

WebFOCUS

WebFOCUS New Features
Release 8205

October 21, 2020

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What's New In WebFOCUS Release 8205

WebFOCUS includes key features and enhancements across the product line.

Through continued innovation and the expansion of our unyielding commitments to support our customers, Information Builders will work in partnership to help ensure your success with WebFOCUS and beyond.

In this chapter:

- ❑ [WebFOCUS 8205 Key Features Summary](#)

WebFOCUS 8205 Key Features Summary

Use the table below to learn more about the key features available in this release.

Category	Topic
Creating Content	Creating Content in WebFOCUS Designer on page 75.
	Creating Workbooks on page 80.
	Enhanced Home Page Layout and Organization on page 81.
Sharing Content	New WebFOCUS BI Portal on page 80.
Data Management	Enhanced and Integrated Data Workflows on page 11.
Administration	Creating, Viewing, and Editing Source Code on page 84.
Adapters	Python Support on page 109.

Data Management Enhancements

WebFOCUS enables you to upload Excel or CSV files to a target environment, configure adapters to various data sources, and create synonyms and cluster synonyms, using the updated workflows. During the upload and connect processes, you can access options to perform data profiling and statistical analysis, and transform your data beyond the default settings.

This topic highlights the new capabilities that are available for data preparation and management in this release of WebFOCUS.

In this chapter:

- ❑ [Enhanced and Integrated Data Workflows](#)
-

Enhanced and Integrated Data Workflows

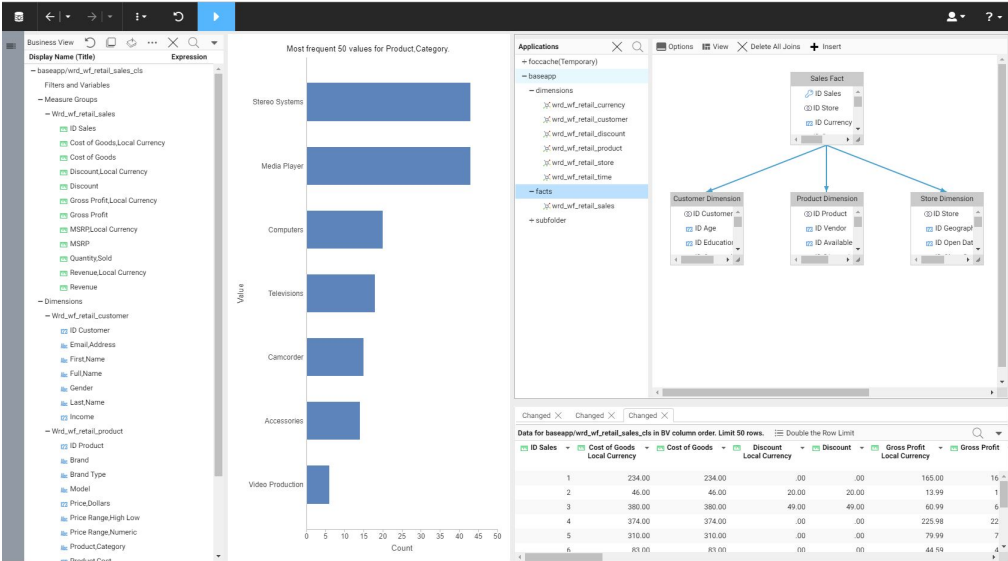
Uploading and connecting to your data is easier than ever using these new, integrated data workflows. Upload data files, such as Excel® spreadsheets, JSON files, or XML files, or connect to your existing data within the same, streamlined environment.

After you upload a file, you can append a file by adding new data to an existing synonym, without changing the structure. You can also merge a file with your data and enhance the existing structure.

After you connect to a data source, you can create a synonym for one or more data objects, or create cluster synonyms for select objects assigned as facts or dimensions.

When either workflow is complete, a shortcut to your data is created in the Repository, so you can locate it quickly, and use that data to start creating content.

A cluster synonym within the Connect to Data workflow is shown in the following image:





Chapter 3

Desktop Development Enhancements

App Studio is a Windows-based GUI development environment for creating WebFOCUS applications. App Studio provides innovative features and functions that simplify development, thereby allowing you to concentrate on interface design, business logic, and data manipulation. Features include data visualization, color exception reporting, intelligent drilldowns, and the ability to generate HTML pages without writing code.

