab then shows the revenue for only Asia Pacific and Web. Changing context changes only the values that appear. It does not limit or change the items in the rows or columns.

		Asia Pacific				
		Web				
		Revenue	2010	2011	2012	2013
Camping Equipment		36,415,479.91	77,222,359.67	121,312,260.99	83,023,522.78	
Mountaineering Equipment			18,115,550.83	37,258,799.5	31,810,456.11	
Personal Accessories		67,562,845.5	94,998,084.39	136,872,087.64	106,879,947.27	
Outdoor Protection		4,135,482.66	4,388,590.73	2,241,092.7	1,107,629.48	
Golf Equipment		8,586,746.5	27,061,602.93	49,822,888.09	39,248,971.12	

Figure 42. Crosstab showing revenue by product line by year filtered to show only Asia Pacific and web orders

The members that are used as the context filter appear in the report header when you run the report.

Any summary values in the report are recomputed to reflect the results returned by the context filter.

You can create multiple context filters to filter across two or more different hierarchies.

**Tip:** The Budget vs. Actual sample report in the Sales and Marketing (cube) package includes a context filter.

**Note:** There are limitations when using context filters:

- Calculated measures do not get suppressed by the filter. To avoid this, drag the desired members from the **Source** tab  directly onto the row or column edge instead of using the members in the context filter.
- Suppression can be slow on large cubes, because all of the data is retrieved and then filtered.

If the desired data in the context filter is from a hierarchy that appears on the crosstab edge, drag the desired members from the **Source** tab directly onto the crosstab edge.

If the desired data is from a hierarchy that does not appear on the crosstab edge, use a context filter in conjunction with other means to limit the data, such as a top or bottom filter.

To use a calculation or expression to define a context filter, create a slicer member set using the query explorer. A slicer member set is an expression that returns a set of members from the same dimension. For example, you can define a slicer member set that filters for the top five products with the greatest revenue.

Context filters are different from other filters. When you filter data, members that do not meet the filter criteria are removed from the report. A context filter does not remove members from a report. Instead, their values are filtered or you see blank cells.

You can also use context filters as prompts when the report is run.

When creating context filters,

- use only members from hierarchies that are not already projected on an edge of the crosstab
- use only one member per hierarchy

### Create a simple context filter

When working with dimensional data, you can use context filters, or slicer filters, to quickly focus your report on a particular view of the data.

#### Procedure

1. Click the **Data** icon , and from the **Source** tab , select or search for one or more items on which to filter.
2. Drag the item on which to filter into the **Context filter** section of the overview area.
3. To change context, select a new item from the **Context filter** box.

### Create an advanced slicer filter

To use a calculation or expression to define a context filter, create a slicer member set using the query explorer. A slicer member set is an expression that returns a set of members from the same dimension. For example, you can define a slicer member set that filters for the top five products with the greatest revenue.

#### Procedure

1. Click the **Queries** icon , and click the query for which you want to add a slicer.
2. Click the **Toolbox** icon  and drag **Slicer member set** to the **Slicer** pane.
3. Drag the members to the **Expression Definition** box.

You must join the members in the expression by using the set function. For example, the following expression contains the Fax and Telephone members from the Order Method dimension:

set ([Fax],[Telephone])

4. To add members from another dimension, repeat step 2 to create a separate slicer member set.

### Define a Prompt Using a Context Filter

If context filters (or slicers) are defined, you can use these filters to create prompts in the report.

Prompts provide questions that help users to customize the information in a report to suit their own needs. For example, you create a prompt so that users can select a region. Only data for the specified region is retrieved and shown in the report.

## Before you begin

Before you define a prompt, you must create context filters.

## Procedure

1. In the **Context filter** section of the overview area, click the down arrow next to the filter to use as a prompt.
2. Click **Prompt** and do one of the following:
  - To remove the prompt, click **No Prompt**.
  - To allow users who run the report to select any member from the hierarchy, click **Prompt on Hierarchy**.
  - To allow users who run the report to select from a list of members in the current level, click **Prompt on Level**.

## Sorting Dimensional Data

---

You can sort items to view them in your preferred order. By default, IBM Cognos Analytics - Reporting retrieves items in the order defined in the data source. OLAP data sources always have a defined order. The data modeler defines the sorting options in the model.

For more information about data modeling, see the *IBM Cognos Framework Manager User Guide*.

**Tip:** The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes sorting.

### Limitations When Sorting SAP BW Data

If you use a SAP BW data source, each level in a hierarchy has an item with the same name as the level and a role of `_businessKey`. Such items are known as level identifiers. You should use only the level identifier of all the time-related characteristics, such as `OCALDAY` and `OCALMONTH`, for sorting. All other (attribute) items in these hierarchies are formatted string representations of the characteristic values with which they are associated. These formatted values sort alphanumerically and not chronologically.

**Tip:** By level identifier, we are referring to a query item with the same name as the level that has the role of `_businessKey`. Each level in a SAP BW hierarchy has a level identifier.

## Sort Sets by Label

You can sort sets of members based on their label (or caption). By default, when you select **Sort by Label**, **Ascending** or **Descending**, the members within the set are sorted only by their labels. You can also perform advanced sorting to sort sets using an intersection (tuple) or a member property.

For example, a set contains regions and you sort the regions within the set in descending alphabetical order. Only extended data items that represent sets support set sorting.

Before you can perform set sorting, you must create sets for the members in your report.

You cannot sort data items from different dimensions that are intermixed. For example, if you have years and products on the same edge and at the same level in your crosstab, you can sort the years, and you can sort the product lines, but you cannot sort them as combined set because years and products come from different dimensions.

## Procedure

1. In a crosstab, select a set to sort.
2. In the report object toolbar, click the sort button  and under **Sort by Label**, click **Ascending** or **Descending**.

**Tip:** To remove a sort order, click **Don't Sort**.

## Sort Sets in the Opposite Axis by Value

You can sort members in the sets on the opposite axis based on the value of a member or measure that you select.

For example, a crosstab contains years inserted as individual members in the columns, product lines inserted as a member set in the rows, and revenue as the measure. You select the 2012 column and then select **Sort by Value, Descending**. The values in the 2012 column are sorted.

Revenue	2012	2013
Personal Accessories	594,009,408.42	443,693,449.85
Camping Equipment	500,382,422.83	352,910,329.97
Golf Equipment	230,110,270.55	174,740,819.29
Mountaineering Equipment	161,039,823.26	141,520,649.7
Outdoor Protection	10,349,175.84	4,471,025.26

Figure 43. Crosstab showing revenue by year by product line with the 2012 column sorted in descending order

Before you can perform this sorting, you must create sets for the members in your report.

In nested crosstabs, items are sorted based on the values of the innermost nested row or column of the opposite axis. For example, a crosstab contains years in the columns and retailers nested within product line in the rows. Select 2012, sort in descending order, and you see retailers listed from the largest value to the smallest value for each product line.

### Procedure

1. In a crosstab, select a member or measure to sort.

For example, to sort a set in the row axis, select a member or measure in the column axis.

2. In the report object toolbar, click the sort button  and under **Sort by Value**, click **Ascending** or **Descending**.

**Tip:** To remove a sort order, click **Don't Sort**.

## Perform Advanced Set Sorting

If you use dimensional data, you can sort using the property of a member.

For example, your report includes employee names and you want to sort the employees using the gender property. You can also sort using an intersection of members, also known as a tuple. For example, you want to sort the employees using the value of sick days taken for the year 2012.

### Procedure

1. Select a set.
2. In the report object toolbar, click the sort button  and under **Other Sort Options**, click **Edit set sorting**.
3. Specify the sorting options.
4. If you are sorting members from different levels and want to preserve the hierarchy, select the **Hierarchized sorting** check box.
5. To sort items using a member property, under **Sort by**, click **Property**, navigate the tree, and select the member property to use.
6. To sort items using an intersection of members, or a tuple, under **Sort by**, click **Intersection (tuple)** and click the ellipsis button. Then, from the **Available members and measures** box, select the items

to use and click the right arrow to move them to the **Intersection members and measures** box. You can also select items from the **Calculated members and measures** tab .

## Working with Dimensional Queries

---

Queries specify what data appears in the report. In IBM Cognos Analytics - Reporting, you create and modify queries using Query Explorer.

Query Explorer provides an alternative way to modify existing reports or to author new reports. You can use Query Explorer to perform complex tasks and other tasks that are more difficult to do in the report layout. For example, use Query Explorer to

- improve performance by changing the order in which items are queried from the database, or by changing query properties to allow the report server to execute queries concurrently where possible

**Note:** Only queries that are referenced in the report layout can be executed concurrently. If a query is defined in Query Explorer by joining two or more existing queries, IBM Cognos Analytics cannot execute the source queries concurrently. By default, queries run sequentially. Your administrator must enable the concurrent query execution feature. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

- view or add filters and parameters and modify their properties
- view or add dimensions, levels, and facts
- incorporate SQL statements that come from other reports or reports that you write
- create complex queries using set operations and joins

### Related concepts

[Queries](#)

## Specify a List of Data Items for an Object

Specify the list of data items for an object when you must reference a data item that is in a query but is not in the layout.

For example, you want to add a layout calculation to a list that uses a data item that is in the query definition. If the data item does not appear in the list, you must reference it in order to make the layout calculation work. You must also specify the list of data items if you apply conditional formatting that uses a data item that is not in the query.

### Procedure

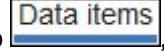
1. Click a layout object.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Properties** property and select data items.

## Relate a Query to a Layout

Queries and layouts work together. After you decide the type of data that you need, you must create a layout in which to show the results. Each column of data must be both selected for the query and shown in a layout unless there are some columns that you do not want to show. The query and layout portions of a report must be linked to produce a valid report.

IBM Cognos Analytics - Reporting automatically links query and layout. For example, when you use Reporting and the list report layout, query and layout are automatically linked.

## Procedure

1. Select a data container.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Query** property to a query.
3. Click the **Data** icon , and from the **Data items** tab , drag data items from the query to the data container.

## Using Dimensional Data Sources with Queries

When you are working with SAP BW data sources, you can use only a single hierarchy in a query.

Creating queries using a mix of OLAP and relational data is not supported. If you create queries using a database for which you do not know the type, consult your database administrator or modeler.

When performing multi-cube queries using dimensional data sources, the following restrictions apply:

- Only basic operators (+, \*, /, -) are available for cross-cube calculations.
- Inner joins are not supported.
- All joins for multi-cube queries are outer joins.
- Viewing MDX using the **Generated SQL/MDX** query property may not show you the actual MDX that is executed. This is because when a multi-cube query is executed, a number of smaller queries are actually executed.

### Related concepts

[Problems with large SAP BW queries](#)

## Connecting Queries Between Different Data Sources

This section lists the data sources between which you can and cannot connect queries.

IBM Cognos Analytics supports the following:

- RDBMS to RDBMS joins
- set operations of any two queries
- master detail relationships between any two queries
- drill from any query to any other query

You cannot create the following types of joins:

- cube-to-cube (homogeneous)
- cube-to-cube (heterogeneous)
- cube-to-RDBMS
- cube-to-SAP BW
- SAP-BW-to-RDBMS

## Multiple-fact Queries

You must understand the result of a query on more than one fact table to achieve the results that you want. The result of a multiple-fact query varies depending on whether you are working with conformed or non-conformed dimensions, on the level of granularity, and on the additive nature of the data.

The GO Data Warehouse (analysis) package has characteristics that affect the results if you use a multiple-fact query with the Inventory and Sales namespaces. Granularity for time differs in that inventory levels are recorded monthly and sales are recorded daily. Also, Sales includes a non-conformed dimension, Order method.

The following examples will help you interpret the results of a multiple-fact query and understand the options for changing a query to obtain the results that you want.

## Conformed Dimensions

Individual queries on Inventory and Sales by Quarter and Product yield the following results.

Quarter	Product	Opening inventory	Closing inventory	Quantity
Q1 2011	Husky Rope 50	0	4,853	9,259
	Aloe Relief	10,614	6,513	8,805
	Course Pro Umbrella	34,907	37,327	70,256
<b>Q1 2011 - Average</b>		<b>15,174</b>	<b>16,231</b>	
<b>Q1 2011 - Total</b>				<b>88,320</b>
Q2 2011	Husky Rope 50	4,853	5,728	8,725
	Aloe Relief	6,513	7,379	8,266
	Course Pro Umbrella	37,327	39,870	57,964
<b>Q2 2011 - Average</b>		<b>16,231</b>	<b>17,659</b>	
<b>Q2 2011 - Total</b>				<b>74,955</b>

A query on multiple facts and conformed dimensions respects the cardinality between each fact table and its dimensions and returns all the rows from each fact table. The fact tables are matched on their common keys, Product and Time.

Product and Time apply to both Inventory and Sales. However, inventory levels are recorded monthly and sales are recorded daily. In this example, results are automatically aggregated to the lowest common level of granularity. Quantity, which comes from Sales, is rolled up to months.

Nulls are often returned for this type of query because a combination of dimensional elements in one fact table may not exist in the other. For example, if Husky Rope 50 was available in inventory in Q1 2011, but there were no sales of this product in the same time period, Quantity would show a null in the Husky Rope 50 row.

IBM Cognos Analytics does not support conformed dimensions generated by IBM Cognos Framework Manager for SAP BW data sources.

## Non-conformed Dimensions

If a non-conformed dimension is added to the query, the nature of the results returned by the query is changed.

Quarter	Product	Order method type	Opening inventory	Closing inventory	Quantity
Q1 2011	Husky Rope 50	Fax	0	4,853	388
	Husky Rope 50	Telephone	0	4,853	1,015
	Husky Rope 50	Mail	0	4,853	240
	Husky Rope 50	E-mail	0	4,853	210
	Husky Rope 50	Web	0	4,853	5,031
	Husky Rope 50	Sales visit	0	4,853	1,961
	Husky Rope 50	Special	0	4,853	414
	Aloe Relief	Fax	10,614	6,513	411
	Aloe Relief	Telephone	10,614	6,513	1,513
	Aloe Relief	Mail	10,614	6,513	433
	Aloe Relief	E-mail	10,614	6,513	839
	Aloe Relief	Web	10,614	6,513	4,740
	Aloe Relief	Sales visit	10,614	6,513	732
	Aloe Relief	Special	10,614	6,513	137
Course Pro Umbrella	Course Pro Umbrella	Fax	34,907	37,327	1,568
	Course Pro Umbrella	Telephone	34,907	37,327	17,120
	Course Pro Umbrella	Mail	34,907	37,327	2,885
	Course Pro Umbrella	E-mail	34,907	37,327	7,213
	Course Pro Umbrella	Web	34,907	37,327	37,123
	Course Pro Umbrella	Sales visit	34,907	37,327	2,793
	Course Pro Umbrella	Special	34,907	37,327	1,554
<b>Q1 2011 - Average</b>			<b>15,174</b>	<b>16,231</b>	
<b>Q1 2011 - Total</b>					<b>88,320</b>

Order method type exists only in Sales. Therefore, it is no longer possible to aggregate records to a lowest common level of granularity because one side of the query has dimensionality that is not common to the other side of the query. Opening inventory and Closing inventory results are repeated because it is no longer possible to relate a single value from these columns to one value from Quantity.

Grouping on the Quarter key demonstrates that the result in this example is based on the same data set as the query on conformed dimensions. Summary values are the same. For example, the total quantity for Q1 2011 is 88,320 in both examples.

### Filters on Non-conformed Dimensions

By default, to improve performance, filters are applied at the database level. The default behavior can result in unexpected nulls when you add a filter to a multiple-fact query. If you create a filter on the Order method dimension to show only the fax order method and apply the filter at the data source, the report includes nulls.

Quarter	Product	Order method type	Opening inventory	Closing inventory	Quantity
Q1 2011	Husky Rope 50	Fax	0	4,853	388
	Aloe Relief	Fax	10,614	6,513	411
	Course Pro Umbrella	Fax	34,907	37,327	1,568
<b>Q1 2011 - Average</b>			<b>15,174</b>	<b>16,231</b>	
<b>Q1 2011 - Total</b>					<b>2,367</b>
Q2 2011	Husky Rope 50	Fax	4,853	5,728	419
	Aloe Relief	Fax	6,513	7,379	103
	Course Pro Umbrella		37,327	39,870	
<b>Q2 2011 - Average</b>			<b>16,231</b>	<b>17,659</b>	
<b>Q2 2011 - Total</b>					<b>522</b>
Q1 2012	Husky Rope 50	Fax	5,188	9,199	327
	Aloe Relief	Fax	7,093	6,395	277
	Course Pro Umbrella	Fax	39,911	38,343	4,040
<b>Q1 2012 - Average</b>			<b>17,397</b>	<b>17,979</b>	
<b>Q1 2012 - Total</b>					<b>4,644</b>
Q2 2012	Husky Rope 50	Fax	9,199	7,038	424
	Aloe Relief	Fax	6,395	5,085	86
	Course Pro Umbrella		38,343	31,799	
<b>Q2 2012 - Average</b>			<b>17,979</b>	<b>14,641</b>	
<b>Q2 2012 - Total</b>					<b>510</b>
<b>Overall - Average</b>			<b>16,695</b>	<b>16,627</b>	
<b>Overall - Total</b>					<b>8,043</b>

The filter is applied only to one subject area, Sales. Because Order method type does not exist in Inventory, all products still appear in the report. For example, Course Pro Umbrella was in inventory in Q2 2012. Because there were no sales using the fax order method for this product in Q2 2012, Order method type and Quantity are null.

To remove the nulls, change the filter so that it is applied to the result set instead of the data source. By applying the filter to the result set, you get the same results that you would get if you were working with conformed dimensions. Only the products that were ordered using the fax order method appear in the report.

Quarter	Product	Order method type	Opening inventory	Closing inventory	Quantity
Q1 2011	Husky Rope 50	Fax	0	4,853	388
	Aloe Relief	Fax	10,614	6,513	411
	Course Pro Umbrella	Fax	34,907	37,327	1,568
<b>Q1 2011 - Average</b>			<b>15,174</b>	<b>16,231</b>	
<b>Q1 2011 - Total</b>					<b>2,367</b>
Q2 2011	Husky Rope 50	Fax	4,853	5,728	419
	Aloe Relief	Fax	6,513	7,379	103
<b>Q2 2011 - Average</b>			<b>5,683</b>	<b>6,554</b>	
<b>Q2 2011 - Total</b>					<b>522</b>
Q1 2012	Husky Rope 50	Fax	5,188	9,199	327
	Aloe Relief	Fax	7,093	6,395	277
	Course Pro Umbrella	Fax	39,911	38,343	4,040
<b>Q1 2012 - Average</b>			<b>17,397</b>	<b>17,979</b>	
<b>Q1 2012 - Total</b>					<b>4,644</b>
Q2 2012	Husky Rope 50	Fax	9,199	7,038	424
	Aloe Relief	Fax	6,395	5,085	86
<b>Q2 2012 - Average</b>			<b>7,797</b>	<b>6,062</b>	
<b>Q2 2012 - Total</b>					<b>510</b>
<b>Overall - Average</b>			<b>12,467</b>	<b>12,786</b>	
<b>Overall - Total</b>					<b>8,043</b>

The overall summary for Quantity is 8,043 using either filter method, which shows that the results are based on the same data set.

In IBM Cognos Analytics - Reporting, there are two types of filters. A detail filter is applied to the data source. A summary filter is applied to the result set.

### Related tasks

[Create a detail or summary filter](#)

## Add a Query to a Dimensional Report

You can create multiple queries in Query Explorer to suit your particular needs. For example, you can create a separate query for each data container in a report to show different data.

**Tip:** The Briefing Book sample report in the GO Sales (analysis) package and the Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package include multiple queries.

### Procedure

- Click the **Queries** icon  and click **Queries**.
- Click the **Toolbox** icon  and drag one of the following objects to the work area.

Object	Description
<b>Query</b>	Adds a query.
<b>Join</b>	Adds a join relationship.

Object	Description
<b>Union</b>	Adds a union operator.
<b>Intersect</b>	Adds an intersect operator.
<b>Except</b>	Adds an except (minus) operator.
<b>SQL</b>	Adds <u>SQL</u> commands.
<b>MDX</b>	Adds <u>MDX</u> commands.

**Note:** When adding queries to the report

- right-click the work area and click **Show Package Sources** to see the queries that use data items from a package
- right-click the work area and click **Expand References** to see the relationships that exist between queries in the report, which is useful when you are creating complex queries

3. Select an object, click the **Show properties** icon , and In the **Properties** pane, set the object properties.
4. Double-click a query.
5. Click the **Data** icon , and from the **Source** tab , drag data items to the **Data Items** pane.

**Tip:** You can add data items to the query that you do not want to appear in the layout. For example, to filter on Product line code and show Product line in the layout, you must add both data items to the query.

6. To create a new data item, click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
7. To add a filter, click the **Toolbox** icon and drag **Filter** to the **Detail Filters** or **Summary Filters** pane and define the filter expression.

**Tip:** You can also create a filter by dragging a data item from the **Source** tab to one of the filters panes and completing the filter expression. When working with a dimensional data source, you can quickly filter data by dragging a member to a filter pane instead of dragging the level to which the member belongs. For example, dragging the member 2012 from the Years level will filter data for the year 2012. This method is quicker than dragging the Years level and specifying data only for the year 2012 in the filter expression.

## Add Dimension Information to a Query

Add dimension information to a query when the data source has no dimension information available or when you want to override, extend, or restrict the information.

Add dimension information if any of the following apply:

- There is no dimension information available in the data source.

For example, the data source contains flat data that you want to model dimensionally.

- You want to override the dimension information in the data source.
- You want to extend or restrict dimension information in the data source.

If you do not add dimension information and the data source contains dimensions, then the dimension structure of the data source is used. If the data source contains no dimensions, IBM Cognos Analytics creates a default dimension structure.

Dimension information is not intended to define the presentation of information, but to help query planning. Dimension information can be considered as a form of query hint. In addition, users will not be able to drill down on dimensions that you add to a report.

**Note:** Adding dimension information is not supported in reports that use the dynamic query mode.

### Procedure

1. Click the **Queries** icon , and click a query.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Override dimension info** property to **Yes**.
3. Double-click the query.  
The **Dimension Info** tab appears in the work area.
4. Click the **Dimension info** tab.
5. To create a dimension from an existing data item, click the **Data** icon , and from the **Source** tab , drag the data item to the **Dimensions** pane.

IBM Cognos Analytics - Reporting automatically generates the entire dimension.

6. To create a new dimension, click the **Toolbox** icon  and drag **Dimension** to the **Dimensions** pane, and then build the new dimension by adding objects to the dimension:
  - To create a level, drag **Level**.
  - To create a level hierarchy, drag **Level hierarchy**.
  - To create a member hierarchy, drag **Member hierarchy**.For information about these objects, see “[Add dimensional data to a report](#)” on page 187.
7. Click the **Data** icon, and from the **Source** tab, drag data items to the objects you added in the previous step.  
For example, if you created a level, define a key by dragging a data item to the **Keys** folder.
8. To create a fact, from the **Source** tab, drag a data item to the **Facts** pane.

### Create a Master Detail Relationship

Create a master detail relationship to deliver information that would otherwise require two or more reports. For example, you can combine a list with a chart. The list can contain product lines and the chart can show details for each product line.

Master detail relationships must appear in nested frames to produce the correct results. You can create a master detail relationship in two ways:

- Use a parent frame for the master query and a nested frame for the detail query.
- Associate a report page with the master query and use a data container, such as a list or crosstab, for the detail query.

You cannot display parent data in the child frame or child data in the parent frame. Also, you cannot perform calculations across master detail queries.

When you are working with dimensional data, IBM Cognos Analytics - Reporting does not support master detail relationships that use a custom group.

You can use a master detail relationship to show data from separate data sources in a single report. However, the data sources must be contained in the same package.

With the dynamic query mode, master detail reports with a crosstab report object are optimized to use a single query whenever possible, rather than a separate query for each report object instance.

If you are working with an SAP BW data source, you cannot use a data item from the master query that contains non-ASCII values.

### Before you begin

To create a master detail relationship using queries that reference two different dimensional data sources, you must first link the members by aliasing the levels that contain the members.

### Procedure

1. To use a parent frame for the master query and a nested frame for the detail query:

- Click the **Toolbox** icon  and drag a **List**, **Repeater Table**, or **Repeater** to the report.
- Add a second data container to the object you inserted.

You can insert a list, crosstab, chart, repeater table, or repeater into a list. You can add a list to a repeater table or repeater.

- Add data items to both data containers.

2. To associate a report page with the master query and use a data container for the detail query:

- Click anywhere in the report page.

- Click the **Show properties** icon , and In the **Properties** pane, click the **Select ancestor** icon  and click **Page**.
- Set the **Query** property.
- Click the **Toolbox** icon, drag a data container to the report.

3. To link a data item in the master query to a parameter in the detail query instead of to another data item, create the parameter in the detail query.

Use parameters to filter values at a lower level in the detail query.

- Click the **Queries** icon , and click the detail query.
- Click the **Toolbox** icon  and drag the **Filter** object to the **Detail Filters** box.
- In the **Expression Definition** box, create the parameter.

4. Click the **Pages** icon , and click the report page.

5. Click anywhere in the report page.

6. Click the **Show properties** icon, and In the **Properties** pane, click the **Select ancestor** icon and click **Page**.

7. Click the data container containing the details.

8. In the **Properties** pane, click the **Master detail relationships** property.

9. Click **New Link**.

10. In the **Master** box, click the data item that will provide the primary information.

11. To link the master query to a data item, in the **Detail** box, click the data item that will provide the detailed information.

12. To link the master query to a parameter, in the **Parameters** box, click the parameter that will provide the detailed information.

**Tip:** To delete a link, select the link and press the Delete key.

13. If your detail query object is a chart, you can disconnect a chart title from the master query.

- Click the chart title, and from the **Properties** pane, click **Master detail relationships**.
- Clear the **Use the master detail relationships from the chart** check box.

14. If the master detail relationship includes a chart as the detail and you are using automatic axis ranges, you can set the same axis range for all the detail charts:
  - Select the axis.
  - In the **Properties** pane, under **General**, double-click the **Axis range** property.
  - Under **Maximum** and **Minimum**, click **Automatic**.

The master detail report option is only available with automatic axis ranges.

  - Under **Master detail reports**, select the **Same range for all instances of chart** check box.

For more information about axis ranges, see “[Change the axis scale of a current default chart](#)” on [page 84](#).

**Tip:** To avoid seeing the same data item twice in the report, click the data item in the data container driven by the detail query. In the report object toolbar, click the **More** icon  and click **Cut**. This removes the item from the report display but keeps it in the query.

#### Related concepts

[Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service](#)

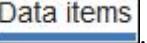
#### Link Members from Two Data Sources

If you create a master detail relationship using queries that reference two different dimensional data sources, you may need to create a relationship between levels with the same member captions but different Member Unique Names (MUNs).

For more information about MUNs, see “[Recommendation - Use Member Unique Name \(MUN\) Aliases](#)” on [page 397](#).

For example, you may want to link the Americas member in the Sales territory level in the Sample Outdoors cube with Americas in the GO Subsidiary level in the Sample Outdoors Finance cube. To create the relationship, you must alias the levels that contain the members to link.

#### Procedure

1. Select the parent frame or the report page, click the **More** icon , and click **Go to query**.
2. Add a query calculation to the query.
  - a) Click the **Toolbox** icon  and drag the **Query calculation** tool to the **Data Items** box.
  - b) In the **Create calculation** window, click the **Other expression** radio button and click **OK**.
  - c) In the **Name** box, type a name for the calculation.
  - d) In the **Expression Definition** box, type the following expression:  
`caption (data item name)`  
 For example, `caption ( [great_outdoors_company].[Sales Territory].[Sales Territory].[Sales territory] )`
3. Replace the level that contains the member that will provide the primary information with the calculation.
  - a) Click the **Pages** icon , and click the report page from step 1.
  - b) Click the **Data** icon  and then click the **Data items** tab .
  - c) From the query where you created the query calculation, drag the calculation to the parent frame or the report page, beside the level that you are replacing.
  - d) Delete the level.
4. Repeat steps 1 to 3 for the level in the data container that contains the details.

A caption alias is created for each level. You can now use the caption alias for each level to create a master detail relationship using member captions, which are the same, instead of MUNs, which are different.

## Results

You can now create the master detail relationship between the two levels.

## Working with Queries in SQL or MDX

For each query in a report, you can work with the SQL or MDX that is executed when you run a report.

**Note:** MDX is not available with DMR data sources.

### View the SQL or MDX for an Entire Report or a Query

View the SQL or MDX to see what is passed to the database when you run a report.

Only SQL is available when using DMR data sources because these data sources were relational.

### Procedure

1. To view the SQL or MDX for the entire report, click the **Queries** icon , right-click the **Report** icon , and click **Show Generated SQL/MDX**.

This option shows the SQL or MDX that will be executed in the data source. The SQL or MDX is organized by query and by query result. If a query is used in more than one data container, a query result is generated for each data container.

2. To view the SQL or MDX for a specific query, do the following:

- Click the **Queries** icon, and click the query.
- Click the **Show properties** icon , and In the **Properties** pane, double-click the **Generated SQL** property.

The **Generated SQL** property shows the SQL or MDX that is executed when you view tabular data (right-click a query and click **View Tabular Data**). Tabular data shows the data that is produced by the query in the form of a list. You can use this property to help you build advanced queries.

## Results

The SQL or MDX for the query appears in the **Generated SQL** dialog box. For SQL, you can choose to view native SQL, which is the SQL that is passed to the database when you execute the query, or IBM Cognos SQL, which is a generic form of SQL that IBM Cognos Analytics - Reporting uses. Cognos SQL is converted to native SQL before the query is executed.

### Related tasks

[Showing prompt values in generated SQL or MDX](#)

### Build a Report Using Your Own SQL or MDX

You can build a report by adding SQL or MDX from an external source, such as another report.

If you are working with MDX, you must be aware of the [MDX syntax](#) that IBM Cognos Analytics - Reporting supports.

If you edit the SQL of a query, you must change the **Processing** property for that query to **Limited Local**.

You cannot build a report by adding your own MDX if the data source is IBM Cognos TM1®. IBM Cognos TM1 does not support custom MDX.

### Procedure

1. Create a new report and choose the **Blank** template.

2. Click the **Queries** icon , and click **Queries**.

3. Click the **Toolbox** icon  and drag **Query** to the work area.

4. From the **Toolbox**, do one of the following:

- To build an SQL query, drag **SQL** to the right of the query.
- To build an MDX query, drag **MDX** to the right of the query.

**Tip:** You can drag **SQL** or **MDX** anywhere in the work area, and Cognos Analytics - Reporting will automatically create a query.

5. Click the **Show properties** icon , and In the **Properties** pane, double-click the **Data source** property and click a data source.

6. If required, set the **Catalog** property to the name of the catalog.

7. Double-click the **SQL** or **MDX** property and type the SQL or MDX.

8. Click **Validate** to check for errors.

9. If you are working with SQL, select the query, and in the **Properties** pane, set the **Processing** property to **Limited Local**.

10. Double-click the query.

If the SQL or MDX is valid, the data items defined in the SQL or MDX appear in the **Data Items** pane.

11. Click the **Pages** icon , and click a report page.

12. Click the **Toolbox** icon and drag an object to the work area.

For example, drag a list, crosstab, chart, or repeater.

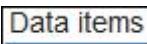
13. Click the data container.

14. Click the **Show properties** icon, and In the **Properties** pane, click the **Select ancestor** icon  and click the container you just created.

For example, if you created a list, click **List**.

**Tip:** You can also click the container selector (three orange dots) of the container to select it.

15. Set the **Query** property to the query for the report type.

16. Click the **Data** icon , and from the **Data Items** tab , drag the items from the query you chose in the previous step to the data container.

### Convert a Query to SQL

You can convert a query to SQL to edit it. You may want to do this to improve performance or to use SQL features that are not supported directly by IBM Cognos Analytics - Reporting.

Converting a query to SQL is an irreversible process.

### Procedure

1. Click the **Queries** icon , and click the query.

2. Click the **Show properties** icon , and In the **Properties** pane, double-click the **Generated SQL** property.

3. Click **OK** and then click **Convert**.

4. Click **Validate** to check for errors.

5. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.

## Edit the SQL or MDX

You can edit the SQL or MDX for a query that has been created as an SQL or MDX query or that has been converted to SQL.

### Procedure

1. Click the **Queries** icon , expand the query, and click the SQL or MDX item under the query.
2. In the work area, double-click the SQL or MDX item.
3. Make changes in the text box.  
  
If you are working with MDX, you must be aware of the [MDX syntax](#) that IBM Cognos Analytics - Reporting supports.
4. Click **Validate** to check for errors.

### First-Rows Optimization

The SQL produced by IBM Cognos Analytics - Reporting depends on the report format you choose. For example, if you specify HTML format, first-rows optimization is requested. All-rows is requested if you specify PDF.

It is important for database administrators and programmers to remember that Cognos Analytics - Reporting does not always use first-rows optimization. If you assume first-rows optimization is always requested, this can cause the RDBMS optimizer to process the query differently than you expect.

### Supported MDX Syntax

If you are working with MDX, you must be aware of the syntax that IBM Cognos Analytics - Reporting supports. Cognos Analytics - Reporting supports the MDX grammar as specified in Microsoft Data Access Software Developer Kit version 2.8.

Cognos Analytics - Reporting supports the following MDX functions. This is a partial list and applies only when you are working with the following data sources:

- cubes
- SAP BW
- IBM Cognos TM1
- IBM Db2 OLAP
- IBM Cognos Consolidation
- IBM Cognos Contributor

For these data sources, IBM Cognos Analytics uses a variation of the Microsoft SQL Server Analysis Services syntax.

- Acos
- Aggregate
- Ancestor
- Ancestors
- Asin
- Atan
- Avg
- BottomCount
- BottomPercent
- BottomSum
- Children
- ClosingPeriod
- CoalesceEmpty

- Convert
- Cos
- Cosh
- Count
- Cousin
- Crossjoin
- CurrentMember
- DefaultMember
- Descendants
- Dimension
- Distinct
- Except
- Exp
- Filter
- FirstChild
- FirstSibling
- Generate
- Head
- Hierarchize
- Hierarchy
- IIf
- Intersect
- Is
- IsAncestor
- IsEmpty
- Item
- Lag
- LastChild
- LastPeriods
- LastSibling
- Lead
- Level
- Levels
- LinkMember
- Ln
- Log10
- Max
- Median
- Members
- Min
- Mtd
- Name
- NextMember

- OpeningPeriod
- Order
- Ordinal
- ParallelPeriod
- Parent
- PeriodsToDate
- PrevMember
- PreviousMember
- Properties
- Qtd
- Rank
- Siblings
- Sin
- Sinh
- Stddev
- Subset
- Sum
- Tail
- Tan
- Tanh
- TopCount
- TopPercent
- TopSum
- Union
- Value
- Var
- Wtd
- Ytd

## Using Dimensional Calculations

---

Insert a calculation to make your report more meaningful by deriving additional information from the data source. For example, you create an invoice report, and you want to see the total sale amount for each product ordered. Create a calculated column that multiplies the product price by the quantity ordered.

You build calculations in the expression editor using functions.

If a calculation is used in multiple reports, or by different report authors, ask your modeler to create the calculation as a standalone object in the model and include it in the relevant package.

### Related concepts

[Considerations when Creating Calculations](#)

## Create a Simple Member Calculation

When working with dimensional data sources, you can select members in your report and create simple calculations.

In addition to simple arithmetic calculations, you can perform the following calculations:

Calculation	Description
Rollup	Summarizes, or rolls up, all the values of the selected items in a hierarchy.
% %	Calculates the value of a selected item as a percentage of another item.
% Difference	Calculates the difference between two items as a percentage.
% Of Base	<p>This calculation is only available if you select two members from different hierarchies, each from a different edge.</p> <p>This calculation takes the first selected member from edge A and the second selected member from edge B. The calculation result of a percent of base should be such that all the values for member A will compare itself to the intersect value of member A and B.</p> <p>For example, you have a crosstab showing quantity sold by year by product line. You select <b>2012</b> and <b>Camping Equipment</b>, right-click the selection, click <b>Calculate</b>, and then click <b>% of Base (2012, Camping Equipment)</b>. The calculated row shows the percentage value of each product line for 2012 as compared to <b>Camping Equipment</b> for 2012.</p>
Custom	Allows you to specify your own value when performing a simple arithmetic calculation. Also allows you to change the order of operands or type a custom name for the new calculated row or column.

### Procedure

1. Select the items in the report to calculate.
  2. In the report object toolbar, click the insert calculation button  and select the calculation to perform.
- Tip:** Calculations that are not applicable to the items you selected are grayed out.
3. To change the order of the operands or the name of the calculated item added to the report, click **Custom**.

### Results

The calculation appears as a new row or column in the report.

## Insert a Query Calculation

When working with dimensional data, insert a query calculation into your report to add a new row or column with values that are based on a calculation. For example, you create a query calculation named Euros that converts dollars to euros by multiplying an existing dollar measure by a conversion rate. Euros can then be displayed to end users in a separate row or column.

In IBM Cognos Analytics - Reporting you can create the following types of calculations:

- Create calculated members or calculated measures where the expression is a member or a tuple-based (as opposed to property-based) value expression. For example, [2013] - [2012] is a calculated member and [Revenue] - [Planned Revenue] is a calculated measure.
- Use set expressions to create calculated sets of members. For example, children ([2012]) is a set expression that displays the child members of 2012.

You must base each set expression on a hierarchy and the set expression must contain only members from this hierarchy.

- Create value expressions when you want to insert a string, number, date, or interval value.

You can also create a calculation that uses an intersection (tuple) that you already defined.

If you are using an IBM Db2 data source, the subtract operator is invalid if you combine the datatypes timestamp2 and packed decimal.

When creating an expression that will be used in a double-byte environment, such as Japanese, the only special characters that will work are ASCII-7 and ~ -- || - \$ ¢ £ ¬.

## Procedure

1. Click the **Toolbox** icon  and drag **Query calculation** to the report.
2. Click the type of calculation you want to create and if required, select the hierarchy that contains the data that is the focus of your calculation.
3. In the **Name** box, type a meaningful name for the calculation.  
For example, if you are calculating the difference between 2012 revenue and 2011 revenue, you could name your expression **2012 - 2011 Revenue**.
4. In the **Available Components** pane, define the calculation:
  - Specify how you want to view the available data items in your data package by clicking the view member tree button  or the view metadata tree button .
  - To add data items that are not shown in the report, on the source tab , double-click the data items.
  - To add data items that are in the report but not necessarily in the model, such as calculations, on the data items tab , double-click the data items.
  - To add data items from a specific query, on the queries tab , double-click data items.
  - To add functions, summaries, and operators, on the functions tab , double-click elements.
  - To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.

Parameters define prompts, drill-through reports, and master detail relationships.

- To add a macro, on the macros tab , drag the parameter maps, session parameters, or functions you want to add to the macro.

**Tip:** Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.

You can also type the calculation directly in the **Expression Definition** box.

When typing date values, ensure that the date format is correct for your database type.

To copy and paste expression components in the **Expression Definition** pane, you can use the copy

button  and the paste button .

5. Click the validate button .

Any validation errors appear on the **Errors** tab of the **Information** pane.

**Tip:** To copy and paste expression components in the **Expression Definition** pane, you can use the

copy button  and the paste button .

#### Related concepts

[Using query macros](#)

## Create a Layout Calculation

Create a layout calculation to add run-time information to your report, such as current date, current time, and user name.

When you create layout calculations, unsupported functions do not appear in the **Functions** tab of the expression editor. Specifically, there is no **Summaries** folder, and some operators, constants, and constructs are also unavailable. These functions are not available because only the database can perform them. Report expressions and calculations based on layout expressions are performed in IBM Cognos Analytics - Reporting.

To see the complete list of functions available in the expression editor, except for report functions, create a query calculation. All functions are available when you create a query calculation because these calculations are performed in the database and not in Cognos Analytics - Reporting.

### Procedure

1. Click the **Toolbox** icon  and drag **Layout calculation** to the report.

2. In the **Available Components** box, define the calculation:

- To add data items that are not shown in the report, on the source tab , double-click data items.
- To add data items from a specific query, on the queries tab , double-click data items.
- To add functions, summaries, and operators, on the functions tab , double-click elements.
- To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.

Parameters define prompts, drill-through reports, and master detail relationships.

### Tips:

- You can also type the calculation directly in the **Expression Definition** box.
- When typing date values, ensure that the date format is correct for your database type.
- To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .

3. Click the validate button .

## Create an Intersection (Tuple)

When working with dimensional data, an intersection, also known as a tuple, is useful for obtaining a value from the combination of two or more members that you specify. Each member must be from a different hierarchy. The intersection can include only one measure.

For example, the intersection (Revenue, 2012, Cooking Gear) shows the revenue value for the year 2012 and for the product line Cooking Gear.

Use tuples to avoid report summaries that do not reflect the visible data. For more information about this issue, see [“Summaries in a report do not correspond to the visible members” on page 369](#).

### Procedure

1. Click the **Toolbox** icon  and drag the **Intersection (Tuple)** object to the report.
2. From the **Available members and measures** pane, select items and click the right arrow to move them to the **Intersection members and measures** box. You can also use items from the **Calculated members and measures** tab .
3. To define the hierarchy for this intersection, click a parent object in the **Intersection hierarchy** box.

## Assigning a Hierarchy or Dimension

You must assign each calculated member, set expression, and intersection (tuple) to a hierarchy or dimension. We recommend that you select the hierarchy or dimension upon which your calculation focuses. For example, if your calculated member is based on years, select the Time hierarchy. If you create a calculated measure, select the Measures dimension.

Select only a hierarchy that cannot affect the value of the calculation. For example, the hierarchy Camping Equipment has the same value no matter what Products context it appears in the report. Therefore,

- the calculation ([Camping Equipment]-[Mountaineering Equipment]) has a well-defined meaning only in the Products hierarchy, so select that hierarchy.
- the calculation tuple ([Revenue], [Camping Equipment]) can be assigned to either the Products or Measures hierarchy, as it is not affected by either context.
- the calculations ([2013] - [Camping Equipment]) and ([Fiscal Year 2013] - [Calendar Year 2013]) do not have a well-defined meaning in any hierarchy, and therefore cannot be used reliably at all.

## Drilling Up and Drilling Down in Dimensional Reports

When working with dimensional or dimensionally-modeled relational (DMR) data sources, you can create reports that allow the reader to view more general or more detailed information on your data within a predefined dimensional hierarchy (such as Years - Year - Quarter - Month) without having to create different reports.

You can link groups of data items from different queries so that when you drill up or drill down in one query, the data item also drills up or drills down in the linked queries. Linking data items is useful if your report includes more than one query with the same data item. For example, if your report shows a list and a crosstab that each include the Product Line data item, you can link the Product Line data item from the crosstab query to the Product Line data item from the list query so that when you drill up in the crosstab Product Line data item, the list Product Line data item also drills up.

## Member Sets

Member sets are used to group data items that are logically related for various actions, such as drill actions, zero suppression, and ranking. They can be defined as a flat list or as a tree structure in which member sets in the same parent chain are considered related.

For example, for drill operations, a member set defines the set of items that can potentially change when a given item in the set is drilled on. The values of other items in the query or even those in the same

hierarchy are preserved when any item in this set is drilled on. Usually, a member set references items that have logical roles in a drill action, such as a detail, a summary of the detail, or a parent of the detail. A single data item can belong to only one member set.

If you do not define member sets for items, the IBM Cognos Analytics server associates items into default member sets and behaviors using simple dimension rules on item expressions. You can override the behavior for a particular item while other items continue to use the default.

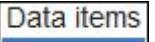
When you define a member set, you must explicitly define behaviors for each item in the set. Items in the set that have no behaviors have their values preserved.

Drill behaviors always act from a root member set. This means that when an item is drilled on, the root member of its member set is found and all items from the root down are processed. Although calculations and aggregates are not directly related by hierarchy, they respond because of their dependence on the items upon which they are based.

### Create Member Sets

Create a member set when you want to define a non-default drill behavior. You specify what items respond to a drill action by adding them to the member set.

#### Procedure

1. Click the **Queries** icon , and click the query in which to create a member set.
2. Click the **Show properties** icon , and In the **Properties** pane, set the **Define member sets** property to **Yes**.
3. Double-click the query and click the **Member sets** tab.
4. Click the **Data** icon , and from the **Data items** tab , drag items to the work area.

To define a member set as a tree structure, drag the item that will serve as the root item of the set to the work area, and then drag other items over the root item to create the tree structure.

**Note:** You can also nest member sets.

### Create a drill-up and drill-down report

You can link groups of data items from different queries so that when you drill up or drill down in one query, the data item also drills up or drills down in the linked queries.

When you drill down or up, you can specify whether the column title shows the member caption value or the level label value. By default, titles use member captions. Using level labels may be more meaningful. For example, within the Country or Region column, you drill down on Australia. By default, the column title becomes Australia, the member caption. It may be more meaningful to use Country or Region, the level label, as the column title.

**Tip:** The Returned Items sample report in the GO Data Warehouse (analysis) package includes drilling.

#### Before you begin

Before you begin, ensure that you are using a dimensional data source.

#### Procedure

1. Click the **Pages** icon  or the **Queries** icon , and click the **Report** icon .
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Advanced drill behavior** property.
3. On the **Basic** tab, in the **Report output drill capabilities** box, select the **Allow drill-up and drill-down** check box.

By default, IBM Cognos Analytics - Reporting determines which items can be drilled on based on the dimensional structure.

4. To enable the report to be used as the source during a package drill-through, select the **Allow this report to be a package-based drill-through source** check box and click **OK**.

For more information about package drill-through, see the *IBM Cognos Analytics Administration and Security Guide*.

5. When the report is a drill-through target, to specify whether to apply additional filtering when names from the context in the source report matches names of items in the target report, select the **Accept dynamic filters when this report is a drill-through target** check box.
6. To disable drill-up or drill-down for a data item, select the data item in either the **Disable drill-up for** box or the **Disable drill-down for** box.
7. From the **Advanced** tab, you can change the drill-up or drill-down behavior for any data item by selecting the data item and then choosing one of the following behaviors.

Behavior name	Drill-up behavior	Drill-down behavior
<b>Preserve</b>	The data item's value will remain unchanged.	The data item's value will remain unchanged.
<b>Empty Set</b>	The set of values associated with this data item is set to be the empty set (novalues). For crosstabs, the data item will effectively be removed from the report.	The data item will be removed from the report.
<b>Replace Item</b>	The data item's value will change to become the parent (if a lowest-level summary was drilled up on) or the grandparent (if a lowest-level detail of a dimension was drilled up on) of the item that was drilled on.	The data item's value will change to become the item that was drilled on.
<b>Replace Expression</b>	The data item's value will change to become the children of the parent (if a lowest-level summary was drilled up on) or the children of the grandparent (if a lowest-level detail of a dimension was drilled up on) of the item that was drilled on.	The data item's value will change to become the children of the item that was drilled on.
<b>Change Expression</b>	The data item's value will change to become the value of some other data item in the query.	The data item's value will change to become the value of some other data item in the query.

Behavior name	Drill-up behavior	Drill-down behavior
<b>Depth Based Expression</b>	The data item's value will change to become all data items n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the <b>Depth</b> value.	The data item's value will change to become all data items n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the <b>Depth</b> value.
<b>Ancestor</b>	The data item's value will change to become the data value of the ancestor n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the <b>Depth</b> value.	The data item's value will change to become the data value of the ancestor n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the <b>Depth</b> value.

8. In the **Column title drill behavior** box, specify whether to use member captions or level labels as the columns titles for each data item.
9. From the **Data items linking** tab, you can link groups of data items:

- Click the **New Group of Linked Data Items** icon 
- Type a name for this group of linked data items and click **OK**.

To rename a group of linked data items, click the group, click the **Rename Group of Linked Data Items** icon , type a name, and click **OK**.

- Use the arrows to move data items from the queries on the left to the groups on the right.

**Note:** You can only add a data item to one group.

## Results

The report will generate links for any item that can be drilled up or down on.

When you run a report, you can drill down or drill up by right-clicking the data item and choosing the action from the context menu. The menu items will be disabled if an item cannot be drilled up or down on.

## Related tasks

[Create a drill-up and drill-down chart](#)

### Recommendation - Drilling Down in Very Large Data Sources

When you drill down in a report that uses a very large data sources query results can be much larger than what can be held in memory. For example, if you insert the lowest level of four hierarchies that each contain 1000 members, the report can contain 1,000,000,000,000 cells. At best, this query will take a very long time to run. While this large query executes, all other queries for the same server process will likely be blocked. For most data sources, the query will likely fail due to insufficient memory or timing out. Then the memory is released and normal services resume.

However, when using a Microsoft SQL Server 2005 Analysis Services (SSAS) cube, the memory consumed by the SSAS client is not always released in a way that other queries can effectively re-use. The server continues to run with insufficient memory, causing new queries to either run very slowly or fail completely. You may encounter an error, and, to continue, the system administrator must manually stop and restart the IBM Cognos Analytics service.

To avoid these problems, consider the size of hierarchy levels and sets when creating reports and avoid combining them in ways that create large queries. To determine the size of a set, create and run a very small report that includes only a count of the members within that set. You can also use filtering techniques to focus your data.



# Chapter 11. Adding Prompts to Filter Data

You can add prompts to a report to add interactivity for users. Prompts act as questions that help users to customize the information in a report to suit their own needs. For example, you create a prompt so that users can select a product type. Only products belonging to the selected product type are retrieved and shown in the report.

Prompts are composed of three interrelated components: parameters, prompt controls, and parameter values. Parameters are based on parameterized filters and form the questions to ask users. Prompt controls provide the user interface in which the questions are asked. Parameter values provide the answers to the questions.

IBM Cognos Analytics - Reporting provides several ways to create prompts. You can

- use the **My parameters**  panel to access parameters that were customized by your administrator
- use the [Build Prompt Page tool](#)
- [build your own prompt and prompt page](#)
- [create a parameter to produce a prompt](#)
- [insert prompts directly into the report page](#)
- in dimensional reporting, you can also [define prompts using context filters](#)

If you include reports from different packages in an interactive dashboard that uses global filters, ensure that you use the same parameter name for the prompt in all the reports. You can also create prompts in the package. For more information, see topics on modeling. You can also use context filters, also known as slicer filters, to focus the data in your report.

## Syntax of Prompt Expressions

Prompt expressions use the following syntax, where p represents the parameter name.

You can also use these expressions to create parameterized data items that you can then use in master detail relationships.

The type of expression you use depends on whether you have chosen relational or dimensional reporting style. For more information about reporting styles, see [“Relational and dimensional reporting styles” on page 10](#).

Relational: Detail Filter Expressions	Dimensional: Context (Slicer) or Edge Expressions
<p>[<i>data item</i>] = ?p?</p> <p>for single-select prompts and master detail relationships</p>	<p>[<i>level or hierarchy</i>]-&gt;?p?</p> <p>For single-select member prompts and master detail relationships</p>

<b>Relational: Detail Filter Expressions</b>	<b>Dimensional: Context (Slicer) or Edge Expressions</b>
[data item] in ?p? for multi-select prompts	<p>set([level or hierarchy]-&gt;?p?)</p> <p>For multi-select member prompts</p> <p>filter ([set], [property expression] = ?p?)</p> <p>For single-select value prompts and master detail relationships</p> <p>A property expression is an expression that is assigned to a property to enable dynamic update of the property when the report runs.</p> <p>filter ([set], [property expression] IN ?p?)</p> <p>For multi-select value prompts</p> <p>A property expression is an expression that is assigned to a property to enable dynamic update of the property when the report runs.</p>

### Related tasks

[Creating application links to other reports or external web pages](#)

Create application links to use an active report to open other reports or external web pages in an iFrame.

[View the SQL for an Entire Report or a Query](#)

## Using customized parameters

You can use the **My parameters**  panel to tailor reports according to your role and to maintain consistency across reports.

Your administrator may decide to adopt a set of standard parameter names that can be used by all report authors. These parameters are called global parameters. The administrator can specify default values for global parameters. These parameters can be customized to your role. It all depends on how often you use certain data items in your own reports.

Global parameters allow you to avoid being prompted repeatedly for the same values. You can set your own values which are then automatically applied to reports when they are run.

You can apply parameter values from the **My parameters** panel with or without prompts:

- If applied on a prompt page, the parameter defaults to your preferred value.
- If applied in a filter expression, the report simply runs with the default values that you selected previously.

### About this task

You can take advantage of global parameters when you perform these tasks:

- [creating a detail or summary filter](#)
- [creating a drill-through definition](#)
- [creating your own prompt and prompt page](#)
- [creating a parameter to produce a prompt](#)

### Procedure

1. Click the **My parameters** icon .

The **My parameters** panel appears. Parameters that were created by your administrator are listed. For each parameter, values appear. Check boxes are selected next to values that your administrator has specified as the default values.