Learn about the new capabilities and enhancements available for App Studio and desktop development in this release of WebFOCUS.

In this chapter:

- ☐ [Creating Controls Using the New Parameters Dialog Box](#)
- ☐ [Creating an Adaptive Dashboard](#)
- ☐ [Creating Responsive Check Box Controls](#)
- ☐ [Using Edit Box Suggestions](#)
- ☐ [Including Organizational Attributes in HOLD Files Using the CUBE Setting for the HOLDATTR Command](#)
- ☐ [Size Property for Domains Area File Types](#)
- ☐ [Creating Content From the Environments Tree Panel](#)
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- ☐ [Creating Accordion Reports in App Studio](#)
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- ☐ [Using the D.M.YY Date Format in a Calendar Control](#)
- ☐ [Using the Double List Control in an HTML Page](#)
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 - ☐ [Adding Labels to Point of Interest Layers on an Esri Map](#)
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Creating Controls Using the New Parameters Dialog Box

When you add content containing parameters to an HTML page, the New Parameters dialog box appears, facilitating the creation of controls for those parameters by grouping relevant options and assisting in the creation of forms.

The New Parameters dialog box has been updated to accommodate virtual controls, which are autoplay controls not bound to controls created in the HTML canvas, and some options have been grouped together. The New Parameters dialog box is shown in the following image.

Name	Create control	Control Type	Chain control
REGION	Default	Drop down list	<input type="checkbox"/>
CATEGORY	Default	Drop down list	<input type="checkbox"/>
PRODUCT	Default	Drop down list	<input type="checkbox"/>
BUDDOLLARS	Default	Edit box	<input type="checkbox"/>
Chain Separator			
Line Separator			

Parameter grouping options: New single layer form

Controls arrangement: ☒ Auto ☐ Row ☐ Column

☐ Don't show again and use default selection
☐ Auto chain controls in above specified order
☐ Don't create run button
☒ Add Schedule Button
☒ Add Defer Button

OK Cancel

The New Parameters dialog box includes the following options:

- ☐ **Up and Down Arrows.** Allow you to rearrange the placement of controls. These can also be used to change the order in which controls are chained.
- ☐ **Create control.** Allows you to change the presentation of the control. You can select one of the following options.
 - ☐ **Default.** A control is created for the parameter.
 - ☐ **Popup.** The control uses pop-up styling, which is available for certain types of controls.

- ☐ **Virtual.** At run time, an autoplay widget allows you to control the parameter. No control appears in the HTML canvas, but you can access virtual controls from the Parameters view tab. The virtual control autoplay widget must be prompted to appear at run time by activating a task created in the Tasks & Animations panel.
- ☐ **Don't create.** No control is created for the parameter.
- ☐ **Control Type.** Right-click to select the type of control to use for the parameter.
- ☐ **Chain control.** Select the check box to chain the controls. When controls are chained, selections in one control determine the values that are available in subsequent chained controls.

You can chain multiple, separate groups of controls by dividing them with a Chain Separator. Use the up and down arrows to move the Chain Separator into the desired position.
- ☐ **Parameter grouping options.** You can group controls into a form. The form can include automatically configured buttons to execute the procedures that contain each parameter, reset the parameter selections, schedule the procedures, or run them deferred with filters applied. Select one of the following options:
 - ☐ **Do not create a form.** Additional form features will not be added. You can choose whether or not to include a run button.
 - ☐ **New single layer form.** Creates a form with schedule and run deferred buttons. This is the default.
 - ☐ **New multiple layer form.** Creates a form in which each control is placed into a separate container.
 - ☐ **Existing form.** Adds the controls to the selected form, which has already been created in the HTML page.
- ☐ **Controls arrangement.** Allows you to arrange controls automatically, into a row, or into a column.
- ☐ **Don't show again and use default selection.** When selected, controls are automatically created for any new parameters using the default options, without showing the New Parameters dialog box.

To bring back the New Parameters dialog box, in the App Studio Options dialog box, on the HTML Page tab, select the *Show 'New Parameters' dialog* check box.
- ☐ **Auto chain controls in the above specified order.** Chains all controls in the order in the parameter list.

- ❑ **Don't create run button.** When you select *Do not create a form* from the Parameter grouping options menu, this option allows you to not create a run button for the controls. To apply control selections, you must create a task to execute the procedures they are associated with.
- ❑ **Add Schedule Button.** Adds a schedule button to the control form, allowing you to schedule the associated request using the ReportCaster Basic Scheduling tool.
- ❑ **Add Defer Button.** Adds a run deferred button to the form, which allows you to run the request deferred. To access deferred requests, click the *WebFOCUS Administration* menu and click *Deferred Status*.
- ❑ **Create edit box controls.** Creates all controls as edit boxes. To select a value using an edit box, start typing a value. Recommendations appear dynamically as you type.

Creating an Adaptive Dashboard

When you create a document using the active report or active PDF output formats, you can enable the Adaptive Dashboard feature for mobile users. This provides a more mobile-friendly layout that is easily navigable on smaller screens while providing access to multiple content items, filters, and in-document analytic features. Charts and reports are shown one at a time, and filter controls are available from a collapsible panel.

Procedure: How to Create an Adaptive Dashboard

1. On the Home tab, in the Content group, click *HTML/Document*.
The HTML/Document Wizard opens
2. For File Type, select *Document*.
3. Click *Next*.
4. In the Output Format list, select either *active report* or *active PDF*.
The Document canvas opens.
5. In the Properties panel, click the drop-down list at the top, and then click *Compound document*.
6. From the Adaptive Dashboard drop-down menu, select *Enable*.
7. Add content to the document, such as charts, reports, and filter controls.

When you run the document on a mobile device, you can swipe to navigate between charts and reports, and tap the hamburger control at the top of the screen to access filter controls.

Creating Responsive Check Box Controls

If you turn on the Enable responsive property in an HTML page, check boxes and other components added to the page inherit the responsive behavior. As the size of the page changes, the check box control values are spaced accordingly.

If you choose not to use responsive design, you can still format the layout of check box controls using the Properties panel. Change the number of columns in which the values are arranged using the Columns property, or space the values evenly to fill the entire height of the control using the Distribute values evenly property.

Procedure: How to Create a Responsive Check Box Control

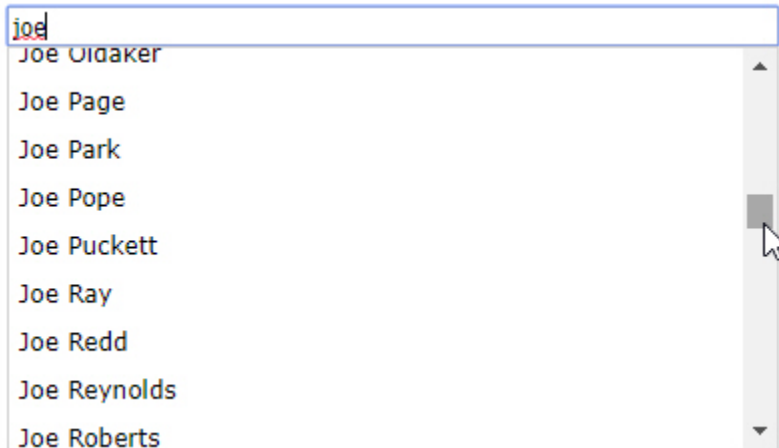
1. Create a new HTML page.
2. Open the Properties panel and, in the Responsive design section, set the Enable responsive property to Yes.

Responsive design is now enabled on the page.
3. On the *Controls* tab, click *Check Box* and draw a check box on the canvas.
The check box has a red border, indicating that it has responsive behavior enabled.
4. Add values to the check box using the Settings panel. The values in the check box can be entered manually using the Static data type, or retrieved from a data source using the Dynamic data type.
5. Optionally, change the check box control to a push button control. Select the check box control and, in the Properties panel, change the Type property to *Push button*.
6. Run the page. When the size of the browser window changes, the check box control adjusts accordingly.

Using Edit Box Suggestions

As you type a value into an edit box on an HTML page, a list of suggestions appears. This list refreshes as you type and includes all values available in the control that include the text string that you have entered.