2. If you want to use a different default value than the one assigned by your administrator, you can select a different value.

**Tip:** You may want to check with your administrator before you change default parameter values. There could be a reason why the administrator is recommending a specific value.

3. If you changed one or more default values but then decide to revert to the values set by your administrator, click **Reset**.

## Use the Build prompt page tool

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Use the **Build prompt page** tool to quickly add filters and prompts to a report. This tool creates filters in the query using the prompt information properties that are set in the IBM Cognos Framework Manager model. For more information about the prompt information properties, see the *Framework Manager User Guide*.

**Note:** The Promotion Success sample report in the GO Data Warehouse (analysis) package includes a prompt page. The Historical Revenue sample report in the Sales and Marketing (cube) package and the Eyewear Revenue by Brand and Size sample report in the GO Data Warehouse (analysis) package include multiple prompts.

### Before you begin

**Note:** The **Build prompt page** tool creates a static report specification, so if the prompt information properties are updated in the Framework Manager model, those updates will not be reflected in your report.

### Procedure

1. Click the column or row on which users will be prompted.

To create multiple prompts or a cascading prompt, click more than one column or row.

2. From the report object toolbar, click the **More** icon , and then click **Build prompt page**.

A prompt page is created that has the following items:

- a page header
- a prompt control for each selected column
- a page footer containing **Cancel**, **Back**, **Next**, and **Finish** buttons

## Build Your Own Prompt and Prompt Page

---

Create your own prompt and prompt page to control how they appear in a report.

**Note:** The Promotion Success sample report in the GO Data Warehouse (analysis) package includes a prompt page.

### Procedure

1. Click the **Pages** icon , and click **Prompt pages**.
2. Click the **Toolbox** icon , and drag **Page** to the **Prompt pages** box.
3. Double-click the page you just created.

4. Click the **Toolbox** icon , drag one of the following prompt controls to the prompt page.

Prompt control	Description
<b>Text box prompt</b>	<p>Retrieves data based on a value that users type. Use this control when users know exactly what value they want to enter, such as a name or account number.</p>
<b>Value prompt</b>	<p>Retrieves data based on values that users select from a list. Use this control to show a list of possible values from which users can choose.</p> <p><b>Note:</b> The maximum number of items that can appear in a list is 5000.</p>
<b>Select &amp; search prompt</b>	<p>Retrieves values based on search criteria that users specify. Data is then retrieved based on values users select from the search results.</p> <p>Use this control instead of a value prompt if the list of values is very long, which can slow down performance.</p> <p><b>Tip:</b> Users have the option of performing a case sensitive or case insensitive search. A case sensitive search is faster, while a case insensitive search usually returns more values.</p> <p>You cannot use this control if you are working with SAP BW data sources.</p>
<b>Date prompt</b>	<p>Retrieves data based on a date that users select. Use this control to filter a date column. Users can retrieve data for a specific day, a set of days, or a range of days.</p>
<b>Time prompt</b>	<p>Retrieves data based on a time that users select. Use this control to restrict a report to a particular time or time range. For example, users can see how many orders are received after business hours. Users can then use this information to determine the number of staff needed to work after hours.</p>
<b>Date &amp; time prompt</b>	<p>Retrieves data based on a date and time that users select. Use this control to filter a datetime or timestamp column. This control is useful for specifying ranges. For example, users can retrieve all orders received from Monday at 12:00 a.m. to Friday at 5:00 p.m.</p>

Prompt control	Description
<b>Interval prompt</b>	<p>Retrieves data based on a time interval that users specify.</p> <p>Use this control to retrieve data that is related to the passage of time. For example, users can retrieve a list of products that were returned 30 or more days after they were purchased.</p>
<b>Tree prompt</b>	<p>Retrieves data based on values that users select from a list. Values are organized hierarchically.</p> <p>This control is useful when you are working with dimensional data sources. Data is shown from the top of a dimension hierarchy to the most detailed member, and users can choose the level of detail they want to view in the report. For more information about tree prompts, see “<a href="#">Control the Data That Appears in a Tree Prompt</a>” on page 248.</p> <p>Tree prompts let you page through large numbers of prompt values with a <b>More</b> link at the bottom of the tree.</p>
<b>Generated prompt</b>	<p>Selects a prompt control based on the data type of the data item.</p> <p>This control acts like a placeholder. When users run the report, the control is replaced by the appropriate prompt control. For example, if users are prompted for date values, the control is replaced by a date &amp; time prompt.</p>

The **Prompt Wizard** dialog box appears.

5. If you are creating a text box, date, time, date and time, interval, or generated prompt, do the following:
    - Create a new parameter for the prompt or use an existing or global parameter.
    - Click **Next**.
    - If you created a new parameter, define the expression by selecting a data item from the package and the operator to use.
- Tip:** Make the prompt optional by selecting the **Make the filter optional** check box.
- Go to step 7.
6. If you are creating a value, select & search, or tree prompt, do the following:
    - Create a new parameter for the prompt or use an existing or global parameter.
    - Click **Next**.
    - If you created a new parameter and you want to use the parameter to filter data, select the **Create a parameterized filter** check box and define the expression by selecting a data item from the package and the operator to use.

If you are creating a tree prompt, you must choose **in** in the **Operator** box.

You can also use a parameter to provide a value for a layout calculation, such as showing a user's name in the report. When the report is run, you can use a parameter to prompt the user to type his name and have it appear in the report.

**Tip:** Make the prompt optional by selecting the **Make the filter optional** check box.

- Click **Next**.
- If you created a parameterized filter and you have more than one query defined in the report, select the check box for the query on which to filter and click **Next**.
- Select the **Create new query** check box to create the query that will be used to build the list of data values shown when the report is run.

**Tip:** Do not create a new query if you want to link the prompt to an existing query or if you intend to create the query at a later time.

- Click the ellipsis button beside **Values to use** and click the data item on which to prompt.
- To choose a data item that is different than what users will see when they are prompted, click the ellipsis button beside **Values to display** and click the data item.
- To create a cascading prompt, in the **Cascading source** box, click the parameter that represents the cascade source.

#### 7. Click **Finish**.

### Results

The prompt control is added to the prompt page. A prompt page is like a report page. You can insert graphics and text and apply formatting.

You can also modify the properties of the prompt control by clicking it and making changes in the **Properties** pane.

## Create a parameter to produce a prompt

IBM Cognos Analytics - Reporting can automatically generate prompted reports based on parameters you create. When you run the report, Reporting can generate a prompt page for each parameter not associated to an existing prompt page depending on whether the prompt run option is selected or not.

**Note:** When Reporting automatically generates a prompt, it creates filters in the query using the prompt information properties that are set in the IBM Cognos Framework Manager model. For more information about the prompt information properties, see the Framework Manager *User Guide*.

You can also define parameters when you want to create a drill-through report or define master detail relationships.

### Procedure

1. From the report object toolbar, click the **Filters** icon .

2. On the **Detail Filters** tab, click the add button .

The **Detail Filter** dialog box appears.

3. In the **Available Components** box, click the **Source** tab , the **Data Items** tab , or the **Parameters** tab  to select the data item to use for the prompt:

- To filter data based on data items not shown in the report, double-click a data item on the **Source** tab.
- To filter data that appears in the report but not necessarily in the model, such as calculations, double-click a data item on the **Data Items** tab.
- To filter data using standardized parameters that were created by your administrator, double-click a data item on the **Parameters** tab in the **Global Parameters** folder.

The data item appears in the **Expression Definition** box.

4. In the **Expression Definition** box, type an operator after the data item or select an operator from the **Functions** tab .

The operator sets some of the default properties of the prompt. For example, if the operator is equals (=), users will be able to select only a single prompt value and the prompt's **Multi-Select** property is set to **No**.

For more information about creating expressions, see [“Using relational calculations” on page 182](#) or [“Using Dimensional Calculations” on page 227](#).

5. Type a name after the operator to define the prompt parameter. A question mark must precede and follow the name.
6. To specify whether the prompt is mandatory, in the **Usage** box, click **Required**, **Optional**, or **Disabled**.

## Create a Prompt Directly in a Report Page

---

You can add prompt controls directly in a report page instead of creating a prompt page.

Prompt controls that are added to report pages will not appear in the following:

- saved reports
- PDF reports
- reports that are sent to users by email
- scheduled reports

Prompt controls are interactive. They are used to satisfy parameter values before running a report. As a result, prompt controls added to a report page only appear when you run the report in HTML format.

When you run a report in HTML format, users select which values they want to see, and the report is refreshed, producing a new report.

For the previously listed non-interactive reports, prompt parameter values must be collected and satisfied before the report is run. You provide the parameter values using the **Run options** tab in the IBM Cognos Analytics portal. If you do not provide all the required values, the report will fail to run. You can

access the Run options tab by clicking the set properties icon  for the report.

**Tip:** The Revenue by Product Brand (2011) sample report in the Sales and Marketing (cube) package and the Rolling and Moving Averages interactive sample report include value prompts.

### Procedure

1. Click the **Toolbox** icon , drag a [prompt control](#) to the report.

The **Prompt Wizard** dialog box appears.

2. [Provide the information](#) necessary to create the prompt.

**Tip:** Make the prompt optional by selecting the **Make the filter optional** check box. Otherwise, when you run the report for the first time, the prompt appears in a generated prompt page rather than in the report page. Alternatively, you can specify a default selection for the prompt.

3. In the work area, click the prompt.

4. In the **Properties** pane, set the **Auto-submit** property to **Yes**.

If you do not set the **Auto-submit** property to **Yes**, the report will not refresh when users select a different prompt value.

**Tip:** An alternative to setting the prompt to auto-submit is to add a prompt button from the **Toolbox** icon and set its **Type** property to **Finish**.

## Results

The prompt control is added to the report page. You can modify its properties by clicking it and making changes in the **Properties** pane.

## Modifying prompts

---

For each prompt you create, you can modify its properties by specifying values in the **Properties** pane.

For example, you can

- [change the prompt control interface](#)
- [require user input](#)
- [enable multiple selections](#)
- [show or hide prompt statuses](#)
- [specify default selections](#)
- [specify prompt values](#)
- [add prompt buttons](#)
- [create cascading prompts](#)

Some properties you set for a prompt may be overridden under some conditions. For example, some properties set for the filter associated with a prompt may override the corresponding prompt property.

### Change the Prompt Control Interface

By default, when you create a prompt, IBM Cognos Analytics - Reporting selects the prompt control interface. You can change the prompt control interface depending on the type of prompt you created. For example, for a value prompt, you can choose a drop-down list, a list box, or a radio button group.

#### Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Select UI** property to the interface.

### Specify that a prompt requires user input

You can specify that a prompt requires user input before the report can run.

#### Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Required** property to **Yes**.
3. Click the **Pages** icon , and click a report page.
4. Click the report object associated with the prompt, from the report object toolbar, click **Filters**  and then click **Edit filters**.
5. Click the filter associated with the prompt.
6. In the **Usage** box, click **Required**.

#### Results

When you run the report, a star appears next to the prompt indicating that the user must select or type a value.

If you have a [cascading prompt](#) and the parent prompt control is required, the child prompt control is disabled. This ensures that users choose at least one value in the parent prompt before they can choose a value in the child prompt. Conversely, if the parent control is optional, then the child control is populated.

This gives users the ability to choose values in the child prompt without having to choose a value in the parent prompt.

## Allow Users to Select Multiple Values in a Prompt

You can allow users to select more than one value in a prompt. For example, you have a prompt for which users must select a product line. You can modify the prompt so that users can select more than one product line.

If you enable multiple selections, the **Auto-submit** property is always set to no.

### Procedure

1. Click the prompt control.
2. In the **Properties** pane, choose whether to allow users to specify more than one value or a range of values:
  - To allow users to specify more than one value, set the **Multi-select** property to **Yes**.
  - To allow users to specify a range of values, set the **Range** property to **Yes**.
3. Click the **Pages** icon , and click a report page.
4. Click the report object associated with the prompt, from the report object toolbar, click **Filters**  and then click **Edit filters**.
5. Double-click the filter associated with the prompt.
6. Change the operator to one of the following:
  - If you are creating a multi-select prompt, change the operator to **in**.  
For example, [Product\_line] in ?Product line? where [Product\_Line] is the name of the data item allows users to select multiple product lines.
  - If you are creating a range prompt, change the operator to **in\_range**.  
For example, [Margin] in\_range ?Margin? where [Margin] is the name of the data item allows users to specify a margin range.

## Show or Hide Prompt Status

Each prompt you create in a report provides dynamic validation when the report is run. Validity checks are performed to ensure that the data is correct and that required values are supplied. For example, a star appears next to each required prompt. An arrow appears next to a prompt if you must select or type a value. If you type an incorrect value, a dotted line appears. You can choose whether to show the star and arrow for each prompt.

### Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Hide adornments** property to **Yes** to hide the prompt characters or **No** to show them.

## Specify a Default Selection for a Prompt

You can specify a default selection for a prompt so that users do not have to select or type a value when they run the report.

### Procedure

1. Click the prompt control.
2. To define a range of values, in the **Properties** pane, set the **Range** property to **Yes**.
3. To specify more than one default selection, in the **Properties** pane, set the **Multi-select** property to **Yes**.

4. In the **Properties** pane, double-click the **Default selections** property.

5. Click the add button  and do one of the following:

- If you chose to define a single value, type the value as the default selection.
- If you chose to define a range of values, type the minimum and maximum values of the range in the **Minimum value** and **Maximum value** boxes, respectively.

6. Repeat step 4 to specify other default selections.

## Customize Prompt Text

You can customize the instructional text that appears around prompts. For example, a value prompt with multiple selections includes a **Select all** link below the choices that you can customize to text other than **Select all**. You can also specify translated text in many languages for international report users.

### Procedure

1. Click the prompt control.

2. To change the default prompt text, in the **Properties** pane, double-click any of the properties under **Prompt Text**.

**Note:** When you select a property in the **Properties** pane, its description appears in the information pane below the **Properties** pane.

3. Click **Specified text**, and then click the ellipsis button.

4. In the **Localized Text** dialog box, type the text that you want to appear.

5. To add customized text for other languages:

- Click **Add**.

- Select the countries and regions for which you want to specify localized text and click **OK**.

- To specify text for a country and region, select the country and region and click **Edit**, and then type the localized text in the text box.

## Specify Prompt Values

You can provide your own values in a prompt instead of the default values that come from the database.

You can specify your own prompt values to

- show something different from what is in the database
- improve performance by not accessing the database
- provide text for optional prompts, such as Select a value
- restrict the number of values available

For example, you have a prompt in which users choose a country or region. For the database value United States, you want USA to appear in the prompt.

**Tip:** The Rolling and Moving Averages interactive sample report includes a value prompt.

### Procedure

1. Click the prompt control.

2. In the **Properties** pane, double-click the **Static Choices** property.

3. Click the add button .

4. In the **Use** box, type the prompt value to add.

5. In the **Display** box, type the value that will appear in the prompt.

6. Repeat steps 3 to 5 to add other prompt values.

7. To link a prompt value to a condition, do the following:

- In the **Variable** box, choose the variable to use or create your own.

For information about creating variables, see “[Add a variable from the condition explorer](#)” on page [289](#).

- In the **Value** box, click one of the possible values for the variable.

- Click the static value to link to the variable and click the edit button 

- In the **Display** box, type the value to appear in the prompt.

- Repeat this procedure for each additional value.

## Add a Prompt Button

Add prompt buttons so that users can submit selected items, cancel reports, or navigate between pages.

When you are building prompts and prompt pages, you may have to add prompt buttons to submit selections. Some prompt controls, such as the value prompt, can be set to submit selections automatically. Other prompt controls, such as the date prompt, require a prompt button.

### Procedure

1. Click the **Pages** icon , and click the page to which to add a prompt button.

2. Click the **Toolbox** icon , drag **Prompt button**  to the work area.

3. Click the prompt button and, in the **Properties** pane, set the **Type** property to one of the following actions.

Goal	Action
Cancel the report	<b>Cancel</b>
Go to the previous prompt page	<b>Back</b>
Go to the next prompt page	<b>Next</b>
Run the report	<b>Finish</b>
Reprompt the user	<b>Reprompt</b>
<b>Tip:</b> Reprompting users is useful when you have cascading prompts.	

## Create a Cascading Prompt

Create a cascading prompt to use values from one prompt to filter values in another prompt. For example, a report contains the columns Product line and Product type. You create prompts for these columns, and you specify that the Product type prompt is a cascading prompt that uses Product line as the source. When users select a product line, they see only the product types related to the selected product line.

**Tip:** The Employee Training by Year sample report in the GO Data Warehouse (analysis) package includes cascading prompts.

### Procedure

1. To make the cascading source a required prompt, select it and, in the **Properties** pane, set the **Required** property to **Yes**.
2. Click the prompt control to use as a cascading prompt.
3. In the **Properties** pane, double-click the **Cascade source** property.
4. Click the parameter that represents the cascade source.

5. If the prompt allows users to select multiple values, add a prompt button to the cascade source to provide the cascading prompt with the appropriate values:

- Click the **Toolbox** icon , drag **Prompt button**  to the report.
- Click the prompt button and, in the **Properties** pane, set the **Type** property to **Reprompt**.
- To change the text in the prompt button, click the **Toolbox** icon, drag the **Text item** icon  to the prompt button and type the text.

## Control the Data That Appears in a Tree Prompt

You can control what data appears in a tree prompt and how the data is structured to get the results that you want. To do this, you add various functions to the filter expression.

In addition, the operator that you chose in the **Prompt Wizard** dialog box controls what appears next to each prompt value. If the operator is in or not in, check boxes appear next to each prompt value. If the operator is equals (=), no check boxes appear.

### Procedure

1. Click the **Queries** icon , and click the query that is associated with the prompt.
2. In the **Data Items** pane, double-click the data item on which you are prompting.
3. In the **Expression Definition** box, type one of the following functions.

Goal	Function
Show the hierarchical structure of all members in the hierarchy. If this function is not used, all members are shown in a flat list.	<code>rootmembers (data_item)</code>
Show the descendants of the data item in a hierarchical structure where x represents the level. For example, if you are prompting on the Year hierarchy and x=1, you will see 2010, 2011, and 2012 in the tree. If x=2, you will see 2010 Q1, 2010 Q2, and so on.	<code>descendants (rootmembers (data_item), x)</code>
Show the children of a member. For example, 2012 Q1, 2012 Q2, 2012 Q3, and 2012 Q4 appear for the member 2012.	<code>children (member)</code>

## Using in\_range Filters with Character Data

If you use an `in_range` filter with character data, and the **From** value is greater than the **To** value, the filter returns no results. For example, if the **From** value is "Zone" and the **To** value is "Aloe Relief", the report returns no data.

To allow results within a range regardless of whether the **From** value is greater than the **To** value, your IBM Cognos administrator can enable a prompting setting. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

## Showing prompt values in generated SQL or MDX

---

You can show prompt values when viewing the generated SQL or MDX of a query or report.

### Procedure

1. Click the **Queries** icon , and click the query for which you want to view the generated SQL or MDX.
2. In the **Properties** pane, set the **Use SQL parameters** property to **Literal**.

### Related tasks

[View the SQL or MDX for an Entire Report or a Query](#)



# Chapter 12. Laying Out a Report

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When creating a report, a good layout is essential to ensure that the information in the report is presented in a clear and effective manner.

## Report layout

---

When you create a report, consider the following structural elements:

- Define the page structure.

Determine what goes into the page header, body, and footer. The page header contains information that appears at the top of each page. The page body contains information that starts on the first instance of the page. If there is too much data to fit on a single page, it continues across all instances of the page. The page footer contains information that appears at the bottom of each page.

- Identify horizontal bands of information.

Look for natural bands of information running across the page. Each of these bands typically translates into a block.

- Identify vertical bands of information.

In each horizontal band of information, look for bands that run up and down the page. Each of these bands typically translates into table cells.

- Decide which data frames to use to lay out the data.

Choose a list, crosstab, chart, repeater, or text frame.

- Set properties at the highest level item possible.

By setting properties at the highest level, you set them once instead of setting them for each child object. For example, if you want all text items in a report to appear in a specific font, set the font for the page.

**Tip:** When setting properties for an object, click the **Select ancestor** icon  in the **Properties** pane title bar to see the different levels available.

- Use padding and margins to create white space.

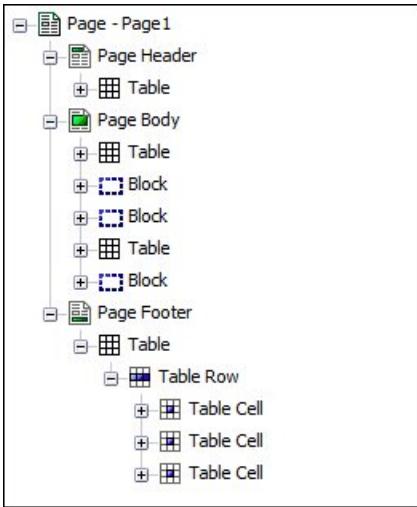
Do not use fixed object sizing unless it is absolutely necessary. When you specify that an object has a fixed size, your layout becomes less flexible.

## The Page Structure View

---

When you add objects to a report, you usually work in the layout. An alternative view of the report is available.

To view the report in a different way, click the **Page views** icon , and then click **Page structure**.



*Figure 44. Example of the page structure view*

Use the page structure view

- to view the entire contents of a report page in a tree structure

Using a tree structure is useful for locating the objects in a page and troubleshooting problems with nested objects.

- to quickly move objects from one area of a page to another

If you have a complex layout, it may be difficult to select, cut, and paste objects in the layout view. Objects are easier to locate in the page structure view.

- to modify object properties

You can modify object properties in the layout or in the page structure view.



**Tip:** To switch back to the report layout, click the **Page views** icon and then click **Page design**.

#### Related concepts

[Work in design, structure, or preview view](#)

## Copy object formatting

You can quickly copy the formatting of items in your report, such as fonts, colors, borders, and number formats, and apply that formatting to other items.

#### Procedure

1. Click an item that has the formatting to copy.
2. Do one of the following:
  - To copy all the formatting applied to the item, from the object toolbar, click the **Pick up style** icon , click the item to format, and then click the **Pick up style** icon again.
  - To copy only one of the formatting styles, click the down arrow to the right of the pick up style button and click the style to copy. Then click the item to format and click the apply style button.
3. If you want to make changes to a style that you copied, click the down arrow to the right of the pick up style button and click **Edit Dropper Style**.
4. In the **Style** dialog box, specify basic and advanced style characteristics.

## Add a header or footer to a report or list

Add a header or footer to make a report easier to read. Headers and footers are containers in which you can add objects like text, images, and report expressions such as the current date and page numbers. You can add headers and footers to pages and lists.

**Tip:** The Revenue by Product Brand (2011) sample report in the Sales and Marketing (cube) package includes a customized header and footer.

Add a page header or footer when you want information to appear on every page in the report, such as a title or page numbers. You can use combinations of text, data items, and report expressions in titles.

You can add the following headers and footers to lists to organize data into logical sections or to identify every change in value of a column.

Type	Description
List page header	Adds a header that appears at the top of the list on every page in which list data appears.
Overall header	Adds a header that appears once at the top of the list.
Group or section header	Adds a header that appears for each group of a grouped column or each section.
Group or section footer	Adds a footer that appears for each group of a grouped column or each section.
Overall footer	Adds a footer that appears once at the bottom of the list.
List page footer	Adds a footer that appears at the bottom of the list on every page in which list data appears. Note that summary calculations in list page footers only summarize the data that is visible on that page of the list report.

You can also add section footers by adding a summary.

### Before you begin

To see the headers and footers, ensure that the visual aids are turned on.

### Procedure

1. If you want to add a page header or footer, from the report object toolbar, click the **More** icon  , click **Headers & footers > Page header & footer**, select the appropriate check boxes, and click **OK**.
2. If you want to add a list header or footer, from the report object toolbar, click the **More** icon  , click **Headers & footers > List headers & footers**, select the appropriate check boxes, and click **OK**.
3. If you want to add objects to a header or footer, click the **Toolbox** icon  and drag the objects to the appropriate location.

To add objects to a list header or footer, you must first unlock the report. Click the **More** icon , then click the **Locked** icon .

**Tip:** To add data items to the page header or footer, you must associate a query to the page.

4. To split a header or footer into multiple cells that span the list, select the cell to be split and then, from the report object toolbar, click the **Split cell** icon .
5. To merge multiple cells in a list header or footer, select the cells that you want to merge, and, from the report object toolbar, click the **Merge cells** icon .

## Add borders to an object

---

You can add borders to objects in a report such as a column, a header, or a footer or to the whole report.

**Tip:** You can also add borders using the report object toolbar by clicking the **Border** icon .

### Procedure

1. Click the object to which to add a border.

**Tip:** To quickly select the parent of an object, click the object, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.

2. In the **Properties** pane, double-click the **Border** property and select values in the **Color**, **Style**, and **Width** boxes.

**Note:** Specifying a width using % as the unit of measure is not supported when producing reports in PDF.

3. Apply the selected values to the top, bottom, left side, right side, or all sides of the object by clicking the appropriate button in the **Preview** section.

**Tip:** To clear the border applied, click the clear borders button .

## Add a Text Item to a Report

---

You can add text to a report. You can insert text in other objects, such as a block or table cell, or directly in the report page.

You can also add multilingual text to a report.

You can now format the text by changing the font, color, size, and so on. Select the text and make the appropriate changes in the **Properties** pane.

### Procedure

1. Click the **Toolbox** icon , drag the **Text Item** object  to the report.

The **Text** dialog box appears.

2. Type the text and click **OK**.

**Tip:** You can also paste text from another part of the report.

## Specify the font for a report

---

You can specify the font for text in a report.

## Procedure

1. Click the object.

**Tip:** To specify the default font for the report, click the page.

2. Do one of the following:

- From the report object toolbar, click the **Font** icon  and then specify the font properties.
- In the **Properties** pane, double-click the **Font** property and specify the font properties.

To specify the color of the text, from the report object toolbar, click the **Font** icon , and then click **Foreground color**. Alternatively, you can specify the color of the text by clicking the **Foreground color** property for the object.

**Tip:** Type a list of fonts in the **Family** box if you are not sure whether a specific font is installed on a user's computer. For example, if you type Times New Roman, Arial, monospace, IBM Cognos Analytics - Reporting checks to see if Times New Roman is installed. If it is not, Reporting checks for Arial. If Arial is not installed, the monospace font used by the computer is used.

## Results

If you clicked **(Default)** for any of the font properties, the default value for the property is used. Default values are stored in a style sheet that is used across all IBM Cognos Analytics tools. You can modify default values by modifying classes.

# Insert an Image in a Report

---

You can insert an image in a report. You can insert images in other objects, such as blocks or table cells, directly in the report page or as the background image of another object.

## Before you begin

The images that you insert must first be uploaded to the IBM Cognos Analytics server or another web server and must be .gif or .jpg format.

## About this task

The images that are included with Cognos Analytics are in a different location than in IBM Cognos Business Intelligence releases. In Cognos Analytics, the images are located in *install\_location* \webcontent\bi\images. If you have existing reports with hard coded links to IBM Cognos Business Intelligence images, you must copy the images to this folder, or update the image references to the folder.

## Procedure

1. Click the **Toolbox** icon , select **Layout**, drag the **Image** object  to the report, and then double-click it.
2. From the **Image Picker** box, specify an image in one of these ways:
  - Double-click an image in the **Image Gallery**.

**Tip:** The image gallery must first be created by your administrator. For more information, see the IBM Cognos Analytics *Managing Guide*.

- In the text box, type the URL of an image.
- Click **Browse** to go to the location that contains the image.

**Tip:** To browse images on a web server, you must enable Web-based Distributed Authoring and Versioning (WebDAV) on your web server. For more information about configuring web servers, see the IBM Cognos Analytics *Installation and Configuration Guide*.

## Insert a Background Image in an Object

You can insert a background image for objects in a report. For example, use a background image to add a watermark to a page.

You can also create your own background visual effects, such as drop shadows and gradient fills. For more information, see [“Add background effects” on page 256](#).

### Before you begin

The images that you insert must first be uploaded to the IBM Cognos Analytics server or another Web server and must be .gif or .jpg format.

### Procedure

1. Select the object.
2. In the **Properties** pane, under **Color & Background**, double-click the **Background Image** property.
3. To use the background from the default style for the object (Cascading Style Sheet (CSS) class), click **Default**.
4. To explicitly not insert a background image, click **None**.

This option overrides any default background images including background gradients on objects that appear in the 10.x report styles.

5. To insert a specific image, click **Specified**, and then do one of the following:
  - In the **Image URL** box, type the URL of an image.
  - Click **Browse**, and double-click an image in the **Image Gallery**.

**Tip:** The image gallery must first be created by your administrator. For more information, see the IBM Cognos Analytics *Managing Guide*.

- Click **Browse**, and go to the location on the web server that contains images.

**Tip:** To browse images on a web server, you must enable Web-based Distributed Authoring and Versioning (WebDAV) on your web server. For more information about configuring web servers, see the IBM Cognos Analytics *Installation and Configuration Guide*.

6. In the **Position** box, choose how to align the image in the object.
7. In the **Tiling** box, click a tiling option.

### Related tasks

[Change a Chart Background in a Legacy Chart](#)

## Add background effects

---

You can add background effects to enhance the appearance of your report. You can enhance objects, such as data containers (lists, crosstabs, and charts), headers, footers, page bodies, and so on with borders, gradient fill effects, drop shadows, and background images. You can also apply background effects as a class style.

The background effect is rendered within the area that bounds the object. To use a generated background in a chart, the chart must have a fixed size.

If the background image is complex and large, the size of the report output may be affected proportionately.

Background effects are rendered only if the data container has a fixed height and width; if a percentage size is used, the effects are ignored.

Resizing or overflow behavior is ignored for generated images in HTML reports.

## Add background effects to a chart

Background effects include borders, fills, drop shadows, images, texture effects, and bevel effects.

### Procedure

1. Click the chart object.
2. To apply a preset background fill effect, from the report object toolbar, click the **Background effects**  **presets** icon.
3. In the **Properties** pane, under **Color & background**, double-click the **Background effects** property.
4. Select one or more of the following:
  - To apply a border, click **Border** and specify settings for border style, width, color, corner radius for rounded rectangles, and transparency.  
If the element also includes a fill with a transparency setting, select the **Allow transparent bleed** check box to apply the same transparency to the border.
  - To apply a fill effect, click **Fill** and specify the settings. The fill effect can either be a solid color, a gradient, or a pattern. You can define a gradient fill effect as a linear, radial line, or radial rectangle gradient.
  - To apply a drop shadow effect, click **Drop shadow** and specify the shadow color, transparency value, color, and offset settings. The default horizontal and vertical offset is 5 pixels.
  - To specify one or more images as a background, click **Images**. You can specify the transparency value and the position for each defined image. You can also specify a custom position for each image.

**Tip:** To remove the effect, clear its check box.

5. To add a texture effect, in the **Properties** pane, under **Color & Background**, select an option under **Material effects**.
6. To add a bevel, in the **Properties** pane, under **Color & Background**, double-click the **Bevel** property and click a bevel effect.

**Note:** To see the **Bevel** property in a bar chart, you must first select the **Series (primary axis)** object in the chart.

## Add a background gradient to a page

A background gradient is a shading that goes from one color to another either horizontally or vertically across your page.

### Procedure

1. Click anywhere in the report page.
2. In the **Properties** pane title bar, click the **Select ancestor** icon  and click **Page**.
3. Under **Color & Background**, double-click the **Gradient** property.
4. Select the **Gradient** check box and then select the colors and direction for the gradient.

Background gradients and drop shadows do not appear in Microsoft Excel spreadsheet software output. They are also supported only for report outputs run in the Microsoft Internet Explorer Web browser.

**Tip:** To remove the effect, clear the **Gradient** check box.

## Add a drop shadow to a container

A drop shadow is a border on the bottom and right of an object. You can specify the color and transparency of this shadow.

## Procedure

1. Click the crosstab, list, repeater table, or table in the report.
2. In the **Properties** pane title bar, click the **Select ancestor** icon  and click **Crosstab, List, Repeater table, or Table**.

**Tip:** You can also click the container selector (three orange dots) of the container to select it.

3. Under **Color & Background**, double-click the **Drop shadow** property.

4. Select the **Drop shadow** check box and then select the color, offset, and transparency values.

Background gradients and drop shadows do not appear in Excel output. They are also supported only for report outputs run in the Internet Explorer Web browsers.

If you add a drop shadow, ensure that you also specify a background color for the object. Otherwise, if you keep the default transparent background, data values also have a drop shadow and are difficult to read.

**Tip:** To remove the effect, clear the **Drop shadow** check box.

## Insert a Formatting Object in a Report

In addition to text and images, the **Toolbox** icon  contains other objects that you can add to the report layout.

Object	Description
<b>Block</b>	Adds an empty block, which is a container in which you can insert other objects. This is useful for controlling where objects appear. <b>Tip:</b> You can use blocks to add space between objects. However, empty blocks are not rendered. You must insert an object or specify the height and width. <b>Tip:</b> The Revenue by GO Subsidiary 2011 sample report in the GO Data Warehouse (analysis) package includes an empty block.
<b>Table</b>	Adds a <u>table</u> , which is a container in which you can insert other objects. This is useful for controlling where objects appear.
<b>Field set</b>	Adds an empty block that has a caption. This is similar to the <b>Block</b> object, but with a caption.
<b>Intersection (tuple)</b>	Adds an intersection (tuple). For more information, see “ <a href="#">Create an Intersection (Tuple)</a> ” on page 231.
<b>Query calculation</b>	Adds a calculated column. For more information, see “ <a href="#">Using relational calculations</a> ” on page 182 or “ <a href="#">Using Dimensional Calculations</a> ” on page 227.
<b>Layout calculation</b>	Adds run-time information to the report layout, such as the current date. For more information, see “ <a href="#">Create a Layout Calculation</a> ” on page 185 in the Relational Reporting Style chapter or “ <a href="#">Create a Layout Calculation</a> ” on page 230 in the Dimensional Reporting Style chapter.

Object	Description
<b>Crosstab space</b>	<p>Inserts an empty cell on a crosstab edge. Allows for the insertion of non-data cells on an edge. Blank cells appear for the edge when the report is run.</p> <p>Insert this object when a crosstab edge does not produce useful data and you want blanks to appear in the cells instead.</p>
<b>Crosstab space (with fact cells)</b>	<p>Inserts an empty cell on a crosstab edge. Allows for the insertion of non-data cells on an edge. The contents of the fact cells for the edge are rendered when a measure is added or the default measure is specified.</p> <ul style="list-style-type: none"> <li>• If the crosstab space is nested, the scope of the fact cells is the scope of the item that is at the level before the space.</li> <li>• If the crosstab space is not nested and there are no items nested below it, the scope of the fact cells is the default measure.</li> </ul>
<b>Singleton</b>	<p>Inserts a single data item. For more information, see “<a href="#">Inserting a single data item</a>” on page 20</p>
<b>Conditional blocks</b>	<p>Adds an empty block that you can use for conditional formatting.</p>
<b>HTML item</b>	<p>Adds a container in which you can insert HTML code. HTML items can be anything that your browser will execute, including links, images, multimedia, tooltips, or JavaScript.</p> <p>HTML items appear only when you run the report in HTML format.</p> <p><b>Note:</b> You cannot include &lt;form&gt; tags in HTML items.</p> <p><b>Tip:</b> The Table of Contents sample report in the GO Sales (analysis) package includes an HTML item.</p> <p><b>Note:</b> When you upgrade to the next version of IBM Cognos Analytics, the report upgrade processes do not account for the use of undocumented and unsupported mechanisms or features, such as JavaScript, that refers to IBM Cognos HTML objects.</p>
<b>Rich text item</b>	<p>Inserts an object that is used to render HTML in the layout. This object is similar to the <b>HTML Item</b>, except that rich text items also render in PDF output. Using rich text items is useful when you want to add annotations defined in a data source to a report.</p> <p><b>Note:</b> Rich text items <a href="#">support</a> only a restricted set of well-formed XHTML.</p>
<b>Hyperlink</b>	<p>Adds a hyperlink so that users can jump to another place, such as a Web site.</p>
<b>Hyperlink button</b>	<p>Adds a hyperlink in the form of a button.</p>
<b>As-of-time expression</b>	<p>Adds an As of Time expression so that you can show data for a specific time period.</p>
<b>Date</b>	<p>Adds the current date.</p>

Object	Description
<b>Time</b>	Adds the current time.
<b>Page number</b>	Inserts page numbers that you can customize.
<b>Row number</b>	Numbers each row of data returned when the report is run. <b>Note:</b> You can add row numbers only to lists and repeaters.
<b>Layout component reference</b>	Adds a reference to another object. Useful when you want to <u>reuse</u> an object.
<b>Table of contents</b>	Creates a table of contents that is rendered in the output of a report.
<b>Table of contents entry</b>	Adds a table of contents marker.
<b>Bookmark</b>	Inserts a bookmark so that users can move from one part of a report to another.
<b>Custom control</b>	Adds a custom user interface in JavaScript. For more information, see “Adding JavaScript to a report” on page 261.

For information about each prompt control and prompt buttons, see [Chapter 11, “Adding Prompts to Filter Data,”](#) on page 237. The **Toolbox** contains other objects when you work in other areas such as Query explorer and Condition explorer.

### Before you begin

Before you can add a hyperlink, HTML item, or hyperlink button, you must have the **HTML items in report** capability. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

### Procedure

To add an object, click the **Toolbox** icon  and double-click it or drag it to the report.

### Elements supported in rich text items

Rich text items support all XHTML character entities, such as &nbsp; (non-breaking space), and the following elements: div, span, ul, ol, and li.

Each element only supports the style attribute, which must contain a valid CSS style. In addition, ul and ol elements support list-style attributes. Specifically, the ol element supports decimal, and the ul element supports circle, disc, and square, as well as list-style-image. For example, the following code produces an unordered list entitled List: with three items. Each list item is in a different color, and the list-style attribute used is circle:

```
<div style="font-size:14pt; text-decoration:underline">List:</div>
<ul style="list-style-type:circle">
<li style="color:green">Item <span style="font-weight:bold">A</span></li>
<li style="color:red">Item B</li>
<li style="color:blue">Item C</li>
</ul>
```

### Tip:

If you want to render more elements than div, span, ul, ol, and li, try enclosing the rich text in <HTML> tags. When rich text is enclosed in <HTML> tags, IBM Cognos Analytics supports more element types. For

example, the following code produces the output "The word **text** is bolded and the word *italics* is italicized.".

```
<html>The word <strong>text</strong> is bolded and the word <em>italics</em> is italicized.<html>
```

## Adding JavaScript to a report

11.0.4

Add JavaScript to a report to provide your own user interfaces when the report is run in HTML.

### About this task

In IBM Cognos Analytics, you can add JavaScript in the following ways.

- As with IBM Cognos Business Intelligence releases, you can add JavaScript in HTML item objects.

In Cognos Analytics, JavaScript in HTML items is executed only when the report is run with limited interactivity (the report property **Run with full interactivity** is set to **No**).

**Note:** If you run a report with full interactivity, use HTML items to insert only static HTML or static CSS into the report output.

- You can add JavaScript to reports by using two types of Asynchronous Module Definition (AMD) modules.

With this choice, JavaScript is executed when the report is run with full interactivity (the report property **Run with full interactivity** is set to **Yes**).

The JavaScript must exist in a separate file that your browser can access.

The two types of AMD modules that you can use are

- A module that implements the `CustomControl` Module interface.
- A module that implements the `Page` Module interface.

You add a `CustomControl` Module interface to a report by referencing the interface in a custom control object. The reference is a file location that you specify in the **Module path** property of the custom control. Add a custom control to provide your own user interface for a prompt-like control that reads and sets parameters or for page navigation buttons.

You add a `Page` Module interface by referencing the interface in a report page or a prompt page. The reference is a file location that you specify in the **Module path** property of the page. Add a page module to set the initial state of prompt controls, to set prompt control custom validation functions, or to read current selections from a prompt control.

For information about the JavaScript that Cognos Analytics supports, see the technote [Adding JavaScript to a report](#) ([www.ibm.com/support/docview.wss?uid=swg21990557](http://www.ibm.com/support/docview.wss?uid=swg21990557)) and article describing the list of [JavaScript samples](#) (<https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2018/03/22/updated-javascript-samples-for-ibm-cognos-analytics-11010?CommunityKey=6b10df83-0b3c-4f92-8b1f-1fd80d0e7e58&tab=recentcommunityblogsdashboard>).

### Procedure

1. To add a custom control, from the toolbox , drag the **Custom control** icon  to the report.

2. Select the custom control and click the **Show properties** icon .

a) To specify the location of the file that contains the JavaScript that you want to use for the control, click the **Module path** property.

b) To add JSON that configures the custom control, click the **Configuration** property.

For example, add JSON that sets the orientation, alignment, and background color of the control.

- c) To specify how you want the control to interact with the report, click the **UI type** property.

If you do not want to render an interface, set the property to **None**. If you do not want events, such as mouseup, to propagate from the control to the report, set the property to **UI without event propagation**. If you want events to propagate to the report, set the property to **UI with event propagation**.

3. To add a page module interface, open the property sheet of the report page or prompt page, click the **Module path** property, and specify the location of the file that contains the JavaScript that you want to use.

#### Related concepts

[Limited and fully interactive reports](#)

Reports can run in limited interactivity or full interactivity mode.

## Align an Object in a Report

---

You can specify a horizontal and vertical alignment for an object in a report to determine where they appear.

[Tables](#) can also be used to determine where objects appear in a report.

**Note:** The **Justify** horizontal alignment works with HTML output but does not apply to PDF output.

#### Procedure

1. Select the object to align.
2. From the toolbar, click one of the available horizontal or vertical alignment buttons.

## Using a table to control where objects appear

---

You can use tables in your report to control where objects appear. Tables can be inserted anywhere in a report, such as a header, a footer, or the page body. After you create a table, insert the objects you want in the cells.

You can also apply a predefined [table style](#) to tables.

The [alignment buttons](#) can also be used to determine where objects appear in a report.

**Tip:** The Singletons on Page Body sample report in the GO Sales (analysis) package includes a table to control the report layout.

#### Procedure

1. Click the **Toolbox** icon , drag **Table**  to the report.

**Tip:** You can also insert a table in an object from the report object toolbar by clicking the **Insert table**  icon.

The **Insert table** dialog box appears.

2. In the **Number of columns** and **Number of rows** boxes, type the number of columns and rows for the table.
3. If you want to have the table span the width of the report page, select the **Maximize width** check box.
4. If you want to add borders to the table, select the **Show borders** check box.
5. If you want to merge cells in the table, select the cells and click the merge cells  button.

6. Select the table object.
7. In the **Properties** pane, under **Positioning**, double-click the **Table Properties** property.
8. To display both the inside and outside borders, do the following:
  - Clear the **Collapse borders** check box.
  - Type a number in the **Cell spacing** text box to define how much space to add between the table cells.
  - Select the **Show empty cell borders** check box to display the borders even for empty cells.
9. To fix the size of the columns in the table, check the **Fixed size** check box.

When this check box is cleared, the table columns expand to fit the text.

## Apply a Table Style

Apply a table style to quickly format tables. You can also apply a table style to lists, crosstabs, and repeater tables.

### About this task

By default, when a new object is inserted in a list or crosstab, the object inherits the style from an object of the same type in the data container. For example, if you insert a measure in a list, the measure inherits the style of a measure that is already in the list, if there is one. If you do not want objects to inherit styles, clear the **Table Style inheritance** option in the **More** options (**More, Options, Report** tab).

The following rules explain how style inheritance is applied to lists and crosstabs.

- Styles are inherited in the following order: custom, client default, and server default.

A custom style is a style that you manually apply. A client default style is one of the styles available in the **Apply Table Style** dialog box. The server default style is the style applied when **Default** is selected in the **Apply Table Style** window.

- When a new column or row is inserted, it inherits the style from the sibling of the same type that is on its right or below it.
- If there is no sibling of the same type, then the style of the nearest sibling that is on its left or above it is applied.
- If there is no sibling of the same type in the container, then the client or server default table style is applied.
- If a custom style is applied to a column or row and the object is then moved to another location, the object retains the custom style.

Custom styles applied to part of an object, such as the header, body, or footer, may be lost. For example, if a container has a footer, the footer is recreated when a column is moved. The recreated footer is rendered using the style that was applied to the footer before you customized its style.

- Deleting a column or row has no impact on the styles of the other objects in the container.
- Styles are preserved if a column is grouped or ungrouped. The same applies when creating or removing sections.
- When drilling up or down, the style of the parent item is applied.

### Procedure

1. Click the table, list, crosstab, or repeater table.
2. From the report object toolbar, click **More > Style > Apply table style**.
3. In the **Table styles** box, click a table style.

**Tip:** Some styles are unique to tables, lists, or crosstabs.

4. If you are applying a table style to a table or list, in the **Apply special styles to** section, select or clear the various column and row check boxes based on how you want to treat the first and last columns and rows.

Some check boxes may not be available for particular table styles, or to particular columns or rows.

5. If you are applying a table style to a list or crosstab and you want the style to be applied to all lists or crosstabs in the report, select the **Set this style as the default for this object type** check box.

For a list, you may need to clear the **First column** and **Last column** check boxes in the **Apply special styles to** section before you can select this check box. In addition, some table styles cannot be set as the default.

## Apply Padding to an Object

---

Apply padding to an object to add white space between the object and its margin or, if there is a border, between the object and its border.

**Tip:** You can quickly apply before or after padding by pressing Tab or Shift+Tab.

**Tip:** The GO Balance Sheet as at Dec 31 2012 sample report in the GO Data Warehouse (analysis) package includes padding.

### Procedure

1. Select the object to which to apply padding.
2. In the **Properties** pane, double-click the **Padding** property.
3. Specify top, bottom, left, and right padding by typing values in the corresponding boxes and choosing the unit of measure.

**Note:** Specifying padding using % as the unit of measure is not supported when producing reports in PDF.

## Set Margins for an Object

---

Set the margins for objects in a report to add white space around them.

For Date, Time, Row Number, and Page Number objects, you can only set the left and right margins. If you want to set the top or bottom margins for these objects, place them in a table or a block. Then set the margin or padding properties on the table or block object.

### Procedure

1. Select the object.
2. In the **Properties** pane, double-click the **Margin** property.
3. Specify the top, bottom, left, and right margins by typing values in the corresponding boxes and choosing the unit of measure.

**Note:** Specifying margins using % as the unit of measure is not supported when producing reports in PDF.

## Add multiple items to a single column

---

You can add multiple items to a single column to condense a report. For example, you have a list report that contains many columns. You can reduce the number of columns in the list by putting related information in a single column.

### Procedure

1. Click the **More** icon , and then click **Locked** to unlock the report.

- From the content pane, drag the items to the column.

For example, you can add data items from the **Source** tab  or text items from the **Toolbox** tab .

## Reuse a Layout Object

---

You can save time by reusing layout objects that you add to a report instead of re-creating them. For example, you have a multiple-page report and you want to show the company logo in the page header of each page. Insert the logo once and reuse it on all other pages.

### Procedure

- Click the object to reuse.

**Tip:** To quickly select the parent of an object, click the object, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.

- In the **Properties** pane, set the **Name** property to a value beginning with a letter to uniquely identify the object and press the Enter key.

IBM Cognos Analytics - Reporting may have already specified a name for the object.

- To reuse the object in another report, open that report.

- Click the **Toolbox** icon , drag the **Layout component reference** object to the location in which it will be reused.

- In the **Component Location** box, do one of the following:

- To reference an object in the current report, click **This report**.
- To reference an object in another report, click **Another report**, click the ellipsis button, and open the report.

**Note:** In active reports, you cannot reference objects from another active report.

- In the **Available components to reference** box, click the object and click **OK**.

- If the referenced object is in another report, click the **Layout component reference** object and in the **Properties** pane, set the **Embed** property to specify how to store the referenced object in the report:

- Click **Copy** to store a copy of the object.

The copy is not automatically updated if the source object is modified.

**Note:** In active reports, you can store referenced objects only by copying them to the report.

- Click **Reference** to store a reference, or pointer, of the object.

The reference of the object is automatically updated if the source object is modified. For example, if you open or run the report, you see the modified object.

### Results

A copy or reference of the object appears where you placed the **Layout component reference** object. If a source object is changed, you can update reused objects.

**Tip:** You can also create a new report or template and add all the objects to share. All your shared objects then reside in a single location, like a library.

## Change a Reused Object

If you reuse an object that contains other objects, you can change the child objects to something different. For example, you have a block object containing a text item in the page header and you decide

to reuse the block in the page footer. However, you want the text item in the page footer block to show different text from that in the page header.

### About this task

If you reuse a visualization, you cannot change the data container of the visualization.

### Procedure

1. In the parent object to reuse, click the child object to change.
2. In the **Properties** pane, set the **Name** property to a value beginning with a letter to uniquely identify the object.

- IBM Cognos Analytics - Reporting may have already specified a name for the object.
3. Select the copy of the parent object you created with the **Layout component reference** object.
  4. In the **Properties** pane, double-click the **Overrides** property.
  5. In the **Overrides** dialog box, select the child object to change and click **OK**.

The child object in the copy of the parent object is replaced by the following text:

**Drop item to override component child.**

6. Drag an object to replace the child object.

You can replace the child object with any other object, not just an object of the same type. For example, if the child object is a text item, you can replace it with an image.

## Update Reused Objects

If a report contains objects referenced in another report, you can quickly update the referenced objects if the source objects have changed. Shared objects are stored in the layout component cache.

### Procedure

1. Open the report to update.

2. Click the **More** icon , click **Layout components**.

The **Layout component cache** dialog box appears, showing all reports that contain referenced objects and the source reports where the objects exist.

3. To view which components are reused, click a source report.

The components that are reused appear in the **Components used** pane.

4. Click **Reload Components** to refresh all referenced objects.

Although referenced objects are automatically refreshed when you open or run a report, clicking this button updates components that were changed while the report is open.

5. Click **Update All Component Copies** to refresh all copied objects.

6. Click **Close**.

## Specify text and container direction

---

You can specify text and container direction by choosing any of these options.

Option	Description
<b>Direction</b>	<p>Sets the reading order of an object, such as right-to-left. If <b>Inherit</b> is selected, the direction is inherited from the parent object. The default is left-to-right.</p> <p>For text objects, an additional choice named <b>Contextual</b> exists. This choice sets the text direction based on the first letter in the text. If the letter belongs to a right-to-left script, the text direction is right-to-left. Otherwise, the text direction is left-to-right. Numbers and special characters do not influence the text direction. For example, if the text starts with a number followed by an Arabic letter, the direction is right-to-left. If the text starts with a number followed by a Latin letter, the direction is left-to-right.</p> <p><b>Tip:</b> You can also set the direction of text objects by clicking the Text direction icon  in the toolbar. This icon is visible only when the IBM Cognos Analytics portal user preference <b>Enable bidirectional support</b> is selected.</p>
<b>Writing mode</b>	Sets the direction and flow of content in an object.
<b>Bidirectional</b>	<p>Sets the level of embedding in an object.</p> <p>For text objects, if the <b>Direction</b> option is set to a value other than <b>(Default)</b> and no value is selected for this option, this option is set to <b>Embed</b>. Setting this option to <b>Embed</b> ensures that the base text direction specified for the text is applied.</p>
<b>Justification</b>	Sets the type of alignment used to justify text in an object.
<b>Kashida space</b>	Sets the ratio of kashida expansion to white space expansion when justifying lines of text in the object. This property is used in languages that use the Arabic writing script.

## About this task

Specifying text direction and container direction depends on the object selected in the report. The following list describes the types of objects in Reporting that you can specify text or container direction.

- Compound objects

Compound objects are container objects that contain text. Examples include charts, maps, active reports, and prompts. You cannot set text direction for specific text objects in a compound object.

To specify container direction for compound objects, click the **Direction & justification** property for the object. To specify text direction for text in compound objects, click the **Contained text direction** property for the object.

- Container objects

You can specify only container direction for container objects, such as a report page. Click the **Direction & justification** property for the object to specify container direction.

By default, the text direction of text in a container object is inherited from the container.

- Text objects

For all text objects, the **Direction & justification** property specifies the text direction.

In charts, container direction impacts all aspects of a chart. The following list describes the parts of a chart that are affected by container direction.

- The chart itself.
- The location of the Y-axis and the horizontal run direction of the X-axis.
- The labeling, including the orientation of angled labels on axes.
- The location of the legend as well as the legend content.

Container direction has no impact on rotary axes. For example, the slices in a pie always progress in the same direction around the pie. However, container direction does affect labelling as well as position and direction of the legend.