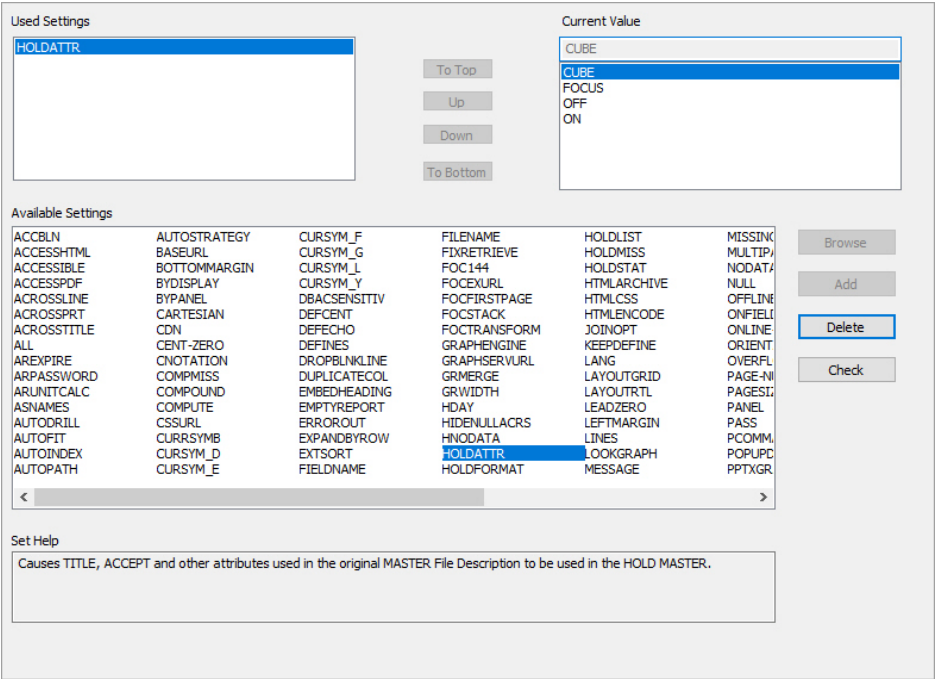
To see all possible suggested values, use the scroll bar, as shown in the following image.



Including Organizational Attributes in HOLD Files Using the CUBE Setting for the HOLDATTR Command

The HOLDATTR parameter controls which attributes from the original Master File are used in the HOLD Master File. This setting does not affect the way fields are named in the HOLD Master File.

The CUBE setting has been added to the Set canvas for the HOLDATTR command, as shown in the following image.



The CUBE setting includes folders, DV_ROLE attributes, and TITLE attributes from the original Master File when a HOLD Master File is created from it, and sets the field name as the ALIAS for each field in the HOLD Master File. The other HOLDATTR options do not include folders and DV_ROLE information when generating HOLD files.

For more information on SET commands, see the *Developing Reporting Applications* technical content.

Size Property for Domains Area File Types

To view the size of a file in App Studio, select it in the Environments Tree panel, open the File/Folder Properties panel, and locate the Size property. The Size property is also shown when you select a folder in the Environments Detail panel.

Some types of files, however, do not contain any actual content, but leverage external items. The Size property for these files appears blank in the File/Folder Properties panel and in the Environments Detail panel. These include the following content types:

- ☐ Library Access List (.acl)

- ☐ Distribution list (.adr)
- ☐ Report Library (.lib)
- ☐ Schedule (.sch)
- ☐ Blog (.blog)
- ☐ Portal (.ptl)
- ☐ Page (.page)