**Note:** You cannot specify base text direction and container direction for legacy charts.

### Procedure

1. Click an object.

**Tip:** To specify the base text direction of a text object that is inside another object, such as a list column, you must first unlock  the report.

2. In the **Properties** pane, click one of the following properties:

- **Direction & justification**
- **Contained text direction**

This property applies only to compound objects.

3. Specify the text direction and container direction options that you want.

### Related concepts

[Support for bidirectional languages](#)

## Specify line spacing and breaking

You can specify text properties by choosing any of these options.

Option	Description
<b>Line height</b>	Sets the distance between lines of text in an object.
<b>Letter spacing</b>	Sets the amount of additional space between letters in an object.
<b>Text indent</b>	Sets the indentation of the first line of text in an object.  <b>Note:</b> This property works with HTML output but does not apply to PDF output.
<b>Word break</b>	Sets line-breaking behavior within words.
<b>Break words when necessary</b>	Sets whether to break words when the content exceeds the boundaries of an object.
<b>Enforce stricter line-breaking rules for Japanese Text</b>	Sets line-breaking rules for Japanese text.

### Procedure

1. Click an object.

2. In the **Properties** pane, double-click the **Spacing & breaking** property.
3. Specify the text properties.

## Specify the Height and Width of an Object

You can specify the height and width of objects using various units of measurement. In addition, if the object is a field set, text box prompt, prompt button, hyperlink button, block, or a conditional block, you can specify how to handle content overflow. Specify the height and width by choosing any of these options.

Option	Description
<b>Height</b>	Sets the height of the object.
<b>Width</b>	Sets the width of the object.
<b>Content is not clipped</b>	If the contents of the block exceed the height or width of the block, the block automatically resizes to fit the contents.
<b>Content is clipped</b>	If the contents of the block exceed the height or width of the block, the content is clipped. <b>Note:</b> The clipped content still exists. It is just not visible in the block.
<b>Use scrollbars only when necessary</b>	If the contents of the block exceed the height or width of the block, scrollbars are added to the block.
<b>Always use scrollbars</b>	Scrollbars are added to the block.

Do not use percentages to resize charts and maps that contain interactive elements that are activated when you pause the pointer over them, such as tooltips or drill-through links, because the browser is unable to realign the hard-coded hot spots after an image is resized.

When you use a percentage to specify the size of an object, the percentage is relative to the object's parent. In some cases, setting the size of an object using percentages will not give you the results that you want unless you also specify the size of the parent container.

### Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Size & overflow** property and specify the height and width.

## Control how other objects flow around an object

You can control how objects flow around other objects by choosing any of the following options.

Option	Description
<b>Float</b>	Sets how other objects flow around the object.
<b>Allow floating objects on both sides</b>	Allows other objects to flow on both sides. The <b>Float</b> property must be set.

Option	Description
<b>Move below any floating object on the left side</b>	If there are other objects to the left of the object, the object moves below those objects. The <b>Float</b> property must be set.
<b>Move below any floating object on the right side</b>	If there are other objects to the right of the object, the object moves under those objects. The <b>Float</b> property must be set.
<b>Move below any floating object</b>	Moves the object under any other object in which the <b>Float</b> property was set.

#### Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Floating** property.
3. Specify how other objects flow around the object by specifying the floating options.

## Specify Report Properties

---

You can change the default report property settings.

#### Procedure

1. Click the **Show properties** icon , and navigate to the report level properties.
2. To specify the classes that IBM Cognos Analytics - Reporting uses to format objects, click **Report styles** and choose one of the available options.
3. For reports with multiple data containers, to render the default number of rows of each data container on each HTML page, you must set the **Page break by data container for interactive HTML** option to **Yes**. The default value is **No**.
4. To show each report page in its own tab in HTML output, click the **View pages as tabs** menu and select the location where you want the tabs to appear in browsers.
5. To create a single, scrollable HTML page when you run and save this report as HTML from the IBM Cognos Analytics portal, clear the **Paginate saved HTML output** check box.

The default is to paginate HTML reports with the same page breaks as PDF reports. The single, scrollable HTML page will be available from the IBM Cognos Analytics portal when you click the view report output versions action .

6. If you work with reports that are created in IBM Cognos ReportNet and you want to create CSV report output, click **Use 1.x CSV export**.

This option ensures that all the query columns are exported. In IBM Cognos ReportNet, if a data item was referenced by using the **Properties** property of a list, it was included in the CSV output. The default is to export only the columns in the list.

#### Related concepts

[Create and modify report and object styles](#)

[Controlling the Rows Per Page for Multiple Containers in HTML and PDF](#)

#### Related tasks

[Producing tabbed reports](#)

When you produce reports in HTML format, you can show each report page as a tab.

## Create and modify report and object styles

---

Create your own classes or modify existing classes in a report to format objects across a report according to your particular needs. In IBM Cognos Analytics - Reporting, objects in reports are assigned a Cascading Style Sheet (CSS) class that provides a default style for the object. For example, when you create a new report, the report title has the class property **Report title text** assigned to it. In addition, objects inherit the classes set on their parent objects.

You can use classes to highlight data using conditional styles.

Classes you create or modify can be applied only to the current report. To create or modify classes for all reports, you must modify a layout style sheet. In addition, some classes can be used to format Query Studio reports.

If you use the Microsoft Internet Explorer Web browser, version 6, some color gradients used in the 10.x default report styles are not supported.

### Modify the report style

You can define whether your report uses the default styles for this version or the styles from a previous version.

#### Procedure

1. Click the **Show properties** icon .

2. Click **Report styles** and select one of the following options:

- To work with classes in the default style sheet, click **10.x styles**.
- To work with classes that were used in IBM Cognos 8, click **8.x styles**.

Use 8.x report styles when you are working with reports created in IBM Cognos 8 and you want to preserve their original appearance.

- To work with classes that were used in IBM Cognos ReportNet, click **1.x styles**.

Use 1.x report styles when you are working with reports created in ReportNet and you want to preserve their original appearance.

- To work with classes that have minimal styling defined, click **Simplified styles**.

This option is useful when creating financial reports.

### Modify object styles

You can change global classes to modify the style of all objects in a report or you can modify local classes and apply them to specific objects.

#### Procedure

1. Click the **Pages** icon , and click **Classes**.

2. To create a new class, click the **Toolbox** icon , drag **Class** to the **Local Classes** pane.

3. To modify an existing class, in the **Local Classes** or **Global Class Extensions** pane, click the class.

Modify a global class to apply a change to all objects that use that class. For example, if you modified the style **List column title cell**, all column titles in lists will reflect your modifications.

**Tip:** Ctrl+click classes to make the same change to more than one class.

4. In the **Properties** pane, modify the properties to specify your desired formatting.

**Tip:** Look at the **Preview** pane to preview your changes for different report objects, such as blocks, table cells, and text items.

If you modify a global class, a pencil symbol appears beside the global class icon to indicate that the class was modified.

5. Apply the class to objects:

- Click the **Pages** icon, and click a report page.
- Click an object to which to apply a class.
- In the **Properties** pane, double-click the **Class** property.
- Click the classes to apply from the **Local classes** and **Global classes** panes and click the right arrow button 
- If you applied more than one class, in the **Selected classes** pane, specify the order in which the classes are applied using the up and down arrow buttons.

Classes in the **Selected classes** pane are applied from top to bottom. The style properties from all classes are merged together when they are applied. However, if the classes have style properties in common, the properties from the last class applied override those from previous classes.

## Reusing styles from another report

You can apply local and global styles or themes from one report in another report.

### About this task

Local styling is kept when you reference styles from another report. However, you can remove some or all local styling from the target report.

If the referenced report is renamed or moved, the reference information in the target report is automatically updated.

You can reference local classes only if local classes with the same name exist in the target report. You can reference styles from a report only if you have the permissions to access the report. If you referenced styles from a report and the permissions for the report are changed so that you can no longer access it, the referenced styles are still applied when the target report is run.

You cannot use a report that contains referenced styles as the source report for style references for other reports.

If the target report contains more than one page, the **Preview** pane in the **Report Style References** window shows how the referenced styles are applied in the report page that you are currently viewing.

**Tip:** You can see which global classes contain inherited styles when you click **Pages > Classes**. Global classes that reference styles from another report are identified by the referenced styles icon . You can also modify classes that contain referenced styles. Such classes are identified by the modified referenced styles icon .

### Procedure

1. Click the **Show properties** icon , click the select ancestor icon , click Report, and then, in the **STYLE** section, click **Theme**.
2. Select the **Apply style from report** check box.
3. Click the ellipsis icon and open the report that contains the styles that you want to reuse.
4. To remove local styles in the report, in the **Remove custom styles from the current report** section, select the check boxes of the styles that you want to remove.
5. To specify when to refresh styles when styles in the referenced report are modified, in the **Refresh report styles** section, select one of the following options.

- To refresh styles automatically, click the **Run time** radio button.
- To control when styles are refreshed, click the **Manually** radio button.

When this choice is selected, styles are refreshed only when you click the **Refresh now** icon.

### **Related concepts**

#### Templates and themes

IBM Cognos Analytics includes several basic report templates and color themes that you can choose from when you create a new report.

## **(Don't Print) class**

The **(Don't Print)** class allows HTML items to display in the Web browser but not to print.

The **(Don't Print)** class behaves as follows in the various report output formats:

- HTML

The Web browser defines the behavior. The HTML standard is that the item appears on the screen in the Web browser but is excluded by the print operation of the Web browser.

- PDF

The item is excluded from the output.

- Microsoft Excel 2002 spreadsheet software

The class is specified in the HTML that IBM Cognos uses to render Microsoft Excel 2002 output.

However, Microsoft Excel 2002 does not appear to honor it and displays the item as missing some or all other style definitions.

- Microsoft Excel 2007 spreadsheet software

The item is excluded from the output.

- CSV

The item is included in the output.

- XML

The item is included in the output.

An alternative way to consistently exclude a report object from HTML, PDF and Microsoft Excel output is to set the **Box Type** property for the object to **None**. CSV and XML report outputs will still contain the object.

## **Modify classes to format Query Studio reports**

Some global classes are specific to IBM Cognos Query Studio or can be applied to Query Studio reports. You can modify the following classes to format Query Studio reports.

To format a Query Studio report using the modified classes, the template must be applied to the report. For more information about applying a template to a Query Studio report, see the *Query Studio User Guide*.

<b>Class</b>	<b>Description</b>
<b>List column body cell</b>	Style used to format list data.
<b>List column title cell</b>	Style used to format list column titles.

To modify classes, you must

1. Create a Query Studio template.
2. Modify the global classes.
3. Save the template.

## Modifying the default layout style sheet

In addition to creating or modifying classes in a report, you can create and modify classes that will apply to all reports. Default styles are stored in a style sheet named GlobalReportStyles.css.

For information about modifying the style sheet, see the following topics:

- [Chapter 3 - Modify Global Style Sheet in How to Implement a Corporate-Wide Reporting Style Using IBM Cognos BI](#)
- [Create Custom Palettes in IBM Cognos 10 Report Studio](#)

**Important:** The documents *How to Implement a Corporate-Wide Reporting Style Using IBM Cognos BI* and *Create Custom Palettes in IBM Cognos 10 Report Studio* refer to Cognos BI 10.2.2. However, the information also applies to Cognos Analytics 11. The only difference is that in Cognos 11, the location `install_location\webcontent\pat` has changed to `install_location\webcontent\bi\pat`.

## Add color to an object

---

You can add background and foreground color to objects in the report. The foreground color applies to the text within objects.

**Tip:** The TOC Report sample report in the GO Data Warehouse (query) package includes objects with color.

### About this task

When you open one of the color windows, such as the **Foreground Color** window, you can save up to eight colors as favorites. Saving colors as favorites is useful when you define a custom color. When you save a custom color as a favorite, you do not need to reenter the RGB color values when you want to use the color elsewhere in the report.

Favorite colors are stored in cookies. As a result, favorite colors are shared across all Reporting users.

### Procedure

1. Select the object.

**Tip:** To quickly select the parent of an object, click the object, and then, from the title bar of the **Properties** pane, click the **Select ancestor** icon . You can also find a version of the **Select ancestor** icon in the report object toolbar.

2. Do one of the following:

- From the report object toolbar, click the **Background color** icon  or click the **Font** icon , and then click **Foreground color**.
- In the **Properties** pane, double-click the **Background color** or **Foreground color** property.

3. To apply an existing color, click the **Basic colors** tab or **Color swatch** tab and choose one of the available colors.

Use a basic color to select a color from a small set of colors. Use the color swatch to select from 216 available colors.

4. To apply a custom color, click the **Custom color** tab and type values in the **Red**, **Green**, and **Blue** boxes.

The values must be hexadecimal.

5. If the object is an extensible visualization and you want to specify the transparency, under **Transparency (%)**, type a percentage value or use the slider to set the transparency to the value that you want.

6. To save a color as a favorite, click **Set as favorite**.

If you save a color with a transparency value as a favorite, the transparency is applied only when you add the favorite color to an extensible visualization.

**Tip:** You can modify or replace a color that was saved as a favorite. Click the favorite color, make the changes that you want, and click **Set as favorite**.

#### Related tasks

[Add background effects to a chart object in a legacy chart](#)



# Chapter 13. Working with your external data

You can supplement your enterprise data with your own external or personal data file.

You can create a report that uses an external file that contains data that is not part of your IBM Cognos Analytics enterprise data. For example, you are an analyst and you receive a spreadsheet that contains what-if data about opening new branches of your retail store. You are asked to analyze the impact of these possible new branches on existing sales volumes. You link this scenario data with your enterprise data and create a professional report in IBM Cognos Analytics.

You import your own data file and start reporting on it right away. After you import the file, it is protected by the same IBM Cognos security as your enterprise data. As a result, you can report on your data in a secure and private environment.

You can import your external data in different tools.

## Upload files tool

You can import the following types of files:

- Microsoft Excel (.xls and .xlsx) spreadsheet software files
- Delimited text files, such as .csv files

After you import your data, it is saved in a database. You then publish a package that contains your data and you can then report on your data. You can grant other users access to your personal data by sharing the corresponding packages.

## Manage External Data tool

You can import the following types of files:

- Microsoft Excel (.xls and .xlsx) spreadsheet software files
- Tab-delimited text (.txt) files
- Comma-separated (.csv) files
- XML (\*.xml) files

After you import your data, you then publish a package that contains your data in addition to the data contained in an existing package. You can then report on your data.

To review an up-to-date list of the environments that are supported by IBM Cognos products, including information about operating systems, patches, browsers, web servers, directory servers, database servers, and application servers, see [Supported Software Environments](http://www.ibm.com/support/docview.wss?uid=swg27047186) ([www.ibm.com/support/docview.wss?uid=swg27047186](http://www.ibm.com/support/docview.wss?uid=swg27047186)).

## Manage external data

You can supplement your enterprise data with your own external or personal data file by using the

## Manage External Data tool

You import your own data file and start reporting on it right away. After you import the file, it is protected by the same IBM Cognos security as your enterprise data. As a result, you can report on your data in a secure and private environment.

You can use the following types of files:

- Microsoft Excel (.xls) spreadsheet software files

The **Manage External Data** tool supports external data sources from Microsoft Excel up to version Microsoft Excel 2007.

To review an up-to-date list of the environments that are supported by IBM Cognos products, including information about operating systems, patches, browsers, web servers, directory servers, database servers, and application servers, see [Supported Software Environments](http://www.ibm.com/support/docview.wss?uid=swg27047186) ([www.ibm.com/support/docview.wss?uid=swg27047186](http://www.ibm.com/support/docview.wss?uid=swg27047186)).

- Tab-delimited text (.txt) files
- Comma-separated (.csv) files
- XML (\*.xml) files

Your XML files must adhere to the IBM Cognos schema specified at `c10_location/bin/xmldata.xsd`. For more information, contact your IBM Cognos administrator.

This schema consists of a `dataset` element, which contains a `metadata` element and a `data` element. The `metadata` element contains the data item information in `item` elements. The `data` element contains all the row and value elements.

For example, the following simple XML code produces a table with two columns (Product Number and Color) and two rows of data.

```
<?xml version="1.0" ?> <dataset xmlns="http://developer.cognos.com/schemas/xmldata/1/" xmlns:xs="http://www.w3.org/2001/XMLSchema-instance"> <metadata> <item name="Product Number" type="xs:string" length="6" scale="0" precision="2" /> <item name="Color" type="xs:string" length="18" scale="0" precision="8" /> </metadata> <data> <row> <value>1</value> <value>Red</value> </row> <row> <value>2</value> <value>Blue</value> </row> </data> </dataset>
```

To work with your external data by using the **Manage External Data** tool, you start with an existing IBM Cognos package. You import data from your external file into the package and create links between data items in your file and data items in your enterprise data source. You then publish a new package that you can use to create reports that use your data and your enterprise data, or reports that use only your data. You can link your external data with both dimensional and relational data sources.

Before you can import your own external data file, your IBM Cognos administrator must grant you permission for the **Allow External Data** capability that is found within the **Reporting** capability. You must also have permissions to use IBM Cognos Analytics - Reporting.

### Packages that contain external data

When you import external data into a package with the **Manage External Data** tool, you do not overwrite the original package. You create a new package that includes the original package, the new external data, and any links or relationships that you defined between the two. By default, the new package is saved in the **My content** area of the IBM Cognos Analytics portal, with **External Data** appended to the original package name. You can change where your package is published.

**Note:** The current content language is used to create the new package, and users cannot select the language for the package. For example, the content language in the IBM Cognos Analytics portal is set to English. External data is imported into the GO Sales (query) package, and a new package called GO Sales (query) External Data is created. If the content language is changed to a different language, the package name is not translated, even though GO Sales (query) is a multilingual package.

### IBM Cognos samples

Sample external data sources in Microsoft Excel (.xls) format are provided with IBM Cognos Analytics. You can import these sample files into the Sample Outdoors Company sample reports that are found in the **GO Data Warehouse (analysis)** or **GO Data Warehouse (query)** package.

You can find sample external data source files on the server where IBM Cognos Analytics is installed. Locate the **Team content > Samples > Models > Sample file\_GO sales.xls** file to explore how to work with external data.

To obtain these files, contact your IBM Cognos administrator.

## Preparing to work with your external data

To work with your external data, follow the process in this section.

There are four steps to preparing to work with your external data. The following diagram details these steps.

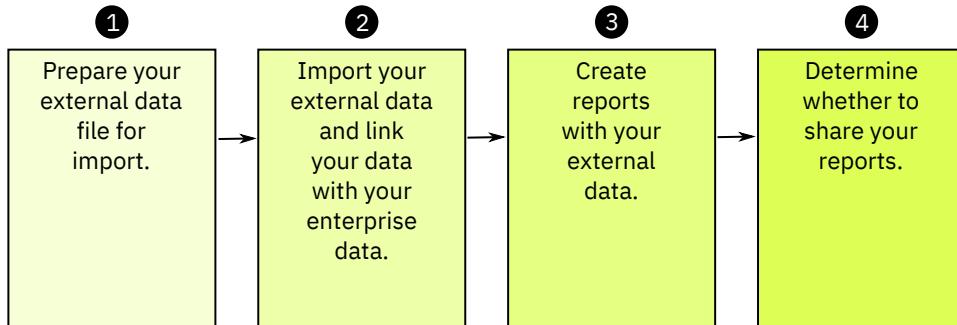


Figure 45. Process to prepare to work with external data

### 1. Prepare your external data file for import.

Ensure that your external data file matches your enterprise data for your reporting needs. For example, if your external data file contains sales values by month, ensure that the formatting of months in your file matches the formatting used in your enterprise data source. Ensure that you can uniquely link at least one column from your external data file, such as product codes or years, with your enterprise data source.

The maximum file size that you can import is 2.5 MB, with a maximum of 20000 rows. You can import a maximum of one external data file per package. Your IBM Cognos modeler can override these governors in IBM Cognos Framework Manager.

### 2. Import your external data.

You import your external data file from your own computer or from a location on your network into an existing IBM Cognos package.

A step-by-step wizard guides you through importing your data. If you want to create reports that contain data from both your external data file and your enterprise data source, you must link data items from the two data sources. You can import all or a subset of data columns from your external file.

By adding external data, you extend an existing IBM Cognos package definition with the new data items from your file and you create a new package.

### 3. Create reports with your external data file.

After you import and link your external data, it appears as a new namespace in the data tree of the **Source** tab and is integrated with the IBM Cognos content.

You can then create reports with your data and perform any operation, such as filtering, sorting, grouping, or adding calculations. When you run the report, it uses data items from your external data file.

You can save reports that contain your external data within the **My content** area of the IBM Cognos Analytics portal.

### 4. Determine whether you want to share your reports that use external data with other people in your organization. If you decide to share, take into account these considerations.

## **Working with Date Data**

If the data that you import contains dates, ensure that the dates use the format yyyy-mm-dd.

## **Working with Dimensional Data Sources**

If your enterprise data source is dimensional, such as OLAP or dimensionally-modeled relational, and you want to link your external data with your enterprise data, you must first create a tabular or list report.

Create and save a list report with your enterprise data that contains the data items that you want to use to link with your external data. Ensure that you remove the aggregate rows that are automatically added in the footer of the list. This list is a projection of your dimensional data source.

When you import your external data, use the list report that you created to link your external data with the query subject from your enterprise data.

Data in your external file is relational by nature because it consists of tables and rows. If your enterprise data source is dimensional, you can still import and work with your external data. However, you cannot mix relational data from your external data files, and dimensional data from your enterprise data source within the same query. For example, a data container, such as a list, crosstab, or chart, uses one query and you cannot mix relational and dimensional data within the same list, crosstab, or chart. Doing so will cause an error.

If you want to use data from both the external data file and the original package within the same query, you must link the external data to a query subject within the current package instead of another report.

## **Working with External Data in an Unsecured IBM Cognos Application**

If your IBM Cognos application is not secured, and users can log on anonymously, you may encounter issues if multiple people import external data in the same package.

For example, Robert imports his external data into package A and saves the package and reports he created in **My content**. Then, Valerie also imports her external data into the same package A and saves the package in **My content**. Valerie has therefore overwritten Robert's external data in package A. Now, if Robert tries to run one of his reports, he encounters errors because his external data is no longer in package A.

To avoid this problem,

- save packages that contain external data with a unique name.
- apply security to your IBM Cognos applications so that users do not share the same **My content** area.

## **Import data**

You select the file to import from your own computer, or from your local area network.

You select which columns to import.

You then specify a namespace to use. The namespace provides a unique name to associate with the data

items that you import. The namespace appears in the data tree in the **Source** tab  and is used to organize the data items. By default, the namespace is the imported file name without the extension.

If you change the default name for the namespace, you are prompted to select the external data file each time that you run the report. To avoid this prompt, select the **Allow server to automatically load file** check box.

## **Procedure**

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.
2. On the **Select Data** page of the wizard, under **External data file**, click **Browse** and select your external data file to import.

If you want the server to load the file without prompting users when they run the report, select the **Allow the server to automatically load the file** check box.

If selected, you must use the Universal Naming Convention (UNC) path, such as `\servername\filename`, and you must ensure that the IBM Cognos server has access to the file.

3. Under **Data items**, select the check box for the data items that you want to import.

4. Type a name for the namespace and click **Next**.

The namespace appears in the **Source** tree, and identifies the external data within the package. By default, the name is the name of your imported external data file.

5. If you do not want to link your data or change the data attributes, click **Finish** now.

### Related tasks

[MSR-PD-0012 error when importing external data](#)

[MSR-PD-0013 error when importing external data](#)

## Map data

If you want to create reports that contain data from both your external file and from your enterprise data, you must link at least one query subject from your package or from an existing report to a data item in your external data. This mapping creates a relationship between your external data and your enterprise data. For example, your external data contains information about employees, including an employee number. You map the employee number from your external data file to the employee number in your enterprise data. This ensures that your data is integrated smoothly.

### About this task

Mapping a data item in your external data to a query subject that references other query subjects is not supported. For example, the query subject cannot contain a calculation that references a query item from another query subject. Such a mapping produces the following error message:

*MSR-PD-0001 Failed to relate external data to objects in the underlying package. The item [query item] does not lead to a query subject.*

### Procedure

1. On the **Data Mapping** page, link existing query subjects in your enterprise data to data items in your external data file.

2. Under **Existing query subject / report**, click the ellipsis button and do one of the following:

- If you want to select a query subject from the data tree, click **Choose Query Subject** and select a query subject.

**Note:** This option is not available when working with dimensional packages.

- If you want to select from the query subjects included in a report, click **Choose Report** and select a report.

3. Click the two data items that you want to link and click the **New link** button.

You cannot link a data item in your external data to a calculation in a query subject.

A link appears linking two data items.

**Tip:** You can create multiple links for multiple data items. To delete a link, select the link and click **Delete Link**.

4. If your report is using the dynamic query mode, specify the type of filter to generate for the join relationship by clicking the **Join filter type (DQM only)** menu and choosing one of the available values.

A join relationship is created when you link data items. The filter type is used to optimize the join relationship. In generates an IN predicate of constant values. Between generates a BETWEEN predicate using the minimum and maximum values of the join keys. Table generates a table row constructor form of the IN predicate. The default value is In.

5. Click **Next**.

## Finish importing data

You can change how query items from your external data file appear after they are imported into IBM Cognos Analytics. For example, you can change the number of decimal places or the default summary.

If you want to use numeric data from your external data source as a measure in a crosstab, you must assign that data item a default summary other than **Unsupported**. A specified default summary makes

the data item appear as a measure in the data tree in the **Source** tab . Otherwise, if you add the data item with an **Unsupported** default summary as the measure in a crosstab, no values appear.

Attribute	Description
Data type	Identifies whether data in the file is one of the following types: <b>Integer</b> , which represents numeric values. <b>Decimal</b> , which represents integer values that are scaled by a variable power of 10. <b>Text</b> , which represents values that contain letters and symbols. <b>Date or Date Time</b> , which represent dates and times.
Default summary	Identifies Sum, Average, Max, Min, Count or Unsupported as the default type of summary for the data item. Applies only to <b>Integer</b> and <b>Decimal</b> data types.
Decimal places	Specifies the number of decimal places for the data item. Applies only to the <b>Decimal</b> data type.

If you mapped links between data items in your external data and data items in your enterprise data, specify the options that define the relationships between the data items.

For each data item that you import and link, specify whether values are unique or exist more than once in both your external data and in your enterprise data. You can also specify how to handle rows that contain missing values in the report results.

### Procedure

1. On the **Data Attributes** page, specify the attributes for each data item after it is imported and click **Next**.

For example, if you import numeric data items, you can change the default summary and number of decimal places.

2. On the **Mapping Options** page, specify the relationships between the linked data items and how to process the results in the report output.
3. Click **Finish**.

## Publish the package

You can change the name and location of the package with your external data to help you differentiate between data packages.

### Procedure

1. If you want to rename the package that will be published or change the location where it is published, do the following:
  - In the **Manage external data** dialog, under **Package name**, click the ellipsis button.

- Type a new name for the package and select the location where to save it.
  - Click **Save**.
2. Click **Publish**.

## Results

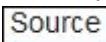
IBM Cognos Analytics imports your external data into a new package. A namespace with the data items from your external file appears in the data tree in the **Source** tab .

You can now create reports with your external data.

## Edit your external data

After you import your data, you can change the data mappings and options that you originally specified and republish the package.

You can

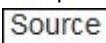
- Rename the namespace, which renames the organizational folder that appears in the data tree in the **Source** tab . If you change the namespace, you are prompted for the external data file when you run the report.
- Change which columns to import.
- Change the data mapping links.
- Change the data attributes.
- Change the mapping options.

You can also import multiple external data files into the same package. To do this, your data modeler must modify governors in the model and republish the package that contains your enterprise data. For more information, see the *IBM Cognos Framework Manager User Guide*.

## Procedure

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.
2. In the **Manage external data** dialog box, select the external data to edit and click the **Edit** icon .
3. In the left pane, select the options that you want to change.
4. Click **OK** and then republish the package.

## Results

IBM Cognos Analytics reimports your external data and updates the data items that appear in the data tree in the **Source** tab .

You can now create and update reports with your external data.

## Delete your external data

You can delete your external data from within the package that you created if you no longer need it.

## Procedure

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.

2. In the **Manage external data** dialog box, select the external data package to delete and click the  delete button.
3. Click **Publish**.

#### Results

The external data namespace is removed from the package.

If you also no longer require the external data package or any reports created with the package, you can delete it from within the IBM Cognos Analytics portal.

### Running a report that contains external data

Reports that contain external data run the same way as reports that contain only enterprise data. If you have access to the report, you will also have access to the external data included within the report.

You may be prompted to select the location of the external data file when you run the report if either

- the report author did not specify to automatically load the file.
- the IBM Cognos Analytics server cannot locate the file.

However, you are not re-prompted within the same Web browser session.

You can determine whether data in a report uses external data by tracing its lineage. For more information, see [“View Lineage Information for a Data Item” on page 28](#).

### Making your reports public

After you create a report that uses your external data, you may want to make it public to share it with coworkers. They can run your report using your external data file that you made available on a public network drive that the IBM Cognos server can access. They can also use their own version of the file. If they use their own version, the file must contain the same columns as your original external data file that you used to import the data and create the report. In addition, you must clear the **Allow server to automatically load file** check box in the **Select Data** page of the **Manage external data** wizard.

To make reports public, you must save them in the **Team content** area of the IBM Cognos Analytics portal. To save content in **Public Folders**, you must have the appropriate permissions. Contact your IBM Cognos administrator to obtain permissions and to inform him or her that you are sharing a package or files.

If you share your reports, ensure that you maintain the reports.

# Chapter 14. Using conditions

You can define conditions to control what users see when they run a report. Conditions can apply to specific items in a report. For example, you can define a conditional style to highlight exceptional data, such as product revenue that exceeds your target.

Conditions can also apply at the report layout level. Conditional layouts are useful for delivering reports to a multilingual audience. For example, you can have text items, such as titles and cover pages, appear in the same language as the data in the report.

## Related concepts

[Creating a Conditional Color Palette in a Chart](#)

## Highlight data using a conditional style

Add conditional styles to your report to better identify exceptional or unexpected results. A conditional style is a format, such as cell shading or font color, that is applied to objects if a specified condition is true.

For example, you want to automatically highlight in green the departments in your organization that meet their budget quotas and highlight in red the departments that go over budget. Creating conditional styles color-codes information in your reports so that you can find areas that need attention.

You can apply multiple conditional styles to objects. For example, you can apply one style in specific cells and another style for the overall report. If multiple styles set the same property, such as font color, the last style in the list is applied.

You can apply conditional styles based on any data item in your report.

You can create the following types of conditional styles.

Type	Description
Numeric Range	Highlights straight numerical data, such as revenues and losses.
Date/Time Range	Highlights data from specific dates and times.
Date Range	Highlights data from specific dates.
Time Range	Highlights data from specific times.
Interval	Highlights data falling between set intervals.
String	Highlights specific alphanumeric items in a report. For example, you can highlight all instances of a specific word or phrase, such as Equipment. String criteria are case-sensitive. If multiple string conditions are met, only the first conditional style is applied.
Advanced	Creates conditional styles that use calculations or expressions. If multiple advanced conditions are met, only the first conditional style is applied.

You can also apply a conditional color palette to a chart.

**Note:** Conditional styles and conditional data formatting do not work on chart axis labels. If you apply a conditional style or conditional data formatting to a chart axis, only the first style defined is applied.

You can perform a search to find objects in your report that use conditional styles. You can also view all the conditional styles used in your report to delete or modify them.

You can also use variables to highlight data. If a report contains both conditional styles and style variables, the style variables are applied first and then the conditional styles are applied.

**Tip:** The Return Quantity by Order Method sample report in the GO Data Warehouse (analysis) package includes conditional highlighting.

## Create a new conditional style

You can apply conditional styles based on any data item in your report.

### Procedure

1. Click the object for which you want to define a conditional style and click the **Conditional styles** icon .

**Tip:** You can also click the object, and then, in the **Properties** pane, set the **Conditional styles** property.

2. Click the add button  and click **New Conditional Style**.

3. Select the data item to determine the condition and click **OK**.

The type of conditional style that you can use depends on the type of data item you select.

4. In the **Name** box, type a name for the conditional style.

5. To define a numeric value, date/time, date, time, or interval condition:

- Click the new button  and select a value to define a threshold.

The value appears in the **Range** column, and two ranges are created.

- For each range, under **Style**, click one of the predefined styles to apply to the range or click the edit button  and create a new style.

**Tip:** You can also define a style for the cells in your report that have missing values.

- Repeat these steps to add other conditions.

**Tip:** Under **Style**, pause the pointer over each range  to see the condition produced for that range.

- To move a value above or below a threshold, click the arrow button  next to the value.

For example, you insert a threshold value of five million. By default, the ranges are less than or equal to five million and greater than five million. Moving the five million value above the threshold changes the ranges to less than five million and greater than or equal to five million.

6. To define a string condition:

- Click the new button and select how to define the condition.
- To select more than one individual value, click **Select Multiple Values** and click the values.
- To type specific values, click **Enter Values** and type the values.
- To specify your own criteria, such as values that begin with the letter A, click **Enter String Criteria** and specify the condition.

- For each condition, under **Style**, click one of the predefined styles to apply or click the edit style button and create a new style. Specify the style to apply to remaining values by clicking one of the predefined styles beside **Remaining values (including future values)**.
  - Specify the order in which to evaluate the conditions.
- Conditions are evaluated from top to bottom, and the first condition that is met is applied.

## Reuse an existing conditional style

You can create a conditional style once and reuse it on multiple objects in your report. You can specify the order in which conditional styles are applied. You can also use existing local classes as your conditional styles.

### Procedure

1. Click the data item for which you want to define a conditional style, and then click the **Conditional styles** icon .
- Tip:** You can also click the data item, and then, in the **Properties** pane, set the **Conditional styles** property.
2. Click the add button , click **Use Existing Conditional Style**, and select the style.

## Create an advanced conditional style

You can create advanced conditional styles that use calculations or expressions.

If multiple advanced conditions are met, only the first conditional style is applied.

### Procedure

1. Click the data item for which you want to define a conditional style, and then click the **Conditional styles** icon .
- Tip:** You can also click the data item, and then, in the **Properties** pane, set the **Conditional styles** property.
2. Click the add button  and click **Advanced Conditional Style**.
3. Type a name for the conditional style.
4. Click the add button and specify the expression that defines the condition.
5. For each condition, under **Style**, click one of the predefined styles to apply or click the edit button  and create a new style. Specify the style to apply to remaining values by clicking one of the predefined styles beside **Remaining values (including future values)**.
6. Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

## Manage conditional styles

You can view, modify, or delete the conditional styles that are applied to your report. You can also define a new conditional style.

In the IBM Cognos Analytics - Reporting options, you can specify whether to automatically delete conditional styles that are no longer used in a report.

## Procedure

Click the More icon , and then click **Conditional styles**.

## Highlight data using a style variable

Highlight data in your report to better identify exceptional results. For example, you want to identify sales representatives who have exceeded their quota. You create a condition that checks whether each representative's sales for the year is greater than their quota for the year.

Style variables are useful if you are working with reports that were created in a previous version of IBM Cognos Analytics or if you want to use language variables to specify conditional styles.

You can also use conditional styles to highlight data. If a report contains both conditional styles and style variables, the style variables are applied before the conditional styles.

## Procedure

1. Create a variable and define the condition that determines if the data will be highlighted.
2. In the work area, click the column to highlight based on the condition.
3. In the **Properties** pane, double-click the **Style variable** property.
4. Click **Variable**, click the variable to assign to the object, and click **OK**.
5. If you assigned a string variable, in the **Values** box, select the values for the condition to support.

**Tip:** A default value exists for the variable, and it is always selected.

6. If you assigned a language variable, in the **Values** box, select the languages for the condition to support.

**Tip:** A default value exists for the variable, and it is always selected.

7. Click **OK**.



8. Click the **Condition explorer** icon  and click a value other than the default value.

**Tip:** When you select a value in the condition explorer, the Explorer bar becomes green to indicate that conditional formatting is turned on and that any changes you make to the report apply only to the variable value.

For example, if you created a Boolean variable, click **Yes**.

9. In the **Properties** pane, specify the formatting with which to highlight the column when the condition is satisfied.

For example, click the **Border** property to create a thicker border around the column.

10. Repeat steps 8 to 9 for other possible values defined for the variable.

**Tip:** To view the report with no variables applied, click the **Condition explorer** icon and click **(No variable)** or triple-click the Explorer bar.

## Results

When you run the report, the report objects to which you applied the variable are highlighted when the condition is satisfied. For example, if you created a Boolean variable, the objects are highlighted when the condition is met. If the condition is not satisfied for any object, no conditional formatting is applied.

## Adding conditional rendering to a report

You can specify which objects are rendered when a report is run.

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

## Add a variable from the condition explorer

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

### Procedure

1. Click the **Condition explorer** icon  and click **Variables**.
2. Click the **Toolbox** icon , drag one of the following variables to the **Variables** pane:
  - To create a variable that has only two possible values, **Yes** and **No**, drag **Boolean Variable**.
  - To create a variable whose values are string-based, drag **String Variable**.
  - To create a variable whose values are different languages, drag **Report Language Variable**.
3. If you created a Boolean variable, in the **Expression Definition** box, define the condition and click **OK**.

For example, the following expression returns the value **Yes** if revenue is less than one million and the value **No** if revenue is greater than or equal to one million:

[Revenue]<1000000

For information about creating expressions, see “[Using relational calculations](#)” on page 182 or “[Using Dimensional Calculations](#)” on page 227.

4. If you created a string variable, do the following:

- In the **Expression Definition** box, define the condition and click **OK**.

For example, the following expression returns the value **high** if revenue is greater than one million and the value **low** if revenue is less than or equal to one million:

`if ([Revenue]>1000000) then ('high') else ('low')`

For information about creating expressions, see “[Using relational calculations](#)” on page 182 or “[Using Dimensional Calculations](#)” on page 227.

- Click the add button  in the **Values** pane.
- For each value that the variable can assume, type the name of the value that corresponds with the possible outcomes defined in the expression.

For example, in the previous expression, you must create two values for the variable, high and low.

**Tip:** You can create a group by clicking two or more values and then clicking the group values button . For example, you can create a group that includes the available French languages.

5. If you created a language-specific variable, in the **Languages** dialog box, select the languages to support.

## Add a variable from the properties pane

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

### Procedure

1. Select the report object.
2. In the **Properties** pane, under **Conditional**, double-click the conditional property to which to assign the variable.

The following conditional properties are available:

Goal	Conditional Property
<p>Specify a variable based on which text can be conditionally shown.</p> <p>For example, you want different text to appear when a report is run in a different language.</p>	<b>Text source variable</b>
<p>Specify a variable based on which object can be conditionally rendered.</p> <p>For example, you want to make a revenue report smaller by not rendering rows that are below a threshold.</p>	<b>Render variable</b>
<p>Specify a variable based on which object can be conditionally styled.</p> <p>For example, you want data that meets some criterion to appear in a different color.</p>	<b>Style variable</b>
<p>Specify a variable based on which objects in a block can be conditionally rendered. Applies only to conditional block objects that you insert in a report.</p>	<b>Block variable</b>

3. In the **Variable** box, click an existing variable or one of the following variable types:

- <New language variable>
- <New string variable>
- <New boolean variable>

4. In the **New variable** dialog box, in the **Name** box, type the name of the variable.



5. If you created a string variable, click the add button , type the string values to define, and click **OK**.

6. If you created a language variable, select the languages to support and click **OK**.

7. In the **Expression Definition** box, define the condition.

## Hide or show an object

You can hide and show objects in a report based on a condition you define.

You can also specify that an object should not be rendered based on a condition.

**Tip:** The Global Bonus Report sample report in the GO Data Warehouse (analysis) package includes hidden objects.

### Procedure

1. Create a variable, and define the condition that determines if the object is shown or hidden.

**Tip:** Create a Boolean variable to show and hide objects, as this type of variable has only two possible values.

2. Click the **Toolbox** icon , drag a **Conditional blocks** object to the work area.
3. Select the conditional block.
4. In the **Properties** pane, double-click the **Block variable** property.
5. In the **Variable** box, click the variable you created and click **OK**.
6. Set the **Current block** property to **Yes**.

7. From the content pane, drag the object to show or hide to the conditional block.

For example, drag a data item from the **Source** tab or from the **Data items** tab.

You may need to link the report page to a query before you can add a data item to the block.

## Results

When you run the report, the report objects to which you applied the variable are visible when the condition is satisfied and invisible when it is not.

## Add conditional rendering

Add conditional rendering to specify which objects are rendered when a report is run. This is useful when your report contains sensitive data.

Conditional rendering is not the same as hiding objects. When you hide an object, the object exists but is transparent. If an object is not rendered, it is not in the report.

### Procedure

1. Select the list column to be rendered conditionally.

**Tip:** You must select the list column, not the list column body or the list column title. If the body or title is selected, as indicated in the **Properties** pane, click the **Select ancestor** icon  and click the list column.

2. In the **Properties** pane, double-click the **Render variable** property.
3. Click **Variable** and click the variable that will determine if the column will be rendered.
4. In the **Render for** box, select the values that the condition will support.

**Tip:** A default value exists for the variable, and it is always selected.

## Add multiple layouts

Add multiple layouts to show a report in different ways. For example, you can define a different layout for each language in a multilingual report. This allows you to create a single report that can be viewed by report consumers that use different regional settings.

### Procedure

1. Create a variable and define the condition that will be used for each layout.

For example, create a report language variable that includes each language that requires a conditional layout.

**Note:** Expressions used in a conditional layout cannot reference a query.

2. Click the **Show properties** icon , in the **REPORT** section, click **Conditional layouts**.
3. Select a variable, and then select the values that require a separate layout.

### Results

A layout is created for each value you selected. Use the **Pages** icon  to navigate the different layouts. For each layout, click **Report pages** to create a report page or **Prompt pages** to create a prompt page and add objects.

**Tip:** You can create new variables from the **Conditional layouts** dialog. The variables are added to the condition explorer. For more information, see “Add a variable from the condition explorer” on page 289.

## Setting up a multilingual reporting environment

You can create reports that show data in more than one language and use different regional settings. This means that you can create a single report that can be used by report consumers anywhere in the world.

The samples databases provided with IBM Cognos store a selection of text fields, such as names and descriptions, in more than 25 languages to demonstrate a multilingual reporting environment. For information about how data is stored in the samples databases and how the samples databases are set up to use multilingual data, see the *Administration and Security Guide*.

Here is the process for creating a multilingual reporting environment:

- Use multilingual metadata.

The data source administrator can store multilingual data in either individual tables, rows, or columns.

For more information about configuring your database for multilingual reporting, see the *Administration and Security Guide*.

- Create a multilingual model.

Modelers use the modeling capabilities of IBM Cognos Analytics or IBM Cognos Framework Manager to add multilingual metadata to the model from any data source type except OLAP. They add multilingual metadata by defining which languages the model supports, translating text strings in the model for things such as object names and descriptions, and defining which languages are exported in each package. If the data source contains multilingual data, modelers can define queries that retrieve data in the default language for the report user.

For more information, see the *Framework Manager User Guide*.

- Create multilingual maps.

Administrators and modelers use a Microsoft Windows operating system utility named Map Manager to import maps and update labels for maps in IBM Cognos Analytics - Reporting. For map features such as country or region and city names, administrators and modelers can define alternative names to provide multilingual versions of text that appears on the map.

For more information, see the *Map Manager Installation and User Guide*.

- Create a multilingual report.

The report author uses Reporting to create a report that can be viewed in different languages. For example, you can specify that text, such as the title, appears in German when the report is opened by a German user. You can also add translations for text objects, and create other language-dependent objects.

- Specify the language in which a report is viewed.

You can use the IBM Cognos Analytics portal to do the following:

- Define multilingual properties, such as a name, screen tip, and description, for each entry in the portal.
- Specify the default language to be used when a report is run.

**Tip:** You can specify the default language on the run options page, in the report properties, or in your preferences.

- Specify a language, other than the default, to be used when a report is run.

For more information, see the *IBM Cognos Analytics portal User Guide*.

The data then appears in the language and with the regional settings specified in

- the user's Web browser options
- the run options
- the IBM Cognos Analytics portal preferences

Any text that users or authors add appears in the language in which they typed it.

## Create a multilingual report in Reporting

You can create a report in IBM Cognos Analytics - Reporting that can be viewed in different languages. For example, you can specify that text such as the title appears in German when the report is opened by a

German user. You can also add translations for text objects and create other language-dependent objects.

## Before you begin

If you want the report to show data in different languages, the model must also be multilingual.

## Procedure

1. Create a report language variable.
2. In the work area, select the object to modify based on a language.
3. In the **Properties** pane, double-click the **Style variable** property.

If you are changing the language of a text string, click **Text source variable** instead.

4. Click **Variable** and click the language variable you created.
5. In the **Values** box, select the languages for the condition to support and click **OK**.

**Tip:** A default value exists for the variable, and it is always selected.

6. Click the **Condition explorer** icon  and a language for the variable.

**Tip:** When you select a value in the condition explorer, the Explorer bar becomes green to indicate that conditional formatting is turned on and that any changes you make to the report apply only to the variable value.

7. In the **Properties** pane, specify the formatting for the language.

For example, to change the language of a text string, double-click the **Text** property and select the new string.

8. Press Enter when you are done.
9. Repeat steps 6 to 8 for all other languages specified for the variable.

**Tip:** To view the report with no variables applied, pause the pointer over the condition explorer button and click **(No variable)** or triple-click the Explorer bar.

## Results

When you run the report, the report objects to which you applied the variable are formatted according to the browser's language.



# Chapter 15. Bursting Reports

Burst a report to distribute its contents to various recipients. Bursting is the process of running a report once and then dividing the results for recipients who each view a subset of the data. For example, salespeople in different regions each need a report showing the sales target for their country or region. You use burst reports to send each salesperson only the information they need. Burst reports can be distributed by email or saved to a folder for viewing in the IBM Cognos Analytics portal.

**Tip:** The Bursted Sales Performance Report sample report in the GO Data Warehouse (analysis) package includes bursting.

To burst a report against a dimensional data source, see “[Creating Burst Reports Using Dimensional Data Sources](#)” on page 299.

You cannot burst crosstab or chart reports. However you can burst a report where a container includes a crosstab or chart that is part of a master detail relationship. In this situation, you can burst only HTML, PDF, and XLS output formats; you cannot burst CSV or XML output formats.

For information about avoiding disk space exhaustion when bursting charts or crosstabs, see “[Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service](#)” on page 375.

## Procedure

1. [define burst recipients](#)
2. [specify burst groups](#)
3. [set burst options](#)
4. [enable bursting](#)

## Defining Burst Recipients

Define the recipients who will receive data when the report is run. You can distribute burst reports to individual users, groups, roles, distribution lists, and contacts.

To define the recipients, you create a calculated field, create the burst table in the source database, and then import the table into a package.

## Create a Calculated Field

You can use a calculated field to dynamically create burst report recipients.

## Procedure

1. Click the **Queries** icon , and click the query that will produce the data to distribute.
2. Click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
3. To give the data item a more meaningful name, in the **Name** box, replace the default name.
4. In the **Expression Definition** box, type the expression that will generate the list of recipients and click **OK**.

For example, typing the following expression builds the list of the employees of The Samples Outdoors Company. The expression concatenates the first letter of each employee's first name with their last name.

```
lower(substring([Employee summary (query)].[Employee by organization].[First name],1,1) + [Employee summary (query)].[Employee by organization].[Last name])
```

## Creating the Burst Table in the Source Database

You can create a burst table in the source database for the list of recipients. The steps you must follow depend on the database system you are using. The burst table must contain the following columns:

- A unique identifier

**Tip:** Some database systems do not require a unique identifier for each table.

- A recipient column

- The data item on which to burst

You can also include other columns that provide additional information. For example, if you plan to distribute reports by email, you can add a column for the email address of each recipient.

After you create the table, add the recipients who will receive the report. You can create a mixed recipients list that includes individual users, groups, roles, contacts, distribution lists, or email addresses. For example, a burst table may contain the following recipients.

Recipient example	Recipient type
CAMID(":Canada")	Group
CAMID(":")/contact[@name='Silvano Allessori']	Contact
CAMID(":")/distributionList[@name='European Partners']	Distribution list
CAMID("LDAP_Local_ID :u:uid=gbelding,ou=people")	Authentication provider user or group, where LDAP_Local_ID is the name of an LDAP namespace ID, and people is the name of an organizational unit
c10@ibmcognos99.com	Email address

CAMID stands for Cognos Access Manager ID, and it represents an internal search path to the recipients. Specify search paths when you want to save burst reports in a folder. You can obtain the search path in the IBM Cognos Analytics portal by opening the **Properties** page for each recipient and clicking **View the search path**. Ensure that you use the proper syntax when adding recipients to the burst table.

In the case of NTLM namespaces, user IDs in the search path use alphanumeric or numeric characters that make them difficult to read. You can use the following alternate search path syntax:

```
directory/namespace[@name="Local NT"]//account[@userName="gbelding"]
```

where Local NT is the name of a namespace and gbelding is the name of a user. The double slash before the account element indicates that you are searching all accounts under the specified namespace.

**Note:** If you have a mixed recipients list, do not mix email address recipients and alternate path recipients. Because the alternate path syntax contains the @ symbol, it will be mistaken for an email address.

For more information about users, groups, roles, contacts, and distribution lists, see the IBM Cognos Analytics *Administration and Security Guide*.

## Importing the Table into a Package

After you create the burst table in the source database, you must add it to the package that you will use to create the report.

For more information about importing tables and creating relationships, see the Framework Manager *User Guide*.

## Procedure

1. Open the package.
2. Import the table.
3. Define the relationship between the burst table and the table containing the data item on which to burst.

For example, you are bursting on country or region code. You define a relationship between country or region code in the burst table and country or region code in the Country or Region table.
4. Save and publish the package.

## Specify a Burst Group

Specify burst groups to set how the report will be distributed. Burst groups are defined by a data item that you create in the report or that you add from the burst table.

## Procedure

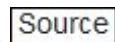
1. Click the **Queries** icon , and click the query that will produce the data to distribute.
2. If you are creating a data item, do the following:
  - Click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
  - In the **Expression Definition** box, type the expression that defines the burst key.

For example, the following expression builds an email address for each sales representative in The Sample Outdoors Company. The expression incorporates the calculated field that was previously created, which is named `userID` in the following expression, with `ibmcognos99.com` as the domain name.

`[userID] + '@ibmcognos99.com'`

**Tip:** To give the data item a more meaningful name, replace the default name in the **Name** box.

3. To specify a burst table column as the data item, do the following:

- Click the **Data** icon , and from the **Source** tab , expand the burst table.
- Drag the data item to the **Data Items** pane.

For example, if you are bursting reports by email, drag the data item containing email addresses.

## Set Burst Options

Set burst options for the report to indicate the data item on which to burst and the recipients.

### Before you begin

Before you set burst options, ensure that the data item on which you intend to burst is in the report and is grouped. The grouped column will create the appropriate subsets of data. In addition, you must associate the burst key with this level of grouping.

## Procedure

1. Click the **Pages** icon  or the **Queries** icon , and click the **Report** icon .
2. Click the **Show properties** icon , and in the **Properties** pane, click the **Burst options** property.
3. Select the **Make report available for bursting** check box.

4. Under **Burst Groups**, in the **Query** box, click the query that contains the data item on which to burst.

**Tip:** You can choose a query that does not appear in the layout. This is useful to distribute the same report to all burst recipients.

5. In the **Label** box, click the data item with which to label each burst report.

6. Click the edit button .

7. In the **Data items** box, drag the data item on which to burst to the **Groups** folder and click **OK**.

**Tip:** You can specify the sort order of data within each group by dragging data items to the **Sort list** folder and then clicking the sort order button .

8. Under **Burst Recipient**, in the **Query** box, click the query that contains the data item to be used as the distribution list.

9. In the **Data Item** box, click the data item that contains the recipients.

10. In the **Type** box, choose the method to burst the report:

- Click **Automatic** to let IBM Cognos Analytics determine from the data item whether to email reports or send them to folders in the Cognos Analytics portal.
- Click **Email addresses** to distribute reports by email.
- Click **Directory entries** to distribute reports to folders that recipients can access in the Cognos Analytics portal.

**Note:** To burst reports to multiple mobile device users, you must choose to distribute reports to folders. You can choose **Directory entries**, or you can choose **Automatic** if the data item returns directory entries instead of email addresses. To view the reports, the recipients must have IBM Cognos Mobile installed on their mobile devices.

When recipients log into IBM Cognos Analytics, they will see only the report that is specific to them.

11. If the report contains two nested data containers, such as a list and a chart, click the ellipsis button beside **Master detail relationships** and define the relationship between the data containers.

For information about master detail relationships, see [“Create a Master Detail Relationship” on page 220](#).

## Enable Bursting

---

When the report is ready to be distributed, enable bursting for the report in the IBM Cognos Analytics portal.

### Procedure

1. Locate the report in the Cognos Analytics portal.

2. Click the **More** icon  and click **Run as**.

3. Enable **Run in background**.

4. Expand **Advanced**.

5. Make sure that the **Burst the report** check box is selected.

6. If you are distributing reports by email, open the **Delivery** slide out menu and select the **Send this report by email** check box.

**Tip:** If you are bursting the report to a folder, you can also send the report by email if the **Send the report by email** check box is selected. Reports will be emailed if the recipient's email address is stored in the authentication source you are using or if they are entered in the recipient's personal information in the Cognos Analytics portal.

7. If the burst report contains a drill-through link to another report and you are distributing the burst report by email, select the **Include a link to the report** check box.

If you do not select the check box, the drill-through links in the burst report will not work.

8. Run the report.

## Results

Allow a few moments for the report to run. If you are an administrator, you can view all outputs for the report. Click the **More** icon  and then click **View versions**. When burst recipients log into the Cognos Analytics portal or access their email accounts, they will see only the data that is meant for them.

## Creating Burst Reports Using Dimensional Data Sources

---

You can burst a report using a dimensional data source by using burst information that is stored in the data source. Because you do not want to append bursting information to existing dimensional data sources, you can create a relational data source that contains the burst information.

Report bursting is limited when the underlying data source is a cube (MOLAP data source such as IBM Cognos PowerCube, Microsoft Analysis Services, Oracle Essbase, or IBM Db2/OLAP). The burst report must be a grouped report, and the burst is restricted to the outermost grouping in the report. For example, if you have a report grouped on Country or Region and State, then you can burst the report only on Country or Region.

## Procedure

1. In IBM Cognos Framework Manager, include both the dimensional data source that is the basis for reporting and the relational burst table in the model.

For more information about models, see the *Framework Manager User Guide*.

2. In IBM Cognos Analytics - Reporting, create a master detail report in which the master query drives the report and the detail query contains the burst information.

You must group the master query on the data item on which you are bursting. This data item must have a corresponding data item in the relational burst table.

Author the detail query against the relational burst table. The burst table must contain two columns: the data item corresponding to the data item used in the master report for bursting and the data item that contains the recipient information. The recipient can be an email address or an expression that results in a search path to an object in IBM Content Manager, such as an account, group, role, contact, or distribution list.

For more information about master detail queries, see [“Create a Master Detail Relationship” on page 220](#).

3. Ensure that the detail query, which must be evaluated by IBM Cognos Analytics when the report is executed, is not visible:

- Place a list that is based on the detail query in a conditional block with a box type of **None**.
- Link the master and detail queries using the following expression:

[Master Burst Key] = [Detail Burst Key]

## Results

When you set the burst options for the report, the master query provides the data items for the burst key and the detail report provides the data items for the burst recipients.



# Chapter 16. Format data

Format data in a report to improve readability. For example, you can show all date values in the order year, month, and day. If you do not set **Data Format** properties here, data is formatted according to the properties set in the model. If the properties were not set in the model, data is formatted according to the International Components for Unicode (ICU) formats.

Special cells, such as overflow or underflow, errors, or not applicable values, appear with two dash (--) characters unless you override them.

You can also format data based on a condition or specify the format for a particular object.

When you create a calculation that uses mixed currency values or other mixed units of measure, an asterisk character (\*) might appear as the unit of measure. To avoid this problem, change the format of the column or row that contains the result of the calculation so that the wanted unit of measure appears.

## Set the default data formats

Set the default data properties for each type of data, including text, number, currency, percent, date, time, date/time, and time interval.

### Procedure

1. Click the **Show properties** icon , click the select ancestor icon , click **Report**, and then, in the **DATA** section, click **Data formats**.
2. In the **Format type** box, click a format type.

The properties that you can set for the selected format type appear in the **Properties** box.

3. If you clicked the **Currency** format type and require different currencies in the report, click the add button  and select currency check boxes.

For example, you may have one column with values are in euros and another column whose values are in US dollars.

4. Set the properties.

If you added currencies in step 3, click each one and set the properties. If you did not add any currencies, any properties you set will apply to all currencies.

For properties in which you type meta-characters that represent certain types of information, such as YYYY-MM-DD for dates, the meta-characters that are required depend on the authoring language specified for the report. For more information, see [“Using patterns to format data” on page 306](#).

If you set a value for the **Pattern** property, all other formatting properties are ignored with the following exceptions:

- **Missing value characters**
- **Zero value characters**
- **Negative pattern**

Some properties are language-sensitive and should be changed only with caution.

### Results

The data formatting properties you set are applied to objects only in the current layout. If a data item contains values in multiple currencies but only a subset of those currencies have defined formats, the default format for the locale in which you are working is applied to values with no specified format.

## Specify the data format for an object

---

Specify the format for a particular object if you are not getting the results you want.

For example, you add a measure to a report and you want to see two decimals when you run the report. You set the number of decimals to two for the **Number** format type for the current layout. However, when you run the report, you see more than two decimals for the measure. To get the results you want, you must map the measure to the **Number** format type.

### About this task

Data formats are not applied in delimited text (CSV) and XML report outputs.

The time interval data format assumes that input values are in milliseconds. As a result, when the time interval format is applied to an object, the values that appear in the report output are in milliseconds. You can apply the cast function to return the interval type that you want.

### Procedure

1. Click the object.
  2. In the report object toolbar, click the **Data format** icon .
- Tip:** You can also click the **Show properties** icon , and then double-click the **Data format** property.
3. Under **Format type**, click the format type to apply to the object.
  4. To override any of the properties of the format type that were defined for the current layout, in the **Properties** box, click the property and specify its value.

## Specifying the number of decimals in numbers

When specifying the number of decimals, IBM Cognos Analytics uses the IEEE 754 default rounding mode known as half even. With half even rounding, numbers are rounded toward the nearest truncated value, unless both truncated values are equidistant, in which case the value ending in an even digit is chosen, as follows:

- If the digit immediately after the precision to be shown is greater than 5, the number is rounded up.
- If the digit immediately after the precision to be shown is less than 5, the number is rounded down.
- If the digit immediately after the precision is a 5, the number is rounded down when the preceding digit is even and rounded up when the preceding digit is odd.

For example, the number 78.5 is rounded to 78, while the number 73.5 is rounded to 74.

In addition, if the maximum number of decimals is less than the actual number of decimals in the number, the number is rounded to the maximum number of decimals.

## Digit shaping in charts and maps

When working with bidirectional content, you cannot specify digit shaping at the chart or map level. You can specify digit shaping for the objects in charts and maps.

To understand how digit shaping is applied to charts and maps, you must know which chart and map objects are considered text and which objects are considered numeric values.

The following table describes the chart and map objects that are considered text.

*Table 8. Chart and map objects that are considered text*

Container	Object
Chart	chart title, subtitle, footer, notes, legend item, legend title, regression label, marker label, background image label, axis titles, discrete axis label (for example, category axis label, x-axis), baseline labels
Map	map title, subtitle, footer, legend title, notes, axis labels

The following table describes the chart and map objects that are considered numeric values.

*Table 9. Chart and map objects that are considered numeric values*

Container	Object
Chart	numeric axis label (for example, measure axis label, y-axis), numeric values that appear in the legend (you can select to show the first, last, maximum, minimum value for each item in legends), numeric values that appear in the chart
Map	legend items

The following list describes the different digit shaping options and how digit shaping is applied to charts and maps.

- The digit shape options for text objects, which include titles, footers, and labels, are Default, None, National, and Contextual. Digit shape options for numeric values are Default, None, and National. There is no Contextual option for numeric values.
- By default, digit shaping is not applied to numbers that appear on an object that is considered text. For example, if a chart shows year data on the x-axis and the content language specified in the IBM Cognos Analytics portal is Arabic (Egypt), no digit shaping is applied because the x-axis label is considered a string.

The following list describes the default digit shaping behavior for charts and maps when the content language implies non-European digits, such as Arabic (Egypt).

- Numeric values that have a specific format, such as decimal or currency, are displayed as Arabic-Indic.
- Except for matrix charts, numeric axis labels for charts and maps are displayed in European digits.

This is due to the way that charts and maps are rendered. The engine used to render charts and maps does not perform any formatting for numeric axis labels. No locale information is passed, and consequently the labels are displayed as European digits. To display the labels as Arabic-Indic, select the digit shaping option National.

Matrix charts are rendered using International Components for Unicode (ICU) to format numbers. Locale information is passed and the numbers are shaped accordingly. For example, when the content language is Arabic (Egypt), ICU displays numbers as Arabic-Indic.

- Numbers within text labels are displayed as is. That is, no digit shaping is applied.

The following list describes the default digit shaping behavior for charts and maps when the content language is Thai.

- Numeric values that have a specific format, such as decimal or currency, are displayed as European digits.
- Numbers within text labels are displayed as is. That is, no digit shaping is applied.

## Related concepts

[Support for bidirectional languages](#)

## Locale-sensitive properties

---

IBM Cognos Analytics - Reporting contains an extensive library of customized properties adapted to users from different regions who speak different languages. For example, if a modeler specifies that a given data item is a currency, only the proper currency symbol must be specified. When reports are created, Reporting automatically adapts the format of the currency numbers to each user according to the content language specified in the IBM Cognos Analytics portal.

When modelers or report authors specify properties, these properties override user preferences and risk creating inconsistent formatting for users of other cultures. It is usually much easier and safer to let Reporting take care of formatting. For example, for the date format type, different regions use different characters to represent the date separator. If you specify a date separator, you may confuse users in other regions.

The following data formatting properties are locale-sensitive:

- **Currency symbol position**
- **Date separator**
- **Date ordering**
- **Calendar type**
- **Time separator**
- **Display AM/PM symbols**
- **Clock**
- **Decimal symbol**
- **Negative sign position**
- **Thousands separator**
- **Group size (digits)**
- **Secondary group size (digits)**
- **Missing value characters**
- **Zero value characters**
- **Pattern**
- **Negative pattern**

## SUPPRESS EMPTY CELLS

---

Sparse data may result in crosstabs showing empty cells. For example, a crosstab that matches employees with products results in many rows of empty values for the revenue measure if the employee does not sell those products.

You can suppress rows, columns, or rows and columns based on divide by zero, missing, and overflow values. Suppressing rows or columns without data gives you a more concise view of your report.

Calculations are performed before suppression is applied. If you have multiple crosstabs or charts, you must select one in order to access suppression options.

Within a list report, suppression applies only to rows and is based on non-grouped data items. If details of a group are null, then the header and footer are also suppressed.

Suppression can also be applied to charts, repeaters, and repeater tables.

Access to the suppression feature depends on the settings in your modeling component, IBM Cognos Transformer, IBM Cognos Framework Manager, and IBM Cognos Administration.

## Procedure

1. From the report object toolbar, click the **Suppress** icon  and click **Suppression options**.
2. Under **Suppress**, choose what sections to suppress.
3. Under **Suppress the following**, choose which values to suppress.

## Related concepts

[Limitations When Formatting Empty Cells in SAP BW Data Sources](#)

## Suppressing null cells by using filters

You can also use filters to suppress null cells in your reports. Using filters ensures that calculations take suppression into account. You may also obtain better report performance because the filtering is done at the data source.

If your report includes more than one measure or fact expression, it is best to base the filter on only one underlying fact or measure.

### Relational-style Reports

In relational-style reports, you can use detail and summary filters.

### Dimensional-style Reports

In dimensional-style reports, you can use the `filter` function.

For example, insert a set expression in your crosstab and use the expression `filter ( descendants ([Set]) is not null)`. If your crosstab includes three or more levels within the same dimension on an edge, use the expression `filter ( descendants ( currentMember([Hierarchy]) ) is not null)`.

If your crosstab includes nested sets, filter the sets using a cascading approach to improve performance. For example, first filter the outermost (or highest nested level) set, and then filter the remaining sets proceeding inward.

## Specify what appears for data containers that contain no data

You can specify what appears in a data container when no data is available from the database.

When no data is available, you can show one of the following options:

- An empty data container, such as a blank list.
- Alternate content, such as another data container or an image. You can insert any object from the **Toolbox** tab.
- Text, such as *There is no data available for this month*. If you show text, you can format it. By default, the text **No Data Available** appears.

You can specify what appears when no data is available for the following data containers: lists, crosstabs, charts, maps, repeaters, repeater tables, and tables of contents.

If your report includes multiple data containers, you can specify different no data contents for each container.

**Tip:** The No Data sample report in the GO Sales (query) package includes data containers that have no data.

## Procedure

1. Select a data container.
2. In the **Properties** pane, click the select ancestor icon  and click the data container type.

3. Click the ellipsis button next to the **No data contents** property and select what should appear for data containers that contain no data:

- To show an empty data container, click **No contents**.
- To show alternate content, click **Content specified in the No data tab**.

Two tabs appear at the top of the data container and the **No data contents** tab  is selected automatically.

Click the **Toolbox** icon , insert the objects to appear when there is no data available into the **No data contents** tab.

- To show text, click **Specified text** and type the text that you want to appear.

## Using patterns to format data

You can format data so that it matches any pattern of text and numbers when default formats are not appropriate. For example, you can format dates to use full text including the era, or you can format them to only use numbers and show the last two digits of years to save space.

Using symbols and patterns can provide similar results as basic data formatting tasks. For example, you can set how many digits appear after the decimal point. You can achieve these types of results with a pattern, or you can set the **Number of decimal places** property. Patterns allow flexibility for more complex requirements.

Each supported content language code requires a specific set of symbols to be used in patterns. For each language code, there are two tables you will need; one for date and time symbols, and one for decimal symbols. The decimal symbols are the same for all locales, however, date and time symbols are grouped into six locale groups. Check the Date and Time Symbol section to see which locale group is used for your locale.

To define patterns, open the **Data format** dialog box, and edit the **Pattern** property for each format type. Use the symbols that are defined in the language code tables, and follow these guidelines.

### Pattern guidelines

When you define a pattern, the number of symbols you use affects how the data will be shown. There are different rules for text, numbers, and values that can take the form of text or numbers.

#### Text

You can specify whether text is produced in full or abbreviated form.

Number of symbols	Meaning	Example
4 or more	Full text form	EEEE produces Monday
Less than 4	Abbreviated form	EEE produces Mon

#### Numbers

The number of symbols you use in a pattern sets the minimum number of digits that are produced in a report. Numbers that have fewer digits than specified are zero-padded. For example, if you specify mm for minutes, and the database value is 6, the report will show 06.

**Note:** The year value is handled differently. If you specify two symbols for year, the last two digits of the year value is produced. For example, yyyy produces 2013, and yy produces 13.

## Text and Numbers

For values that can produce text or numbers, such as months, you can specify whether text or numbers are produced, and whether words are abbreviated.

Number of symbols	Meaning	Example
3 or more	Text	MMMM produces January MMM produces Jan
Less than 3	Numbers	MM produces 01 M produces 1

## Date and time symbols

Date and time symbols are divided into locales, each of which is detailed in the following sections.

### Locale Group A

Locales: af-za, en, en-au, en-be, en-bw, en-ca, en-gb, en-hk, en-ie, en-in, en-mt, en-nz, en-ph, en-sg, en-us, en-vi, en-za, fo-fo, gl-es, id, id-id, is, is-is, it, it-ch, it-it, kk-kz, ms, ms-bn, ms-my, nb-no, nl, nl-be, nl-nl, no, no-no, om-et, om-so, pl, pl-pl, pt, pt-br, pt-pt, so-dj, so-et, so-ke, so-so, sv, sv-fi, sv-se, sw-ke, sw-tz

Meaning	Symbol	Presentation	Example
Era	G	Text	AD
Year	y	Number	2013
Year (of 'Week of Year')	Y	Number	2013
Month in year	M	Text and number	July and 07
Week in year	w	Number	27
Week in month	W	Number	2
Day in year	D	Number	189
Day in month	d	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	a	Text	pm
Hour in day (1 to 24)	k	Number	24
Hour in a.m. or p.m. (0 to 11)	K	Number	0

Meaning	Symbol	Presentation	Example
Hour in a.m. or p.m. (1 to 12)	h	Number	12
Hour in day (0 to 23)	H	Number	0
Minute in hour	m	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	z	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

### Locale Group B

Locales: be-by, bg-bg, el, el-gr, fi, fi-fi, hr, hr-hr, hu, hu-hu, ja, ja-jp, ko, ko-kr, ro, ro-ro, ru, ru-ua, ru-ru, sh-yu, sk, sk-sk, sl-si, sq-al, sr-sp, th, tr, tr-tr, uk-ua, zh, zh-cn, zh-hk, zh-mo, zh-sg, zh-tw

Meaning	Symbol	Presentation	Example
Era	G	Text	AD
Year	a	Number	2013
Year (of 'Week of Year')	A	Number	2013
Month in year	n	Text and number	July and 07
Week in year	w	Number	27
Week in month	W	Number	2
Day in year	D	Number	189
Day in month	j	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	x	Text	pm
Hour in day (1 to 24)	h	Number	24

Meaning	Symbol	Presentation	Example
Hour in a.m. or p.m. (0 to 11)	K	Number	0
Hour in a.m. or p.m. (1 to 12)	k	Number	12
Hour in day (0 to 23)	H	Number	0
Minute in hour	m	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	z	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

### Locale Group C

Locales: ca-es, cs, cs-cz, da, da-dk, es, es-ar, es-bo, es-cl, es-co, es-cr, es-do, es-ec, es-es, es-gt, es-hn, es-mx, es-ni, es-pa, es-pe, es-pr, es-py, es-sv, es-us, es-uy, es-ve, eu-es, mk-mk

Meaning	Symbol	Presentation	Example
Era	G	Text	AD
Year	u	Number	2013
Year (of 'Week of Year')	U	Number	2013
Month in year	M	Text and number	July and 07
Week in year	w	Number	27
Week in month	W	Number	2
Day in year	D	Number	189
Day in month	t	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	a	Text	pm

<b>Meaning</b>	<b>Symbol</b>	<b>Presentation</b>	<b>Example</b>
Hour in day (1 to 24)	h	Number	24
Hour in a.m. or p.m. (0 to 11)	K	Number	0
Hour in a.m. or p.m. (1 to 12)	k	Number	12
Hour in day (0 to 23)	H	Number	0
Minute in hour	m	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	z	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

#### Locale Group D

Locales: de, de-at, de-be, de-ch, de-de, de-lu

<b>Meaning</b>	<b>Symbol</b>	<b>Presentation</b>	<b>Example</b>
Era	G	Text	AD
Year	j	Number	2013
Year (of 'Week of Year')	J	Number	2013
Month in year	M	Text and number	July and 07
Week in year	w	Number	27
Week in month	W	Number	2
Day in year	D	Number	189
Day in month	t	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	a	Text	pm

Meaning	Symbol	Presentation	Example
Hour in day (1 to 24)	h	Number	24
Hour in a.m. or p.m. (0 to 11)	K	Number	0
Hour in a.m. or p.m. (1 to 12)	k	Number	12
Hour in day (0 to 23)	H	Number	0
Minute in hour	m	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	z	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

### Locale Group E

Locales: fr, fr-be, fr-ca, fr-ch, fr-fr, fr-lu

Meaning	Symbol	Presentation	Example
Era	G	Text	AD
Year	a	Number	2013
Year (of 'Week of Year')	A	Number	2013
Month in year	M	Text and number	July and 07
Week in year	w	Number	27
Week in month	W	Number	2
Day in year	D	Number	189
Day in month	j	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	x	Text	pm

<b>Meaning</b>	<b>Symbol</b>	<b>Presentation</b>	<b>Example</b>
Hour in day (1 to 24)	h	Number	24
Hour in a.m. or p.m. (0 to 11)	K	Number	0
Hour in a.m. or p.m. (1 to 12)	k	Number	12
Hour in day (0 to 23)	H	Number	0
Minute in hour	m	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	z	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

## Locale Group F

Locales: ga-ie

<b>Meaning</b>	<b>Symbol</b>	<b>Presentation</b>	<b>Example</b>
Era	R	Text	AD
Year	b	Number	2013
Year (of 'Week of Year')	B	Number	2013
Month in year	M	Text and number	July and 07
Week in year	t	Number	27
Week in month	T	Number	2
Day in year	l	Number	189
Day in month	L	Number	10
Day of week in month	F	Number	2 (2nd Wed in July)
Day of Week (1=first day)	e	Number	2
Day in week	E	Text	Tuesday
a.m. or p.m. marker	a	Text	pm

Meaning	Symbol	Presentation	Example
Hour in day (1 to 24)	u	Number	24
Hour in a.m. or p.m. (0 to 11)	K	Number	0
Hour in a.m. or p.m. (1 to 12)	k	Number	12
Hour in day (0 to 23)	U	Number	0
Minute in hour	n	Number	30
Second in minute	s	Number	55
Millisecond	S	Number	978
Time zone	c	Text	Pacific Standard Time
Escape used in text	'	n/a	n/a
Single quote	"	n/a	'

## Decimal format symbols

All locales

Symbol	Meaning
0	A digit that is shown even if the value is zero.
#	A digit that is suppressed if the value is zero.
.	A placeholder for decimal separator.
,	A placeholder for thousands grouping separator.
E	Separates mantissa and exponent for exponential formats.
;	Separates formats for positive numbers and formats for negative numbers.
-	The default negative prefix.
%	Multiplied by 100, as percentage.
‰	Multiplied by 1000, as per mille.
¤	The currency symbol. If this symbol is present in a pattern, the monetary decimal separator is used instead of the decimal separator.

Symbol	Meaning
¤¤	The international currency sign. It will be replaced by an international currency symbol. If it is present in a pattern, the monetary decimal separator is used instead of the decimal separator.
X	Other characters that can be used in the prefix or suffix.
'	Used to quote special characters in a prefix or suffix.
/u221E	Infinity symbol.
/uFFFD	Not a Number symbol.

# Chapter 17. Using query macros

A macro is a fragment of code that you can insert in the Select statement of a query or in an expression. For example, add a macro to insert a new data item containing the user's name.

You can include references to session parameters, parameter maps, and parameter map entries in macros. Parameter values are set when you run the query. For example, you can use the language session parameter to show only the data that matches the language setting for the current user.

Macros can be used in these different ways:

- They can be inserted in the SQL.

An example is `Select * from Country where Country.Name = #{$myMap{$runLocale}#}`

- They can supply an argument to a stored procedure query subject.

If a value is not hard-coded for the argument, the stored procedure query subject can be used to return different data.

- They can be inserted in expressions, such as calculations and filters.

An example is a filter `[gosales].[Sales staff].[Staff name] = #{$UserLookUpMap{$UserId}#}`

- They can be used as a parameter wizard.

Parameters can reference other parameters. An example is `Map1, Key = en-us, Value = #{$myMap{$UserId}#}`

You can also add query macros to the IBM Cognos Framework Manager model. For more information, see the Framework Manager *User Guide*.

Support for query macros in IBM Cognos Analytics - Reporting includes the same capabilities as macros used in Framework Manager. However, Reporting query macros do not extend to the layout. Therefore, when making changes to the query using macros, you must bear in mind the side-effects on the layout. For example, if a macro removes a column from the query that the layout refers to, a run-time error will occur.

## Syntax

Use the following syntax to reference session parameter and parameter values.

Object	Syntax	Example
Session key	<code>\$session_key</code>	<code>#{\$my_account#}</code>
Parameter map key	<code>\$map{&lt;key&gt;}#</code>	<code>#{\$map_one{'abc'}#}</code>
Parameter map entry whose key is defined by a session parameter	<code>\$map{\$session_key}#</code>	<code>#{\$map_one{\$my_account}#}</code>

You can add the following elements to further define the macro expression.

Symbol	Purpose
Single quotation marks '	<p>Delineates a literal string that has a single quotation mark as part of the string.</p> <p>If the single quotation mark displays in a string, such as a query item, the string must be enclosed in a single quotation mark on both sides of the string and the single quotation mark must be doubled. For example, ab'c is written as 'ab' 'c'</p> <p>If the single quotation mark displays in a macro, the string must be enclosed in square brackets. For example, ab'c is written as [ab'c]</p> <p>If the single quotation mark displays in a prompt, there is no need to enclose the string.</p> <p>To escape a single quotation mark in an expression, use &amp;apos;</p>
Square brackets [ ]	<p>Encloses model objects, such as a namespace or query subject and macro names that contain restricted characters, such as a number sign, hyphen, or space.</p>
Curly brackets, also known as braces { }	<p>Calls a function that is unknown to the parser, such as dateadd in IBM Db2, and whose first argument is a keyword.</p> <p>Example:</p> <pre data-bbox="878 1094 1090 1163">dateadd ({month},2,&lt;date expression&gt;)</pre>
+ operator	<p>Concatenates two strings, such as 'abc' + 'xyz'</p>
Single quote function (sq)	<p>Surrounds the result of a string expression with single quotation marks. If the single quotation mark displays in a string, such as a query item, the string must be enclosed in a single quotation mark on both sides of the string and the single quotation mark must be doubled. You can use this function to build clauses to test against literal parameter-driven values.</p> <p>Here is an example:</p> <pre data-bbox="878 1643 1041 1670">#sq(\$my_sp)#+</pre> <p>If a session parameter (my_sp) has the value ab'cc, the result is</p> <pre data-bbox="882 1790 972 1818">'ab"cc'</pre>

Symbol	Purpose
Double quote function (dq)	<p>Surrounds the result of a string expression with double quotation marks. You can use this function to refer to table and column names with non-identifier characters, such as a blank space or a percent sign (%).</p> <p>Here is an example:</p> <pre>#dq ('Column' + \$runLocale)#+</pre> <p>If runLocale=en-us, the result is</p> <pre>"Column en-us"</pre>
Square bracket function (sb)	<p>Inserts a set of square brackets into the argument to build object references in a model query and model expressions, such as filters and calculations.</p> <p>Here is an example:</p> <pre>#sb ('my item in ' + \$runLocale)#+</pre> <p>If runLocale=en-us, the result is</p> <pre>[my item in en-us]</pre>

## Add a query macro

Add a query macro to allow run-time changes to be made to SQL queries.

### About this task

When you reference a parameter, you must do the following:

- Use a number sign (#) at the beginning and end of each set of one or more parameters.

Everything between the number signs is treated as a macro expression, which is processed at runtime. Framework Manager removes anything that is outside the number signs.

- Precede each parameter map entry with a dollar sign (\$)
- Use a name that starts with an alpha character (a..z, A..Z)

Do not insert macros between existing quotation marks or square brackets because IBM Cognos Analytics - Reporting does not execute anything within these elements.

### Procedure

1. To add a macro to an expression, in the Expression Editor, click the macros tab .
2. Click the **Queries** icon , and click **Queries**.
3. If the query to which you are adding a macro was built by using your own SQL, do the following:
  - Click the **SQL** object that is linked to the query.
  - In the **Properties** pane, double-click the **SQL** property.

- In the **SQL** dialog box, type the macro.
4. If the query to which you are adding a macro was not built by using your own SQL, do the following:
- Click the query.
  - In the **Properties** pane, double-click the **Generated SQL/MDX** property.
  - In the **Generated SQL/MDX** dialog box, click **Convert**.
  - In the **SQL** dialog box, type the macro.

## Creating prompts using query macros

---

You can create mandatory and optional prompts in reports using query macros.

Use the prompt macro functions `prompt` and `promptmany` to create single-value and multiple-value prompts. You can use prompt macro functions when working with a relational data source or a dimensionally-modeled relational (DMR) data source.

If you want to use a prompt macro in an expression such as a calculation, you must specify the data type when using an overloaded operator, such as a plus sign (+). You can use the plus sign to concatenate two items and to add two items.

If you want to define a filter on a dimension level and have the filter use the `prompt` or `promptmany` macro, you must provide the data type as `memberuniqueName` and a default value.

Here is an example:

```
members( [MS_gosales].[New Dimension].[PRODUCTLINE].[PRODUCTLINE])
    in ( set( #promptmany('what', 'memberuniqueName',
        '[MS_gosales].[PROD1].[PRODUCTLINE].[PRODUCTLINE]
        ->[all].[1]')# ) )
```

Here is an example of a mandatory prompt:

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL_COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY = #prompt('CountryName')#
```

When default values are specified in the syntax of macro prompts, you may see an error. Use prompt syntax such as where Country = ?Enter Country?.

The `prompt` and `promptmany` functions have the following mandatory and optional parameters. All argument values must be specified as strings.

### Name

This mandatory parameter is the name of the prompt. Name can also refer to the name of a parameter on a user-created prompt page, in which case the user-created prompt page appears when the report is run instead of the default prompt page that the macro would generate.

## Datatype

This optional parameter is the prompt value data type. The default value is string. Prompt values are validated. In the case of strings, the provided value is enclosed in single quotation marks and embedded single quotation marks are doubled.

Values include the following:

- boolean
- date
- datetime
- decimal
- double
- float
- int
- integer
- interval
- long
- memberuniquename

Memberuniquename is not an actual data type. This value must be used when the data type of the parameter is member unique name (MUN).

- numeric
- real
- short
- string
- time
- timeinterval
- timestamp
- token

Token is not an actual data type. It is a way to pass SQL. A token does not pass values.

- xsddate
- xsddatetime
- xsddecimal
- xsddouble
- xsdduration
- xsdfloat
- xsdint
- xsdlong
- xsdshort
- xsdstring
- xsdtime

## DefaultText

This optional parameter is the text to be used by default. If a value is specified, the prompt is optional.

If you use a space and no values are provided in the **Prompt Value** dialog box, a Where clause is usually not generated.

If you use text and no values are provided in the **Prompt Value** dialog box, a Where clause is usually generated using the default value.

Ensure that the text you provide results in a valid SQL statement.

**Note:** If the data type is memberuniqueName, a value for the DefaultText parameter must be provided. For example:

```
(#prompt('WhichLevel', 'memberuniqueName', '[goSalesAgain].[PRODUCT1].[PRODUCT].[PRODUCT(A11)]->[all]')#)
```

### Text

This optional parameter is text that precedes any user-provided values, such as ' and column1 = '.

### QueryItem

This parameter is optional. The prompt engine can take advantage of the **Prompt Info** properties of the query item. Descriptive information can be shown, although the prompt value is a code.

### TextFollowing

This optional parameter is the closing parenthesis that is used most often for the promptmany function. This parameter is also useful when the prompt is optional and is followed by hardcoded filters in the SQL statement.

## Examples - selecting country or region prompts

When a report is run, you want your users to be prompted to choose the country or region for which they want to see data. The following code examples describe how you can use macros to create different prompts.

### Mandatory prompt with no data type specified

Note the following:

- The Datatype argument is not specified. Therefore, it is a string, which is correct in this case.
- The DefaultText argument is not specified. Therefore, it is a mandatory prompt.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY = #prompt('CountryName')#
```

### Mandatory prompt with the data type specified

Note the following:

- This prompt requires a valid integer value as response.
- The DefaultText argument is not specified. Therefore, it is a mandatory prompt.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE >
    #prompt('Starting CountryCode',
        'integer',
        ',
```

```
  ''',[gosales].[COUNTRY_MULTILINGUAL].[COUNTRY_CODE]')#
```

### Optional prompt and mandatory filter with the data type and default value specified

Note the following:

- This prompt allows the user to supply a valid integer response.
- The DefaultText argument is specified. Therefore, the user may omit entering a value, in which case the value 10 is used. This makes it an optional prompt, but not an optional filter.

Example 1:

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE >
#prompt('Starting CountryCode',
        'integer',
        '10'
)#+
```

Example 2:

```
[gosales].[COUNTRY].[COUNTRY] = #prompt('countryPrompt','string',''''Canada''')#
Result 2:
[gosales].[COUNTRY].[COUNTRY] = 'Canada'
```

Note the following:

- The defaultText parameter must be specified such that is literally valid in the context of the macro, because no formatting takes place on this value. See details below.
- The default string Canada in Example 2 is specified as a string using single quotes, in which the embedded single quotes are doubled up, thus 3 quotes. This results in the string being properly displayed within single quotes in the expression.
- As a general rule for the string datatype, the defaultText should always be specified as in the previous note, except in the context of a stored procedure parameter.
- For the defaultText of types date or datetime, a special format should be used in the context of SQL. Examples of these formats are 'DATE ''2012-12-25''' and 'DATETIME ''2012-12-25 12:00:00''''. In all other contexts, you use the date/datetime without the keyword and escaped single quotes (e.g., '2012-12-25').

### Prompt that appends text to the value

Note the following:

- The DefaultText argument is specified as a space character. In this case, the generated text is just the space character, which eliminates the Where clause from the query.
- The Text argument is specified, which is written into the generated SQL before the user-provided prompt value.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
#prompt('Starting CountryCode',
        'integer',
        ' ', // < = = this is a space
```

```
'where COUNTRY_MULTILINGUAL.COUNTRY_CODE >'  
 )#
```

## Syntax substitution

Note the following:

- The Datatype argument is set to token, which means that the user-provided value is entered without any checking on the provided value.

Because checking is not performed on the value, the expression editor may indicate that the expression is not valid. When a valid user-provided value is supplied or if you provide a valid default value, expression editor will interpret the expression as valid.

- Token should be used only if there is a list of pick-values for the user.
- The DefaultText argument is specified. Therefore, this is an optional prompt and group by COUNTRY is used in the generated SQL.

```
Select  
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,  
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,  
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,  
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME  
from  
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL  
#prompt('Sort column',  
        'token',  
        'group by COUNTRY',  
        'group by'  
)#
```

## Examples - creating prompts that use parameter maps

When a report is run, you want your users to select a language for the data in the report. The following examples describe several ways you can do this.

### Prompt that uses session variables

Note the following:

- The name of the prompt is specified using a lookup in the parameter map named PromptLabels. The key value is the session variable \$language.
- The Where clause is using a parameterized column.

```
select  
    ORDER_METHOD.ORDER_METHOD_CODE as ORDER_METHOD_CODE,  
    ORDER_METHOD.ORDER_METHOD_#$language#  
    as ORDER_METHOD_EN  
from  
    gosales.gosales.dbo.ORDER_METHOD ORDER_METHOD  
#prompt($PromptLabels{$language},  
    '';  
    '';  
    'where ORDER_METHOD.ORDER_METHOD_ ' + $language + '  
>'  
)#
```

### A parameter map that nests prompts

Note the following:

- In the model, there is a parameter map DynPromptLabels with #\$PromptLabels{\$language}#
- Part of the prompt information is run from a parameter map instead of being coded directly inside the SQL.

- The whole macro containing the prompt can be a value in a parameter map.

```

select
    ORDER_METHOD.ORDER_METHOD_CODE as ORDER_METHOD_CODE,
    ORDER_METHOD.ORDER_METHOD_#$language#
    as ORDER_METHOD_EN
from
    gosales.gosales.dbo.ORDER_METHOD ORDER_METHOD
#prompt($DynPromptLabels{'ex9'}, 
    ' ', 
    'where ORDER_METHOD.ORDER_METHOD_ ' + $language + '
>')
)#

```

## Examples - creating a multiple value prompt

When a report is run, you want your users to select one or more values. The following examples describe several ways you can do this.

### Prompt with a required minimum

Note the following:

- The user must enter at least a single value.
- This resembles the first example on prompting for a country or region [“Mandatory prompt with no data type specified” on page 320](#).

```

select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY IN (#promptmany('CountryName')#)

```

### Prompt with a required minimum with the data type specified

Note the following:

- This resembles the second example on prompting for a country or region [“Mandatory prompt with the data type specified” on page 320](#).

```

select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN (
    #promptmany('Selected CountryCodes',
        'integer',
        '',
        '[gosales].[COUNTRY_MULTILINGUAL].[COUNTRY_CODE]'#)
)

```

### Optional prompt with the data type and default value specified

The In clause and both parentheses are part of the SQL statement.

```

select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL

```

```

where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN (
    #promptmany('Selected CountryCodes',
        'integer',
        '10'
    )#
)

```

### Prompt that adds text before the syntax

Note the following:

- This example uses the TextFollowing argument.

```

select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
#promptmany('Selected CountryCodes',
    'integer',
    '',
    // < == this
is a space
    'where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN
( ',
    '',
    ')';
)#

```

### Optional prompt that adds text before the syntax

```

Select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL,
    gosales.gosales.dbo.COUNTRY XX
where COUNTRY_MULTILINGUAL.COUNTRY_CODE = XX.COUNTRY_CODE
    #promptmany('Selected CountryCodes',
        'integer',
        '',
        ' and COUNTRY_MULTILINGUAL.COUNTRY_CODE IN (
            ',
            ')';
)#

```

---

# Chapter 18. Using drill-through access

Using drill-through access, you can move from one report to another within a session while maintaining your focus on the same piece of data. For example, you select a product in a sales report and move to an inventory report about that product.

Drill-through access helps you to build analytical applications that are bigger than a single report. Drill-through applications are a network of linked reports that users can navigate, retaining their context and focus, to explore and analyze information.

Drill-through access works by defining the target report or object and then using information from the source report to filter the target. IBM Cognos Analytics can match data from the source to metadata in the target report, or you can define parameters in the target for greater control.

**Note:** In the dimensional reporting style, you can also enable drilling up and drilling down. For more information about drilling up and drilling down, see [“Create a drill-up and drill-down report” on page 232](#).

## What You Should Know

For a drill-through link to work, it is necessary to know

- the source
- the target
- how the data in the packages that contain these objects is related

Depending on the underlying data, you may create a drill-through definition and have IBM Cognos Analytics match the data (dynamic drill-through) or create parameters in the target (parameterized drill-through).

- whether to run the target report or to open it

The target of drill-through access is usually a saved report definition. The report can be created in IBM Cognos Analytics - Reporting, IBM Cognos Query Studio, IBM Cognos PowerPlay Studio, or IBM Cognos Analysis Studio. The target of drill-through access can also be a package that contains an IBM Cognos PowerCube, in which case a default view of the PowerCube is created.

- whether the users of the drill-through link in the source report have the appropriate permissions to view or run the target report
- if the target is being run, in what format to run it, and what filters to use on the target

If you do not want to run the target report on demand, you may link to a bookmark in the saved output instead of running the report. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

## Sources and Targets

In IBM Cognos Analytics, there are many different examples of source and target. For example, you can drill through

- between reports created in different packages against different data source types, such as from an analysis against a package that contains a PowerCube to a detailed report against a package based on a relational data source
- from one existing report to another report using definitions created in Reporting
- between IBM Cognos Viewer reports authored in Reporting, Query Studio, and Analysis Studio
- to and from a package built on a PowerCube
- from IBM Cognos Series 7 to IBM Cognos Analytics reports

**Tip:** In the GO Data Warehouse (analysis) package, the Positions to Fill sample report is a drill-through target report and the Recruitment Report sample report is a drill-through source report.

## **Understanding drill-through concepts**

---

Before you set up drill-through access, you must understand the key concepts about drilling through. Knowing these concepts will help you to avoid errors so that report consumers drill through as efficiently as possible.

### **Drill-through paths**

You can create a drill-through path in a source report, or using drill-through definitions. A drill-through path is the definition of the path that is taken when moving from one report to another, including how the data values are passed between the reports.

Using **Drill-Through Definitions**, you can create a drill-through path from any report in the source package to any target report in any other package. This type of drill-through definition is stored in the source package.

For any target report that contains parameters, you should map the target parameters to the correct metadata in the drill-through path. This ensures that the values from the source report are passed to the correct parameter values, and that the target report is filtered correctly. If you do not map parameters, then the users may be prompted for values when the target report is run.

A report-based drill-through path refers to a path created and stored in a source report. This type of drill-through path is also called authored drill through. The path is associated with a specific data column, chart, or cross tab in the source report, and is available only when users select that area of the report. If an authored drill-through definition is available, a hyperlink appears in the source report when it is run.

Report-based drill-through is limited to reporting source reports and any target reports. Use this type of drill-through access when you want to pass data item values or parameter results from within a source report to the target report, pass the results of a report expression to a target report, or a use URL link as a part of the drill-through definition.

### **Selection contexts**

The selection context represents the structure of the values selected by the user in the source.

In IBM Cognos Analysis Studio, this includes the context area. When a package drill-through definition is used, the selection context is used to give values for mapped parameters (parameterized drill-through) or also to map the appropriate data items and values.

Drill-through links can also be defined to open the target object at a bookmark. The content of this bookmark may also specified by the selection context.

Drill-through access is possible between most combinations of the IBM Cognos Analytics studios. Each studio is optimized for the goals and skills of the audience that uses it, and in some cases for the type of data source it is designed for. Therefore, you may need to consider how the various studios manage the selection context when you drill through between objects created in different studios, and how the data sources are conformed. During testing or debugging, you can see how source values are being mapped in different contexts using the drill-through assistant.

### **Drilling through to different report formats**

The settings in the drill-through definition determine the format in which users see the report results.

For example, the users may see the reports in IBM Cognos Viewer as an HTML Web page, or the reports may open in IBM Cognos Query Studio, IBM Cognos PowerPlay Studio, or IBM Cognos Analysis Studio. If your users have PowerPlay Studio, then they may also see the default view of a PowerCube.

Reports can be opened as HTML pages, or as PDF, XML, CSV, or Microsoft Excel spreadsheet software formats. When you define a drill-through path, you can choose the output format. This can be useful if the expected use of the target report is something other than online viewing. If the report will be printed, output it as PDF; if it will be exported to Excel for further processing, output it as Excel or CSV, and so on.

To run reports, or drill to targets that run reports in the delimited text (CSV), PDF, Microsoft Excel spreadsheet (XLS), or XML output formats, users require the generate output capability for the specific format.

**Note:** PDF drill-through is supported only in Internet Explorer using the Adobe PDF plug-in.

If you define a drill-through path to a report that is created in Analysis Studio, PowerPlay Studio, or Query Studio, consumers can open the report in its studio instead of in IBM Cognos Viewer. This can be useful if you expect a consumer to use the drill-through target report as the start of an analysis or query session to find more information.

For example, if an application contains a dashboard style report of high-level data, you can define a drill-through link to Analysis Studio to investigate items of interest. The Analysis Studio view can then be drilled through to a PDF report for printing.

**Note:** IBM Cognos Analytics - Reporting does not display data results.

## Drilling through between packages

You can set up drill-through access between packages.

The two packages can be based on different types of data source, but there are some limits. The following table shows the data source mappings that support drill-through access.

Table 10. Data source mappings that support drill-through access	
Source data source	Target data source
OLAP	OLAP  <b>Note:</b> OLAP to OLAP drill through is supported only if the data source type is the same, for example, SSAS to SSAS.
OLAP	Dimensionally modeled relational
OLAP	Relational data  <b>Note:</b> For more information, see <a href="#">“Business keys” on page 330</a> .
Dimensionally modeled relational	Dimensionally modeled relational
Dimensionally modeled relational	Relational
Relational	Relational

## Bookmark references

When you drill through, the values that you pass are usually, but not always, used to filter the report. IBM Cognos Analytics supports bookmarks within saved PDF and HTML reports so that a user can scroll a report to view the relevant part based on a URL parameter.

For example, you have a large inventory report scheduled to run daily or weekly during off hours because of resource considerations. Your users may want to view this report as a target because it contains detailed information, but you want them to view the saved output rather than run this large report. Using this Action option and bookmark settings, users can drill through from another source location based on products to open the saved report to the page that shows the product they want to focus on.

When a bookmark in the source report is used in a drill-through definition, it provides the value for the URL parameter. When report consumers drill through using this definition, they see the relevant section of the target report.

Bookmark references are limited to previously run reports that are output as PDF or HTML and contain bookmark objects.

## Members and values

Dimensionally modeled data, whether stored in cubes or stored as dimensionally modeled relational (DMR) data, organizes data into dimensions. These dimensions contain hierarchies. The hierarchies contain levels. And the levels contain members.

An example of a dimension is Locations. A Locations dimension may contain two hierarchies: Locations by Organization Structure and Locations by Geography. Either of these hierarchies may contain levels like Country or Region and City.

Members are the instances in a level. For example, New York and London are members in the City level. A member may have multiple properties, such as Population, Latitude, and Longitude. Internally, a member is identified by a Member Unique Name (MUN). The method by which a MUN is derived depends on the cube vendor.

Relational data models are made up of data subjects, such as Employees, which are made up of data items, such as Name or Extension. These data items have values, such as Peter Smith.

In IBM Cognos Analytics, the methods of drilling through available are

- Dimensional (member) to Dimensional (member)
- Dimensional (member) to Relational (data item value)
- Relational (data item value) to Relational (data item value)

If the target parameter is a member, the source must be a member. The source and target should usually be from a conformed dimension. However, if the data supports it, you may also choose to define a mapping using different properties of the source metadata item.

If the target parameter is a value, the source can be either a value or a member. If the source is a dimensional member, you must ensure that the level or dimension is mapped to the target data item correctly in the drill-through definition. The business key from which the member is sourced should usually match the relational target value, which is most often the business key. However, if the data supports it, you may also choose to define a mapping from the caption of the source metadata item.

## Member unique names

The member unique name (MUN) is a unique identifier for a member in IBM Cognos reports. It is stored in the report specification when the member is referenced in the report directly.

The MUN is used in drill-through between OLAP data sources. The member keys in the MUN for the different OLAP data sources must match.

The MUN is used to find the member in the data source, which is similar to how business keys are used to find records in a table. For example, when you create OLAP dimension Products, you use the Product Line database column as a label for the members in your Product Line level. However, you use the Product Line Code business key from the database table to ensure that all the Product lines are unique in that level. The source value that you used to create the members is used in combination with the data source name, hierarchy, and level information in the member unique name.

If the MUN changes, members that are directly referenced in expressions, filters, or reports are no longer found. Changes to the MUN may be related to other changes. For example, changes to the hierarchy and level structures may change the level unique name, and changes to the business key values may change the member key path. Other factors that can affect the MUN are application changes during the design stage or over time, IBM Cognos PowerCube category codes that are unpredictably unique, the production environment that has more members than the test environment, or removing the member from the data source.

To avoid potential problems, we recommend the following best practices when you build OLAP data sources:

- Use unique codes and keys within a dimension for the member keys.

- Define your OLAP and relational packages using unique conformed values for the source values (business keys) within similar dimensions or data values where drill-through between applications may be required.
- Ensure that the business keys and dimension metadata structure are the same in the production and test environments.
- Do not change the business keys in IBM Cognos Framework Manager in the production environment.
- Resolve the non-unique keys in a dimension in the data source before you build the cube.

Ensure that there are no duplicate source values in all levels of a dimension before you build a PowerCube. We do not recommend using the tilde character (~) in the category codes.

For more information, see the section about uniqueness in the *IBM Cognos Series 7 Step-by-Step Transformer*.

For information about PowerCubes migrated from IBM Cognos Series 7, see the *IBM Cognos PowerPlay Migration and Administration Guide*.

## Conformed dimensions

If you work with more than one dimensional data source, you may notice that some dimensions are structured the same, and some are not.

The reason that dimensions can be structured differently is that the data sources may serve different purposes.

For example, a Customer dimension appears in a Revenue data store, but not in an Inventory data store. However, the Products dimension and the Time dimension appear in both data stores.

Dimensions that appear in multiple data stores are conformed if their structure is identical for all of the following:

- hierarchy names
- level names
- level order
- internal keys

Drilling through is possible between different dimensional data stores only if the dimensions are conformed, and if the dimension data store is of the same vendor type, such as IBM Cognos PowerCube as the source and the target. For example, in two data stores for Revenue and Inventory that contain Products and Time dimensions, it is possible to define the Products and Time dimensions differently for each data store. However, for drill-through between the Products and Time dimensions to work, their structures must be identical in each data store.

If you are not sure whether your dimensions are conformed, then you should check with the data modeler to ensure that the drilling through will produce meaningful results.

IBM Cognos Analytics does not support conformed dimensions generated by IBM Cognos Framework Manager for SAP BW data sources.

## Dimensionally modeled Relational Data Sources

Ensure that each level contains a business key that has values that match your PowerCube or other DMR models. Also, you must also ensure that the **Root Business Key** property is set and uses the business key of the first level in the hierarchy. This helps to ensure that you have a conformed member unique name when attempting to drill through using members from this dimension.

### Related concepts

[Data Does Not Appear in a Target Report or the Wrong Data Appears](#)

### Related tasks

[Unexpected or Empty Results When Drilling Through](#)

## Business keys

When drill-through access is defined from a member to a relational value, the business key of the member is passed by default.

This means that your relational target parameter must be set up using the data item with a matching value, which is most often the business key data item. You can also choose to pass the caption of the source metadata item.

For example, employees are usually uniquely identified by an employee number, not by their name, because their name is not necessarily unique. When you drill through from a dimensional member to a relational data item, the value provided is the business key. Therefore, the parameter in the target report must be defined to accept a business key value. The exact logic used to define the business key value supplied depends on the cube vendor. For IBM Cognos PowerCubes, the business key value is the **Source** property defined for the level in IBM Cognos Transformer. IBM Cognos Series 7 Transformer PowerCubes pass the source value if the drill-through flag was enabled before the cube was built. Otherwise, the category code is used.

In IBM Cognos Analytics - Reporting, you can determine what the member business key is using an expression such as `roleValue('_businessKey', [Camping Equipment])`. This expression is case-sensitive.

SSAS 2005 multipart business keys are not supported in drill-through operations.

**Tip:** When other users run your drill-through report, you may not want them to be prompted for a business key. In Reporting, you can build a prompt page with a text that is familiar to the users, but filters on the business key. Your IBM Cognos Framework Manager modeler can also set the **Display Item Reference** option for the **Prompt Info** property to use the business key when the data item is used in a prompt.

### Related concepts

[Data Does Not Appear in a Target Report or the Wrong Data Appears](#)

### Related tasks

[Unexpected or Empty Results When Drilling Through](#)

## Scope

Scope is specific to drill-through definitions created using drill-through definitions (package drill-through definitions). The scope you set defines when the target report is shown to the users, based on the items they have in the source report.

Usually, you define the scope of a drill-through path to match a parameter that it passes. For example, if a target report contains a list of employees, typically you want to display the report as an available drill-through choice only when a user is viewing employee names in a source report. If employee names are not in the source report and the scope was set on the employee name in the drill-through definition, the employee report does not appear on the list of available drill-through target reports in the **Go To** page. You can set the scope to a measure or to an item in the report.

In report-based drill-through access, where the drill-through path is associated with a specific report column, the column serves as the scope.

## Mapped parameters

Drill-through targets may contain existing parameters or you can add parameters to the target for greater control over the drill-through link.

You usually map all parameters in a drill-through target to items from the source.

When you map source items that are OLAP or DMR members to target parameters, you can select from a set of related member properties to satisfy the requirements of the target parameter. For a dimensional target, a dimensional source item uses the member unique name by default. For a relational target, a dimensional source item uses the business key by default.

For example, you could change the source member property that is used for a mapping to the member caption instead of the business key to match the parameter in a relational target. For a dimensional target, you could define a parameter that accepts a particular property (such as business key or parent unique name), then pass the appropriate source property to satisfy that target.

**Note:** If you define drill through between non-conformed dimensions, you should test carefully to ensure that the results behave as expected.

If you do not specify parameter mappings, then by default, you will be prompted for any parameters required in the target when you use the drill-through link. To customize this behavior, use the display prompt pages setting.

When the action is set to **Run the report using dynamic filtering**, then additional filtering is applied if names from the context in the source report match names of items in the target. Use this action as well when there are no parameters defined in the target.

If parameters are not mapped correctly, then you may receive an empty report, the wrong results, or an error message.

The source and target cannot contain identical parameter names when they are from different packages, even if the data structure is conformed. If the source and target are from the same package, there is no restriction.

If you have the necessary permissions, you can use the drill-through assistant to look at what source parameters are passed, and what target parameters are mapped for a given drill-through link.

You can change the dynamic drill-through filter behavior if you want drill-through to generate a filter using the Member Business Key instead of the default Member Caption. For more information, see *Changing Drill-Through Filter Behavior* in the *IBM Cognos Administration and Security Guide*.

## Drilling through on dates between PowerCubes and relational packages

The usual method of drilling through from OLAP to relational packages requires that the target report parameter is set using the business key in the relational data, which does not work well for dates.

OLAP data sources typically view dates as members, such as Quarter 1 2012, while relational data sources view dates as ranges, such as 1/Jan/2012 to 31/March/2012.

A special feature exists for drilling through between PowerCubes and relational packages. Ensure that the target report parameter is set up using `in_range`. The parameter must be of type date-time, and not integer.

An example follows:

```
[gosales_goretailers].[Orders].[Order date] in_range ?Date?
```

Also ensure that the drill-through definition maps the parameter at the dimension level and that the PowerCube date level is not set to suppress blank categories. Enabling the option to suppress blank categories in the Transformer model before you build the cube may cause the drill-through on dates to be unsuccessful. This happens because there are missing values in the range.

## Set up drill-through access in a report

Set up drill-through access in a source report to link two reports containing related information.

You can then access related or more detailed information in one report (the target) by selecting one or more data item values from another report (the source). IBM Cognos passes values from the source to the target and uses the passed values to filter the target object. If the data in the source and target is conformed or if the data item names are the same, then the system may map the source values to filter the target (dynamic drill-through). If you require greater control, you may define parameters in the target object (parameterized drill-through).

For instructions about creating parameters in other kinds of targets, see the IBM Cognos Analytics *Administration and Security Guide*.

When you define the drill-through path in IBM Cognos Analytics - Reporting, you can pass a value from a different data item that is hidden from the user for display purposes but still in the query. For example, users see the Product Name data item and can drill through on that item, but the drill-through definition passes the Product Number value for the product name the user chose. You can also define the target parameter to accept multiple values or a range of values from the data item in the drill-through source report or to accept a value from a parameter in the source report.

Drill-through definitions that have been authored inside a Reporting report appear in the source report as blue underlined links. Users click the hyperlink to select the value they want passed to the target and to drill through to the target report. If a user selects multiple items within a single column then when the drill-through target report is run, the values from each selected row are passed to the target parameters. This occurs as an *and* condition.

You can also drill through within the same report by creating bookmarks. As well, you can create drill-through definitions in the source package instead of the Reporting report. Users can use package drill-through definitions to navigate to a target report from an IBM Cognos Analysis Studio analysis, an IBM Cognos Query Studio report, an IBM Cognos PowerPlay Studio report or IBM Cognos PowerCube package, or a Reporting report. For more information, see the *Administration and Security Guide*.

If you have the IBM Cognos Software Development Kit, you can use URLs to set up drill-through access to and from third-party sources.

You can also drill through from a map.

## Create a parameter in the target

---

Set up drill-through access in a source report to link two reports containing related information. You can then access related or more detailed information in one report (the target) by selecting one or more data item values from another report (the source).

If you are using an SAP BW data source for the target report and the target report contains a variable for a hierarchy node, values from the source report can be values only of the data item representing the leaf-level identifier of the hierarchy.

### Before you begin

Before you begin, ensure that you have a report that will serve as the source report and another report that will serve as the target report.

### Procedure

1. In IBM Cognos Analytics - Reporting, open the target report.
2. Create a parameter that will serve as the drill-through column or that will filter the report.

For example, to drill through or filter Product line, create the following parameter:

[Product line]=?prodline\_p?

**Tip:** Use the operators `in` or `in_range` to enable the target report to accept multiple values or a range of values.

3. In the **Usage** box, specify what to do when a value for the target parameter is not passed as part of a drill through:

- To specify that users must select a value, click **Required**.

If a value for the target parameter is not passed, users are prompted to choose a value.

- To specify that users do not need to select a value, click **Optional**.

Users are not prompted to choose a value and so the value is unfiltered.

- To specify not to use the parameter, click **Disabled**.

The parameter is not used during the drill-through. It will also not be used in the report for any other purposes.

**Tip:** If the parameter is needed in the report for other reasons, then you can also specify not to use it in the drill-through definition (**Parameters** table, **Method**, **Do not use parameter**).

## Create a drill-through definition

---

Create a drill-through definition to link two reports containing related information (the source report and the target report).

Drill-through definitions that have been authored inside an IBM Cognos Analytics - Reporting report appear in the source report as blue underlined links. Users click the hyperlink to select the value they want passed to the target and to drill through to the target report. If a user selects multiple items within a single column then when the drill-through target report is run, the values from each selected row are passed to the target parameters. This occurs as an *and* condition.

### Before you begin

Before you begin, ensure that you have a report that will serve as the source report and another report that will serve as the target report.

### Procedure

1. Check the drill-through target:
  - Confirm that the drill-through users have access to the target.
  - If necessary, check what parameters exist in the target.
2. Open the source report.
3. Click the element in the report that will serve as the starting point for the drill-through link.

You can select a data item that your report users are likely to choose to drill on for more detailed information, such as an Employee Name data item.

**Tip:** If you are passing only parameter values to the target report, you do not have to drill on a data item. Instead, you can drill on any object in the report, such as the report title. Therefore, you can drill from outside the context of a query.

4. Click the **Show properties** icon  in the **DATA** section, double-click the **Drill-through definitions** property.
  5. Click the **Add** icon .
- A drill-through definition is created.
- Tip:** To change the drill-through name, click the rename button, type the new name, and click **OK**.
6. On the **Target report** tab, click the ellipsis button next to the **Report** box and select the drill-through target report.
  7. In the **Action** box, decide how users will view the target report when they click the drill-through link in the parent report:
    - To view the latest data in IBM Cognos Viewer, select **Run the report**.
    - To edit an IBM Cognos Query Studio, IBM Cognos Analysis Studio, or IBM Cognos PowerPlay Studio target, select **Edit the report**.
    - To have IBM Cognos Analytics match values from the selection context with data in the target (dynamic filtering), select **Run the report using dynamic filtering**.

**Note:** If you chose this option, any parameters in the target report are still used for the drill-through access.

- To view the most recently saved output version of the target report from the IBM Cognos Analytics portal, select **View the most recent report**.
- To use the default action specified for the report in the IBM Cognos Analytics portal, select **(Default)**.

8. If the target report contains parameters, then, under the **Parameters** box, click the edit button.

Each required and optional parameter defined in the target report appears in the **Parameters** dialog box.

9. For each parameter, specify the **Method** of treatment:

- To specify not to pass any value, click **(Default)**.
- To specify not to use this parameter, click **Do not use parameter**.

The target report will not be filtered by this parameter.

- To pass values from a data item, click **Pass data item value**, click **Value**, and then click the data item.

Values for the selected data item are passed to the target report.

- To pass values from a source report parameter, click **Pass parameter value**, click **Value**, and then click the parameter.

Values for the selected parameter are passed to the target report.

- If you choose to pass parameters, and the source report is based on a dimensional package, then click an item from the drop-down list in the **Source metadata item properties** column. You can pass the default property of the source metadata item (business key) or another property, such as the member caption.

10. Click **OK**.

11. If you chose to run the target report, in the **Format** box, click the output format for your report.

**Tip:** Click **(Default)** to run the report using the default format specified for the report in the IBM Cognos Analytics portal.

12. To open the target report in a new window, select the **Open in new window** check box.

13. In the **Display prompt pages** box, choose how to display prompt pages:

- To always display prompt pages when the drill-through action occurs regardless of whether values were specified for the required parameter values, click **Always**.
- To use the prompt settings of the target report (specified by the **Prompt for Values** check box in the IBM Cognos Analytics portal, **Report Properties**, **Report** tab) to determine whether to show the prompt pages, click **Based on the default prompt settings of the target report**.

**Tip:** If you leave the **Prompt for values** check box selected (the default) and run a report that contains the same parameter name that appears in your **My parameters** panel, you are not prompted to provide a value for the parameter. The system automatically uses the default values that were set for the user's role. Even if the parameter on the report is optional, the default value for the global parameter is passed.

- To not display prompt pages when the required parameter values are provided by the drill-through definition, click **Only when required parameter values are missing**. This is the default setting.

## Results

The drill-through text appears as a blue hyperlink in text items in the non-chart areas of the report. Report consumers can also start the drill-through action by clicking the **Go To** button or by right-clicking the item and clicking **Go To, Related links**. If you have the necessary permissions, you can view which parameters were passed from the source and how they are mapped in the target object from the **Go To** page using the drill-through assistant.

For more information, see the *Administration and Security Guide*.

## Defining independent drill-through definitions for crosstabs

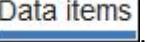
By default, you can create only one drill-through definition for fact cells in a crosstab, regardless of how many facts there are. This topic describes how to define different drill-through definitions for different measures in crosstab fact cells.

For example, a crosstab has Quantity and Revenue as measures. For the Quantity cells, you want to define a drill-through definition to a target report that contains more information about quantities sold. For the Revenue cells, you want to define a drill-through definition to a different target report that shows details about revenue generated.

### Procedure

1. Open the source report.
2. Click the **More** icon  and then click the **Locked** icon .
3. In the crosstab, click the white space inside one of the fact cells of the measure for which you want to define a drill-through definition.

Do not click the measure text. You want to select the crosstab intersection and not the text item. In the **Properties** pane title bar, ensure that **Crosstab intersection** appears.
4. In the **Properties** pane, set the **Define contents** property to **Yes**.

The text item in the crosstab intersection disappears.
5. Click the **Data** icon  and then click the **Data items** tab .
6. From the crosstab query, drag the measure that disappeared in step 4 to the empty crosstab intersection.
7. Click the measure in the crosstab intersection and then, in the **Properties** pane, click **Drill-through definitions**.
8. Create the drill-through definition.

### Results

A drill-through definition is defined for the selected measure. Repeat the steps to define different drill-through definitions for other measures in the crosstab. When users run the report, clicking values from different measures takes them to a different target report.

## Specify the drill-through text

---

You can specify the drill-through text that appears when users can drill through to more than one target.

For example, if users from different regions view the report, you can show text in a different language for each region.

### Procedure

1. Click the drill-through object and then, from the **Properties** pane, click **Drill-through definitions**.
2. If more than one drill-through definition exists for the object, in the **Drill-through definitions** box, click a drill-through definition.
3. Click the **Label** tab.
4. To link the label to a condition, in the **Condition** box, do the following:
  - Click **Variable** and click an existing variable or create a new one.
  - Click **Value** and click one of the possible values for the variable.
5. In the **Source type** box, click the source type to use.
6. If the source type is **Text**, click the ellipsis button that corresponds to the **Text** box and type text.

7. If the source type is **Data item value** or **Data item label**, click **Data Item** and click a data item.
8. If the source type is **Report expression**, click the ellipsis button that corresponds to the **Report expression** box and define the expression.
9. If the label is linked to a condition, repeat steps 5 to 8 for the remaining possible values.

## Results

When users run the source report and click a drill-through link, the **Go to** page appears. The drill-through text you specified appears for each target. If you did not specify the drill-through text for a target, the drill-through name is used.

# Chapter 19. Working with multiple pages

Divide a report into multiple pages and add navigation elements to make it easier to use.

**Note:** The pages that you see in the **Pages** icon  differ from physical, printed pages. For example, if you create page breaks in a long report, the **Pages** icon could show only one page, but your report could include several physical pages when you print it.

## Add a page to a report

Add pages to create a multiple-page report.

### About this task

Reports may contain pages with a variety of content. For example, you are creating a sales report and you want to include general information about the company. You decide to create an introduction page to show this information. When you run the report, page 1 of the report is the introduction page and the following pages contain data.

**Tip:** The TOC Report sample report in the GO Data Warehouse (query) package includes multiple pages.

### Procedure

1. Click the **Pages** icon  and click **Report pages**.

**Tip:** Click **Prompt pages** to add a prompt page.

2. Click the **Toolbox** icon , drag **Page** to the work area.
3. To change the order of pages, drag pages above or below other pages.
4. To associate a query to the page, in the **Properties** pane, set the **Query** property to the query.

Associate the page to a query to add data-related objects directly to the page header, body, or footer, such as data items and filters.

5. Double-click the page to open it in page design view.
6. Add objects to the page.

## Page breaks, page sets, and page layers

You can create simple page breaks, advanced page sets, or page layers to associate pages with a query structure to force page breaks.

For example, a query contains the data item Product line, which is grouped. Creating a page set that is associated with this query adds page breaks for each product line. When working with dimensional data, you can use the **Page layers** area to show values on a separate page for each member.

When you are working with dimensional data, IBM Cognos Analytics - Reporting does not support page breaks or page sets that are based on custom groups.

**Tip:** The Global Bonus Report sample report in the GO Data Warehouse (analysis) package includes page sets.

### Reports in Excel 2007 format

When you produce reports in Excel 2007 format, you can configure IBM Cognos Analytics to dynamically name the Excel worksheet tabs, based on the data items that are used to break pages. For example, you

specify to break pages by Product line. In Excel 2007 output, the five worksheet tabs that are generated are named Camping Equipment, Mountaineering Equipment, Personal Accessories, Outdoor Protection, and Golf Equipment. To dynamically name Excel worksheet tabs, ask your administrator to add the RSVP.EXCEL.PAGEGROUP\_WSNAME\_ITEMVALUE advanced setting to the report service. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

If a report contains two page sets that use the same grouping data item, the suffix \_<number> is appended to the Excel tabs. For example, a report contains two page sets that use Product line as the grouping item. In the Excel output, worksheet tabs are named Camping Equipment, Golf Equipment, Camping Equipment\_2, Golf Equipment\_2, and so on. Similarly, page set header and footer pages are named Camping Equipment, Camping Equipment\_2, Camping Equipment\_3, and so on.

If a report contains nested page sets, worksheet tab names are a concatenation of the nested items separated by commas. For example, a report contains a page set with Product line as the grouping item. The page set has a nested page set that uses Product type as the grouping item. Examples of worksheet tab names that are generated are Camping Equipment,Cooking Gear and Camping Equipment,Lanterns.

**Note:** In Excel, tab names cannot exceed 30 characters. Tab names with more than 30 characters are truncated. If truncated tab names produces duplicate names, the prefix s\_<worksheet indexing> is added to the names. For example, multiple pages are named Camping Equipment,Cooking Gear. The first tab name is Camping Equipment,Cooking Gea. The second tab name is s\_22Camping Equipment,Cooking.

## Creating page breaks

Create page breaks in a report by adding page sets.

### About this task

Page sets define sets of pages within a report. You customize the grouping and sorting of each page set to produce the results that you want.

You cannot create page sets if you set the option to show report pages as tabs in HTML output (**Show properties > View pages as tabs**).

### Procedure

1. Click the **Pages** icon , and click **Report pages**.
2. Create the report pages.
3. Click the **Toolbox** icon  and drag the **Page set** object to the **Report pages** pane.
4. Click the **Show properties** icon , and in the **Properties** pane, set the **Query** property to the query that you want to associate with the page set.

**Tip:** You can also create a page set and associate it to a query by clicking the **Data** icon , right-clicking a query and clicking **Insert**.

5. Organize the pages in the report by dragging report pages to the page set.
6. Insert the page containing details in the **Detail Pages** folder.

Detail pages are the pages that repeat based on the items by which you group in the following step.

**Tip:** You can insert multiple detail pages into the same page set and link them using a master detail relationship.

7. Define the grouping structure for the page set:
  - Click the page set.
  - In the **Properties** pane, double-click the **Grouping & sorting** property.
  - In the **Data items** pane, drag the data item by which to group data items to the **Groups** folder in the **Groups** pane.

- To sort the data within each group, in the **Data items** pane, drag the data item by which to sort to the **Detail Sort List** folder, and then click the sort order button  to specify the sort order. For more information about sorting data, see “[Sorting Relational Data](#)” on page 172 or “[Sorting Dimensional Data](#)” on page 211.

**Note:** Grouping an item for a page set is not the same as grouping a column in the layout. Grouping a column in the layout visually shows groups in a report. Grouping an item for a page set groups the item in the query. If you want to use an item that is already grouped in the layout, you must still perform step 7.

- Repeat steps 3 to 7 to create other page sets.

**Tip:** You can nest page sets and join them by defining a master detail relationship. Create nested page sets to have pages occur within other pages. For example, you want pages containing product type information to occur within pages containing product line information.

## Join nested page sets

If you have nested page sets in your report, define a master detail relationship between them to see data in the nested page set that is related to the data in the parent page set.

For example, you have a page set that shows pages of product line information. The page set contains a nested page set that shows pages of product type information. For each product line page, you want to see the related product type pages, as shown in the following example:

Product line\_1

- Product type\_1
- Product type\_2
- Product type\_3

Product line\_2

- Product type\_4
- Product type\_5
- Product type\_6

For more information about master detail relationships, see “[Create a Master Detail Relationship](#)” on page 220.

## Procedure

- Click the **Pages** icon  and click **Report pages**.
- In the **Report pages** pane, click the nested page set.
- In the **Properties** pane, double-click the **Master detail relationships** property.
- Click the **New Link** button.
- In the **Master Query** box, click the data item that provides the primary information.
- Link the master data item to the details by doing one of the following:
  - To link to another data item in the detail query, in the **Detail Query** box, click the data item that provides the detailed information.
  - To link to a parameter, in the **Parameters** box, click the parameter that provides the detailed information.
- Repeat steps 4 to 6 to create other links.

**Tip:** To delete a link, select it and press the Delete key.

## Create page layers

When working with dimensional data, you can create page layers in a report to show values for each member on a separate page. For example, your report contains payroll information for the entire company. You want to view values for each department on a separate page.

After you create page layers, a caption appears in the header to indicate the contents of each page. You can navigate between the different pages using links below the report.

Creating page layers is similar to filtering using context. However, with context filters, values are filtered according to the member you add to the **Context filter** area. With page layers, the report is split into a separate page for each child of the member you add to the **Page layers** area.

To create more complex page layers in your reports, such as a report book with title and end pages, create page sets.

### Procedure

1. In the source tree, select or search for one or more items on which to filter.
2. Drag the item into the **Page layers** section of the overview area.

The crosstab shows the results for the children of the selected item on separate pages, and a list appears under **Page layers**.

**Tip:** To navigate between pages, click **Page down** and **Page up** below the report.

3. To replace the page breaks with items from the same dimension, select an item from the list. To delete the page breaks, from the list, click **Delete**. To delete all the page breaks, right-click the **Page layers** area and click **Delete All**.

## Add a bookmark

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Add a bookmark so that users can quickly move from one part of a report to another. For example, a list report contains many rows of data. You add bookmarks so that users can move to specific rows.

You can also drill through to another report.

If you want to use page numbers to move from one part of a report to another, you can also create a table of contents.

Bookmarks work for reports produced in HTML format or PDF. In HTML format, they work best when viewing saved report outputs, as the entire report appears in a single HTML page. When reports are run interactively, more than one HTML page may be generated, and a bookmark works only if the target exists in the page currently being viewed.

If you run a saved report using a URL, and you specify a bookmark within the URL, you always go to the first page of the report. The bookmark defined in the URL is not honored. For more information about using URLs to run reports, see the *Administration and Security Guide*.

**Tip:** You can reduce the number of HTML pages generated when a report is run interactively by specifying a value for the **Rows per page** property for a data container in the report.

**Tip:** The Briefing Book sample report in the GO Sales (analysis) package includes bookmarks.

### Procedure

1. Click the **Toolbox** icon , drag a **Bookmark**  object to the report.
2. Click the bookmark and, in the **Properties** pane, set the **Source type** property to a source type.

Source type	Description
<b>Text</b>	<p>Creates a static bookmark using a text value.</p> <p>For example, a list has sections and you want users to jump from each section to the top of the report.</p>
<b>Report expression</b>	<p>Creates a dynamic bookmark whose values are derived from an expression that you define.</p>
<b>Data item value</b>	<p>Creates a dynamic bookmark that has data as possible values. This is useful for creating a context-based bookmark.</p> <p>For example, a list has sections and you want users to jump from the top of the report to a specific section.</p> <p><b>Note:</b> This source type appears only if the bookmark is inserted next to a data item.</p>
<b>Data item label</b>	<p>Creates a bookmark that has the label of a data item as its value. Use this source type to jump to the first occurrence of a data item label.</p> <p>For example, a list is divided into sections using Product line. You want users to jump to the first product line section that appears in the list rather than to a specific section, such as Camping Equipment.</p> <p><b>Note:</b> This source type appears only if the bookmark is inserted next to a data item.</p>
<b>Member caption</b>	<p>In a crosstab, creates a dynamic bookmark that uses member captions as possible values.</p>
<b>Cell value</b>	<p>In a crosstab, creates a dynamic bookmark that uses cell values as possible values.</p>

3. Set the property that appears under the source type you chose to the bookmark value.

For example, if the source type is **Data item value**, set the **Data item value** property to the data item.

4. Click the object that will jump to the bookmark, from the report object toolbar, click the **More** icon , and then click **Drill-Through Definitions**.

For example, click a data item, image, chart, or text item.

**Tip:** The object can exist in a different report, so you can jump from one report to another.

5. Click the **New Drill-Through Definition** icon .

6. Click the **Bookmark** tab.

7. Click **Source type** and click one of the source types described in step 3.

Click the source type to use to produce the value needed to jump to the bookmark. For example, click **Data item value** if you want the value to come from a data item such as Product line.

8. If you clicked one of the following source types, specify the value to use to jump to the bookmark.

- For **Text**, click the ellipsis button next to **Text** and type a text value.

- For **Data item value** or **Data item label**, in the **Data item** list, choose a data item.
- For **Report expression**, click the ellipsis button next to **Report expression** and define the expression.

## Create a table of contents

---

You can create a table of contents that appears in the rendered output of your report. A table of contents is useful for reports that include sectioned items, grouped items, or multiple pages in the layout. The report output indicates page numbers and allows for easy navigation.

You can include multiple tables of contents in your report, which are useful if your report contains grouped lists. You can also add section numbers in front of entries in the table of contents by modifying the heading level property.

Table of contents entries are logical markers placed anywhere in a report. For example, you can place entries at the top of a page or in a list group header to mark each grouped data value. Although table of contents entries are visible in IBM Cognos Analytics - Reporting, they cannot be seen when a report is run.

A table of contents works only for reports produced in PDF or non-interactive HTML format. In HTML format, they work best when viewing saved report outputs, as the entire report appears in a single HTML page. When reports are run interactively, more than one HTML page may be generated, and a table of contents works only if the target exists in the page currently being viewed.

**Tip:** You can reduce the number of HTML pages generated when a report is run interactively by specifying a value for the **Rows per page** property for a data container in the report.

If you want to quickly move from one part of a report to another without using page numbers, you can add bookmarks.

**Tip:** The Briefing Book sample report in the GO Sales (analysis) package includes a table of contents.

### Before you begin

You must first create a table of contents before adding entries in the report. All entries must be inserted after the table of contents in the report layout.

### Procedure

1. Click the **Toolbox** icon , drag the **Table of contents** object to the new location, which can be anywhere in the report.

A table of contents placeholder appears.
2. Drag the **Table of contents entry** object to the location of your first table of contents marker.

The new entry appears in the table of contents.
3. Double-click the **Double-click to edit text** box of the new marker.
4. In the **Text** box, type the text to appear in the table of contents and click **OK**.
5. To edit the heading level of a table of contents entry, click the entry and, in the **Properties** pane, set the **Heading level** property to the level.

The heading level is used to insert section numbers in front of entries in the table of contents using layout calculations.
6. When you finish creating the table of contents, run the report. By clicking the arrow to the right of the run report button, you can specify whether to run the report as HTML or PDF.

## Insert page numbers in a report

---

You can insert page numbers in a report and specify the number style to use.

You can select a predefined page numbering scheme or create a custom scheme. You can easily insert page numbers using the **Page number** object.

You can also manually create an expression to insert page numbers by inserting a layout calculation and using the different page report functions in the expression editor.

### Procedure

1. Click the **Toolbox** icon , drag **Page number** to the report.

**Tip:** When you create a new report using one of the existing report layouts, **Page number** is already inserted in the page footer.

2. Double-click the page number symbol and choose the style to use.

The first three choices apply only to vertical page numbers. The remaining choices specify how vertical and horizontal page values appear.

**Note:** The 1 of 3 number style works only for reports produced in PDF or non-interactive HTML format. In HTML format, the 1 of 3 number style works when viewing saved report outputs, as the entire report appears in a single HTML page.

3. If you want to customize the choice that you made in the previous step, click the edit button , make your changes, and click **OK**.

A custom number style is created. If you later choose a different number style, the custom style is removed from the list.

**Tip:** In the **Custom number style** dialog box, when you pause the pointer over a box, a tooltip describes how that box affects page numbers. For example, the **Separator** box contains the text, such as a hyphen, that separates page values for both vertical and horizontal pages.

## Control page breaks and page numbering

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You can control page breaks and page numbering in a list, crosstab, table, or report page by choosing any of these options.

The options that are available depend on which object you have selected. All the options for all the objects are described in the following table.

Option	Description
<b>Keep with header</b>	Keeps all headers on the same page with the number of detail rows specified.
<b>Keep with footer</b>	Keeps all footers on the same page with the number of detail rows specified.
<b>Keep with previous</b>	Keeps the object with the specified number of preceding objects on the same page, if space permits.
<b>Keep with next</b>	Keeps the object with the specified number of subsequent objects on the same page, if space permits.

Option	Description
<b>Reset page count</b>	Resets the page count after a page break to the value specified.
<b>Reset page number</b>	Resets the page number after a page break to the value specified.
<b>Repeat every page</b>	If the report renders multiple pages, this object is repeated on every page.
<b>Allow contents to break across pages</b>	Allows contents to break across pages. In lists and crosstabs, controls whether a cell is broken across pages, which is useful when there is a lot of text.
<b>Allow horizontal pagination</b>	<p>In PDF output, allows the columns of a list or crosstab to break across horizontal pages if they do not fit on a single page.</p> <p><b>Tip:</b> In lists, you can select the <b>Repeat every page</b> option for list columns that show on every horizontal page.</p> <p>If the <b>Allow horizontal pagination</b> option is not selected, the size of the list or crosstab is scaled down when necessary so that it fits on a single page.</p> <p><b>Tip:</b> The Horizontal Pagination sample report in the GO Sales (analysis) package includes horizontal pagination.</p> <p>If your report includes nested data frames such as a list within a list, horizontal pagination is supported on either the parent or child frame, but not both. If horizontal pagination is enabled on both the parent and child frame, it will be ignored on the child frame when the report runs. We recommend that you do not enable horizontal pagination on both the parent and child frames. Horizontal pagination is not supported for data containers, such as a list or crosstab, that are nested in repeater tables.</p> <p>You can also specify page number options that use compound numbering schemes. For example, you can use the numbering scheme 1-1, 1-2, 2-1, 2-2, and so on. For more information, see “<a href="#">Insert page numbers in a report</a>” on page 343.</p>

Option	Description
<b>Enable horizontal page numbering</b>	<p>Increments page numbers of horizontal pages separately from the main page numbers when you select a page numbering style that includes horizontal pages. For example, if a page has three page breaks horizontally and you selected the page number style 1a, the horizontal pages are numbered 1a, 1b, and 1c. If you did not select a numbering style that includes horizontal pages, the horizontal pages are all numbered 1 for the first vertical page, 2 for the second vertical page, and so on.</p> <p>If this option is not selected and there are horizontal pages, all pages are numbered sequentially. For example, if a report has two vertical pages and three horizontal pages, the PDF pages are numbered from 1 to 6. Pages 1 to 3 are the three horizontal pages for the first vertical page and pages 4 to 6 are the three horizontal pages for the second vertical page.</p>
<b>Allow row contents to break across pages</b>	<p>In tables, allows the contents of a row to break across pages. For example, if a row contains four lines of text, the first two lines from the row appear on the first page, and the last two lines appear on the next page.</p>
<b>Repeat table rows on page break</b>	<p>In tables, if a row breaks across pages, repeats the rows that were previously rendered on each page. By default, table rows are repeated.</p> <p><b>Note:</b> This option applies to saved reports only. In interactive HTML reports, table rows are always repeated even if this option is not selected.</p>

You can also specify the style to use for page numbers.

#### Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Pagination** property.
3. Specify the page break and numbering options.

## Creating a report booklet

In an IBM Cognos Analytics - Reporting report, you can add references to other reports to create a report booklet. Each report reference represents a booklet item.

#### About this task

You can insert or move report references before and after pages and page sets. However, you cannot add report references to a page set.

You can copy a report reference and paste it in a valid area in the report. If you try to paste a report reference in a page set, the report reference is added to the end of the report.

You can create a table of contents entry for a report reference. When the table of contents is generated, by default, the report name is used for the table of contents entry. You can edit the entry by selecting it in the table of contents. If the report name is changed, you must manually update the table of contents entry. If you change the order of pages in the report, the table of contents is automatically updated when it is generated.

You cannot add references to other reports if you set the option to show report pages as tabs in HTML output (**Show properties > View pages as tabs**).

### Procedure

1. Click the **Pages** icon  and click **Report pages**.
  2. Click the **Toolbox** icon , drag **Report reference** to the **Report pages** pane.  
The **Choose report** window opens.
  3. Locate the report that you want to add as a report reference and double-click it.
- Tip:** If you want to change the report reference, from the **Properties** pane, double-click the **Referenced report** property and choose a different report.
4. Optional: Create a table of contents entry for the booklet item by modifying properties in the **Properties** pane, in the **Table of contents** group.
    - a) Set the **Table of contents entry** property to **Yes**.
    - b) To roll up table of content entries for the booklet item into the report booklet, set the **Roll up table of contents** property to **Yes**.
    - c) Specify the starting heading level for the booklet item by typing a value in the **Start heading level** property.  
For example, if you specify 2, all table of content entries for the booklet item have section numbers that start at 2.
  5. To render prompt pages that exist in the booklet item when the report is run, set the **Show prompt pages** property to **Yes**.
  6. Specify how to handle saved parameter values that come from the booklet item when the report is run by clicking one of the options in the **Saved parameter values** property.

Parameter values include signon, validation, and prompt information, and they are saved on the IBM Cognos server.

- If you do not want to use saved parameter values from the booklet item, select **Ignore**.
- If you want to use saved parameter values from the booklet item, select **Merge**.

When **Merge** is selected, parameter values that come from the booklet item are merged with parameter values that come from the report. If the same value exists for both the booklet item and the report, the booklet item value is ignored.

## Producing tabbed reports

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When you produce reports in HTML format, you can show each report page as a tab.

### About this task

Report page names are used to name each tab in the output.

The option to show pages as tabs is not supported when a report is used as a report reference in a report booklet. This option is also not supported when a report contains page sets. Page sets are created in a report when you add a page set object, page layers, and page breaks.

In Excel output, each tab becomes a single sheet within the same workbook.

## **Procedure**

1. Click the **Show properties** icon , and go to the Report properties.
2. Click the **View pages as tabs** menu and select the location where you want the tabs to appear in browsers.



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# Chapter 20. Managing existing reports

After you have created a report, you can make changes or enhancements, such as setting up the report for bursting.

Before you modify an existing report, ensure that you have the proper security permissions. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

## Copy a report to the clipboard

You can copy a report specification to the clipboard so you can open it from the clipboard later.

This process is different for the Microsoft Internet Explorer and Mozilla Firefox Web browsers because the clipboard works differently in each Web browser.

### Copy a report to the clipboard in Internet Explorer

This process is different for the Microsoft Internet Explorer and Mozilla Firefox Web browsers because the clipboard works differently in each Web browser.

#### Procedure

Click the **Pages** icon  or the **Queries** icon , right-click the **Report** icon , then click **Copy Report to Clipboard**.

### Copy a report to the clipboard in Firefox

This process is different for the Microsoft Internet Explorer and Mozilla Firefox Web browsers because the clipboard works differently in each Web browser.

#### Procedure

1. Click the **Pages** icon  or the **Queries** icon , right-click the **Report** icon , then click **Copy Report to Clipboard..**
2. In the **Copy Report to Clipboard** dialog box, copy the entire report specification.
3. Open a text editor and paste the report specification.
4. Copy all the text from the text editor report specification.

Now the text is saved on your computer's clipboard.

## Open a report from the Clipboard

You can open a report specification that was previously copied to the clipboard.

To copy a report to the clipboard, see “[Copy a report to the clipboard](#)” on page 349. This is useful for importing an XML report specification from outside the IBM Cognos Analytics environment.

Although IBM Cognos Analytics - Reporting attempts to validate the report specification, it is your responsibility to ensure that it is correct. For more information, see the *IBM Cognos Software Developer Kit Developer Guide*.

## Procedure

Click the **Pages** icon  or the **Queries** icon , right-click the **Report** icon , then click **Open Report from Clipboard**.

## Open a file from another studio

---

You can open reports, templates, or analyses that were created in IBM Cognos Query Studio or IBM Cognos Analysis Studio in IBM Cognos Analytics - Reporting. All the capabilities of Reporting are available to you so you can change formatting, layout, calculations, and queries.

**Note:** If you make and save changes to a Query Studio report or an Analysis Studio analysis in Reporting, the report or analysis can no longer be opened in Query Studio and Analysis Studio.

## Procedure

1. To locate an item, from the **Home page** window, click **Team content** , **My content**, or to search for an item by name, click **Search** and enter a name.
2. Double-click to open folders and then click the report, template, or analysis.

## Analysis Studio query specification

IBM Cognos Analysis Studio defines each group of rows and columns as a set. When you import an analysis into IBM Cognos Analytics - Reporting, the report will have one query that processes all the sets found on the crosstab. Each set is defined by data items that segment and summarize the base set definition. To maintain reports converted from Cognos Analysis Studio, you must understand what each of these items represents and how they relate to each other.

Before you modify any of the data items in the Cognos Analysis Studio set definitions, we recommend that you fully understand each data item and its dependencies. Modifying the data items may cause unpredictable results and may slow the performance of your report.

The data items for a set specify the following:

- the set definition
- set segments, including which members were excluded and hidden individually
- filter rules for defining which members are to be retrieved
- calculations for Subtotal (N items), More & Hidden, Subtotal (included), Subtotal (excluded), and the total

For more information, see the *IBM Cognos Analysis Studio User Guide*.

- which subtotals should appear
- any user-defined calculations

The default measure identifies which measure is the default for the crosstab or chart. If no default measure is specified, the default measure may be empty.

## Set Definitions

The following table shows the definitions and dependencies for the data items in the set definition.

Data item	Definition	Dependencies
<set name> (base)	Defines the set of members to be used for sorting, filtering, and summary operations. This data item provides a generic reference for all other data items and may reference one of the other set definitions.	None
<set name> (level)	Identifies the level for a level-based set.	None
<set name> (list)	Defines the list of members in a selection-based set.	None
<set name> (depth N)	Defines the set of members at N, number of levels down.	None
<set name> (named set)	References a predefined set.	None

### Set Segments Definitions

The following table shows the definitions and dependencies for the data items in the set segment definition.

Data item	Definition	Dependencies
<set definition> (hidden list)	Lists the members that are manually hidden using the <b>Hide</b> command in Cognos Analysis Studio. This set appears when you try to unhide a member.	<set definition>
<set definition> (included set)	Lists the set of members after filters are applied and hidden items are excluded, but before the <b>More</b> limit is applied. Sort or order operations, if any, are defined in this data item.	<set definition> (hidden list)
<set definition> (visible items set)	Limits the set to show the number of members according to the <b>More</b> limit with a small tolerance. The tolerance allows showing the last two members if they are all that remain in the <b>More</b> portion of the set.  The choice of visible members can be based on a sort order.	<set definition> (included set)

Data item	Definition	Dependencies
<set definition> (excluded list)	Identifies members that were manually excluded from the analysis. If no members were manually excluded, the expression defines an emptySet. This set appears when you try to remove a member from the <b>Excluded items</b> list in the <b>Properties</b> pane.	<set definition>

## Filters

The following table shows the definitions and dependencies for the data items in the filter.

Data item	Definition	Dependencies
<set definition> (filter rules)	Specifies the user-defined filter rules to reduce the set definition using operators such as greater than or less than based on measures, calculations, or attributes.	<set definition>
<set definition> (excluded filters)	Removes members that were manually excluded from the results after applying the user-defined rules.	<set definition> (excluded list), <set definition> (filter rules)
<set definition> (filter top bottom)	Focuses on the members based on top / bottom / first n where n can be a count or a percentile. For more information about Top/Bottom filters, see the <i>IBM Cognos Analysis Studio User Guide</i> .	<set definition> (excluded filters) and totals for sets on the opposite axis
<set definition> (filter rules)	Specifies the user-defined filter rules to reduce the set definition using operators such as greater than or less than based on measures, calculations, or attributes.	<set definition>

## Subtotals and Related Conditions

The following table shows the definitions and dependencies for the data items in the subtotals and related conditions.

Data item	Definition	Dependencies
<set definition> (subtotal)	Aggregates the visible items in the set.	<set definition> (visible items set)

Data item	Definition	Dependencies
<set definition> (subtotal display)	Shows the subtotal if the number of included items is greater than the number of visible items.	<set definition> (visible items set), <set definition> (included set), <set definition> (subtotal)
<set definition> (more and hidden subtotal)	Calculates the <b>More &amp; hidden</b> subtotal by subtracting the aggregation of the included members from the aggregation of those members that were manually hidden or hidden by exceeding the maximum display limit. Not available for selection-based sets.	<set definition> (included set), <set definition> (visible items set), <set definition>
<set definition> (more and hidden subtotal as set)	Converts the <b>More &amp; hidden</b> subtotal member to a set for use in set operations.	<set definition> (more and hidden subtotal)
<set definition> (more and hidden subtotal as member)	Generically references the <b>More &amp; hidden</b> subtotal.	<set definition> (more and hidden subtotal)
<set definition> (more and hidden subtotal display)	Shows the <b>More &amp; hidden</b> subtotal if the number of items hidden or clipped is greater than zero.	<set definition> (more and hidden subtotal)
<set definition> (included subtotal)	Calculates the <b>Subtotal (included)</b> . For selection-based sets, this data item references the summary data item for the set.	<set definition> (included set)
<set definition> (included subtotal display)	Shows the <b>Subtotal (included)</b> if any members passed the filter criteria.	<set definition> (included set)
<set definition> (excluded subtotal)	Calculates the value for <b>Subtotal (excluded)</b> . This data item is not available for selection-based sets.	<set definition> (total), <set definition> (included subtotal), <set definition>
<set definition> (excluded subtotal display)	Shows <b>Subtotal (excluded)</b> if the number of members in the filtered set is less than the base set. This means that the filter rule is filtering out something.	<set definition> (excluded subtotal), <set definition>

Data item	Definition	Dependencies
<set definition> (total)	<p>Identifies the total for the set. This value is calculated directly from the data store.</p> <p>The expression used to calculate the summary depends on the set type:</p> <ul style="list-style-type: none"> <li>• Details-based set: The selected member.</li> <li>• Level-based and depth-based sets: The root member for the hierarchy.</li> <li>• Selection-based set: The aggregate, typically the sum, of the selected members.</li> </ul>	<set definition>

## Managing changes in the package

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If changes were made to the package that was used to create a report, the report must be updated.

When you open a report, IBM Cognos Analytics - Reporting automatically checks to see if the package has changed. If it has, a message appears indicating that the report will be updated to the latest version of the package. However, you may need to make additional changes to the report if

- the namespace name or query subject and data item names in the package have changed
- the name of the package has changed

### Update a name reference

If the namespace name or query subject and data item names in the package have changed, you must update reports that were created with the package to reflect the change.

The names of data items in a report are a concatenation of the namespace name, the query subject name, and the data item name. For example, if you add Order number from the GO Data Warehouse (query) sample package to a filter expression, you will see [Sales (query)].[Sales order].[Order number] in the expression. Similarly, package filter names are a concatenation of the namespace name and the filter name.

#### Procedure

1. To update a data item name reference:
  - Click the data item.
  - In the **Properties** pane, double-click the **Expression** property.
  - In the **Expression Definition** box, update the data item name reference.
2. To update a package filter name reference:
  - From the report object toolbar, click **Filters** 
  - Double-click the package filter.
  - In the **Expression Definition** box, update the namespace name.

## Changing the package

If the name of the package that was used to create a report has changed, you must change the package connection to update the report.

### Procedure

1. Click the **Data** icon .
2. Click the **Add report data** icon .
3. From the **Open** window, choose the new package.
4. Click **Open**.

The new package is loaded and the report is validated. If errors are found, the **Validation response** window appears, showing the elements that must be updated to reflect the package change.

5. Click **Close**.
6. Make any required changes in the report to support the new package.

For example, you may need to link the data items in the report to the new package.

**Tip:** You can use **Query explorer** to make the changes.

### Related tasks

#### Adding data

Add data to a report by loading packages or data modules in IBM Cognos Analytics - Reporting.



# Appendix A. Troubleshooting

This appendix describes some common problems you may encounter.

For more solutions, see the troubleshooting topics on IBM Knowledge Center.

## Problems Creating Reports

The topics in this section document problems you may encounter when creating reports.

### Division by Zero Operation Appears Differently in Lists and Crosstabs

If you have a list that accesses a relational data source, a calculation containing a division by zero operation appears as a null value, such as an empty cell. In a crosstab, the division by zero operation appears as /0.

This happens when the query property **Avoid division by zero** is set to **Yes**, which is the default.

To have a consistent display of null values in lists and crosstabs, define an if-then-else statement in the expression in the crosstab cell that changes the value /0 to the value null.

### Application error appears when upgrading a report

When upgrading a report, the following error appears if the report contains data items in the page layout that are not in a data container:

RSV-SRV-0040 An application error has occurred. Please contact your Administrator.

This error occurs when IBM Cognos Analytics cannot determine the query reference for a data item. Such data items are identified by a red circle with a white x icon.

To correct the error, drag the data items into a container. If the container is a list, we recommend that you drag the data items into the list page header or footer, or the overall header or footer. If you want to see the first row of the item on each page or in the overall report, drag the item to the list page header or overall header. If you want to see the item's last row on each page or in the overall report, drag the item to the list page footer or overall footer.

**Tip:** If a header or footer does not exist, create it.

### Nested List Report Containing a Data Item That is Grouped More Than Once Does Not Run After Upgrade

When you upgrade a nested list report that contains a data item that is grouped in both lists, the report does not run.

The following error occurs when the report is run against a dimensional data source and both lists are using the same query. This error does not occur if the report is run against a relational data source.

*OP-ERR-0199: The query is not supported. The dimensions on the edge are inconsistent. The dataItems from dimension="[Product line]" must be adjacent.*

For example, you have a list that contains the grouped items Product line and Product type and a nested list that contains the data items Year, Quarter, Product line, and Unit sale price. Year, Quarter, and Product line are grouped items in the nested list.

To resolve the issue, delete the data item that is grouped in both lists from the inner list.

### Procedure

1. Click anywhere in the report.

2. Click the **Show properties** icon , and In the **Properties** pane, click the **Select ancestor** icon and click the **List** link that represents the inner list.
3. Double-click the **Grouping & sorting** property.
4. In the **Groups** pane, select the data item that you want and press the Delete key.

## **Background Color in Template Does not Appear**

When creating a Query Studio template in IBM Cognos Analytics - Reporting, if you add a list object and change its background color, the color change does not appear when you apply the template to a Query Studio report.

To work around this issue, do one of the following:

- Edit the style sheet (CSS) classes for lists in Cognos Analytics - Reporting.
- Do not add any objects to the page body when you are creating a Query Studio template.
- Leave the page body blank.

## **Subtotals in Grouped Lists**

When using an IBM Cognos PowerCube that contains a ragged hierarchy, if you group on the first level in the hierarchy, subtotals may appear in the wrong place or show wrong values.

To resolve the issue, group on the second level.

## **Chart Labels Overwrite One Another**

In IBM Cognos Analytics - Reporting and Query Studio, if you define a chart and render it in HTML or PDF format using the default sizes, the axis labels of the chart may overwrite each other.

To avoid this problem, make the chart wider or taller by modifying the height and width properties of the chart or enable the **Allow skip** property.

## **Chart Shows Only Every Second Label**

You create a report that includes a chart. The **Allow skip** property is set to false, but when you run the report, labels are skipped.

This can occur if there is not enough room for all labels and the properties **Allow 45° rotation**, **Allow 90° rotation**, and **Allow stagger** are also set to false. IBM Cognos Analytics has no options for making the labels fit, so it skips every second label.

The solution is to select either **Allow 45° rotation**, **Allow 90° rotation**, or **Allow stagger**.

## **Chart Gradient Backgrounds Appear Gray in Internet Explorer**

In IBM Cognos Analytics - Reporting, you can define a custom palette for a chart that includes a gradient. When the chart is rendered in HTML format in Microsoft Internet Explorer, the chart background appears gray. This is an Internet Explorer issue.

To avoid this problem, select the chart and define the color white as the chart background.

For more information, see the Microsoft Knowledge Base article # 294714 at <http://support.microsoft.com>.

## **Metadata Change in Oracle Essbase Not Reflected in Reports and in the Studios**

When there is a metadata change on the Oracle Essbase server, the change is not immediately reflected in the metadata tree in the studios. In addition, when a report is run, the report does not pick up the republished changes.

To view the new structure, you must restart the IBM Cognos Content Manager server.

## **Relationships Not Maintained in a Report With Overlapping Set Levels**

In a report, the relationship between nested or parallel member sets at overlapping levels in the same dimension may not always be maintained.

For example, a named set in the data source that contains members from both a Year and Month member is nested under Year, but is not properly grouped by year.

In another example, an error message such as this appears:

*OP-ERR-0201 Values cannot be computed correctly in the presence of multiple hierarchies ([Product].[B1], [Product].[Product]) that each have a level based on the same attribute (Product).*

This problem occurs in the following scenarios involving non-measure data items X and Y, which overlap in the same dimension:

- X and Y together as ungrouped report details
- Y nested under X
- Y appended as an attribute of a group based on X

When using named sets, or sets that cover more than one level of a hierarchy, do not use sets from the same dimension in more than one place in the same report. They should appear on only one level of one edge.

## **Summaries in Query Calculations Include Nulls with SAP BW Data Sources**

When using an SAP BW data source in IBM Cognos Analytics - Reporting, null values in the database are returned in the result set and the count summary function includes the empty cells in the following scenarios:

- A query calculation includes an arithmetic calculation where one or more NULL operands and an aggregation is performed on the calculation.
- The result of a query calculation is a constant, such as `current_time` and `current_date`.

The count summary function should normally exclude null values.

To avoid this problem, for the first scenario, ensure that both operands do not return null values. For example, the original expression is `[num1]+[num2]`. Instead, use the following expression:

```
if ([num1] is null) then (0) else ([num1])
if ([num2] is null) then (0) else ([num2])
```

There is no workaround for the second scenario.

## **Creating Sections on Reports That Access SAP BW Data Sources**

SAP BW data sources may have problems with sections in reports under different circumstances:

If a section in a report uses the lowest-level query item in a ragged hierarchy, such as the children of the not assigned node, the following BAPI error may appear:

*BAPI error occurred in function module BAPI\_MDDATASET\_SELECT\_DATA. Value <valueName> for characteristic <cubeName> unknown*

### **Lowest-level Query Item in a Ragged Hierarchy**

The solution is to remove the section from the lowest-level query item.

### **Several Multicubes with SAP Variables**

The solution is to use one SAP multicube when creating sections in reports.

### **Related concepts**

[Tips for working with ragged or unbalanced hierarchies](#)

## **Error Characters (--) Appear in Reports**

When you run a report, you see two dash (--) characters in your report instead of values.

These characters may appear if you use an OLAP data sources other than PowerCube and Microsoft SQL Server 2005 Analysis Services (SSAS), and you apply aggregation to calculations and measures that use rollups other than Sum (Total), Maximum, Minimum, First, Last, and Count.

All other types of rollup either fail or return error cells, which typically display as two dash characters (--).

This problem occurs in, but is not limited to, the following:

- footers
- aggregate function
- summary filters and detail filters that use a summary
- detail, summary, and context filters that select more than one member of a hierarchy that is used elsewhere on the report

If you are working with a SSAS 2005 data source, these characters may also appear in summary cells if you use an OR filter in the summary. To avoid this problem, do not use OR filters in summaries.

## **Columns, Rows, or Data Disappear With SSAS 2005 Cubes**

Microsoft SQL Server 2005 Analysis Services (SSAS) has a feature called AutoExists that removes tuples that have no facts at the intersection of two hierarchies of the same dimension.

Columns, rows, or data can disappear if you set the default member of a hierarchy to a member that does not exist with every other member in the dimension. To avoid this problem, change the default member that caused the disappearance to a member that exists with all other members in the dimension.

Columns, rows, or data can also disappear if members are specified that result in one or more non-existent tuples. There is currently no workaround for this scenario. For more information, see Microsoft Knowledge Base article #944527 at <http://support.microsoft.com>.

You may also encounter unexpected results if the default member of a hierarchy is a member that doesn't also exist in all other hierarchies in the dimension, and if you query members from different hierarchies in the same dimension.

For example a crosstab includes the following (using the Adventure Works cube):

- Rows: Generate([Adventure\_Works].[Account].[Accounts],set([Balance Sheet],[Units])) nested with

- children([Adventure\_Works].[Department].[Departments]->:[YK].[[Department]].[Departments]).&[1]))
- Column: [Adventure\_Works].[Account].[Account Number].[Account Number]
- Measure: [Adventure\_Works].[Measures].[Amount]

You run the report and notice that the query renders with some blank cells. You then apply the simple detail filter [Amount]>1 and run the report. Only row labels are displayed and all data and columns are missing.

In the Adventure Works cube, the [Account].[Accounts] attribute has a default member set to [Net Income]. When evaluating the GENERATE set expression, SSAS looks in the entire cube space and looks at all coordinates for the [Account] dimension. These coordinates include both [Account][Account Type].&[] and [Account].[Accounts].[Net Income]. Because these two coordinates don't exist within the same hierarchy, SSAS returns an empty set.

To avoid this problem the SSAS administrator must set the default member in the cube to a member that exists in all other hierarchies.

## Function Unreliable with Sets

If you create an expression that uses the descendants function with sets, you may encounter unpredictable results. Some expected members may be missing or may have blank captions or labels.

This problem occurs if the descendants function uses a set as its first parameter instead of a single member and if the descendants function is nested under another data item from the same hierarchy.

To avoid this problem, replace the first parameter in the descendants function with the function currentmember(H), where H is the hierarchy of the desired set and under which the expression is nested. For example, use descendants(currentmember(H)).

## Searching for values might return unexpected results

In the expression editor, when searching for values for a data item, the results you obtain might contain unexpected results if the data item is not a string data type. Because you can edit the expression for a data item, IBM Cognos Analytics cannot determine with certainty what the data type is.

Therefore, IBM Cognos Analytics guesses the data type of the data item by looking at its aggregate and rollup aggregate set.

### Related tasks

[Browse or Search the Values of a Data Item](#)

## Report Differences Between TM1 Executive Viewer and IBM Cognos Analytics with TM1 Data Sources

When using an IBM Cognos TM1 data source, comparable reports created in IBM Cognos Analytics and in TM1 Executive Viewer may contain different cell values. This occurs because the TM1 Executive Viewer product uses an algorithm for selecting default members for non-projected dimensions that differs slightly from traditional OLAP clients.

To avoid this problem, when filtering your reports in IBM Cognos Analytics, use context filters that match the default selections shown in the Executive Viewer user interface. This ensures that the cell values in IBM Cognos Analytics match the values in Executive Viewer.

## Order of Metadata Tree Differs for TM1 Data Sources

When using a an IBM Cognos TM1 data source, the order of members in the metadata tree of the **Source** tab in IBM Cognos Analytics may differ from the order shown in TM1 Architect.

By default, TM1 Architect renders members of hierarchies using a slightly different algorithm than does IBM Cognos Analytics. IBM Cognos Analytics automatically renders member metadata from TM1 data sources in hierarchical order.

From within TM1 Architect, if you want to see how IBM Cognos Analytics will render a hierarchy, click the **Hierarchy Sort** button.

### MSR-PD-0012 error when importing external data

When you try to import an external data file, you receive an MSR-PD-0012 error.

*MSR-PD-0012: Unable to upload the specified external data file. It exceeds the permitted file size of "0(KB)", as specified by your system administrator.*

This error occurs when the size of the file you are trying to import is greater than the value specified for the **Maximum external data file size (KB)** governor in the Framework Manager model.

To resolve the issue, the modeler must update the governor, save the model, and republish the package.

### MSR-PD-0013 error when importing external data

When you try to import an external data file, you receive an MSR-PD-0013 error.

*MSR-PD-0013: Unable to upload the specified external data file. It exceeds the permitted maximum number of rows "0", as specified by your system administrator.*

This error occurs when the number of lines in the file you are trying to import is greater than the value specified for the **Maximum external data row count** governor in the Framework Manager model.

To resolve the issue, the modeler must update the governor, save the model, and republish the package.

## Problems Calculating Data

The topics in this section document problems you may encounter when calculating or summarizing data.

### Unexpected Summary Values in Nested Sets

If a report contains nested sets, summaries other than the inner set summaries may contain unexpected values. For example, you insert a summary in a crosstab that contains a set with years in the rows.

		Revenue
2012		1,495,891,100.9
2013		1,117,336,274.07
Total		2,613,227,374.97

Figure 46. Example of revenue numbers for the years 2012 and 2013

You then nest a product line set within years.

		Revenue
2012	Camping Equipment	500,382,422.83
	Golf Equipment	230,110,270.55
2013	Camping Equipment	352,910,329.97
	Golf Equipment	174,740,819.29
Total		2,613,227,374.97

Figure 47. Example of revenue numbers for the listed products for the years 2012 and 2013

Notice that the summary value does not change to represent the total of the new values. This occurs because the within set aggregation used with dimensional packages does not take into account sets that are nested below the set that is summarized.

To show the correct summary values, if the inner and outer sets do not belong to the same dimension, you can nest a copy of the inner summary item under the outer summary item, as follows.

		Revenue
2012	Camping Equipment	500,382,422.83
	Golf Equipment	230,110,270.55
	Total	730,492,693.38
2013	Camping Equipment	352,910,329.97
	Golf Equipment	174,740,819.29
	Total	527,651,149.26
Total	Total	1,258,143,842.64

Figure 48. Example of the combined aggregate set for the years 2012 and 2013

## Null Results for Calculations Using SAP BW Data Sources

When using a SAP BW data source, the expression you use in your calculation is evaluated as a null value if your expression contains a null item. For example, in the calculation `some_expression = result`, the result is null if a row or column that the expression references includes a null value.

To avoid obtaining null values as the result of your calculations, suppress null values before you create the calculation.

## Incorrect Results with IBM Cognos PowerCubes and Time Measures

If a report uses an IBM Cognos PowerCube data source and a combination of data items, you will encounter incorrect results.

The following combination of data items in a report that uses an IBM Cognos PowerCube data source will give incorrect results.

- a measure with a **Time State Rollup** set to **Average** or **Weighted Average**
- an aggregate (*members from time dimension*) expression
- an intersection with a member in a relative time hierarchy

To avoid incorrect results, do not use this combination in your reports.

## Incorrect Results in Summaries When Using OLAP Data Sources

When using an OLAP data source, summaries that use `for` clauses give incorrect results.

This occurs because `for` clauses require access to the detail rows of the fact table. OLAP data sources do not have detail rows.

For example, this report uses a dimensionally-modeled relational (DMR) data source and contains the following summaries:

- `mx: maximum ([Revenue] for [Year (ship date)])`
- `mx2: maximum (Aggregate([Revenue]) for [Year (ship date)])`

Year	Quarter	Revenue	mx	mx2
2010	Q1 2010	221,704,705.31	252,408.9	235,750,316.25
	Q2 2010	222,143,384.57	252,408.9	235,750,316.25
	Q3 2010	235,750,316.25	252,408.9	235,750,316.25
	Q4 2010	234,754,397.59	252,408.9	235,750,316.25
<b>2010 - Summary</b>		<b>914,352,803.72</b>		
2011	Q1 2011	293,228,460.53	292,402.7	306,706,702.72
	Q2 2011	278,180,759.96	292,402.7	306,706,702.72
	Q3 2011	281,079,666.95	292,402.7	306,706,702.72
	Q4 2011	306,706,702.72	292,402.7	306,706,702.72
<b>2011 - Summary</b>		<b>1,159,195,590.16</b>		
2012	Q1 2012	344,124,267.07	363,575.08	391,874,462.51
	Q2 2012	391,874,462.51	363,575.08	391,874,462.51
	Q3 2012	378,118,012.54	363,575.08	391,874,462.51
	Q4 2012	381,774,358.78	363,575.08	391,874,462.51
<b>2012 - Summary</b>		<b>1,495,891,100.9</b>		
2013	Q1 2013	471,624,367.69	349,132.3	479,269,923.82
	Q2 2013	479,269,923.82	349,132.3	479,269,923.82
	Q3 2013	166,441,982.56	349,132.3	479,269,923.82
<b>2013 - Summary</b>		<b>1,117,336,274.07</b>		
<b>Overall - Summary</b>		<b>4,686,775,768.85</b>		

Figure 49. Example list report that uses a dimensionally-modeled relational data source and revenue for four years

Notice that the mx and mx2 values are different, where mx2 is based on visible data, but mx is not. This result is correct.

The following report uses an OLAP data source and contains the same summaries.

Year	Quarter	Revenue	mx	mx2
2010	2010 Q 1	221,704,705.31	235,750,316.25	235,750,316.25
	2010 Q 2	222,143,384.57	235,750,316.25	235,750,316.25
	2010 Q 3	235,750,316.25	235,750,316.25	235,750,316.25
	2010 Q 4	234,754,397.59	235,750,316.25	235,750,316.25
<b>2010 - Summary</b>		<b>914,352,803.72</b>		
2011	2011 Q 1	293,228,460.53	306,706,702.72	306,706,702.72
	2011 Q 2	278,180,759.96	306,706,702.72	306,706,702.72
	2011 Q 3	281,079,666.95	306,706,702.72	306,706,702.72
	2011 Q 4	306,706,702.72	306,706,702.72	306,706,702.72
<b>2011 - Summary</b>		<b>1,159,195,590.16</b>		
2012	2012 Q 1	344,124,267.07	391,874,462.51	391,874,462.51
	2012 Q 2	391,874,462.51	391,874,462.51	391,874,462.51
	2012 Q 3	378,118,012.54	391,874,462.51	391,874,462.51
	2012 Q 4	381,774,358.78	391,874,462.51	391,874,462.51
<b>2012 - Summary</b>		<b>1,495,891,100.90</b>		
2013	2013 Q 1	471,624,367.69	479,269,923.82	479,269,923.82
	2013 Q 2	479,269,923.82	479,269,923.82	479,269,923.82
	2013 Q 3	166,441,982.56	479,269,923.82	479,269,923.82
	2013 Q 4		479,269,923.82	479,269,923.82
<b>2013 - Summary</b>		<b>1,117,336,274.07</b>		
<b>Overall - Summary</b>		<b>4,686,775,768.85</b>		

Figure 50. Example list report that uses a dimensional data source and revenue for four years

In the example report, mx and mx2 values are now the same. Both summaries are based on visible data. The mx value is incorrect.

Incorrect results also appear for footer summaries.

To avoid this problem, when using OLAP data sources, ensure that the parameter that precedes the `for` clause is an aggregate function.

## Problems Filtering Data

The topics in this section document problems you may encounter when filtering data.

### Unexplained Discrepancies in Number Calculations

You might find unexplained discrepancies in number calculations due to round-off errors.

For example:

- You run regression tests and find differences in numbers. They are different only because of the rounding off of decimal places.
- You choose not display zeros in reports, but the zeros are displayed anyway because there are decimal places (0.0000000000000426, for example) that are rounded off to zero in reports.

Round-off problems are not specific to IBM Cognos software. They can occur in any environment where rounding off occurs.

## **Binary Round-Off Errors**

Discrepancies in calculations might occur due to binary round-off errors. For example, if the number 1.1 is represented as a binary floating point number and your report format includes a large number of decimal places, the number 1.1 might actually be something like 1.09999999999997.

If your report is formatted to use only one decimal point, decimal round-off takes place, compensating for the binary round-off. So the number appears to be 1.1 when it is really 1.09999999999997. When the number is used in calculations, you might get round-off errors. For example, Microsoft Excel calculations use binary numbers (without rounding off decimal places) but formatting in reports shows rounded off decimal places, which can create small discrepancies.

## **Division Round-Off Errors**

Calculations that involve division typically incur round-off errors, regardless of how the numbers are represented. Examples of such calculations are Average and Percent of Base.

## **Design Guidelines to Minimize Round-Off Effect**

The best solution is to change the underlying database schema or cube model but that may not always be possible. Another solution is to minimize the round-off effect by following these guidelines when authoring reports and creating models in IBM Cognos Framework Manager and external OLAP cubes:

- Avoid storing data in floating point format whenever possible. This is especially true for currency values, which should be stored as either fixed-point decimals or as integers with a scale value such as 2.

For example, in a cube, the Revenue for Camping Equipment in 2012 is \$20,471,328.88. If revenue details are stored as floating point numbers, round-off errors might occur when revenue is calculated.

The round up errors might have slight differences, depending on the order of calculation. If revenue for Products is calculated first and revenue for Time is calculated second, you might get a different round-off error than if Time is calculated first and Products is calculated second.

Total revenue might be calculated as the number shown in the previous example. Or there might be slight discrepancies, for example, \$20,471,328.8800001 as opposed to \$20,471,328.88. The internal number might be slightly different than what is displayed. The number might even be for different runs of the same report, depending on the order that the OLAP engine uses for calculation.

- In reports, avoid division whenever possible. When division is unavoidable, try to do it as late as possible in the calculation process. For example, instead of Total([Revenue]/1000), use Total([Revenue])/1000.
- When doing comparisons, add a margin to allow for round-off. For example, you may want [Profit %] to be a fractional value formatted as a percentage with no decimals. However, the filter [Profit %]<>0 (or [Profit %] NOT BETWEEN 0 and 0) rejects zero values and may still return values that appear to be 0% after formatting.

To avoid this, filter in one of these two ways:

- [Profit %] NOT BETWEEN -0.005 and 0.005
- ([Profit %] <- 0.005) OR ([Profit %]> 0.005)

Note that 0.005 is equivalent to 0.5%, which displays as either 0% or 1%, depending on floating point precision losses.

In some cases, you may prefer control round-off errors by rounding values explicitly. For example, instead of [Profit %], use round([Profit %],2).

- Recalculate numbers every time instead of reusing calculations that might contain rounded off decimals.

There might be additional considerations for Microsoft Analysis Services 2005/2008, especially when comparing report results from different runs (as happens in Lifecycle Manager). Refer to Microsoft documentation for more information.

## Error when filtering on a \_make\_timestamp column

You cannot filter on a \_make\_timestamp column. If you do that, the following error messages appear:

UDA-SQL-0114 The cursor supplied to the operation "sqlOpenResult" is inactive

UDA-SQL-0206 The OLEDB driver returned the following value:  
HRESULT= DB\_E\_CANTCONVERTVALUE

RSV-SRV-0025 Unable to execute this request

The solution is to apply the filter after aggregation, and not before.

## Problems Running Reports

---

The topics in this section document problems you may encounter when viewing or running reports.

### Report runs slowly

The following is a list of questions that will help you to troubleshoot a slow report.

- Does your IBM Cognos environment conform with the supported environments?
- Has the report always been slow or did it recently become slow?

If it recently became slow, can you identify an event that occurred just before the report began to run slowly? Events could include changes to configuration settings, changes to tuning settings, a recent upgrade where your previous settings have not been applied, an introduction of firewalls or proxies, changes to existing firewalls or proxies, changes to virus scans on temp directories, or temporary table space restrictions on the database. This event could have caused the change in report performance.

- Is the performance slow for all reports or just one report?

If all reports are slow, the issue may be due to your environment or database. If all reports from a specific package are slow, the issue may be due to the model design. If just one report is slow, the issue may be due to a specific report element.

- How many queries does your report contain?

The number of queries on the report will proportionally affect the report execution time.

- Does the report run slowly for everyone, or just for one user?

If the report runs slowly for just one user, the issue may be due to something in that user's environment, such as virus scanning, page file size or location settings, or their location on the network.

- Is the report burst or run often by many people?

If many people are running the same report at the same time, you may need to scale your environment or consider using dispatcher routing rules to direct all requests for a specific package or group of users to a specific server or server group. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

- Do your queries require local processing?

The following report elements require local processing: crosstabs and charts, master relationships, unions or joins, multiple fact queries, bursting, and non-vendor specific functions. Local processing requires the IBM Cognos server to compute operations on the result set returned by the database, which can impact the SQL execution time.

- Does your environment use a Custom Authentication Provider?

Using a Custom Authentication Provider could cause a memory leak if the code is not destroying objects correctly.

- Have you reviewed the logs in the *install\_location/logs* directory and the audit logs?

They may help you identify the source of the problem. Monitoring your processes, such as the Java and the bus processes could also identify excessive memory use.

- Is your environment tuned correctly?
- Have you recently upgraded?

Ensure that any tuning settings that were applied to your previous installation are applied to the new environment. Ensure that your models have been verified, upgraded, and republished. Verify that the IBM Cognos Framework Manager governor that allows enhanced model portability at runtime is not enabled. Depending on your upgrade method, you may also need to open and save the reports again after upgrading.

The following tips may help you improve report performance.

- Change the order in which items are queried from the database. For more information, see “[Working with Relational Queries](#)” on page 173 or “[Working with Dimensional Queries](#)” on page 213.
- Create sections without creating master detail relationships. For more information, see “[Divide data into sections](#)” on page 158.
- Share queries between lists and repeaters.

You can share an identical query between data containers that use it. To share a query, data containers must be lists, repeaters, or repeater tables and must use the same grouping structure and list of properties. The data containers cannot be part of a master detail relationship. Sharing queries improves performance by minimizing the number of queries executed against the database.

To share a query, set the **Share result set** property for the data container to **Yes**.

- Convert queries to SQL. For more information, see “[Convert a Query to SQL](#)” on page 181 for relational reporting or “[Convert a Query to SQL](#)” on page 224 for dimensional reporting.
- Avoid using functions with limited support, as indicated by the quality of service indicators. For more information, see “[Insert a Query Calculation](#)” on page 184 for relational reporting or “[Quality of Service Indicators](#)” on page 388 for dimensional reporting.
- Be aware of the limitations of creating expressions with SAP BW data sources. For more information, see “[Using Microsoft Excel Functions with SSAS 2005 Data Sources](#)” on page 390.
- Use Select & Search prompts instead of value prompts if your list of prompts is long. For more information, see “[Build Your Own Prompt and Prompt Page](#)” on page 239.
- Provide your own prompt values in a prompt to avoid accessing the database. For more information, see “[Specify Prompt Values](#)” on page 246.
- Suppress null cells using filters. For more information, see “[Suppressing null cells by using filters](#)” on page 305.
- Set page breaks without creating master detail relationships. For more information, see “[Page breaks, page sets, and page layers](#)” on page 337.
- Do not modify IBM Cognos Analysis Studio set definitions. For more information, see “[Analysis Studio query specification](#)” on page 350.
- Do not put filters on non-identifiers.
- Avoid combining large hierarchy levels and sets in a drill-through report in a way that creates large queries. For more information, see “[Recommendation - Drilling Down in Very Large Data Sources](#)” on page 234.
- Use database functions when possible.
- Use fixed width objects in PDF reports by setting their **Size & overflow** properties. For more information, see “[Set list properties](#)” on page 37, “[Set Crosstab Properties](#)” on page 43, “[Customizing chart properties](#)” on page 70, or “[Set Map Properties](#)” on page 416.

For more information, search for Performance and tuning (<http://www.ibm.com/developerworks/analytics/practices.html>) documents that may help you improve your report performance.

## Summaries in a report do not correspond to the visible members

If a crosstab or chart created in IBM Cognos Analytics - Reporting using a dimensional data source has a context-dependent set function such as `filter` or `topCount` on an edge, summaries do not correspond to the visible members.

This problem occurs because a summary that has the query property **Use set aggregation** set to **Yes**, which produces an expression that contains the `within set` clause, uses a set that is dependent on the members that it intersects with on the opposite edge. For example, the following crosstab has the top three products returned as columns. The expression used to generate the columns is

`topCount ([Product],3,[Return quantity])`

where `[Product]` is the level.

Return quantity	BugShield Lotion	BugShield Extreme	Sun Shelter 30	Total	Minimum
Americas	25,219	19,870	13,814	62,392	17,303
Asia Pacific	22,822	19,171	6,389	54,758	12,765
Northern Europe	8,325	14,634	4,065	32,936	8,325
Central Europe	17,627	13,854	14,089	45,570	13,854
Southern Europe	7,196	4,726	5,401	20,220	5,790
<b>Total</b>	<b>81,189</b>	<b>72,255</b>	<b>43,758</b>	<b>215,876</b>	<b>58,037</b>
<b>Minimum</b>	<b>7,196</b>	<b>4,726</b>	<b>4,065</b>	<b>20,220</b>	<b>5,790</b>

Figure 51. A crosstab showing that the summary values for all rows do not correspond to the visible members.

The summary values for **Total** and **Minimum** for all rows except **Central Europe** do not correspond to the member values in the crosstab. This means that the top three products returned in all regions except for Central Europe are not Bug Shield Lotion, Bug Shield Extreme, and Sun Shelter 30. Note that the summary values for **Total** and **Minimum** for all columns do correspond to the visible member values. That is because those summary values represent the total and minimum quantities returned for those three products in each region.

You can see what the top three products returned in each region are by dragging the columns to the right of the rows.

Americas	<i>BugShield Lotion</i>	25,219
	<i>BugShield Extreme</i>	19,870
	<i>TrailChef Water Bag</i>	17,303
	<b>Minimum</b>	<b>17,303</b>
	<b>Total</b>	<b>62,392</b>
Asia Pacific	<i>BugShield Lotion</i>	22,822
	<i>BugShield Extreme</i>	19,171
	<i>Single Edge</i>	12,765
	<b>Minimum</b>	<b>12,765</b>
	<b>Total</b>	<b>54,758</b>
Northern Europe	<i>BugShield Extreme</i>	14,634
	<i>Star Peg</i>	9,977
	<i>BugShield Lotion</i>	8,325
	<b>Minimum</b>	<b>8,325</b>
	<b>Total</b>	<b>32,936</b>
Central Europe	<i>BugShield Lotion</i>	17,627
	<i>Sun Shelter 30</i>	14,089
	<i>BugShield Extreme</i>	13,854
	<b>Minimum</b>	<b>13,854</b>
	<b>Total</b>	<b>45,570</b>

Figure 52. A single-edge crosstab showing the Total Returned Products and Minimum Returned Products for each region

To obtain summary values that reflect the visible members, modify the expression of the data item containing the context-dependent set function so that it includes a tuple that is locked to the default member of every hierarchy that appears on the opposite edge. For this example, modify the expression to the following:

```
topCount ([Product],3,tuple([Return quantity], defaultMember([Retailer site])))
```

where [Product] is the level and [Retailer site] is the hierarchy.

When you run the report, all summary values reflect the visible members in the crosstab.

Return quantity	<i>BugShield Lotion</i>	<i>BugShield Extreme</i>	<i>Sun Shelter 30</i>	Total	Minimum
Americas	25,219	19,870	13,814	58,903	13,814
Asia Pacific	22,822	19,171	6,389	48,382	6,389
Northern Europe	8,325	14,634	4,065	27,024	4,065
Central Europe	17,627	13,854	14,089	45,570	13,854
Southern Europe	7,196	4,726	5,401	17,323	4,726
<b>Total</b>	<b>81,189</b>	<b>72,255</b>	<b>43,758</b>	<b>197,202</b>	<b>42,848</b>
<b>Minimum</b>	<b>7,196</b>	<b>4,726</b>	<b>4,065</b>	<b>17,323</b>	<b>4,065</b>

Figure 53. A crosstab showing the return quantity of products in different regions of the world

## **QE-DEF-0288 Cannot Find the Database in the Content Store**

You cannot retrieve data from the selected database when running a report.

The following error message appears:

QE-DEF-0288 Unable to find the database...

If this error does not occur when you are logged on as an administrator, then to solve the problem, ensure that the user has permissions to the signon embedded. If this error always occurs, the data source has not been created. Create the data source with the name mentioned in the error message.

## **Parse Errors When Opening or Running an Upgraded Report**

Earlier versions of IBM Cognos ReportNet and IBM Cognos Business Intelligence included the `cast_Date` function for reports that run on an Oracle database. This function does not exist for Oracle in IBM Cognos 8.1.2 MR1 and later versions. If a report that uses an Oracle database includes the `cast_Date` function, parse errors will be received when you try to open or run the report.

## **Overflow Error Occurs When a Value in a Crosstab Is More Than 19 Characters**

In a crosstab report, values support a maximum of 19 characters, including the decimal point. If a value exceeds 19 digits, an overflow error occurs. By default, the decimal precision is set to 7 digits, which restricts the number of integers to 11 digits.

To use more than 11 integers, you must edit the `qfs_config.xml` file in the `install_location\configuration` directory. For more information, see the section about reducing decimal precision in the *IBM Cognos Analytics Administration and Security Guide*.

## **The ORA-00907 Error Appears When Running a Report**

When using an Oracle 9.2 data source, under certain circumstances, multiple or nested join operations may fail and produce the following error.

`ORA-00907: missing right parenthesis`

A query that uses both a left outer join and an ON clause condition returns zero values instead of null values.

## **A Report or Analysis Does Not Run Because of Missing Items**

You attempt to run a report or analysis and a message indicates that one or more items are missing or changed. Each missing item is listed by its MUN (member unique name). The MUN includes the complete path within the hierarchy for the item. When you place your cursor on an item in the **Source** tab, the MUN for that item is displayed in a tooltip. This situation may occur if members have been removed from or changed in the data source. It may also occur when you attempt to run a report that uses items to which you do not have access. For example, an administrator may create an analysis that includes items that you do not have the correct permission to access.

The solution is to find a suitable replacement in the **Source** tab, and drag it to the work area. The report or analysis will then run.

## **Cannot View Burst Report**

When you burst a report, each burst output is sent to the associated list of recipients.

If a list of recipients contains invalid entries, the following occurs:

- The burst output is not saved to IBM Cognos Content Manager.

Consequently, you cannot view the burst output.

- If you choose to send the output by email, only valid recipients will receive an email. Although the output is sent as an attachment if you select the **Attach the report** check box, no link is generated if you select the **Include a link to the report** check box.
- The following error message appears in the run history for the report, where parameter 1 is the burst key, parameter 2 is the list of recipients, and parameter 3 contains the error messages returned by Content Manager:

*An error occurred while saving the output for the burst instance <param type="string" index="1"/> with the recipients (<param type="string" index="2"/>). Here are the details: <param type="string" index="3"/>*

**Note:** The list of recipients includes both the valid and invalid recipients.

For example, a report is set up to burst on Country or Region, and the recipients are managers. Running the report produces the following countries and regions and recipients:

- Canada: John, Mary
- US: Peter, Frank
- France: Danielle, Maryse

Frank is an invalid recipient. The burst outputs for Canada and France are saved to Content Manager, but not the U.S. output. If you choose to send an e-mail to each recipient and you selected the **Include a link to the report** check box, the e-mail to Peter will not contain a link to the output for US. The error message that is generated will contain Peter and Frank as values for parameter 2 with no indication as to which is invalid.

#### Procedure

1. View the error message in the run history for the report.
2. From the list of recipients, determine which recipients are invalid.  
You may need to consult with your administrator to find out which recipients are invalid.
3. Correct or remove the invalid recipients.  
Correcting or removing invalid recipients will depend on how the list of recipients was defined, such as through a calculated field or a burst table.
4. Run the report again.

#### An upgraded report does not retain its original look

When you upgrade a report to IBM Cognos Analytics, a new style sheet is applied that changes the look of the report.

To preserve the formatting that was used in the original report, you can select a different style sheet. This retains the original look of the report and specifies that any new items added to the report, such as list columns or crosstab levels, have the original formatting applied to them.

#### Procedure

1. Open the report in IBM Cognos Analytics - Reporting.
2. Click the **Pages** icon  or the **Queries** icon , and then click the **Report** icon .
3. Click the **Show properties** icon , and in the **Properties** pane, click the **Report styles** property and select one of the available values.

For example, to use the IBM Cognos ReportNet style sheet, select **1.x styles**.

#### Measure Format Disappears in SSAS 2005

Microsoft SQL Server 2005 Analysis Services (SSAS) does not propagate formatting through calculations. IBM Cognos compensates for this whenever possible, but cannot guarantee to do so in all cases. As a

result, if you are working with a Microsoft SSAS cube, any calculation (other than a non-count summary) that is based on or intersects with a formatted measure, such as a currency, may lose the measure format. This may also happen if you use a detail filter or context filter (slicer).

For example, a crosstab includes members on one edge and a measure with formatting, such as a currency symbol and decimal places, applied on the other edge. When you run the report, you see the formatting for each cell. However, if you add a detail filter, such as measure > 1 and run the report, all the formatting disappears.

Additionally, the fine details of the MDX generated by IBM Cognos Analytics can change from release to release. As the SSAS behavior depends on the MDX generated, the loss of formatting in reports might not occur in a future release.

To avoid this problem, specify explicit formatting for the affected row, column, or cell.

## Drill-through Links are Not Active in the Safari Browser

When viewing a PDF report in the Macintosh Safari browser, you cannot open hyperlinks. This is because the Macintosh Safari browser does not have the necessary Adobe Acrobat plug-in.

To avoid this problem, use the HTML format when creating drill-through reports that may be viewed in Safari.

## Data Does Not Appear in a Target Report or the Wrong Data Appears

If no data appears when you drill through to a target report or if the wrong data appears, the problem might be data source conformance. The business keys might be different or might be mismatched.

For example, the business key for Camping Equipment might be 100 in the data source for the source report and 1 in the data source for the target report, in which case no data appears in the target report. Another example might be that the business key for Camping Equipment is 100 in the data source for the source report but, in the data source for the target report, 100 is the business key for Golf Equipment, in which case the wrong data appears in the target report.

To solve the problem, ensure that business keys have the same value in both data sources. If there are cases where data does not appear to match, contact your database administrator or data modeler.

For more information about data source conformance, search for "conformed dimensions" and "business keys" in the *IBM Cognos Transformer User Guide*.

You might also want to see ["Unexpected or Empty Results When Drilling Through" on page 378](#).

### Related concepts

[Conformed dimensions](#)

[Business keys](#)

## A Running Total in Grouped Reports Gives Unexpected Results

You have a running total calculation in a grouped report that returns unexpected values.

Because tabulation of the running total calculation depends on the order in which the grouping is executed, you must ensure that the grouped totals are tabulated before applying the running total.

To ensure that the grouping is executed in correct order, define a running total calculation as a freestanding calculation outside the query subject in IBM Cognos Framework Manager, and ensure that the Regular Aggregate property is set to Automatic.

This may also be an issue with other running, moving, and ranking aggregations.

## Recursive evaluation error

You run a report and encounter the following error.

```
PCA-ERR-0057 Recursive evaluation has exceeded limit. Calculated member trace:  
COG_OQP_USR_Aggregate(Retailer Type): COG_OQP_INT_m2: COG_OQP_INT_m1:  
COG_OQP_USR_Aggregate(Retailer Type): COG_OQP_INT_m2: COG_OQP_INT_m1:  
COG_OQP_USR_Aggregate(Retailer Type): COG_OQP_INT_m2: COG_OQP_INT_m1:  
COG_OQP_USR_Aggregate(Retailer Type): COG_OQP_INT_m2: COG_OQP_INT_m1
```

You may encounter this error when two or more data items form a recursive evaluation. For example, in this error, the calculation of Aggregate(Retailer Type) is dependent on a column expression while at the same time the column expression is dependent on Aggregate(Retailer Type). Therefore, the cyclic relationship cannot be resolved.

To avoid this problem, ensure that calculations do not have cyclic relationships.

## Arithmetic Overflow Error When Running a Report in PDF Format

If you use a Microsoft SQL Server 2005 data source and your report includes aggregations, you may encounter the following error when you run your report in PDF format:

```
RQP-DEF-0177 An error occurred while performing operation 'sqlOpenResult' status='-28'. UDA-SQL-0114  
The cursor supplied to the operation "sqlOpenResult" is inactive. UDA-SQL-0564 [Microsoft OLE DB  
Provider for SQL Server] Arithmetic overflow error converting expression to data type int.  
(SQLSTATE=22003, SQLERRORCODE=8115)
```

This error occurs because the action is performed in the database, and the database data type is too small.

To avoid this problem, increase the size of the the database data type.

## RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-69' UDA-SQL-0043 Error

You cannot run a report in IBM Cognos Analytics - Reporting or IBM Cognos Query Studio, and the following error messages appear.

```
RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-69' UDA-  
SQL-0043 The underlying database detected an error during processing the SQL request.[NCR][ODBC  
Teradata Driver][Teradata Database] Partial string matching requires character operands
```

These error messages do not indicate an IBM Cognos Application Firewall problem.

There is a problem with your data source not converting numeric data items. Ask your administrator to consult the topic *Enable Conversion of Numeric Search Keys to Strings in Queries* in the *IBM Cognos Analytics Administration and Security Guide*.

## Problems with viewing saved Active Report output in Mozilla Firefox 8 or later versions

When you try to view saved Active Report output in Mozilla Firefox 8 or later, you receive errors. The problem also occurs when you try to insert a saved active report in a workspace in IBM Cognos Workspace.

No problems occur when you use an earlier version of Firefox. In Firefox 8 and above, you see the following errors:

Error: ReferenceError: HTMLIsIndexElement is not defined

Error: TypeError: \_IS1 is undefined

The problem occurs because HTMLIsIndexElement was deprecated as of Firefox 8. To resolve the problem, rerun the active report and create a new saved output version.

**Tip:** If you must rerun many active reports, you can create a job to run multiple reports.

## Problems with large SAP BW queries

When you are working with an SAP BW data source, if your report includes a data set greater than 1,000,000 cells, you might encounter an XQE error.

XQE-CON-0007 XQE error encountered: XSB-ERR-0022 Execution of MDX failed: XSB-ERR-0038 SAP Error executing BAPI BAPI\_MDDATASET\_SELECT\_DATA:  
com.cognos.xqe.data.providers.olap.sbwodp.bapi.JBapiSAPException: RFC Error: MDX result contains too many cells (more than 1 million).

To avoid this error, set the **Processing** property for the query to **Limited Local**. This option allows the report to process locally.

## Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service

When running a master detail or burst report that includes a chart or crosstab, disk space exhaustion may cause the report or other requests to fail. A large set of burst keys or master rows may produce one or more charts per detail, resulting in many master detail executions. This may cause the temp folder to accumulate many gigabytes of temporary files containing data required for successful chart rendering.

To avoid this issue, we recommend that you test large master detail or burst reports that include charts or crosstabs to determine the potential peak disk requirements for the report.

## PCA-ERR-0087 error when you run a large report

You run a large report and you receive a PCA-ERR-0087 error that indicates that the report exceeds the maximum number of tuples allowed.

*PCA-ERR-0087 The "crossJoinSet" operator is not applicable. The limit on the number of tuples per edge has been exceeded (<value>).*

This error appears when there is an item in a query that has no relationship to the rest of the data or does not make sense in the query.

To resolve the problem, review the query for unrelated items. If an item is found, redesign the query or apply a filter on the item to reduce the number of results returned.

If you still receive the error, ask your administrator to modify the maximum number of tuples setting in IBM Cognos Analytics. The setting is an XML attribute named maxTuplesPerEdge. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.

## Differences in the appearance of charts that are run in different formats or on different operating systems

IBM Cognos Analytics - Reporting charts can appear differently when reports are run in different formats or on different operating systems. For example, donut and pie charts can appear smaller in reports that are run on the Linux on System z® operating system compared to the Windows operating system.

The differences in appearance occur only with Cognos Analytics - Reporting default charts. Cognos Analytics - Reporting legacy charts are not affected. When default charts are rendered in HTML or PDF, the following font-related problems might occur.

- The font that is used in HTML output is different than the font used in PDF output.
- Some chart items appear misaligned. For example, a pie chart might show smaller pies in PDF output than in HTML output.
- The font that is used in the chart is different from the expected font.
- The font that is used in the chart is different when you run the chart in different operating systems.

There are two possible causes to the font-related problems.

- The Java Runtime Environment (JRE) used by IBM Cognos Analytics did not find the font that is specified in the chart, and substituted the font with a different font.
- An unknown default font is specified.

To resolve the problem, ask your administrator to configure JRE to find the installed fonts on the Cognos Analytics server. There are two ways that you can configure JRE to find the installed fonts:

- Copy the installed fonts to the `jre/lib/fonts` folder.

For example, to use the Cognos Analytics default font Andale WT, copy `Andalewt.ttf` from the `install_location/bin/fonts` folder to `jre/lib/fonts`.

- Configure the JRE font search path to point to the location where the fonts are installed.

On AIX®, set the shell environment variable `JAVA_FONTS=<list of directories>`

**Tip:** Setting this variable is equivalent to setting the properties `java.awt.fonts` and `sun.java2d.fontpath`.

The default fonts configuration in your Cognos Analytics server default style sheet can also cause font-related problems, particularly when the operating system is UNIX. On UNIX systems, fonts must be purchased and installed. To ensure that a specific font is used, perform one of the following tasks:

- Ask your administrator to update the Cognos Analytics server default style sheet to reflect the fonts that are installed on the server.
- Update the chart fonts that are used in your report to use that font, and do not rely on any default fonts.

## Out-of-memory errors with reports that are run in interactive HTML format

Out-of-memory errors occur when you run a report in interactive HTML format. The errors do not occur when you run the report in other formats, such as PDF or saved HTML.

Out-of-memory errors occur in reports that contain many objects that require memory intensive processing, such as crosstabs and charts that are linked together with master-detail relationships. Running reports in interactive HTML can consume more memory than running reports in other formats. When a report is run in interactive HTML, data sets are kept in memory for all pages in the report. For report formats like PDF, data sets are released from memory after the report is rendered.

Under certain conditions, you can exceed the memory limitations of a 32-bit configuration of the Cognos Analytics server report server component when you interact with an interactive HTML report. For example, scrolling through a report page by page or drilling up or drilling down can consume more memory and processing capacity in interactive HTML than in other output formats.

## Charts in PDF Output Show Unexpected Results

Charts, when viewed in PDF output, have different levels of interaction support, depending on the version of Adobe Acrobat Reader and the style of chart element.

Adobe Reader version 5 does not support tooltips. Drill up and down and Go to links have limited support, due to technical limitations. Only rectangular areas in charts, such as bars, columns, horizontal labels on the axis, or legend labels can be enabled for drill or Go to interaction. Non-rectangular areas, such as pie slices in pie charts, cannot be enabled for drill or Go to interactions.

Adobe Reader version 6 and 7 supports tooltips, drill up and down, and Go to links for all chart types. When chart elements overlap or are separated by only a few pixels, the interactive region may be smaller than the area shown.

## Result set of a multi-fact query contains blanks

The result set of a multi-fact query contains blanks in some columns, even though there is a conformed dimension that should join the records from both fact tables.

When IBM Cognos Analytics processes a multi-fact query, it breaks it up into two single fact queries (each with items from a single star in the star schema), then stitches the results of both of those queries

together to create a single result set. You can see the two queries and stitching in the native SQL generated for the multi-fact query in Reporting.

Stitching these queries together is not the same as joining tables in the model. Stitching the two sides together requires a stitch key that exists in each single fact query as a unique value for the row. The rows from the two single fact queries are then matched 1:0, based on the stitch key values. The stitching must be 1:0. Otherwise, you can get double counting of measure data, or exclude rows that should be included. The stitching also means that it is possible for a row from one of the single fact queries to not have a corresponding row from the other single fact query, leading to blanks in the result set.

When the fact tables contain non-conformed dimensions between them, there is not a suitable stitch key among the query items selected. As a result, IBM Cognos Analytics creates one using RSUM, and joins the results of the two queries. For more information, see the topic *Multiple-fact, Multiple-grain Query on Non-Conformed Dimensions* in the *Framework Manager User Guide*.

When there is a conformed dimension, it is still possible to not have a suitable stitch key, depending on what items are used in the query and other model design factors. In such cases, IBM Cognos Analytics uses the conformed dimensions and the row numbers from the results of each query to create a stitch key. If one single fact query returns more rows than the other, there are blanks in the result.

To resolve the problem, it might be possible to avoid splitting the query by changing the model. For more information, see *Resolving Queries That Should Not Have Been Split* in the *Framework Manager User Guide*. If you cannot avoid splitting the query and the report needs these two result sets to be joined differently, create two separate, single-fact queries in Reporting, create a join between them, and define the join links and cardinality as needed.

## Cognos Statistics object is not displayed in a report

An IBM Cognos Statistics object is not displayed in a report.

Each removed statistical object is replaced with an image in the report:



Figure 54. Image that replaces statistical objects in upgraded reports

A warning also is displayed in the **Upgrade Information** window for each statistical object that is replaced with the image.

Beginning with IBM Cognos Business Intelligence version 10.2.1, IBM Cognos Statistics is no longer available.

To ensure that reports that were created in previous releases and that contain statistical objects run, statistical objects are removed when the reports are upgraded.

**Tip:** Queries, and their data items, that are associated to statistical objects are not removed from upgraded reports.

You can use IBM SPSS® Statistics to perform statistical reporting and analysis.

## Problems When Drilling Through

The topics in this section document problems you may encounter when drilling through reports.

### Cannot Drill Through Between PowerCubes Because MUNs Do Not Match

We recommend that business keys be unique throughout the dimension for PowerCubes. These keys are used as the source value for levels in a hierarchy of a dimension. If the values are not unique throughout the dimension, the corresponding Category Code values may be generated with tildes.

For example, if a category for the Product Line level has a source value of 101 and a category in the Product Type level has a source value of 101, the Category Code value for the Product Type level is automatically generated with a unique value such as 101~245. The Category Code values are used in the Member Unique Name (MUN) for each member, for example, **[Sales and Marketing].[Products].[Products].[Product type]->:[PC].[@MEMBER].[101~245]**.

Because these values are generated automatically, they cannot be guaranteed from one cube build to the next or in a build for another cube with the same dimension structure using the same source values. Therefore, drilling from one PowerCube to another on what appears to be the same member might not work since the MUNs might not match.

If the MUNs do not match, consult the cube modellers to see if the business keys can be made unique throughout the dimension. If this is not likely, or might take some time to resolve, you can use calculations to pass the source value from one PowerCube to another for drill-through.

For more information about drill-through access, see the Drill-Through Access chapter in the *IBM Cognos Analytics Administration and Security Guide*.

### Procedure

1. In the target report, create a filter with the following syntax:

```
filter([Hierarchy or Level], roleValue('_businessKey', [Hierarchy or Level])  
= ?Parameter?)
```

For example:

```
filter([Sales Cube].[Products].[Products].[Product type],  
roleValue('_businessKey', [Sales Cube].[Products].[Products].[Product type])  
= ?Prod Type?)
```

2. In the source report, create a Query Calculation which is used to pass the business key (source value) to the target report by mapping it to the target parameter in the drill-through definition. Use the following syntax:

```
roleValue('_businessKey', [Hierarchy or Level])
```

For example:

```
roleValue('_businessKey', [sales_and_marketing].[Products].[Products].[Product type])
```

### Unexpected or Empty Results When Drilling Through

When you drill from a source report to a target report, there might be no data returned. This might be the correct result if there is no data that corresponds to the drill-through selections or if you do not have permission to view the data.

In other cases, if no data or the wrong data appears, the source item might not be mapped to the target correctly or the values in the data sources might not be conformed (the values do not match in both data sources).

If you have the necessary permissions, you can debug drill-through definitions by using the drill-through assistant from the **Go To** page (right-click the selection in the source report and select **Go To**). You can view the passed source values and the mapping to the target report parameters. You can use this tool for both authored and package drill-through definitions.

You might be able to correct the problem by modifying the parameter mapping in the drill-through definition. For example, when you drill from a cube to a relational data source, sometimes no data is returned or the wrong data is returned because the business key values in the two data sources do not match. You can change the drill-through definition to pass the caption of the IBM Cognos PowerCube member instead of the business key, but you must also change the target report to filter on the corresponding string value and not the business key value.

However, it is best to ensure the data sources are conformed. In this example, the business keys in the cube should match the business keys in the relational source. Filtering on a key is more efficient than filtering on a larger string that may or may not be indexed in the database.

For more information on data source conformance, search for "conformed dimensions" and "business keys" in the *IBM Cognos Transformer User Guide*.

## Procedure

1. Ensure that the target report filters on a string value that matches the caption being passed from the PowerCube.
2. Edit the drill-through definition as follows:
  - If the drill-through definition was created in IBM Cognos Analytics - Reporting, open the report, and go to the drill-through definition associated with the drill-through source object. On the parameter mapping page, select **Member caption** in the **Property to pass** column.
  - If the drill-through definition was created in the source package, in the IBM Cognos Analytics portal, click the **New** icon  **Other, Drill-Through Definitions**. Open the package drill-through definition. On the **Target** tab of the drill-through definition, select **Member caption** in the **Property to pass** column for the appropriate parameter.

## Results

When you drill through, instead of the business key, the caption is passed to the target.

You might also want to see “[Data Does Not Appear in a Target Report or the Wrong Data Appears](#)” on page 373. For more information about drill-through access, see the Drill-Through Access chapter in the *IBM Cognos Analytics Administration and Security Guide*.

## Related concepts

[Conformed dimensions](#)

[Business keys](#)

## Cannot Drill Through From a Relational Source to a Cube

By default, you cannot drill through from a relational data source to a cube. This is because a cube expects a Member Unique Name (MUN) as a parameter value and relational sources do not use MUNs.

Members have properties which include a business key and a caption. If either of these match data items within the relational source, drilling through can be performed as long as the cube target report is authored in Reporting.

If the source data source has a query item, for example display name, that corresponds to a member property in the target cube, for example caption, you must create the parameter on the caption in the target report.

To pass the data item to the cube target, do the following:

- In the cube target report, create a parameter that accepts the caption of the member. This parameter should be created in a Query calculation object from the **Toolbox** icon  with the following syntax. Type the following

```
filter([ Hierarchy or Level],caption([Hierarchy of Level]) = ?Parameter?)
```

For example:

```
filter([sales_and_marketing].[Products].[Products].[Product line],  
caption([sales_and_marketing].[Products].[Products].[Product line])  
= ?Product Line?)
```

For more information about drill-through access, see the Drill-Through Access chapter in the *IBM Cognos Analytics Administration and Security Guide*.

## Calculations Do Not Appear in the Target Report

If you drill through to PowerPlay Studio from a report in Reporting, Analysis Studio, or PowerPlay Studio, calculations on the edges in the target report might not appear.

For example, you have a target report with the calculation Personal Accessories+100 as a column in a crosstab report. When you drill through from a source report to the target report, if Personal Accessories is filtered out of the target report (Personal Accessories is not one of the items that is returned on the column edge), then the Personal Accessories+100 calculation does not appear. Personal Accessories has been filtered out of the target report and is not available to fulfill the calculation.

To see the calculations in the target report, ensure the items used in the calculations are returned in the result set (not filtered out). For more information and examples, see *Understanding Drill-Through Behavior in IBM Cognos 8* at [developerWorks](http://www.ibm.com/developerworks) ([www.ibm.com/developerworks](http://www.ibm.com/developerworks)).

## Nested Crosstab Only Filters on Some Items

If you perform a parameter-based drill-through from a source report to an IBM Cognos Analytics - Reporting target report with two or more dimensions nested on a row or column, you may encounter unexpected results depending on the filters applied to the target report.

For example, a target Cognos Analytics - Reporting report has the following two filters:

- [sales\_and\_marketing\_mdc].[Order method].[Order method].[Order method type]=?Order Method Type?
- [sales\_and\_marketing\_mdc].[Retailers].[Retailers].[Region]=?Region?

Order method type and Region both have filters, but Product line does not. A drill-through definition mapped to the appropriate parameters, in this case Order method type and Region, is created.

When the source report is run and the intersection of Outdoor protection, Northern Europe, and Telephone is selected to drill through to the target report, the order method type and region display as expected, but all product lines are returned. This is because there are filters on Order method type and Region but not Product line.

For more information and examples, see *Understanding Drill-Through Behavior in IBM Cognos 8* at [developerWorks](http://www.ibm.com/developerworks) ([www.ibm.com/developerworks](http://www.ibm.com/developerworks)).

## Data is Not Filtered in the Target Report After Drill-Through

You drill through to a target report, but no filtering occurs in the target report. For example, you drill through on a crosstab intersection of Camping Equipment and 2010 and expect to see only data for Camping Equipment for 2010 in the target report. Instead you see all products for all years. This occurs because the target report has no filters for the parameters that were passed.

To solve the problem, ensure that the target report has the correct filters. In the previous example, the correct filters in the target report are Product line and Year. Alternatively, you can enable Dynamic Drill-Through in a package-based drill-through definition.

## Drill-through links in active reports do not work

When viewing an active report that contains drill-through links in Microsoft Internet Explorer 8 and later, the links do not work.

Clicking on a drill-through link produces an error like the following:

The search path "<drill\_through\_target\_search\_path>" is invalid. An object may contain invalid syntax, or an unsupported character, or the user account in the namespace may not have sufficient privileges. Check the object to ensure that the target destination location does not contain special characters.

Details

CM-REQ-4069 The property "na" is unknown. Replace it with a valid property.

When clicking a link in an active report, you are attempting to move from a local domain (the active report MHT file on your computer) to the IBM Cognos Analytics server's domain. Internet Explorer views this as a potential risk. To resolve the problem, make the following changes to the security settings in Internet Explorer.

### **Procedure**

1. Click **Tools, Internet Options**.
2. Click the **Security** tab.
3. Click **Trusted sites** and then click **Sites**.
4. In the **Add this website to the zone** box, type the IBM Cognos Analytics server's domain.
5. Click **Add** and then **Close**.
6. Click **Custom level**.
7. In the **Scripting** section, under **Enable XSS filter**, click **Disable** and then click **OK** twice.



---

## Appendix B. Limitations when using dimensional data sources

There are limitations when authoring or running reports against dimensional data sources.

### Running a Report Against a Dimensional Data Source

---

You can cancel a report that is running against Microsoft SQL Server Analysis Services only during the initial portion of its execution. After this time, the report runs to completion.

The same behavior applies to SAP BW data sources.

In IBM Cognos Framework Manager, you can also control the number of levels within a hierarchy from which members, or values, are extracted from the hierarchy to populate a tree prompt.

For SAP BW, you can reduce the number of hierarchy levels to limit the number of nodes by setting the SAP BW variable property `trimHierarchyLevels` to 1. This removes the lowest level from the hierarchy prior to creating the list of nodes.

### Units of Measure Notation

When running a report against an SAP BW data source, units of measure are included in the same column as the data values, separated by one space. For example, Celsius and Fahrenheit notations are appended to the end of the value.

If you see an asterisk character (\*), one of the following was detected:

- an unknown currency
  - a value with an unknown or questionable unit of measure, such as a mixed currency calculation or rollup
- Mixed currency values occur when you calculate values with different currencies.

This behavior occurs when you are using an IBM Cognos cube as a data source.

This behavior also occurs for SAP BW data sources.

### Unsupported SAP Variable Properties

The following SAP variable properties are not supported:

- Exclusionary ranges appear as an inclusionary prompt.
- Mandatory not initial appears as a mandatory prompt.

When using Business Explorer (BEx) to define variables in your SAP data source, avoid using exclusionary ranges and the mandatory not initial property.

### Limitations When Using Set Expressions in List Reports

---

In list reports, we recommend that you avoid using set expressions. When in a list, set expressions, such as `TopCount`, may produce fewer rows than in the corresponding crosstab.

For example, the following list includes Year in the first column, followed by a column containing an expression that returns the top three months by revenue. Only three rows appear in the report and they

correspond to the top three months across all years. If you group by Year, the report still shows only three months. However, the corresponding crosstab, you see three months for each year.

Year	Top 3 Months	Revenue
2013	March 2013	171,457,960.73
2013	July 2013	166,441,982.56
2013	June 2013	161,995,729.54
Revenue		Revenue
2010	December 2010	84,197,463.09
	June 2010	82,169,806.98
	July 2010	80,723,457.3
2011	December 2011	109,868,142.48
	November 2011	103,650,656.99
	June 2011	100,066,807.17
2012	June 2012	141,875,242.63
	December 2012	130,525,197.76
	August 2012	129,235,970.16
2013	March 2013	171,457,960.73
	July 2013	166,441,982.56
	June 2013	161,995,729.54

Figure 55. List showing the top three revenue months in 2013, and the corresponding crosstab

In crosstab reports in IBM Cognos Analytics, set evaluation is always done in the context of what the set is nested under in the report. However, in list reports set evaluation is done independently of the grouping. For example, if the first column contains Country or Region instead of Year, you see the top three months for each country or region (across all years) in both cases.

In the case of different dimensions, you can force context independence by replacing [Revenue] in the topCount expression with tuple ([Revenue], X), where X is the default member of the hierarchy that contains Month.

However, for nested levels in the same hierarchy, there is no such workaround at this time.

## Limitations When Using Clauses in Summary Functions

A summary function that uses a `for` clause may yield unexpected results. These may include error messages, warnings, incorrect numbers, and more or fewer than expected rows, columns, or chart points and lines.

To avoid these problems, ensure that the parameters that follow the `for` clause adhere to the following constraints:

- Parameters must be simple data item references.
- All data items in the parameter list must appear on every list, crosstab, or chart that uses that summary.
- For any edge used in the `for` clause, data items listed in the `for` clause must start with the first data item on that edge.
- Data items must be listed in the order in which they appear on each edge of the report with no gaps.
- In crosstabs and charts, there must be no sibling data items that are considered details. Summaries are normally not considered details.
- Section headers must not be included in the parameter list.

If following these constraints does not resolve the problems and your report uses dimensional data with no detail or summary filters, consider using the `within set` clause instead of the `for` clause.

## Limited Support for Relational Functions When Used with OLAP Data Sources

---

When working with an OLAP data source, we recommend that you not use relational functions, such as substring and concatenation functions, in a report that also contains a measure with the **Aggregate Function** property set to **Calculated** or **Automatic** in the model. If you do so, you may encounter unexpected results. For example, some summaries are calculated using the **Minimum** function instead of the aggregate function derived from the individual query items.

In the expression editor, an exclamation mark (!) that precedes a function indicates that the function is not naturally supported for that data source. IBM Cognos Analytics uses a local approximation for that function. Because an approximation is used, performance can be degraded and the results may not be what you expect.

For example, you create an IBM Cognos Query Studio report that contains the data items Product line and Retailer site count. The footer summary is set to **Calculated**. You then insert a calculated column that returns the first three characters of the Product line item, which uses the relational concatenation function. The footer summary now shows the lowest gross margin value.

Product line	First Three Characters	Retailer Site Count
Camping Equipment	Cam	632
Mountaineering Equipment	Mou	265
Personal Accessories	Per	810
Outdoor Protection	Out	639
Golf Equipment	Gol	367
<b>Summary</b>		<b>265</b>

Figure 56. A report that contains a calculated footer summary

### Related concepts

[Summarizing data dimensionally](#)

## Limitations When Summarizing Measures in DMR Data Sources

---

There are limitations when summarizing dimensionally-modeled relational (DMR) measures and semi-additive measures in crosstabs using the aggregation function count distinct, median, standard-deviation, or variance. The following limitations can produce empty or error cells when the report is run:

- The aggregation function must apply to all members of a level or all children of a member.
- To use OLAP functions in detail filters that are applied to a dimension that is not in the report, or is at a level below what is being reported, only the functions `children`, `level`, `members`, `roleValue`, and `rootMembers` will work.
- You cannot define detail filters that reference one or more measures and are set to **After auto aggregation**.
- You cannot define context filters that have more than one member from a dimension that does not appear in the report.
- Context filters that have more than one member from a dimension that appears in the report produce errors in all cells that are ancestors of the slicer members.

- If a crosstab has a row that is a set of members from one dimension (dimension A) and another row that is a set of members from another dimension (dimension B), and a context filter containing members from dimension A is defined, error cells are produced in the row that contains members from dimension B.
- If a context filter contains members from a dimension, and a crosstab has a row that is a set of members from a higher level than the slicer members, error cells are produced for that row.
- Error cells are produced when drilling down on a crosstab that has two nested levels.

If you do not consider these limitations in a calculation, the report may return inaccurate results.

If there is a non-measure calculation that returns a constant or contains a summary function, and the calculation has a lower solve order than the measure being aggregated, error cells are returned for the aggregated measure.

In list reports, error cells are produced as a result of these limitations if the list uses an OLAP function other than `children`, `filter`, `level`, `members`, `roleValue`, and `rootMembers`.

## **Limitations when filtering dimensional data sources**

---

Avoid combining context filters (slicers) with dimensional constructs that involve members from hierarchies that are used elsewhere in the report. This combination gives results that are often not what you might expect and that may change in a future release.

Dimensional data sources provide implicit rollup at all levels of each dimensional hierarchy. Context filters and slicers with more than one member invalidate any pre-computed rollup of members at hierarchy levels before the level at which the filter applies.

The following types of filtering are safe for dimensional reporting:

- Context filters (slicers) with one or more explicit, non-calculated members per hierarchy, if those hierarchies are not used elsewhere in the report.
- Expressions that use the `filter` function (not in a slicer), comparing measure, tuple, or attribute values.

### **Nesting Incomplete Sets**

When you nest sets (especially sets of explicit members, and sets that result from the functions such as `filter` and `intersect`), there may be members at one nesting level that have no corresponding members that can appear nested after them. In such cases, filtering results may not be what you expect: the higher-level members may or may not appear in the result.

While this is most commonly seen within a single hierarchy, it can also happen across different hierarchies and dimensions.

To avoid this problem, ensure that the sets are constructed to ensure that they are never empty for any of the members in the higher-level set. For example, you could filter only the high level set and nest only the complete set of descendants at the desired levels after that one.

### **Error Characters (--) When Filtering**

When you use slicers or context filters with a calculated fact or measure, you may see two dashes (--) as values for some or all of the cells in the report that represent aggregates that are calculated in the database (aggregation is set to **Automatic**). This means that the data source is unable to compute these values.

You can avoid this error by using an explicit rollup rule or aggregation function such as **Total**. However, do this only if you are familiar with the data and absolutely certain that this is the appropriate answer for that report.

## Time Hierarchies

Error characters also appear in summaries if your report includes a time hierarchy and you use two or more members from a different time hierarchy as a context filter. To avoid the error, use only one member as the context filter.

## Filters in Queries and Sub-queries

For dimensional data sources, filters in queries and sub-queries are considered equivalent. The same applies to slicers.

## Limitations When Specifying the Scope of Summary Filters with Dimensional Data Sources

When you specify the scope for a summary filter, consider the following limitations. The scope of a summary filter

- must refer to a grouped data item for list reports. Otherwise, you encounter the following error:

*OP-ERR-0212 The summary filter scope (Scope1) found in the query (Query1) is not valid. It must refer to a grouped query item.*

- can refer to multiple data items, but it can refer to only one data item per edge of the crosstab. Otherwise, you encounter the following error:

*OP-ERR-0213 The summary filter scope (Scope1) found in the query (Query1) is not valid. Referencing more than one query item from the same edge is not supported.*

- must refer to a level and cannot refer to a measure. Otherwise, you encounter the following error:

*OP-ERR-0209 The summary filter scope (Scope1) found in the query (Query1) is not valid. It must refer to a level.*

- must refer to a data item that is projected on an edge of the crosstab. If the scope of a summary filter refers to a data item that was deleted from the report layout, you may encounter unexpected results. Otherwise, you encounter the following error:

*OP-ERR-0213 The summary filter scope (Scope1) found in the query (Query1) is not valid. Referencing more than one query item from the same edge is not supported.*

- must refer to unique data items. For example, the summary filter cannot refer to the same data item more than once.

## Limitations When Filtering Data Using an SAP BW Data Source

If you are working with an SAP BW data source, you must consider additional exceptions when applying filters.

If you apply a filter and a sort to an item that corresponds to the leaf-level of a recursive hierarchy, siblings may appear in the report even though the aggregated values are correct. Siblings are characteristic values with the same parent as the filtered member.

Each level in an SAP BW hierarchy has an item with the same name as the level and a role of \_businessKey. Such items are known as level identifiers. The level identifier must be an exact value for the operators =, <, and > to work. For example, for the filter [Office] > 'Chicago' to work, the value 'Chicago' must exist in the data source. If you do not know the exact values, you can apply the filter to one of the attribute items associated with the level, such as [OfficeLongName] > 'C'. Filters on non-identifiers are possible, but they are slower because SAP BW data sources are optimized for queries based on level identifiers.

When filtering time-related data, only the level identifier items of the time-related characteristics in SAP BW, such as OCALDAY and OCALMONTH, should be used for performing anything other than equality filters. All other (attribute) items in these hierarchies are formatted string representations of the characteristic values with which they are associated. These formatted values sort alphanumerically and not chronologically.

## Using Prompt Expressions in Filters

If you create a filter expression using report item attributes, such as the following, no data is returned.

[ *report item attribute* ] = ?prompt?

To resolve the problem, do one of the following:

- Fully qualify the item by using items from the source tree instead of data items from the report.
- Use prompt controls in the report instead of hand coded prompts.

## Considerations when Creating Calculations

---

Consider the following information and limitations when creating dimensional calculations.

### Calculation Solve Order

When calculations in the rows and columns of a report intersect, calculations are performed in the following order: addition or subtraction, multiplication or division, aggregation (rollup), and then the remaining arithmetic functions.

The remaining functions are as follows:

- absolute, round, average, minimum, maximum, medium, count
- percentage, % difference (growth), or % of total
- rank, quartile, quantile, percentile

If both calculations have the same precedence, for example, if they are both business functions, then the row calculation takes precedence.

You can override the order of precedence by changing the solve order property. For more information, see [“Resolve Multiple Calculations for Crosstabs and Charts” on page 391](#).

### Length of Expressions

When creating layout calculations that use complex expressions, limit the length of the expression to less than 1,000 tokens. A token is a keyword, identifier, constant, or special character symbol that the server identifies when it parses the SQL. For example, the expression 1+1+1+1+1+1+1+1+1 contains approximately 28 tokens, whereas the expression 1+1+1...+1 (400 times) contains more than 1000 tokens.

**Tip:** The Sales Commissions for Central Europe sample report in the GO Data Warehouse (analysis) package includes expressions.

### Quality of Service Indicators

Not all data sources support functions the same way. The data modeler can set a quality of service indicator on functions to give a visual clue about the behavior of the functions. Report authors can use the quality of service indicators to determine which functions to use in a report.

The quality of service indicators are:

- not available (X)  
The function is not available for any data source in the package.
- limited availability (!!)  
The function is not available for some data sources in the package.
- limited support (!)  
The function is available for all data sources in the package but is not naturally supported for that data source. IBM Cognos Analytics uses a local approximation for that function. Because an approximation is used, performance can be poor and the results may not be what you expect.

- unconstrained (check mark)

The function is available for all data sources.

## Using Quotation Marks in Literal Strings

When inserting literal strings in an expression, you must enclose the string in single quotation marks. If the string contains a quotation mark, it must be escaped. For example, if you want to insert the string ab'c, you must type 'ab"\'c'.

## Limitations of calculations in dimensional reporting

You should use only the expressions and functions available in IBM Cognos Analytics - Reporting and follow their syntax.

Minimal checking exists for calculations. If your calculation uses an invalid expression, your report results may contain unexpected values.

In addition, you should define member summaries as follows:

```
summary_function (currentMeasure within set set_reference)
```

where *set\_reference* is a level or set inserted from the **Source** tab 

Unless otherwise required, *summary\_function* should be the aggregate function. If you use an explicit summary function, you may encounter problems with measures (such as profit margin, distinct count, and so on) that have complex rollup values, and/or scenario or account dimension members that do not roll up.

Know your data, and confirm with the owner of the cube where overriding the automatic aggregation is safe.

Because of these limitations, summaries of calculations may not provide reliable values. For convenience, you may have to build reports where row summaries and calculated member columns intersect. In such reports, these intersections may contain unexpected values. In contrast, row calculations intersecting with column aggregates using the aggregate function are safe because the calculation is performed on the reliably summarized values.

## Units of Measure

When creating calculations, you may encounter problems with the units of measure. For example, the calculation Cost \* Cost returns the unit of measure \* (asterisk) instead of a currency unit of measure. To avoid this problem, change the format of the corresponding column to obtain the desired unit of measure.

## Limitation When Using Dimensional Functions with Running and Moving Summaries

IBM Cognos Analytics does not currently support queries that contain both dimensional functions and running summaries or moving summaries. For example, when you drill down in a report, the query uses the dimensional function *children*, which is not compatible with running and moving summaries. Running and moving summaries are supported for only the overall level of a dimension.

## Creating Expressions Using SAP BW Data Sources

You must consider the following when creating expressions using an SAP BW data source, or you may not get the results you expect.

- The case and if/then/else constructs are not supported in filters.
- The query item identifier of the leaf-level of the OCALDAY characteristic and its presentation hierarchies is of type date. When the values for the query item identifier are presented in IBM Cognos Analytics -

Reporting, they are formatted as dates. These formatted values should not be used in filter expressions. The correct date constant format for use in expressions is YYYY-MM-DD.

- You can apply a comparison expression with an operator other than equals to a query item that represents a level identifier. However, level identifiers are more efficient for identifying specific values. Range comparisons must be performed on the IBM Cognos application server, which slows down the performance of the report.

## Using Microsoft Excel Functions with SSAS 2005 Data Sources

If you are working with a Microsoft SQL Server 2005 Analysis Services (SSAS) data source and you want to use Microsoft Excel VBA functions such as ROUNDDOWN in MDX queries, the following Microsoft Office features must be installed on the SSAS server:

- Microsoft Office Excel
- Microsoft Visual Basic for Applications

To see a list of Excel VBA functions, see the Microsoft Web site (<http://www.microsoft.com>).

If these Microsoft Office features are not installed on the SSAS 2005 server, and you use Excel VBA functions, you encounter an error such as the following: YK-ERR-0008 The data provider returned an error message: "The '[Excel].[ROUNDDOWN]' function does not exist.".

This error occurs because the OLAP server cannot process the function since Excel function libraries are missing.

For more information, see the Microsoft Knowledge Base article 932214 at <http://support.microsoft.com>.

## Concatenating Strings

When IBM Cognos Analytics concatenates strings locally and if any of the involved strings contain null values, the result of the concatenation is an empty cell or a null value. This occurs because IBM Cognos Analytics requires that an expression that involves a null value returns a null value. Many databases ignore null strings when they perform concatenations. For example, if you concatenate strings A, B, and C, and if string B is a null value, the database may concatenate only strings A and C.

## Intersecting Calculations in Crosstabs and Charts

An intersection point in a crosstab or chart can contain a value that is derived from multiple calculations.

If the query expressions for the row and column that intersect in a crosstab both include calculations, the intersecting value is the result of performing both calculations. The second calculation is performed on the result of the first calculation. If you change the order in which the calculations are performed, the resulting value at the intersection point changes.

The solve order is a positive numeric value that you assign to data items. Negative values are not supported. The data item with the lowest value is calculated first, followed by the next higher value, and so on. The data item with the highest solve order is computed last. If you do not specify a solve order, the default value of 0 is used. In crosstabs, if more than one data item has the same solve order, column items are calculated first and row items are calculated second.

For example, a crosstab contains the columns Revenue, Sales target, and a column that calculates the percentage by which actual revenue exceeds target revenue. The crosstab contains a row for each Year and a summary row that calculates the overall totals for each of the three columns. The cell where the percentage calculation and the overall total calculation intersect contains only one value. By default, IBM Cognos Analytics calculates the column percentage first and the summary row last. The value that appears at the intersection is therefore a sum of the percentages, which is not a meaningful result. The value is more meaningful if the overall percentage is calculated after the actual and sales target revenues are summed. Specifying a solve order for the percentage calculation that is higher than the overall total calculation gives the following result:

	Revenue	Sales target	Percentage by which Actual Exceeds Target
2010	\$914,352,803.72	\$812,885,300.00	12%
2011	\$1,159,195,590.16	\$1,036,923,300.00	12%
2012	\$1,495,891,100.90	\$1,332,553,100.00	12%
2013	\$1,117,336,274.07	\$1,023,006,840.00	9%
<i>Total</i>	<i>\$4,686,775,768.85</i>	<i>\$4,205,368,540.00</i>	<i>11%</i>

Figure 57. Crosstab showing a calculation that has a solve order specified

It is not necessary to specify the solve order for the overall total calculation. Because the default solve order is 0, setting the solve order for the percentage calculation to a value higher than 0 is sufficient.

### Nested Calculations in Crosstabs

If a crosstab contains nested calculations, the calculations are performed in the following order by default:

1. outermost calculation on the columns
2. innermost calculation on the columns
3. outermost calculation on the rows
4. innermost calculation on the rows

If there are solve order ties, column items are calculated before row items and outer nesting items are calculated before inner nesting items.

### Resolve Multiple Calculations for Crosstabs and Charts

If an intersection in a crosstab or chart contains a value that is derived from multiple calculations, you can specify the order in which to perform the calculations. The solve order must be a positive numeric value. The calculations are performed from lowest to highest solve order value.

Setting the **Summary aggregation** property to **Calculated** for a data item assigns a solve order that is higher than any other data item in a query unless a solve order is explicitly specified. If there are multiple data items that have the **Summary aggregation** property set to **Calculated**, the normal rules for solve order apply.

### Procedure

1. Click the data item for which to specify the solve order.

A data item can have only one solve order value. Consequently, if a data item is in a query that is used in more than one context and you want the data item to have a different solve order in each context, you must use a separate data item.

2. Click the **Show properties** icon , and in the **Properties** pane, set the **Solve order** property to an integer value.

### Resolve Query Calculations that Intersect with Calculated Measures Defined in Microsoft Analysis Services

Microsoft SQL Server Analysis Services (SSAS) data sources may include data source calculations. Because IBM Cognos Analytics cannot predict the presence of a solve order on such calculations, setting the **Solve order** property may not resolve the solve order correctly. You can suppress potentially meaningless results when querying dimensional data sources that include data source calculations. In the following example, the columns **YTD Change** and **YTD Growth** are data source calculated members and the summary values for these two columns were suppressed.

Revenue	Prior YTD	YTD	YTD Change	YTD Growth
Camping Equipment	290,355,466.50	352,910,329.97	62,554,863.47	21.54%
Personal Accessories	329,883,402.11	443,693,449.85	113,810,047.74	34.50%
Outdoor Protection	5,942,944.77	4,471,025.26	-1,471,919.51	-24.77%
Golf Equipment	138,993,560.79	174,740,819.29	35,747,258.50	25.72%
Mountaineering Equipment	93,654,629.48	141,520,649.70	47,866,020.22	51.11%
<b>Total(Product line)</b>	<b>858,830,003.65</b>	<b>1,117,336,274.07</b>	--	--

Figure 58. Crosstab showing revenue by product line with a summary row

When a query-defined calculated member and a data source calculated member intersect, the value is the result of performing both calculations. The second calculation is performed on the result of the first calculation. Whether the final value is meaningful depends on the order in which the calculations are performed. Because IBM Cognos Analytics cannot determine the presence of these members ahead of time, it cannot automatically determine the correct solve order.

In most cases, SSAS 2005 gives the expected results when no solve order is defined in the cube. Therefore, when using SSAS 2005, you do not need to set either the **Solve order** property in the query or the **Calculation intersection** property.

**Note:** Dimensionally-modeled relational (DMR) data sources query one or more underlying relational databases, and therefore cannot contain data source calculations. They are not considered dimensional data sources in the context of this topic.

### Procedure

1. Click the **Queries** icon , and click the query that contains the data item for which to suppress values.
2. In the **Data Items** pane, click the data item.
3. Click the **Show properties** icon , and in the **Properties** pane, set the **Calculation intersection** property to **Show "Not applicable"**.

### Results

When a query-defined calculated member and a data source calculated member intersect, the resulting value is suppressed. If the intersecting members do not contain data source calculations, the value is not suppressed.

## Null (Missing) Values in Calculations and Summaries

The data source that you use determines how null (or missing) values are handled in calculations, summaries, and other expressions.

Null values represent missing data values. For example, a new eyewear product, called Abby, is introduced in 2012. Therefore there are no sales in 2011. If you create a report with the years 2011 and 2012, the values for sales of Abby for the year 2011 are null (missing).

By default, null values appear as blank cells in a crosstab or list report. You can change the default to specify the display of other characters, such as the word null, by changing the data format of the **Missing Value Characters** property for the cells or report. For more information, see “[Set the default data formats](#)” on page 301.

### Arithmetic Operations

Null values in arithmetic operations yield different results depending on the type of data source.

In Microsoft SQL Server Analysis Services (SSAS) and Cubing Services data sources, a null value in arithmetic operations is treated as follows:

- In operations such as addition (+), a null value yields the same result as zero ( $9 + \text{NULL} = 9$ )
- In operations such as multiplication (\*), a null value yields a null result ( $9 * \text{NULL} = \text{NULL}$ )

You can accommodate this behavior by using more complex expressions such as the following:

- `if ([M] is not NULL, then ([M]) else (0))`
- `if ([M] is not NULL, then (<expression involving M>) else NULL)`

In relational and other OLAP data sources the result of an operation that includes a null value is always null. For example,  $9 + \text{NULL} = \text{NULL}$ .

### Equality Comparisons

Equality comparisons, such as equal to (=) and not equal to ( $\neq$ ), compare two values and return a Boolean value of true or false.

For all data sources, equality comparisons are treated as tests for missing data. Inequality comparisons are treated as tests for non-missing data.

For example,  $\text{NULL}=\text{NULL}$  is true and  $\text{NULL}=0$  is false.

### Ordered Comparisons

In ordered comparisons, such as `rank` and `quantile` functions, null values are handled as follows.

For relational data sources, the result of the comparison is always false. For example,  $\text{NULL} < 1$  is false.

For Microsoft SSAS, Cubing Services, and other OLAP data sources, the null value is treated as zero. For example,  $\text{NULL} < 1$  is true.

### Boolean Functions

In Boolean operations, such as `or`, null values are handled as follows.

For relational and dimensionally-modeled relational data sources, the result of a Boolean operation is always null. Boolean functions are used in conditions and the null result is treated as a false condition. For example,  $\text{NULL OR TRUE} = \text{NULL (FALSE)}$

For Microsoft SSAS, Cubing Services, and other OLAP data sources, the null value is treated as if it is false. For example,  $\text{NULL OR TRUE} = \text{TRUE}$ .

### Summary Functions

All summary functions, such as `aggregate`, `average`, and `maximum`, ignore null values. For all functions except `count`, if all values in the expression are null, the result is null. For `count`, if all values in the expression are null, the result is zero.

For example, if the value for Quantity for 2013 is 10 and the values for 2011 and 2012 are null, then the average is as follows:

- `average ([Quantity] within set set([2012], [2013])) = 10`
- `average ([Quantity] within set set([2012], [2011])) = NULL`

The count is as follows:

- `count ([Quantity] within set set([2012], [2013])) = 1`
- `count ([Quantity] within set set([2012], [2011])) = 0`

## **String Operations**

For all data sources, the result of string operations, such as concatenation (||), that include a null value is always null.

For example, 'A' || NULL = NULL and NULL || NULL = NULL.

## **Dimensional coercion rules**

IBM Cognos Analytics uses dimensional coercion rules to automatically convert dimensional types to better match other types. These conversions help you build simpler expressions, making them easier to understand. In addition to the implicit rules that IBM Cognos Analytics provides, you can make explicit data type conversions using various functions, such as `children`.

IBM Cognos Analytics supports the following types of coercion:

- coercion of an object of one dimensional type into another, such as a level into a member set
- coercion of a dimensional object into a numeric, date, time, or string value, such as a numeric measure into a numeric value

Coercion rules are applied to expressions and data items. In expressions, an operator or function may require operands to be of a particular dimensional type. When an operand is not of the required type, one or more coercion rules may be applied to coerce the operand to the appropriate type. Coercion rules may also be applied to data items to coerce the data item to a collection of members or values.

## **Function Operands**

The following describes how coercion rules are applied to function operands:

- If the operand is of the required type, no coercion is required.
- If the function operand is supposed to be a numeric value, it is coerced into one.  
A coercion rule exists for each type of dimensional object coercion.
- If the function operand is supposed to be a dimensional object and a coercion exists to coerce the operand to the required type, the coercion is applied.
- If no coercion exists, an error message with the code QE-DEF-0478 appears to indicate that an unsupported conversion of a dimensional object from the source to target type occurred.

## **Comparison and Other Symmetric Operators**

Binary operators that accept operands of more than one type, such as equals (=) and `in`, need both operands to be the same dimensional type.

No coercion is possible between value domains (numeric, date, time, and string) or between members and values. Consequently, if either operand is a value type, both must be in the same value domain and converted explicitly using a function. Otherwise, the query fails.

Members and member set operands are valid only with the operators equals (=), not equals (<>), `in`, and `not in`, where the right side of the expression is a member, member set, or prompt. Only the following are valid:

- `[member / member set] = [member]`
- `[member / member set] <> [member]`
- `[member / member set] = ?p?`
- `[member / member set] <> ?p?`
- `[member / member set] in ([member], ...)[member / member set] not in ([member], ...)`
- `[member / member set] in ([member set])[member / member set] not in ([member set])[member / member set] in ?p?[member / member set] not in ?p?`

## Exceptions

For the left operand, member sets are supported in detail and summary filter expressions, but not in expressions that use the `filter` function. Members are not supported in detail and summary filters, but they may be used in expressions that use the `filter` function.

The `in_range` operator is not supported for members and member sets.

Normal coercion rules apply to these operands.

NULL operands are considered values, rather than members.

## Examples

The following examples illustrate how coercion is applied to levels in expressions with operators.

`[Sales].[Products].[].[Product Line] = [Sales].[Products].[].[Product Line]->[Outdoor Equipment]`

The left operand is coerced to the following member set:

`members ([Sales].[Products].[].[Product Line])`

The following expressions are invalid:

- `[Sales].[Products].[].[Product Line] = NULL`
- `[Sales].[Products].[].[Product Line] + 1`
- `[Sales].[Products].[].[Product Line] = 'Canada'`
- `[Sales].[Products].[].[Product Line] > 2000`

The following examples illustrate how coercion is applied to members in expressions with operators. In each example, the left operand is coerced to a value of the current cell at this member:

`(tuple ([Sales].[Products].[].[Product Line]->[Outdoor Equipment]))`

- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] = NULL`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] + 1`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] > 2000`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] + 'Canada'`

## Coercion Rules for Dimensional Objects

The following table describes coercion rules that are applied when coercing an object of one dimensional type into another.

**Note:** Measures and Member Unique Names (MUNs) are considered members.

Source type	Target type	Result
Measure dimension	Hierarchy	A measure dimension can be used without any conversion as a hierarchy.
Measure dimension	Member set	<p>The member set contains the members of the measure dimension.</p> <p>This coercion is done in two steps. First, measure dimensions are coerced to hierarchies, and then hierarchies are coerced to member sets.</p>
Hierarchy	Member set	A set containing the members of the hierarchy.

Source type	Target type	Result
Level	Member set	A set containing the members of the level. The equivalent expression is <code>members (level)</code> .
Measure	Member	A measure can be used without any conversion as a member.
Measure	Tuple	This coercion is done in two steps. First, measures are coerced to members, and then members are coerced to tuples.
Measure	Member set	This coercion is done in two steps. First, measures are coerced to members, and then members are coerced to member sets.
Member	Tuple	The tuple consists of the member. The equivalent expression is <code>tuple (member)</code> .
Member	Member set	The set consists of the member. This coercion is done in two steps. First, members are coerced to tuples, and then tuples are coerced to member sets.

#### Coercion Rules for Numeric and String Values

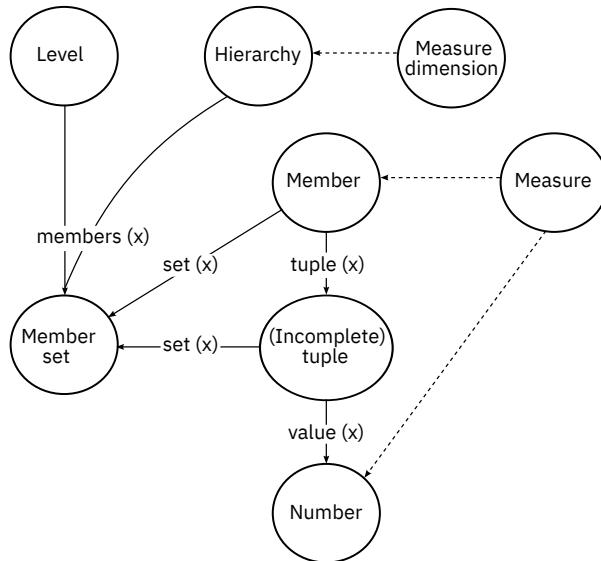
The following table describes the coercion rules for expressions or prompts that return a numeric or string value. These rules apply to functions and operators that require an operand of a particular data type, as well as to binary operators that require operands of the same type.

Source type	Target type	Result
Measure	Number, Date/Time, or String	The result is the value of the measure at the current cube intersection.
Member	Number	The result is the value of the cell at the cube intersection specified by the member. This coercion is done in two steps. First, members are coerced to tuples, and then tuples are coerced to the target type.

Source type	Target type	Result
Tuple	Number	<p>The value of the cell at the cube intersection specified by the tuple.</p> <p>The equivalent expression is <code>value (operand or parameter)</code>.</p>

### Coercion Paths

The following diagram shows how coercion rules are connected. The expression that coerces a source node type to a target node type is built by following the path that connects them. A dotted line indicates a coercion that does not require an explicit conversion function. This occurs whenever the source type is a specialization of the target type. For example, every measure is a member so you can use measures without conversion wherever a member is required.



### Recommendation - Use Member Unique Name (MUN) Aliases

If you are working with a dimensional data source, use MUN aliases to simplify building reports and expressions. In addition, you can tie the MUN back to the member in the package.

When working with dimensional data sources, IBM Cognos Analytics uses MUNs to uniquely identify members. MUNs are very complex. For example, the MUN for the member 2012 might appear as

[great\_outdoors\_company].[Years].[Years].[Year]->: [PC] . [@MEMBER] . [20120101-20121231].

When you build expressions that involve members, the use of MUNs makes these expressions difficult to read and maintain.

IBM Cognos Analytics - Reporting has an option that automatically generates an alias for MUNs (**More**

icon  **Options, Report tab, Alias member unique names**). The MUN alias is a data item that has the MUN as its definition. For the previous example, you would see 2012 as the MUN alias in the **Expression** property for the data item. If the MUN alias is not enabled, in the **Expression** property, you would see the complex MUN for 2012.

**Important:** Do not modify or rename MUN aliases, because they will lose their connection to their respective members in the package.

### Running a Report That Contains Members

If you are using members in a report and your modeler has updated the data source in a way that changes member unique names, the following problems may arise when you run the report.

- If the report queries an OLAP data source, you receive an error message explaining that some specific members cannot be found.
- If the report queries a dimensionally modeled relational (DMR) data source, data items whose member unique names have changed do not appear in the report. Calculations that refer to members that have changed no longer contain values from the members.

To resolve these problems, you must update the member unique names in the report. Open the query that contains the members that you need to update in Query Explorer. Delete the member from the pane in which it appears and reinsert it from the **Source** tab. For example, if you inserted the member as a detail filter, delete it from the **Detail Filters** pane and reinsert it.

## **Limitations When Formatting Empty Cells in SAP BW Data Sources**

---

When working with SAP BW data sources, if the SAP BW server administrator configured custom formatting for empty cells on the SAP BW server, this custom format does not appear in IBM Cognos Analytics reports. Ask your administrator to configure the formatting of empty cells in IBM Cognos Analytics.

### **Related tasks**

[Suppress empty cells](#)

---

## Appendix C. Limitations When Producing Reports in Microsoft Excel Format

There are limitations when producing reports in Microsoft Excel format.

---

### Unable to Load Images from the IBM Cognos Analytics Content Store in a Report

If a report contains an image whose URL points to the IBM Cognos Analytics content store, the Microsoft Excel spreadsheet software generates an access violation error and shuts down.

This problem is a known issue in the Microsoft knowledge base, and Microsoft is currently investigating the problem. This problem occurs only in Excel 2002.

---

### Blank Worksheet Appears

If the Microsoft Excel spreadsheet software cannot download a worksheet within a timeout period, Excel may instead open a blank worksheet.

---

### Warning Message Appears When Excel Opens an IBM Cognos Analytics Report

Each time the Microsoft Excel spreadsheet software opens an IBM Cognos Analytics report, a warning message appears.

The warning message is as follows:

Some of the files in this Web page are not in the expected location. Do you want to download them anyway? If you are sure the Web page is from a trusted source, click Yes.

The Excel workbook in HTML/XML format requires the presence of the file filelist.xml. IBM Cognos Analytics does not allow the creation of local files on the client side. In addition, a local file that contains URLs introduces a security issue. Consequently, this message will appear whenever you open an IBM Cognos Analytics report in Excel. If you see this error message, click **Yes** to open the report.

---

### Spreadsheet Content Not Saved for Reports Saved in XLS Format

If you open a report that was saved in XLS format or run a report in XLS format, and security settings in your Web browser are set so that you are prompted to open or save the report, do not click **Save**. If you save the report, the spreadsheet content will not be saved. This is because Microsoft Excel reports in Microsoft Office 2000 HTML format use relative paths to the spreadsheets. The relative URL paths are no longer available when you open a saved XLS report.

Instead, click **Open** first and then choose to save the report.

---

### Unable to Nest Labels in Charts

Currently, it is not possible to specify nested labels for the category axis via XML.

## Data Series Are Truncated

---

The Microsoft Excel spreadsheet software may group data series or categories differently when compared to a chart produced by IBM Cognos Analytics.

A 1 KB buffer limit in Excel limits the maximum number of data series per chart to 120. Data series over 120 are truncated.

## Colors Different From Those in HTML or PDF

---

If an IBM Cognos Analytics report contains a chart that uses custom colors, the Microsoft Excel spreadsheet software may not be able to add the custom color to the Excel color palette. Excel will attempt to match the custom color to one of its available standard colors. As a result, colors in Excel may vary from those seen in HTML or PDF.

We recommend that you use standard colors in charts.

## Repeating Pie Charts

---

If you have a report that has repeating pie charts and you define a chart title, the Microsoft Excel spreadsheet software will show each pie with a title that is a concatenation of the chart title and the data series. For example, if the chart title is Quantity Sold by Order Method and Product Line and the data series is Order method, the title of each pie in Excel will be Quantity Sold by Order Method and Product Line, *order method*.

## Unable to Skip Discrete Axis Labels

---

In IBM Cognos Analytics charts, you can control the skipping of discrete axis labels. This feature is not supported in Microsoft Excel charts.

## Unsupported IBM Cognos Analytics Formatting

---

About 30% of the formatting functions available in IBM Cognos Analytics are not supported in the Microsoft Excel spreadsheet software.

In particular, Excel does not allow changing locale-dependent formatting attributes, such as the following:

- Decimal Separator
- Exponential Symbol
- Group Separator
- Monetary Decimal Separator
- AM String
- Day Name
- Day Short Name
- Decimal Delimiter Symbol
- Month Name
- Month Short Name
- PM String
- YYYY date format pattern

Excel does not provide an equivalent capability to the Y formatting character. As a result, Cognos Analytics cannot preserve this capability when creating XLSX files.

In addition, Excel does not support the following:

- Format Width
- International Currency Symbol
- List Separator
- Percent Symbol (Excel does not support percent symbols for charts)
- Multiplier
- Overline Text Format
- PerMill Symbol
- Plus Sign
- Scale (Excel has a different scaling formula than IBM Cognos Analytics)
- Calendar (Excel does not allow changing the calendar)
- Era Name
- First Day Of Week
- Show Era

## Cells Contain Series of #

---

Cells in the Microsoft Excel spreadsheet software have a limit of 255 characters. If your report contains text strings that are longer than 255 characters, they will be formatted as text and appear as #####.

To resolve this problem, use fewer characters.

## Table and Column Widths

---

The Microsoft Excel spreadsheet software does not support using percentages to determine the width of tables.

If the report contains only one table, the value of the width attribute for the Table element in the report specification determines the width of the table in the Excel worksheet. If the report contains more than one table, Excel determines the width of all the tables in the worksheet. If the tables are nested, the width specified for the outer table is used and, if necessary, the width is adjusted to accommodate data in the nested tables. The columns and rows around the table are merged to preserve the appearance of the nested table. When you save the workbook, only a single table is saved per worksheet.

## Secure Socket Layer (SSL) Is Not Supported in Some Excel Formats and Versions

---

SSL is supported for only the Microsoft Excel 2002 format in Microsoft Excel 2002 and Microsoft Excel 2003.

## Number Formats Become Currency Formats in Japanese Excel

---

A report uses the Number data format and you save it as Microsoft Excel output. When you open the report in the Japanese version of Microsoft Excel, the data format is listed as Currency rather than Number. This occurs because Japanese Excel interprets the standard Number data format slightly differently than other versions of Excel.

The value appears correctly in Number format. For example, if you specified five digits as your number format, five digits still appear. In Excel, click the **Custom** number format to see the exact format string being used.

## Reports Show Data in Wrong Columns

---

A report contains a large amount of data that is presented using a large number of nested report objects, such as tables and blocks. When the report is produced in Microsoft Excel format, some of the data appears in the wrong columns. This occurs because Excel has a 64K limit on how many nested cell objects can appear in a single spreadsheet.

To solve this problem, you can redesign the report to present the data using non-nested structures.

## Unable to Access Reports on Remote Servers

---

You cannot access a report in Microsoft Excel format on a remote server.

To resolve this problem, you must change the hostname portion of the gateway URI from localhost to either the IP address of the computer or the computer name. You do this using IBM Cognos Configuration.

## Drill-through Reports Are Not Supported in Excel

---

IBM Cognos Analytics does not support drill-through for reports in Microsoft Excel format.

## Map Reports Are Not Supported in Excel

---

IBM Cognos Analytics does not support map reports in Microsoft Excel format.

## Unsupported Excel Formatting

---

IBM Cognos Analytics does not support some formatting.

The following formatting functions that are available in the Microsoft Excel spreadsheet software are not supported by IBM Cognos Analytics:

- background images in table cells
- Excel-specific headers and footers
- text flow and justification
- floating text objects
- white space, normal, and wrap text formatting
- maximum characters

Some layouts do not show exactly in HTML and PDF due to Excel limitations.

## Hyperlink Buttons Are Not Supported in Excel

---

The Microsoft Excel spreadsheet software does not support hyperlink buttons.

## **Unable to View Reports in Excel Format Sent as Email Attachments**

---

IBM Cognos Analytics can send Microsoft Excel reports in HTML and XML format by email. However, you cannot open them directly from the email message.

Save the Excel email attachments to your computer and view them from there.

## **Many items on axis produces empty chart in Excel**

---

If a chart contains many items on the x-axis, an empty chart is generated when the report output format is Microsoft Excel 2002.

This problem is caused by a limitation in Excel 2002 for chart data strings. To work around the problem, produce the report in Excel 2007 format. Excel 2007 does not have this limitation.

## **Chart legend titles are not supported in Excel**

---

The Microsoft Excel spreadsheet software does not support chart legend titles.

## **Unsupported Chart Properties in Excel**

---

The following IBM Cognos Analytics chart properties are not supported in the Microsoft Excel spreadsheet software:

- tool tips
- conditional text
- depth
- visual angle
- show values
- marker text location
- show baseline
- new note
- new marker
- truncation text and allow n-degrees rotation category labels
- border
- margin
- box type
- font and font alignment
- footer
- subtitle
- regression line
- baseline
- Include Zero For Auto Scale
- Summarize Small Slices
- Summarize Small Items

In addition, IBM Cognos Analytics makes sure that Excel reuses the same color palette that is defined in IBM Cognos Analytics. However, Excel can only use the first 16 colors from the IBM Cognos Analytics

palette. If the number of categories in a chart exceeds 16, the rest of the colors are taken from the default Excel palette.

## Unsupported chart types in Excel

---

About 30% of the chart types available in IBM Cognos Analytics are not matched in the Microsoft Excel spreadsheet software.

The following chart types appear differently or are not supported. Charts that are not supported appear as a default column chart in Excel.

- Bipolar charts
- Bubble charts

Excel does not support regression lines.

- Bullet charts

Excel does not support certain fills. As a result, the colored regions in bullet charts do not appear in Excel output.

- Combination charts

In Excel, combination charts appear as two-dimensional. If a three-dimensional or two-dimensional combination chart includes only an area, column, or line chart, only the one chart appears.

- Gauge charts
- Donut charts

Excel may fill in the donut hole to accommodate extra measures. Excel shows donut three-dimensional charts as donut charts.

- Maps

In Excel, no chart appears.

- Matrix charts
- Metrics range charts

In Excel, they appear as combination charts with two line charts for the tolerance bars.

- Pareto charts

In Excel, the cumulative line is not displayed.

- Pie charts

Excel shows only one type of pie chart and may show it at a different angle.

- Progressive column charts
- Polar charts

In Excel, a scatter chart appears instead.

- Quadrant charts
- Radar charts

Excel does not support stacked area radar charts. Excel names area radar charts as filled radar charts. Excel shows radar charts as radar with markers.

- Scatter charts

In Excel, three-dimensional scatter charts appear as two-dimensional scatter charts. The z-axis is dropped.

- 100% stacked bar and column charts

Clustered (side-by-side) stacked column charts are not supported in Excel. Only one column is rendered in the Excel output. For example, you have a 100% stacked column chart with Product line

and Order method as columns. In the Excel output, columns for only Product line appear in the chart, but both Product line and Order method appear in the legend.

## Cell Height and Width Are Incorrect

---

The width and height of cells that contain data with curly brackets {} or parentheses () may appear incorrectly.

This is because the Microsoft Excel spreadsheet software uses different word wrapping algorithms than IBM Cognos Analytics.



# Appendix D. Prompt API for IBM Cognos Analytics

The JavaScript Prompt API provides report authors with a method of customizing prompt interaction in the reports they author.

With the prompt API, JavaScript applications can interact with IBM Cognos Analytics report prompts for the purposes of validation or custom interaction. The prompt API can query and set user selections, validate typed-in values using patterns, set default values using expressions or query data, and more. Examples are provided to show various usage scenarios of the prompt API.

**Note:** The prompt API does not support tree and search prompt controls. Additionally, date and date & time prompt controls do not support the `setValidator` method.

## cognos.Prompt object

Defines the class that contains a prompt object from a report.

This object should only be accessed through an instance of `cognos.Report`.

### cognos.Prompt.getControlByName method

Returns the control object associated with a name.

#### Syntax

```
(cognos.Prompt.Control) getControlByName(String sName)
```

#### Parameters

##### {String} sName

Specifies the prompt name property set for the control in IBM Cognos Analytics - Reporting.

#### Returns

##### {cognos.Prompt.Control}

Object associated to the specified sName control. Returns null if the control does not exist.

#### Example

The following is an example of the `clearMyPrompt()` function.

```
<script type="text/javascript">
    function clearMyPrompt() {
        var oCR = cognos.Report.getReport("_THIS_");
        var myPrompt = oCR.prompt.getControlByName("myPrompt");
        myPrompt.clearValues();
    }
</script>
```

### cognos.Prompt.getControls method

Returns an array of all controls associated with the report.

#### Syntax

```
(cognos.Prompt.Control[]) getControls()
```

## Parameters

None.

## Returns

{cognos.Prompt.Control[]}

An array of controls associated with the report.

## Example

This example implements a function, `clearAllValues()`, that resets (clears the selection of) all prompt controls for a page.

```
<script type="text/javascript">
    function clearAllValues() {
        var oCR = cognos.Report.getReport("_THIS_");
        var aControls = oCR.prompt.getControls();
        for (var i = 0; i < aControls.length; i++) {
            aControls[i].clearValues();
        }
    }
</script>
```

## cognos.Prompt.Control object

---

A control is a visual element in the prompt page, such as a text prompt or a value prompt.

### cognos.Prompt.Control.addValue method

Add an array of values to a control.

If the control does not support multiple values, only the first one provided is used.

## Syntax

```
{void} addValues(aValues)
```

## Parameters

{cognos.Value[]} aValues

The new values to use for this control.

## Returns

{void}

## Example

This example adds an array of two values (use and display) to a prompt.

```
var oCR = cognos.Report.getReport("_THIS_");
function setPromptValue( promptName, useValue, displayValue ) {
    var oP = oCR.prompt. getControlByName( promptName );
    var oValue = { 'use': useValue, 'display': displayValue };
    oP.addValues( [oValue] );
}
setPromptValue ( 'country', 'ca', 'Canada');
```

## cognos.Prompt.Control.clearValues method

Clear (or deselect) all values for this control.

### Syntax

For a text prompt, the text is set to empty. For a value prompt, all the selections are removed.

```
{void} clearValues()
```

### Parameters

None.

### Returns

```
{void}
```

### Example

This example resets all the controls of a page.

```
function clearAllValues() {
    var oCR = cognos.Report.getReport("_THIS_");
    var aControls = oCR.prompt.getControls();
    for (var i = 0; i < aControls.length; i++) {
        aControls[i].clearValues();
    }
}
```

## cognos.Prompt.Control.getName method

Returns the name of the control.

The name is set in IBM Cognos Analytics - Reporting in the name property set for the control.

### Syntax

```
{String} getName()
```

### Parameters

None.

### Returns

```
{String}
```

The value specified by the name property set for the control.

## cognos.Prompt.Control.getValues method

Returns the current value for the control.

This method always returns an array, even if there is only one value selected.

- The following is an example for a text box prompt (single):

```
[ {use: "Smith", display: "Smith"} ]
```

- The following is an example for a select prompt (multiple):

```
[ {use: "CAN", display: "Canada"}, {use: "JPN", display: "Japan"} ]
```

- The following are examples of range prompts:

A range is an array of two elements, with the mandatory names `start` and `end`. The value of each element is a regular array as in earlier examples. When the range values are equal, this method returns a normal value instead of a range:

```
[ {use: useValue, display:displayValue} ]
```

When the range values are different, this method returns a range:

```
[ start:{use: useValue, display:displayValue}, end:{use: useValue, display:displayValue} ]
```

## Syntax

```
{cognos.Value[]} getValues(boolean v_allOptions)
```

### Parameters

#### **{Boolean} v\_allOptions**

This optional parameter is applicable only to value prompts. The parameter specifies whether to retrieve all values or only selected values.

If the parameter is true, then all options are returned. If the parameter is false or missing, then only the selected options are returned.

The default value of this parameter is `false`.

### Returns

#### **{cognos.Value[]}**

An array of values for the control.

## Example

This example demonstrates how to adjust your code based on whether the result is a single value or a range.

```
function isRangeOutOfLimits(datePrompt, rangeLimit) {
    var result = false;
    var v = datePrompt.getValues();
    var rangeValue = v[0];
    var rangeDaysDiff = 0;
    if (rangeValue.start) {
        rangeDaysDiff = 0;
        var startDate = rangeValue.start.use;
        var endDate = rangeValue.end.use;
        rangeDaysDiff = dateUtils.subtractDate(endDate,startDate);
    }
    if (rangeDaysDiff > 0 && rangeDaysDiff <= rangeLimit) {
        result = true;
    }
    return result;
}
```

This example demonstrates the use of the parameter `v_allOptions`.

```
var allValues = valueControl.getValues(true);
var selectedValues = valueControl.getValues();
```

## cognos.Prompt.Control.setValidator method

Changes the default validation function for a control to one defined by the user.

When the specified function returns `false`, the UI element associated with the control indicates that a validation error occurred. When used in a multi-select control, the **Insert** button is disabled.

**Note:** Date and date & time prompt controls do not support this method.

## Syntax

```
{void} setValidator(oFct)
```

## Parameters

### {function} oFct

A user-defined function that takes the user input as a parameter and returns a Boolean value.

## Returns

```
{void}
```

## Example

This example demonstrates how to ensure that a valid postal code is provided in the form A1A 1A1.

```
textBox.setValidator(
    function (values) {
        var result = false;
        if (values && values.length > 0) {
            var sValue = values[0]['use'];
            var rePostalCodeFormat = new RegExp( "[a-z][0-9][a-z] ?[0-9][a-z][0-9]", "gi" );
            if ( rePostalCodeFormat.test(sValue) ) {
                result=true;
            }
        }
        return result;
    }
);
```

## cognos.Prompt.Control.setValues method

Resets the control and adds an array of values to a control.

If the control doesn't support multiple values, only the first value provided is used. This is a convenience method that issues consecutive calls to `clearValues()` and `addValues()`.

## Syntax

```
{cognos.Value[]} aValues
```

## Parameters

### {cognos.Value[]} aValues

New values to use for this control.

## Returns

```
{void}
```

## Example

```
function setPromptValue( promptName, value ) {
    var oCR = cognos.Report.getReport("_THIS_");
    var oP = oCR.prompt.getControlByName( promptName );
    oP.setValues( oValues );
}
oValues = [{ 'use': 'ca', 'display': 'Canada' },
            { 'use': 'us', 'display': 'USA' }];
setPromptValue( 'countries', oValues );
```

## cognos.Report object

---

Represents a report object in the content store.

### Properties

#### **prompt**

References a cognos.Prompt object for this instance.

### Example

This example creates a new cognos.Report object from the current instance.

```
var ocr= cognos.Report.getReport("_THIS_");
```

The new ocr object is specific to the cognos.Report namespace and avoids collisions with other objects in your scripts. The keyword \_THIS\_ should always be used. The Report Server will replace it with a unique namespace during report execution.

## cognos.Report.getReport method

Getter method for a cognos.Report object.

Namespaces are used to support HTML fragments. Always use a proper namespace when using this method to retrieve a cognos.Report object.

### Syntax

```
<static> {cognos.Report} cognos.Report.getReport(sNamespace)
```

### Parameters

**{String} sNamespace** *Optional*

### Returns

**{cognos.Report}**

The cognos.Report instance for this namespace.

### Example

```
var oCR = cognos.Report.getReport( "_THIS_ " );
```

## cognos.Report.sendRequest method

Sends a requests with the current parameters and values.

### Syntax

```
{void} sendRequest(eAction)
```

### Parameters

**{cognos.Report.Action} eAction**

Specifies one of the cognos.Report.Action enumeration values. No other values are allowed.

### Returns

**{void}**

## Example

```
function customButton( eAction )
{
    var oCR = cognos.Report.getReport("_THIS_");
    oCR.sendRequest( eAction );
}
```

## cognos.Report.Action object

---

Defines constants for report navigation.

### cognos.Report.Action.BACK

Go back one prompt page.

#### Syntax

```
<static> <constant> cognos.Report.Action.BACK
```

### cognos.Report.Action.CANCEL

Cancel report execution and navigate to the previous page.

#### Syntax

```
<static> <constant> cognos.Report.Action.CANCEL
```

### cognos.Report.Action.FINISH

Submit parameter values and skip all remaining optional prompts and prompt pages.

#### Syntax

```
<static> <constant> cognos.Report.Action.FINISH
```

### cognos.Report.Action.NEXT

Submit parameter values and go to the next prompt page.

#### Syntax

```
<static> <constant> cognos.Report.Action.NEXT
```

### cognos.Report.Action.REPROMPT

If the report contains prompt pages, the first prompt page is displayed. Otherwise, if the report doesn't contain prompt pages, this constant will re-prompt for values.

#### Syntax

```
<static> <constant> cognos.Report.Action.REPROMPT
```

## cognos.Value class

---

JSON structure to represent parameter values.

This object includes the following valid attributes:

- display
- end
- start
- use

### Simple values

```
{ 'use': '[a].[b].[c]', 'display': 'Canada' }
```

### Range values

```
{
  'start': {'use': '2007-01-01', 'display': 'January 1, 2007'},
  'end': {'use': '2007-12-31', 'display': 'December 31, 2007'}
}
```

### Multiple values

```
[
  { 'use': '12', 'display': 'Canada' },
  { 'use': '41', 'display': 'Germany' },
  { 'use': '76', 'display': 'Japan' }
]
```

# Appendix E. Legacy Map Manager maps

This appendix describes the Map Manager maps functionality that has been replaced by new maps functionality as described in other areas of this document.

IBM Cognos Analytics - Reporting provides a set of maps that you can use to represent tabular data in a spatial context. For example, on a map of the world, countries and regions can be colored to represent the level of revenue.

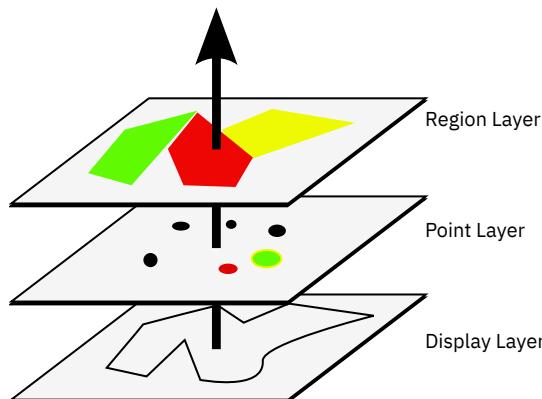
Maps are not supported for reports run in Microsoft Excel format.

## The Reporting map object

Maps are most often used to show geographical areas, but they can be used to show other spatial information, such as a floor plan in a building, seats in an airplane, or parts of the human body.

Maps are similar to crosstabs in the way their data is organized. The display is different, but maps show the intersection of data the same ways as crosstabs; for example, you can see the revenue for golf equipment in Canada.

A map in IBM Cognos Analytics consists of a collection of layers. Each layer contains different information and acts like a transparency that is placed over the map. Each layer adds more information to the map. For example a map of the world may contain information related to countries or regions on one layer and information related to cities on another level.



IBM Cognos Analytics - Reporting maps provide the following three types of layers:

- Region layer

Specifies the regions on a map to be differentiated according to values in the data source. For example, to show the revenue level for each country and region on a map of the world, choose Country and Region as the region layer and then specify that the color of each country and region is based on the revenue value for that country and region. Areas can be set up for drilling through to other reports.

- Point layer

Specifies the points to be placed on a map. The color and size of the points is based on the data that you select. For example, you choose to show cities as points on a map and set the color of each point by revenue and the size of each point by profit. Points can be set up for drilling through to other reports.

- Display layer

You can show or hide items such as grid lines or capital cities. This layer is determined in the map file and not in the data source.

**Note:** If you intend to create CSV or XML output from your map, use only a point layer or a region layer. CSV and XML do not support the simultaneous use of both layers in the same map. Only one layer will be rendered in the output.

## Creating a map report

---

To show how revenue for the company is distributed throughout the world, you can create a report that contains a map that shows the distribution of revenue by country and region.

### Procedure

1. To start IBM Cognos Analytics - Reporting click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. Click the **Data** icon, click the **Add report data** icon , find the package and click **Open**.
4. Click the **Toolbox** icon, double-click **Map**.
5. In the **Choose map** dialog box, in the **Maps** pane, expand the **World** folder and click **World**.
6. In the **Region layers** box, click **Countries and Regions + Territories**.
7. In the **Point layers** box, click **None**.
8. In the **Display layers** box, click **Oceans** and then click **OK**.

**Tip:** You can select or deselect multiple display layers by Ctrl+clicking.

**Tip:** You can return to the **Choose Map** dialog box at any time by double-clicking the map background.

9. Drag data items to the map and run the report.

## Set Map Properties

---

When you select an element in a map, you can view its properties in the **Properties** pane. Some properties are dependent on the existence of other properties.

If you are familiar with using conditional variables, you can customize the map to change appearance or provide information in response to expressions or conditions.

When you change a map property, you usually do not see the change until you run the report. Changes to the properties of labels and titles are reflected immediately.

These are some of the properties you can change in maps. These properties are available when you select the map object, unless specified otherwise in the **Action to perform in the Properties pane** column.

Goal	Action to perform in the Properties pane
Hide or show the title, subtitle, footer, or axis title	Under <b>Chart Titles</b> , set the <b>Title</b> , <b>Subtitle</b> , <b>Footer</b> , or <b>Axis Title</b> property.
Hide or show the legend	Under <b>Chart Annotations</b> , set the <b>Legend</b> property.
Hide or show region and point layer values and labels on the map	Select the region or point layer. Under <b>Chart Labels</b> , double-click the <b>Show Values</b> property and select the options that you want.  To hide overlapping labels, select the <b>Hide overlapping labels</b> check box.

Goal	Action to perform in the Properties pane
Hide or show display layer labels on the map	<p>Select the display layer. Under <b>Chart Labels</b>, double-click the <b>Show Labels</b> property and select the option that you want.</p> <p>To hide overlapping labels, select the <b>Hide overlapping labels</b> check box.</p>
Hide or show the border around the legend	Select the legend icon. Under <b>Box</b> , set the <b>Borders</b> property.
Change the border around the map object	Under <b>Box</b> , set the <b>Border</b> property.
Hide or show the tooltips  <b>Note:</b> Some versions of Acrobat Reader do not support tooltips.	Under <b>Chart Labels</b> , set the <b>Tooltips</b> property.
Change the amount of white space around the map	Under <b>Box</b> , set the <b>Padding</b> or <b>Margin</b> property.
Change the default colors for all map elements	Under <b>Color &amp; Background</b> , set the <b>Background Color</b> , <b>Foreground Color</b> , or <b>Fill Effects</b> property.
Change the font and the alignment of text	<p>Under <b>Font &amp; Text</b>, set the <b>Font</b> or <b>Relative Alignment</b> property.</p> <p><b>Tip:</b> The 2011 Quarterly Sales Forecast sample report in the GO Sales (analysis) package includes text alignment.</p>
Resize the map	Under <b>Positioning</b> , set the <b>Size &amp; Overflow</b> property.
Change the font for the legend	Select the legend icon. Under <b>Font &amp; Text</b> , set the <b>Font</b> property.
Change the format of values in the legend	Select the value in the region or point layer. Under <b>Data</b> , set the <b>Data Format</b> property.
Ignore data with no features	Under <b>Data</b> , set the <b>Ignore Data with No Features</b> property.
Specify the size of points	In the point layer, click the measure in the <b>Size</b> drop zone and set the <b>Minimum Size</b> and <b>Maximum Size</b> properties.
Add titles, subtitles, footers, or axis titles	Set the <b>Title</b> , <b>Subtitle</b> , <b>Footer</b> , or <b>Axis Title</b> property.

## Procedure

1. Select the map object or map element to change:

- To change general properties, such as size and color, click the map object.
- To change specific map elements, such as a layer or title, click the element itself.

**Tip:** To cancel a selection, press the Esc key.

2. In the **Properties** pane, set the property value.

An ellipsis button indicates that a dialog box provides further options.

**Note:** You may have to scroll to see all the properties.

## Defining Data Values for the Region Layer

---

The map that you created in the previous topic is not yet linked to a data source. You will now specify the data values from your data source that will determine the color of each region.

### Procedure

1. From the **Source** tab , expand your data.
2. Drag your measure to the **Color** drop zone.
3. Drag your country or region items to the **Location** drop zone.
4. Run the report.

## Match Data Values to Names in the Map File

---

If the **Ignore Data with No Features** property is set to **No**, then each object that is called from the data source must have a matching label in the specified layer of the map file. For example, if your data source has a country and region named United States and the layer in the map file labels the same country and region USA, then there is a mismatch that must be corrected. IBM Cognos Analytics - Reporting only makes you aware of a mismatch if each object in your data source does not have a corresponding label in the map file. If there are extra labels in the map file that do not have a match in the data source, the report will run without an error message.

A mismatch between your data and the map file must be corrected by the report author. It can not be corrected by a consumer of the map report at run time. There are two ways to correct a mismatch between your data and the labels in the map files. You can use IBM Cognos Map Manager to edit the labels in the layers of the map file, or you can use the dictionary property to create an alias for each mismatched object. When you use the dictionary property, it resolves the mismatch only for a single report, and is not shared with other reports. If you intend to continue using a map with the same data source, it is best to edit the map in Map Manager so that the labels match the objects in your data source.

For information about using Map Manager, see the Map Manager *Installation and User Guide*.

### Procedure

1. Select the map object.

The title bar of the **Properties** pane now shows the word **Map**.

2. In the **General** section of the **Properties** pane, double-click the **Dictionary** property.

3. Click the new button .

4. In the **Dictionary Entry** dialog box, click **Search**.

5. In the **Search string** box, type a word or part of a word for which to search.

For example, if you are searching for United States, type in part or all of the name.

6. In the **Search map layer** box, click the layer to search and click **Search**.

7. In the **Matching features** box, click the label to which to match your data source and click **OK**.

8. In the **Alias** box, type the name as it appears in the data source and click **OK**.

For example, if the country and region in your data source is named USA, type USA as the alias.

**Note:** To find out the name for the objects in your data source, run a list report. For example, you can run a list report to show the names of all the countries and regions in your data source. For more information see [Chapter 3, “Lists,” on page 37](#).

## Define Data Values for the Point Layer

---

The Point layer in a map is used to visually represent data for point locations, such as cities or sales outlets. Both the color and size of points can be based on data from your data source.

### Procedure

1. Open the **Choose Map** dialog box:

- When you create a new map report, this dialog box appears automatically.
- If you are already in a map report, double-click the map background.

2. In the **Point Layers** box, select the layer containing the points to show on the map.

For example, on a map of the world, you may want the points to represent cities.

3. From the **Source** tab , drag a data item to the **Color** drop zone in the **Point Layer**.

For example, to have the color of the point based on revenue, drag **Revenue** from the **Source** tab to the **Color** drop zone.

4. From the **Source** tab, drag a data item to the **Size** drop zone in the **Point Layer**.

5. From the **Source** tab, drag a data item to the **Location** drop zone in the **Point Layer**.

The object must be supported in the map file as a point location. For example, in the World sample map, city is supported as a point location but country or region is not.

6. If you need to refine the location, drag an object to the **Refine Location** drop zone.

Use this drop zone when there is more than one location with the same name. For example, if you try to run a report with cities in the point layer, and there is more than one city in your data source with the same name, the report does not run. An error message indicates that there are cities in your data source with duplicate names. You can differentiate the cities by using the data object **Region** to refine the location.

## Add Colors to the Region or Point Layer

---

You can add colors for regions or points and specify values to determine when those colors are shown.

### Procedure

1. In the report, click the **Region Layer** or **Point Layer**.

2. In the **Color & Background** section of the **Properties** pane, double-click the **Palette** property.

3. Click the new button  and click **Color**.

A new color is added to the list of colors.

4. To view the palette colors as a continuous spectrum in which colors blend into one another, click **Continuous Colors**.

5. With the new color selected, click **Color** in the right pane of the dialog box and select a color.

6. Change the percentage boundaries for the colors.

**Tip:** To specify absolute values rather than percentages, clear the **Percentage** check box.

## Add a Legend Title to a Map

---

There are legend titles for the entire legend, for the color of the regions, for the color of the points, and for the size of the points.

### Procedure

1. If the legend title is not showing, click the legend icon .
2. In the **General** section of the **Properties** pane, set the **Legend Title** to **Show**.
3. In the report, double-click the legend title and type the title.
4. By default, the legend titles are taken from the object you have selected from the data source. To change the legend title for the region color, point color, or point size, do one of the following:
  - Click the **Toolbox** icon , drag a text or calculation object to the **Color Legend Title** drop zone in the Region Layer or Point Layer, or the **Size Legend Title** drop zone in the Point Layer.
  - Double-click the **Color Legend Title** or **Size Legend Title** drop zone, to change from the default legend title, then double-click the drop zone again. In the **Text** dialog box, type text for the legend title.

## Add a Note to a Map

---

You can add one or more notes, determine their position in the map report, and specify borders around notes.

### Procedure

1. Select the map object.
2. In the **Chart Annotations** section of the **Properties** pane, double-click the **Notes** property.
3. Click the new button , and click **OK** twice.  
A note icon with the words **New Note** appears in the report.
4. Click **New Note** next to the note icon .
5. In the **Text Source** section of the **Properties** pane, double-click the **Text** property.
6. Type the text to appear in the note and click **OK**.
7. In the report, click the note icon.
8. In the **Positioning** section of the **Properties** pane, type values to specify the bottom position, left position, height, and width for the note.  
The location of the note is defined by the number of pixels.
9. Set the **Note Border** property to specify a border around the note.
10. Run the report to view the note.  
If necessary, change the position again.

## Drill Through to Another Report From a Map

---

You can link regions or points on a map to another report. For example, on a map of the world, you can specify that when you click on China, a map of China opens.

## Procedure

1. Open the target report.
2. From the report object toolbar, click **Filters**.
3. On the **Detail Filters** tab, click the add button 
4. In the **Available Components** box, click the **Source** or **Data Items** tab to select the data item to use.

For example, to open the target report when Canada is clicked in the source report, expand **Countries and Regions** and double-click **Country and Region**.

5. In the **Expression Definition** box, type an operator after the data item or select an operator from the **Functions** tab and then enter a value.

For example, to open the report when Canada is clicked in the source report, the expression would be as follows:

[Country and Region]='Canada', where [Country and Region] is the name of the data item in the package.

6. Save the target report.
7. Open the source report.
8. Select the region layer or the point layer.
9. In the **Data** section of the **Properties** pane, double-click the **Map Drills** property.

10. In the **Map Drills** dialog box, click the new button 

11. In the **Search string** box, type the name of the feature to use for the drill-through link.

For example, to open a report when you click on Canada in the map, search on all or part of the word **Canada**.

12. Click **Starts with** to search for features that start with the search string or click **Contains** to search for feature names that include the search string.
13. To include a parent layer's name in the results of your search, select a layer in the **Include parent layer** list.

For example, if you searched for **Oslo** and you included the parent layer of **Countries and Regions + Territories**, the search result would be **Oslo (Norway)**.

14. Click **Search**.
15. Select a feature from **Matching features** box and click **OK**
16. In the **Drill-Through Definitions** dialog box, click the new button.
17. Click the ellipsis button beside the **Report** box, and select the target report.
18. Run the report.

## Results

When you click the selected feature in the source report, the target report will open.

## Edit a Map

With IBM Cognos Map Manager you can edit the labels in maps to be consistent with the object names in your database.

Administrators and modelers use a Microsoft Windows operating system utility named Map Manager to import maps and update labels for maps in IBM Cognos Analytics - Reporting. For map features such as country or region and city names, administrators and modelers can define alternative names to provide multilingual versions of text that appears on the map.

For instructions, see the *Map Manager Installation and User Guide*.

## Additional Maps

---

IBM Cognos supplies a set of standard maps that can be used directly with IBM Cognos Analytics - Reporting as well as IBM Cognos Map Manager.

If you already have proprietary geographic data, you can also convert them to .TAB and .XML files that can be imported into Map Manager. Map Manager uses the files to generate .CMF map files, which you can use in Reporting. For more information about the required .TAB and .XML files format and how to generate .CMF map files with Map Manager, see the Map Manager *Installation and User Guide*.

## Location intelligence

---

Sophisticated mapping functionality, known as location intelligence, can be used for a broad range of business applications that extend the mapping capability of IBM Cognos Analytics. These include the ability to dynamically create geographic filters and custom areas for aggregating data for ad-hoc analysis. Examples of business applications of location intelligence are listed in the following table.

Business application	Benefits
Target marketing	Learn who your best clients are and find more like them.
Network optimization and site location analysis	Put stores near your customers and look for gaps in geographical coverage.
Routing and work force optimization	Reduce the number of trucks you need and make your drivers more efficient.
e-government	Provide citizens with self-service opportunities.
Sales territory creation	Create balanced sales territories.
Economic development	Plan the development of your community.
Communications network planning	Avoid costly mistakes by putting cell towers in the correct locations. Identify the locations of clients in your service area.

# About this guide

---

This document is intended for use with IBM Cognos Analytics - Reporting. It provides step-by-step procedures and background information to help you create standard and complex reports. Reporting is a Web product for creating reports that analyze corporate data according to specific information needs.

## Finding information

To find product documentation on the web, including all translated documentation, access [IBM Knowledge Center](http://www.ibm.com/support/knowledgecenter) (<http://www.ibm.com/support/knowledgecenter>).

## Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products. Reporting has accessibility features.

IBM Cognos HTML documentation has accessibility features. PDF documents are supplemental and, as such, include no added accessibility features.

## Forward-looking statements

This documentation describes the current functionality of the product. References to items that are not currently available may be included. No implication of any future availability should be inferred. Any such references are not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of features or functionality remain at the sole discretion of IBM.

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# Index

## Special Characters

-- characters  
  errors when filtering [386](#)  
  marking special cells [301](#)  
  troubleshooting in reports [360](#)  
! characters [385](#)  
\* characters [301](#)  
% calculations  
  in dimensional reporting [227](#)  
  in relational reporting [183](#)

## Numerics

100% stacked charts [67](#)  
3-D charts [68](#)

## A

absolute charts [65](#)  
access code  
  setting for active report [136](#)  
active reports  
  adding controls [139](#)  
  adding interactivity [137](#)  
  choosing where to render visualizations [119](#)  
  controls [135](#)  
  converting existing reports [136](#)  
  creating and managing active report variables [137](#)  
  data lists [142](#), [150](#)  
  defining connections between controls [145](#)  
  drill-through links do not work [380](#)  
  formatting in preview view [151](#)  
  iFrames [142](#)  
  integrating with IBM Cognos Workspace [137](#)  
  linking to other reports or external web pages [152](#)  
  preview view [151](#)  
  report prompts [142](#)  
  running [153](#)  
  saving in MHT format [153](#)  
  setting access code [136](#)  
  setting properties [136](#)  
  specifying maximum number of rows that can appear [136](#)  
  specifying reaction behavior of controls [146](#)  
  specifying selection behavior of controls [146](#)  
  summarizing data [151](#)  
  unable to add to Cognos Workspace [374](#)  
  unable to view in Firefox 8 or later [374](#)  
  using master detail relationships when authoring decks [149](#)  
  variables [136](#)  
aggregating  
  limitations with measures [385](#)  
  mapping functions from data sources [166](#)  
  member sets [202](#)  
  specifying aggregation properties in models [161](#)

aggregating (*continued*)  
  troubleshooting running totals [373](#)  
  using a simple summary in dimensional reporting [200](#)  
  using simple summaries in relational reporting [160](#)  
  values in crosstabs and charts [200](#)  
aliases in maps [418](#)  
aligning objects [262](#)  
ambiguous data  
  maps [133](#)  
annotations  
  chart baselines [90](#)  
  notes in charts [89](#)  
area charts [56](#)  
arithmetic overflow errors [374](#)  
Auto Group & Summarize [160](#)  
automating IBM Cognos Analytics using the IBM Cognos Software Development Kit [35](#)  
averages  
  moving and rolling [203](#)  
axes  
  in charts [49](#)  
  titles in maps [417](#)  
axis scales [84](#)

## B

backgrounds  
  adding background effects to charts [256](#)  
  adding colors to objects [274](#)  
  changing in current default charts [79](#)  
  changing in legacy charts [80](#)  
  colors not appearing in templates [358](#)  
  inserting background images [256](#)  
  troubleshooting in charts [358](#)  
bar charts [56](#)  
base text direction [31](#)  
baselines  
  adding to charts [90](#)  
bidirectional support  
  digit shaping [302](#)  
  enabling [22](#)  
binary round-off errors [365](#)  
BlackBerry devices  
  creating mobile reports for [35](#)  
block objects [8](#)  
blocks  
  inserting [258](#)  
  resizing [269](#)  
booklet items, *See* report booklets  
bookmarks  
  adding [340](#)  
  creating for drill-through access [327](#)  
borders  
  adding to charts [256](#)  
  adding to legacy charts [80](#)  
  adding to objects [254](#)  
bottom filtering [194](#)

broadcasting same report to different users, See burst reports  
bubble charts  
    specifying bubble size in current default charts [105](#)  
Build Prompt Page tool [239](#)  
bullet charts  
    customizing current default charts [109](#)  
burst reports  
    creating against cubes [299](#)  
    creating against dimensional data sources [299](#)  
    creating calculated fields to define recipients [295](#)  
    defining groups [297](#)  
    defining recipients [295](#)  
    denial of service errors in dimensional reporting [375](#)  
    denial of service errors in relational reporting [179](#)  
    enabling in IBM Cognos Analytics portal [298](#)  
    Microsoft Excel format [403](#)  
    setting options [297](#)  
    troubleshooting [371](#)  
business keys  
    using for drill-through [330](#)  
button bars [140](#)

## C

calculated fields in burst reports [295](#)  
Calculation Intersection [391](#)  
calculations  
    adding in dimensional reporting [227](#)  
    adding in relational reporting [182](#)  
    building in dimensional reporting [228](#)  
    building query calculations in relational reporting [184](#)  
    creating simple in dimensional reporting [227](#)  
    creating simple in relational reporting [183](#)  
    function quality of service indicators in dimensional reporting [388](#)  
    function quality of service indicators in relational reporting [184](#)  
    intersecting in crosstabs and charts [390](#)  
    limitations in dimensional reporting [389](#)  
    limitations in relational reporting [182](#)  
    limitations with units of measure in dimensional reporting [389](#)  
    limitations with units of measure in relational reporting [182](#)  
    null values [392](#)  
    resolving in dimensional data sources [391](#)  
    solve order in dimensional reporting [388](#)  
    solve order in relational reporting [182](#)  
    unexplained number discrepancies [365](#)  
    using quotation marks in dimensional reporting [389](#)  
    using quotation marks in relational reporting [184](#)  
calculations do not appear in target report  
    troubleshooting drilling through [380](#)  
CAMID,, See IBM Cognos Access Manager ID  
cascading prompts  
    adding [247](#)  
cascading style sheets [271](#)  
cast\_Date functions  
    troubleshooting [371](#)  
chart configurations  
    100% stacked [67](#)  
    3-D [68](#)  
    stacked [66](#)

chart configurations (*continued*)  
    standard [65](#)  
chart properties  
    specifying [51](#)  
chart types  
    area charts [56](#)  
    bar charts [56](#)  
    bubble charts [59](#)  
    bullet charts [60](#)  
    column charts [54](#)  
    combination charts [57](#)  
    gauge charts [61](#)  
    line charts [54](#)  
    Marimekko charts [64](#)  
    metrics range charts [65](#)  
    microcharts [63](#)  
    Pareto charts [62](#)  
    pie charts [55](#)  
    point charts [57](#)  
    polar charts [64](#)  
    progressive column charts [62](#)  
    quadrant charts [60](#)  
    radar charts [64](#)  
    scatter charts [58](#)  
    win-loss charts [63](#)  
charts  
    aggregating values [200](#)  
    background effects [256](#)  
    background effects in legacy charts [80](#)  
    backgrounds in current default charts [79](#)  
    backgrounds in legacy charts [80](#)  
    bands of color in the background [86](#)  
    baselines [90](#)  
    borders [256](#)  
    changing backgrounds in current default charts [79](#)  
    changing backgrounds in legacy charts [80](#)  
    changing colors [74](#)  
    changing lines [83](#)  
    changing scales [83](#)  
    colored regions in current default charts [81](#)  
    configurations [53](#)  
    converting current default charts to a matrix [101](#)  
    converting types [68](#)  
    creating [49](#)  
    cumulation line in current default Pareto charts [108](#)  
    cumulation line in legacy Pareto charts [109](#)  
    current default [49](#)  
    customizing current default combination charts [100](#)  
    customizing labels [82](#)  
    customizing legend items in current default charts [87](#)  
    customizing legend items in legacy charts [88](#)  
    customizing palettes [74](#)  
    defining colors by values in current default charts [104](#)  
    defining query contexts [98](#)  
    displaying every second label [358](#)  
    drilling up and down [110](#)  
    drop shadows [256](#)  
    elements [49](#)  
    fills [256](#)  
    gridlines [86](#)  
    inserting microcharts into crosstabs [109](#)  
    legacy [49](#)  
    legend titles not supported in Excel [403](#)  
    limitations [376](#)

charts (*continued*)  
  many items on axis produces empty chart in Microsoft Excel 2002 403  
  markers 92  
  notes 89  
    positioning legends in current default charts 87  
    properties not supported in Microsoft Excel 403  
    regression lines in current default charts 95  
    regression lines in legacy charts 96  
    resizing 269  
    resizing current default 73  
    resizing legacy 74  
    resolving multiple calculations 390  
    series colors in current default combination charts 100  
    setting properties 70  
    showing data labels 97  
    showing data labels in current default pie and donut charts 98  
    showing data points 99  
    showing value markers 99  
    specifying bubble size in current default bubble charts 105  
    specifying default measures 47  
    summarizing small slices or items in current default charts 98  
     tooltips 70  
    troubleshooting axis labels 358  
    troubleshooting differences in appearance when run in different formats or on different operating systems 375  
    troubleshooting gray gradient backgrounds 358  
    types 53  
    types not supported in Microsoft Excel 404  
checkbox groups 141  
classes  
  changing the default for a report 271  
clipboards  
  copying reports 349  
  opening reports 349  
Cognos SQL  
  in dimensional reporting 223  
  in relational reporting 180  
Cognos Statistics  
  object missing from a report 377  
Cognos Workspace  
  creating reports for workspaces 32  
  filters in workspaces 34  
colored regions  
  adding to current default charts 81  
colors  
  adding to current default charts 104  
  adding to objects 274  
  changing in charts 74  
  not appearing in templates 358  
column charts 54  
columns  
  adding multiple items in a single column 264  
  calculated in dimensional reporting 227  
  calculated in relational reporting 182  
  grouping in relational reporting 156  
  hiding or showing in list controls 148  
  setting the group span 157  
  sorting in dimensional reporting 212  
  sorting in relational reporting 173  
  swapping with rows 47  
columns (*continued*)  
  width limitations in Microsoft Excel 401  
combination charts 57  
concatenating strings 390  
conditional block lists  
  inserting 259  
conditional palettes  
  creating 76  
conditional rendering  
  adding multiple layouts 291  
  adding variables 289  
  hiding and showing objects 290  
conditional styles  
  creating 285  
  using variables 288  
container direction 31  
context filters  
  creating 209  
  prompting with 210  
continuous values sliders 142  
control data items  
  referencing 144  
controls  
  active reports 135  
  adding data 143  
  adding to an active report 139  
  button bars 140  
  buttons 142  
  checkbox groups 141  
  continuous values sliders 142  
  data button bars 140  
  data checkbox groups 141  
  data decks 139  
  data discrete values sliders 142  
  data drop down lists 141  
  data iterators 141  
  data list boxes 141  
  data radio button groups 140  
  data repeater tables 139  
  data tab controls 140  
  data toggle button bars 140  
  decks 139  
  defining connections 145  
  discrete values sliders 142  
  drop down lists 141  
  iterators 141  
  list boxes 141  
  radio button groups 140  
  referencing data items defined in static controls 144  
  repeater tables 139  
  row numbers 139  
  specifying reaction behavior 146  
  specifying selection behavior 146  
  tab 140  
  toggle button bars 140  
  variable text items 139  
converting  
  lists to crosstabs 48  
  to MDX in dimensional reporting 224  
  to SQL in dimensional reporting 224  
  to SQL in relational reporting 181  
  visualizations 123  
copying  
  reports to the clipboard 349

copying reports [349](#)  
crosstab node members [41](#)  
crosstab nodes [41](#)  
crosstabs  
    aggregating values [200](#)  
    allow sorting [149](#)  
    applying table styles [263](#)  
    creating single-edge [44](#)  
    crosstab node members [41](#)  
    crosstab nodes [41](#)  
    default measures [47](#)  
    defining independent drill-through definitions [335](#)  
    formatting [43](#)  
    indenting data [47](#)  
    intersections [43](#)  
    nesting data [44](#)  
    order of styles [43](#)  
    overflow errors [371](#)  
    resolving multiple calculations [390](#)  
    showing values as percentages [46](#)

CRX-API-0018 errors [388](#)

CSV format  
    importing your own files [277](#)  
    producing reports in [26](#)

cubes  
    troubleshooting drilling through to relational data [378](#)

cumulation lines  
    in current default charts [108](#)  
    in legacy charts [109](#)

currencies  
    data format limitations in Microsoft Excel output [401](#)  
    formatting [301](#)  
    formatting disappearing in SSAS 2005 [372](#)

current default charts [49](#)

custom controls [261](#)

custom groups  
    creating [157, 197](#)

custom polygons  
    maps [129](#)

**D**

dashboards  
    using bullet charts [60](#)  
    using gauge charts [61](#)  
    using global filters [237](#)

data button bars [140](#)

data checkbox groups [141](#)

data decks [139](#)

data discrete values sliders [142](#)

data does not appear in target report  
    troubleshooting drilling through [373](#)

data drop down lists [141](#)

data formats  
    date and time symbols [307](#)  
    decimal format symbols [313](#)  
    locale-sensitive [304](#)  
    Microsoft Excel limitations [401](#)  
    specifying default [301](#)  
    specifying for objects [302](#)  
    using patterns [306](#)

data is not filtered in target report  
    troubleshooting drilling through [380](#)

data iterators [141](#)

data list boxes [141](#)

data lists [38, 142, 150](#)

data modules  
    loading [19](#)

data points  
    showing in charts [99](#)

data radio button groups [140](#)

data repeater tables [139](#)

data series in charts [49](#)

data sources [187](#)

data stores  
    conformed dimensions [329](#)

data tab controls [140](#)

data toggle button bars [140](#)

data trees  
    customizing [188](#)

date & time prompts [240](#)

date prompts [240](#)

dates  
    filtering [172](#)  
    using for drill-through access [331](#)

decimals  
    rounding [302](#)

decks  
    using master detail relationships [149](#)

denial of service errors  
    in dimensional reporting [375](#)  
    in relational reporting [179](#)

depth  
    charts [70](#)

derived columns [172](#)

detail filters [167](#)

dial charts [61](#)

dictionary properties in maps [418](#)

digit shaping  
    in charts and maps [302](#)

dimensional [197](#)

dimensional coercion rules [394](#)

dimensional data sources  
    creating burst reports [299](#)  
    creating master detail relationships [222](#)  
    report limitations [383](#)  
    resolving calculations [391](#)  
    running reports against [383](#)  
    using with queries [214](#)

dimensional reporting  
    adding data [187](#)  
    best practices [10](#)  
    drilling up and down [231](#)  
    filtering data [208](#)  
    sorting data [211](#)  
    summarizing data [198](#)  
    using calculations [227](#)  
    working with queries [213](#)

dimensionally-modeled relational data sources  
    adding dimensional data [187](#)  
    limitations when aggregating measures [385](#)

dimensions  
    conformed [214](#)  
    conformed for drill-through access [329](#)  
    non-conformed [214](#)  
    overlapping named set levels [359](#)  
    searching [189](#)

discrete values sliders [142](#)

distributing reports,, *See* burst reports  
 dividing by zero  
     troubleshooting 357  
 Don't Print class 273  
 drilling down  
     creating drill-up/drill-down reports 232  
     in charts 110  
     using member sets 231  
 drilling through  
     business keys 330  
     calculations do not appear in target report 380  
     concepts 326  
     creating drill-through reports 331  
     cubes to relational data 378  
     data does not appear in target report 373  
     data is not filtered in target report 380  
     defining different drill-through definitions for crosstabs 335  
     in maps 420  
     links not active in Safari Web browsers 373  
     members and values 328  
     Microsoft Excel limitations 402  
     model-based access 326  
     multiple values 332  
     nested crosstab only filters on some items 380  
     packages 327  
     paths 326  
     PowerCubes and packages 331  
     problems with active reports 380  
     relational data to cubes 379  
     report formats 326  
     report-based access 326  
     selection contexts 326  
     specifying drill-through text 335  
     troubleshooting PowerCubes 377  
     using bookmarks 327  
     using dates 331  
     using member unique names 328  
     using scope in model-based reporting 330  
     using URLs 327  
     with conformed dimensions 329  
     wrong data appears in target report 373  
 drilling up  
     creating drill-up/drill-down reports 232  
     in charts 110  
     using member sets 231  
 drop down lists  
     defining no list value item 148  
 drop shadows  
     adding to legacy chart elements 80  
 drop shadows in charts 256  
 Dynamic Query Migration validation option 21

## E

emailing reports,, *See* burst reports  
 empty cells  
     specifying what appears for empty data containers 305  
     suppressing 304  
 error messages  
     CRX-API-0018 388  
     denial of service in dimensional reporting 375  
     denial of service in relational reporting 179  
     HRESULT 367

## F

field sets

error messages (*continued*)  
 missing items 371  
 MSR-PD-0001 281  
 MSR-PD-0012 362  
 MSR-PD-0013 362  
 OP-ERR-0199 357  
 OP-ERR-0201 359  
 OP-ERR-0209 387  
 OP-ERR-0210 387  
 OP-ERR-0212 387  
 OP-ERR-0213 387  
 ORA-00907 371  
 overflow errors in crosstabs 371  
 PCA-ERR-0057 374  
 PCA-ERR-0087 375  
 QE-DEF-0288 371  
 QE-DEF-0478 394  
 ReferenceError: HTMLIsIndexElement is not defined 374  
 RQP-DEF-0177 374  
 RSV-SRV-0025 367  
 RSV-SRV-0040 357  
 TypeError: \_IS1 is undefined 374  
 UDA-SQL-0114 367, 374  
 UDA-SQL-0206 367  
 UDA-SQL-0564 374

errors  
 application errors upgrading a report 357  
 filtering results in error characters 386  
 null values in count summaries 359  
 out of memory 234, 376  
 parse errors with upgraded reports 371  
 recursive evaluation 374  
 troubleshooting error cells in reports 385

escape characters  
 in calculations in dimensional reporting 389  
 in calculations in relational reporting 184

examples for relational metadata  
 prompts 320

Excel 2002  
 empty chart produced when too many items on axis 403

expression editor  
 browsing data 171  
 creating filters in dimensional reporting 208  
 creating filters in relational reporting 167  
 creating parameters to create prompts 242  
 dimensional coercion rules 394  
 searching for values 361

expressions  
 length 388  
 using summary functions in relational reporting 161

extended data items  
 enabling for new reports 270  
 report option 14

extensible visualizations 113

external data  
 importing your own files 277  
 MSR-PD-0012 error when importing 362  
 MSR-PD-0013 error when importing 362  
 reporting 277

**field sets (continued)**  
 inserting [258](#)  
**filled region, See maps**  
**fills**  
 adding to charts [256](#)  
 adding to legacy charts [80](#)  
**filter text**  
 adding [167](#)  
**filtering**  
 -- error characters [386](#)  
 adding filter text [167](#)  
 creating detail filters [167](#)  
 creating global prompts in dashboards [237](#)  
 creating summary filters [167](#)  
 data from SAP BW data sources [387](#)  
 data in dimensional reporting [208](#)  
 data in relational reporting [167](#)  
 date columns [172](#)  
 limitations when specifying the scope [387](#)  
 limitations with dimensional data sources [386](#)  
 members in a set [195](#)  
 multiple-fact queries [214](#)  
 removing or editing [171](#)  
 removing or editing detail filters [171](#)  
 removing or editing summary filters [171](#)  
 suppressing null values [305](#)  
 to top or bottom values [194](#)  
 troubleshooting \_make\_timestamp columns [367](#)  
 using context filters [209](#)  
 using slicers [209](#)  
 workspaces in Cognos Workspace [34](#)  
**filters**  
 in\_range [248](#)  
**Filters pane** [4](#)  
**first-rows optimization**  
 in dimensional reporting [225](#)  
 in relational reporting [181](#)  
**floating objects** [269](#)  
**fonts**  
 setting in maps [417](#)  
 specifying colors [274](#)  
 specifying for reports [254](#)  
**footers**  
 adding to maps [417](#)  
 adding to reports and lists [253](#)  
**for clauses** [161](#)  
**FOR clauses**  
 incorrect results for OLAP [363](#)  
 limitations when using in summary functions [384](#)  
**foregrounds**  
 adding colors to objects [274](#)  
**formatting**  
 disappearing in SSAS 2005 [372](#)  
**functions**  
 quality of service indicators in dimensional reporting  
[388](#)  
 quality of service indicators in relational reporting [184](#)

**G**

**gauge charts** [61](#)  
**generated prompts** [241](#)  
**geospatial data**  
 maps [133](#)

**global filters in dashboards** [237](#)  
**glossaries**  
 accessing the IBM InfoSphere Information Governance Catalog [30](#)  
**gridlines**  
 adding to charts [86](#)  
 in charts [49](#)  
 major and minor [83](#)  
**grouping**  
 data in relational reporting [156](#)  
 setting group spans [157](#)  
 troubleshooting incorrect running totals [373](#)  
 troubleshooting nested list reports [357](#)  
 troubleshooting subtotals in grouped lists [358](#)  
**groups**  
 custom [157, 197](#)

**H**

**headers**  
 adding to reports and lists [253](#)  
 creating for sets [45](#)  
**heatmap visualizations** [115](#)  
**heights**  
 specifying for objects [269](#)  
**hiding columns**  
 list reports [38](#)  
**hiding objects** [290](#)  
**hierarchies**  
 inserting [190](#)  
**highlighting**  
 adding colors to objects [274](#)  
 using conditional styles [285](#)  
**horizontal pagination** [343](#)  
**hotspots** [110](#)  
**HRESULT errors** [367](#)  
**HTML format**  
 producing reports in [22](#)  
 viewing report pages as tabs [270, 346](#)  
**HTML items**  
 inserting [259](#)  
**hyperlinks**  
 buttons are not supported for Microsoft Excel [402](#)  
 inserting [259](#)

**I**

**IBM Cognos Analytics interactive viewer** [24](#)  
**IBM Cognos for Microsoft Office**  
 creating reports for [34](#)  
**IBM Cognos Software Development Kit** [35](#)  
**IBM Cognos Viewer** [24](#)  
**IBM InfoSphere Information Governance Catalog** [30](#)  
**iFrame** [142](#)  
**images**  
 adding to chart backgrounds [256](#)  
 inserting in backgrounds [256](#)  
 inserting in reports [255](#)  
 Microsoft Excel limitations [399](#)  
**in\_range filters** [248](#)  
**indenting**  
 data in crosstabs [47](#)  
 objects [264](#)

inline objects 8  
interactive reports 24  
intersections of members  
  in dimensional reporting 231  
interval prompts 241  
iPhone devices  
  creating mobile reports for 35  
iterators 141

## J

Japanese  
  Microsoft Excel limitations 401  
JavaScript  
  adding 261  
join relationships  
  creating in relational reporting 177  
justification  
  setting for objects 266

## L

labels  
  customizing in charts 82  
gauge charts  
  customizing 103  
  specifying in current default gauge charts 103  
  specifying in legacy gauge charts 104  
latitude 128  
layout  
  using tables 262  
layout component caches 266  
layout component references  
  inserting 260  
layouts  
  adding 291  
  pages 7  
  relating to queries in dimensional reporting 213  
  relating to queries in relational reporting 174  
  report objects 7  
  report structure 251  
  using the page structure view 251  
legacy charts 49  
legends  
  adding titles in maps 420  
  hiding or showing in maps 416  
  in charts 49  
  in maps 419  
  positioning in current default charts 87  
level hierarchies 187  
levels  
  member unique names 328  
limitations  
  aggregating measures in dimensionally-modeled  
    relational or relational data sources 385  
line breaks 268  
line charts 54  
line spacing 268  
lineage information 28  
linear scales  
  showing 83  
lines  
  adding regression lines to charts 95

lines (*continued*)  
  adding regression lines to legacy charts 96  
  changing in charts 83  
linking data items for drilling 232  
list boxes 141  
list reports  
  hiding columns 38  
lists  
  adding headers and footers 253  
  allow sorting 149  
  applying table styles 263  
  converting to crosstabs 48  
  formatting 37  
  grouping data 156  
  hiding or showing columns 148  
  limitations 383  
  scrollable 38  
  single-edge crosstabs 44  
  subtotals in grouped lists 358  
  *See also* data lists

literal strings  
  in calculations in dimensional reporting 389  
  in calculations in relational reporting 184  
locales  
  locale-sensitive properties 304  
locking objects 9  
logarithmic scales  
  showing 83  
longitude 128

## M

Manage External Data tool  
  overview 277  
Mapbox 129, 130  
maps  
  aliases 418  
  ambiguous data 133  
  creating 127, 128, 416  
  custom polygons 129  
  customizing 416  
  dictionary property 418  
  drilling through 420  
  geospatial data 133  
  ignoring data with no features 417  
  legends 419  
  matching data values 418  
  Microsoft Excel limitations 402  
  notes 420  
  point layers 419  
  region layers 418  
  resizing 269  
  showing or hiding properties 416  
margins  
  setting for objects 264  
Marimekko charts 64  
markers  
  adding to charts 92  
master detail relationships  
  creating in dimensional reporting 220  
  creating in relational reporting 178  
  creating when authoring active reports 149  
  denial of service errors in dimensional reporting 375  
  denial of service errors in relational reporting 179

master detail relationships (*continued*)  
linking members from two dimensional data sources  
[222](#)  
using to join page sets [339](#)

matrix  
charts [101](#)

matrix reports [41](#)

MDX  
adding your own in dimensional reporting [223](#)  
converting to in dimensional reporting [224](#)  
working with in dimensional reporting [223](#)

measures  
specifying defaults [47](#)

member properties  
inserting [191](#)

member sets  
aggregating [202](#)  
creating [191, 232](#)

member unique names  
relational metadata [328](#)  
troubleshooting running reports with [397](#)

members  
drill-through access [328](#)  
excluding [194](#)  
expanding and collapsing [196](#)  
folder [187](#)  
inserting properties [191](#)  
intersections in dimensional reporting [231](#)  
moving [194](#)

metrics range charts [65](#)

MHT  
saving active reports [153](#)

microcharts  
adding to data lists [150](#)  
inserting [109](#)

Microsoft Excel  
chart legend titles not supported [403](#)  
limitations of nested report objects [402](#)  
producing reports in [26](#)  
report limitations [399](#)

missing items  
troubleshooting [371](#)

missing values  
suppressing [304](#)

mobile devices  
creating reports for [35](#)

models  
aggregation properties [161](#)  
using design filters [22](#)

moving averages [203](#)

MSR-PD-0001 errors [281](#)

MSR-PD-0012 errors [362](#)

MSR-PD-0013 errors [362](#)

multilingual reports [291](#)

MUNs,, See member unique names

My Data Sets tool  
overview [277](#)

My parameters panel [238](#)

## N

named sets  
limitations when summarizing [199](#)  
nested or parallel sets overlapping [359](#)

names  
updating references [354](#)

native SQL  
in dimensional reporting [223](#)  
in relational reporting [180](#)

nested crosstab only filters on some items  
troubleshooting drilling through [380](#)

nested list reports  
not running after upgrading [357](#)

nested report objects  
Microsoft Excel limitations [402](#)

nested sets  
unexpected summary values [362](#)

nesting  
data in crosstabs [44](#)

no data  
specify not to render pages [25](#)  
specifying what appears [305](#)

No Data Contents [305](#)

notes  
adding to charts [89](#)  
adding to maps [420](#)

null values  
calculations with SAP BW data sources [363](#)  
suppressing [304](#)  
suppressing with filters [305](#)  
troubleshooting in count summaries [359](#)

number data formats  
Microsoft Excel limitations [401](#)

numeric shaping. See digit shaping

## O

objects  
adding [7](#)  
aligning [262](#)  
as containers [9](#)  
finding in reports [9](#)  
hiding and showing [290](#)  
hierarchies [9](#)  
indenting [264](#)  
inheriting formatting from parents [9](#)  
inline or block [8](#)  
inserting formatting objects [258](#)  
locking and unlocking [9](#)  
reusing for layouts [265](#)  
specifying data format [302](#)  
updating reused [266](#)

OLAP data sources  
inserting data [187](#)  
limitations with relational functions [385](#)

OP-ERR-0199 errors [357](#)

OP-ERR-0201 errors [359](#)

OP-ERR-0209 errors [387](#)

OP-ERR-0210 errors [387](#)

OP-ERR-0212 errors [387](#)

OP-ERR-0213 errors [387](#)

opening reports  
from other studios [350](#)

ORA-00907 errors [371](#)

Oracle data sources  
troubleshooting [371](#)

Oracle Essbase  
changes [359](#)

out of memory errors 234  
overflow errors in crosstabs 371

## P

packages  
    changing 355  
    deleting 19  
    drilling through 327  
    loading 19  
    referencing items in child queries 177  
    replacing 19  
packed bubble visualizations 117  
padding  
    applying to objects 264  
page breaks  
    controlling 270  
    creating 337, 338  
    creating with page layers 340  
page layers 340  
page numbers  
    adding 343  
    modifying with options 343  
page sets  
    creating 337  
    joining nested page sets 339  
pages  
    adding 337  
    associating queries with 337  
    not rendering when there is no data 25  
    viewing as tabs in HTML output 270, 346  
pagination  
    horizontal in PDF output 343  
    specifying for HTML output 270  
palettes  
    conditional 76  
    customizing in charts 74  
parameter values  
    clearing 22  
parameters  
    for prompts 242  
    using in master detail relationships in dimensional reporting 220  
    using in master detail relationships in relational reporting 178  
Pareto charts  
    cumulation lines in current default charts 108  
    cumulation lines in legacy charts 109  
PCA-ERR-0057 errors 374  
PCA-ERR-0087 375  
PDF format  
    producing reports 22  
PDF problems  
    charts 376  
percent calculations  
    in dimensional reporting 227  
    in relational reporting 183  
performance details 28  
pie charts  
    converting to current default donut charts 106  
    exploding slices in current default charts 107  
    limitations for Microsoft Excel outputs 400  
    setting the first slice angle in current default charts 106  
point charts 57  
point layers 419  
polar charts 64  
polygon, *See* maps  
PowerCubes  
    incorrect results 363  
    troubleshooting drilling through 377  
Preview view  
    active reports 151  
printing  
    not printing objects 273  
progressive column charts 62  
prompt pages  
    creating your own 239  
prompt texts  
    customizing 246  
prompts  
    adding prompt buttons 247  
    changing prompt control interfaces 244  
    creating cascading 247  
    creating in a report page 243  
    creating using query macros 318  
    date 240  
    date & time 240  
    examples 320  
    generated 241  
    in\_range 248  
    interval 241  
    modifying 244  
    pages 239  
    parameters 242  
    requiring user input 244  
    select & search 240  
    selecting multiple values 245  
    showing and hiding 245  
    showing values in generated SQL or MDX 249  
    specifying default selections 245  
    specifying default values 246  
    text box 240  
    time 240  
    tree 248  
    using context filters 210  
    using slicer filters 210  
    using the Build Prompt Page tool 239  
    using the expression editor 242  
    value 240  
    workspaces in Cognos Workspace 33  
    *See also* active reports, linking to other reports or external web pages  
Properties 174  
Properties menu 4  
public variables  
    defining in active reports 137

## Q

QE-DEF-0288 errors 371  
QE-DEF-0478 errors 394  
quadrant charts 60  
quadrants  
    adding to current default charts 81  
queries  
    associating with pages 337  
    connecting between data sources in dimensional reporting 214

queries (*continued*)  
connecting between data sources in relational reporting 174  
in dimensional reporting 213  
in relational reporting 173  
multiple-fact 214  
referencing data items in dimensional reporting 213  
referencing data items in relational reporting 174  
referencing package items in child queries 177  
relating to layouts in dimensional reporting 213  
relating to layouts in relational reporting 174  
result set of multi-fact query contains blanks 376  
using with dimensional data sources 214  
working with MDX in dimensional reporting 223  
working with SQL in dimensional reporting 223  
working with SQL in relational reporting 179

query calculations  
creating in dimensional reporting 228  
creating in relational reporting 184  
null values in count summaries 359

query context  
defining in charts 98

Query Explorer  
using in dimensional reporting 213  
using in relational reporting 173

query macros  
adding 317  
using to create prompts 318

Query Studio  
templates 19

quotation marks  
in calculations in dimensional reporting 389  
in calculations in relational reporting 184

**R**

radar charts 64

radio button groups 140

ragged hierarchies 196

referenced objects  
changing 265  
updating 266

referenced report styles 272

region layers 418

regression lines  
in current default charts 95  
in legacy charts 96

relational functions  
limitations when used with OLAP data sources 385

relational reporting  
adding data 155  
best practices 10  
filtering data 167  
grouping data 156  
sorting data 172  
summarizing data 159  
troubleshooting drilling through to cubes 379  
using calculations 182  
working with queries 173

Render Page when Empty 25

repeater tables 139

repeaters  
formatting 263

Report  
Report (*continued*)  
maps  
creating 130

report booklets 345

report formats  
CSV 26  
Excel 26  
HTML 22  
PDF 22  
specifying 22  
XML 27

report prompts 142

report properties 270

report specifications 35

report styles  
reusing 272

Reporting  
setting options 12

reports  
active 135  
adding data 19  
adding interactivity 137  
adding JavaScript 261  
changing the maximum number of tuples allowed 375  
converting to active reports 136  
creating booklets 345  
creating page breaks 338  
formatting changes when upgrading 372  
multilingual 291  
out of memory errors in interactive HTML output 376  
setting interactivity level 24  
supporting bidirectional languages 31  
tabbed 346  
templates 19  
themes 19  
validating 21  
validation options 21

resizing  
current default charts 73  
legacy charts 74  
objects 269

reusing  
styles 252

rich text items  
inserting 259  
supported elements 260

rolling averages 203

rollup calculations  
in dimensional reporting 227  
in relational reporting 183

round-off errors 365

rounding numbers 302

row numbers  
inserting 260

rows  
swapping with columns 47

rows per page  
controlling for multiple containers in HTML and PDF 25  
setting 22

RQP-DEF-0177 errors 374

RSV-SRV-0025 errors 367

RSV-SRV-0040 errors 357

running and moving summaries  
limitations with dimensional functions 389

running reports  
    against dimensional data sources [383](#)  
    against SAP BW [383](#)  
cannot find database errors [371](#)  
IBM Cognos Analytics interactive viewer [24](#)  
IBM Cognos Viewer [24](#)  
ORA-00907 errors [371](#)  
    Reporting is slow [367](#)

running totals  
    dimensional functions [227](#)  
troubleshooting [373](#)

**S**

Safari Web browsers  
    drill-through links not active [373](#)

SAP BW data sources  
    creating burst reports [299](#)  
    creating expression [389](#)  
large queries [375](#)  
limitations when calculating data [182](#)  
limitations when sorting data [211](#)  
null results [363](#)  
query calculations [359](#)  
running reports against [383](#)  
sectioning reports [360](#)  
units of measure notation [383](#)

SAP variable properties  
    unsupported [383](#)

scales  
    changing for chart axes [84](#)  
    changing intervals [83](#)  
    linear [83](#)  
    logarithmic [83](#)

scatter charts [58](#)

scope  
    filtering [167](#)  
    using in drill-through access [330](#)

scrollbars  
    adding to block objects [269](#)  
    adding to lists [38](#)  
    *See also* data lists

searching  
    dimensions [189](#)

section headings [158](#)

sections  
    creating for dimensional data [340](#)  
    creating on reports with SAP BW data sources [360](#)  
    removing [158](#)

Secure Socket Layer  
    Microsoft Excel limitations [401](#)

select & search prompts [240](#)

set definitions [193](#)

set expressions  
    building in dimensional reporting [228](#)  
    limitations in list reports [383](#)

sets  
    editing [193](#)  
    filtering [195](#)  
    reusing [191, 192](#)  
    sharing [191, 192](#)

sets of members  
    creating [191](#)  
    nested or parallel sets overlapping [359](#)

shared sets  
    copying [192](#)  
    creating [191](#)  
    managing [192](#)

sharing  
    sets [191, 192](#)

showing objects [290](#)

single-edge crosstabs [44](#)

singletons [20](#)

sizes  
    specifying for objects [269](#)

slicer filters  
    prompting with [210](#)

slicers  
    creating [209](#)

solve order  
    combined with calculated rollup aggregate function [391](#)  
    dimensional data sources [391](#)

sorting  
    crosstabs [149](#)  
    data in dimensional reporting [211](#)  
    data in relational reporting [172](#)  
    limitations with SAP BW data sources [211](#)  
    lists [149](#)  
    multiple columns in dimensional reporting [212](#)  
    multiple columns in relational reporting [173](#)  
    visualizations [124](#)

source trees  
    customizing [188](#)

spaces  
    adding around objects [264](#)

Specifying chart properties [51](#)

spider charts [64](#)

SQL  
    adding your own in dimensional reporting [223](#)  
    adding your own in relational reporting [180](#)  
    Cognos in dimensional reporting [223](#)  
    Cognos in relational reporting [180](#)  
    converting to in dimensional reporting [224](#)  
    converting to in relational reporting [181](#)  
    first-rows optimization in dimensional reporting [225](#)  
    first-rows optimization in relational reporting [181](#)  
    native in dimensional reporting [223](#)  
    native in relational reporting [180](#)  
    working with in dimensional reporting [223](#)  
    working with in relational reporting [179](#)

SSAS 2005 cubes  
    troubleshooting [360](#)

SSAS 2005 data sources  
    creating expression [390](#)  
    disappearing data formats [372](#)

SSAS cubes  
    problems when very large [234](#)

stacked charts [66](#)

standard charts [65](#)

star charts [64](#)

strings  
    concatenating [390](#)

studios  
    Oracle Essbase changes [359](#)

styles  
    conditional [285](#)  
    reusing [252, 272](#)

subtotals

subtotals (*continued*)  
     troubleshooting in grouped lists [358](#)

summaries  
     adding simple in dimensional reporting [200](#)  
     adding simple in relational reporting [160](#)  
     adding to active reports [151](#)  
     adding to visualizations [122](#)  
     aggregate in dimensional reporting [204](#)  
     aggregate in relational reporting [163](#)  
     automatic in dimensional reporting [204](#)  
     automatic in relational reporting [163](#)  
     average in dimensional reporting [204](#)  
     average in relational reporting [164](#)  
     calculated [391](#)  
     calculated in dimensional reporting [205](#)  
     calculated in relational reporting [164](#)  
     count distinct in dimensional reporting [205](#)  
     count distinct in relational reporting [164](#)  
     count in dimensional reporting [205](#)  
     count in relational reporting [164](#)  
     custom in dimensional reporting [206](#)  
     custom in relational reporting [165](#)  
     FOR clauses [363](#)  
     maximum in dimensional reporting [206](#)  
     maximum in relational reporting [165](#)  
     median in dimensional reporting [206](#)  
     median in relational reporting [165](#)  
     minimum in dimensional reporting [206](#)  
     minimum in relational reporting [165](#)  
     none in dimensional reporting [206](#)  
     none in relational reporting [165](#)  
     not applicable in dimensional reporting [206](#)  
     not applicable in relational reporting [165](#)  
     null values [392](#)  
     rolling and moving averages [203](#)  
     standard deviation in dimensional reporting [207](#)  
     standard deviation in relational reporting [165](#)  
     summarize in dimensional reporting [207](#)  
     summarize in relational reporting [165](#)  
     total in dimensional reporting [207](#)  
     total in relational reporting [166](#)  
     troubleshooting [369](#)  
     variance in dimensional reporting [207](#)  
     variance in relational reporting [166](#)

summarizing data  
     in dimensional reporting [198](#)  
     in relational reporting [159](#)

summary filters [167](#)

summary functions  
     in dimensional reporting [204](#)  
     in relational reporting [163](#)  
     limitations when using FOR clauses [384](#)  
     using in expressions in relational reporting [161](#)

summary values  
     unexpected when using nested sets [362](#)

suppressing  
     data [304](#)

Symbian devices  
     creating mobile reports for [35](#)

**T**

tab controls [140](#)  
   tabbed reports [346](#)

tables  
     applying styles [263](#)  
     inserting [262](#)  
     Microsoft Excel width limitations [401](#)  
     using for layout [262](#)

tables of contents  
     creating [342](#)

tabular data  
     viewing [22](#)

templates  
     background colors not appearing [358](#)  
     creating [19](#)  
     icons [19](#)  
     Query Studio [19](#)

text  
     adding to reports [254](#)  
     specifying flow in objects [266](#)

text box prompts [240](#)

textures  
     adding to legacy charts [80](#)

themes [19](#)

time periods  
     showing data only for specific [203](#)

time prompts [240](#)

TM1 data sources  
     order of metadata tree [361](#)  
     report differences [361](#)

toggle button bars [140](#)

tooltips  
     adding to charts [70](#)  
     hiding or showing in maps [417](#)

top filtering [194](#)

totals  
     troubleshooting running totals [373](#)

tree prompts  
     adding [241](#)  
     controlling the data that appears [248](#)

treemap visualizations [114](#)

trend lines  
     in current default charts [95](#)  
     in legacy charts [96](#)

troubleshooting  
     differences in the appearance of charts run in different formats or on different operating systems [375](#)  
     out of memory errors with reports run in interactive HTML [376](#)  
     result set of multi-fact query contains blanks [376](#)  
     unable to open saved Active Report output in Firefox 8 or later [374](#)

tuples  
     changing the maximum allowed in reports [375](#)  
     in dimensional reporting [231](#)

TXT data  
     importing your own files [277](#)

**U**

UDA-SQL-0043 errors [374](#)  
   UDA-SQL-0114 errors [367, 374](#)  
   UDA-SQL-0206 errors [367](#)  
   UDA-SQL-0564 errors [374](#)  
   unbalanced hierarchies [196](#)  
   unexplained number calculations [365](#)  
   union query

union query (*continued*)  
    creating 176  
units of measure  
    notation for SAP BW data sources 383  
unlocking objects 9  
upgrading reports  
    applications errors 357  
    formatting not retained 372  
    reports will not open 371  
user interface 1

## V

validating reports 21  
value markers  
    showing in charts 99  
value prompts 240  
values  
    showing crosstab values as percentages 46  
    specifying defaults in prompts 246  
variable text items 139  
variables  
    active reports 136, 137  
    adding 289  
    conditional styles 288  
viewing reports  
    troubleshooting 371  
views  
    page design view 6  
    page preview 6  
    page structure view 6  
visual aids 5  
visualizations  
    adding 113  
    changing the nesting order 120  
    choosing where to render 119  
    converting 123  
    extensible 113  
    resizing 120  
    sorting 124  
    specifying the categorical data to display 121  
    specifying the range of values to display 121  
    summarizing data 122  
    updating 123  
    using embedded data 123  
    working with visualization properties 119

## W

waterfall charts 62  
Web browser settings 16  
white spaces  
    adding padding to objects 264  
    margins 264  
widths  
    Microsoft Excel limitations 401  
    specifying for objects 269  
win-loss charts 63  
Windows Mobile devices  
    creating mobile reports for 35  
word breaks 268  
workspaces  
    Cognos Workspace 32

workspaces (*continued*)  
    prompts in Cognos Workspace 33  
    wrong data appears in target report  
        troubleshooting drilling through 373

## X

XLS format  
    importing your own files 277  
    limitations 399  
XML  
    importing your own files 277  
    producing a report 27  
    report specifications 35  
XQE-CON-0007 errors 375

## Z

zeros  
    suppressing 304





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