Creating Content From the Environments Tree Panel

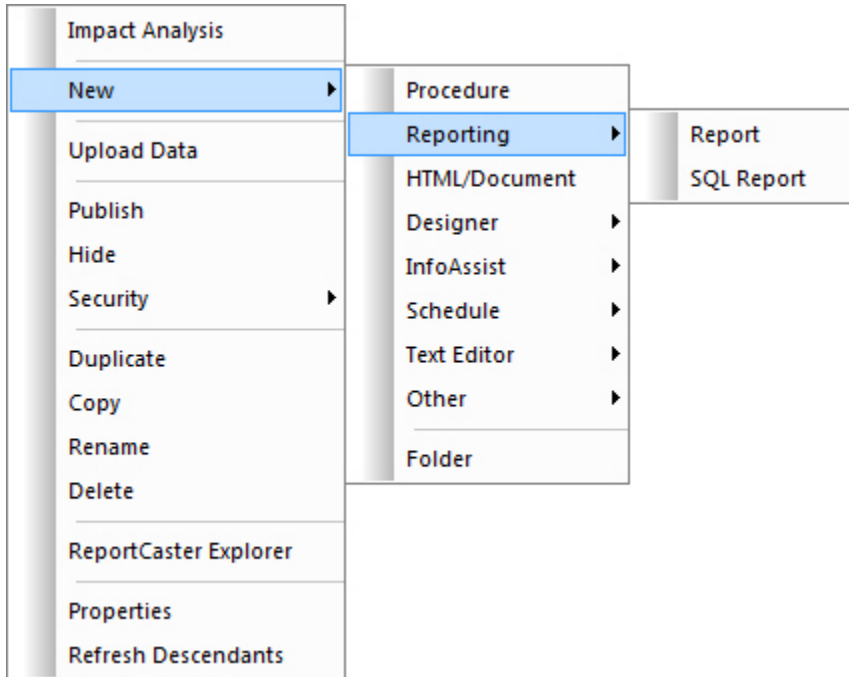
In Release 8.2 Version 05, you can create content using WebFOCUS Designer launched from App Studio, and access content that was created in Designer from the App Studio Environments Tree panel.

To create a workbook, chart, or page using WebFOCUS Designer, right-click a file, folder, or domain in the Domains area, point to *New*, point to *Designer*, and select an option. If necessary, you are prompted to select a data source. Designer then opens in a browser window, where you can create and save your content.

For more information about WebFOCUS Designer, see the WebFOCUS 8205 KnowledgeBase.

To save space and accommodate these new content creation options, similar kinds of content that you can create from the Environments Tree panel have been grouped into submenus under the *New* submenu.

Submenus have been created for the Reporting, Designer, InfoAssist, Data & Metadata, Schedule, Text Editor, and Other categories. The Environments tree shortcut menu showing the Reporting submenu is shown in the following image.



The following options are available from the New submenu in the Environments Tree panel shortcut menu.

- ☐ **Procedure.** Creates a new procedure folder in your current application folder.
- ☐ **Reporting.** Expands a submenu containing the following options.
 - ☐ **Report.** Creates a new report.
 - ☐ **SQL Report.** Creates a new SQL report.
- ☐ **HTML/Document.** Creates a new HTML page or document.
- ☐ **Designer.** The Designer submenu is only available when you right-click a file or folder in the Domains area. The Designer submenu contains the following options.
 - ☐ **Workbook.** Creates a new workbook using WebFOCUS Designer.
 - ☐ **Chart.** Creates a new chart using WebFOCUS Designer.

- ☐ **Page.** Creates a new Designer page.
- ☐ **InfoAssist.** Expands a submenu containing the following options.
 - ☐ **Chart.** Creates a new chart using the Chart canvas.
 - ☐ **SQL Chart.** Creates a new SQL chart.
 - ☐ **Visualization.** Creates a new visualization. This option is only available from within the Domains area.
 - ☐ **Alert.** Creates a new alert. This option is only available from within the Domains area.
- ☐ **Data & Metadata.** The Data & Metadata submenu is only available when you right-click a file or folder in the Data Servers area. The Data & Metadata submenu contains the following options.
 - ☐ **Synonym.** Creates a new Master File after you have selected a configured adapter, or configure a new adapter.
 - ☐ **Synonym via Metadata Canvas.** Creates a new Master File in the Metadata canvas.
 - ☐ **Define Function Library.** Creates a user-defined function library. Any user-defined functions created in this library are available for use in any content created within the same folder as the library.
 - ☐ **Upload Data.** Connects to the Upload Desktop File utility in the Reporting Server Console. Using this utility, you can upload new data to an application.
- ☐ **Schedule.** The Schedule submenu is only available when you right-click a file or folder in the Domains area. The Schedule submenu contains the following options.
 - ☐ **Schedule.** Creates a new schedule.
 - ☐ **Distribution List.** Creates a new distribution list.
 - ☐ **Library Access List.** Creates a new library access list.
- ☐ **Text Editor.** Expands a submenu containing the following options.
 - ☐ **JavaScript File.** Creates a new JavaScript file from which you can create original JavaScript. The JavaScript File option is only available from within the Domains area.
 - ☐ **Cascading Style Sheet.** Creates a new cascading style sheet. The Cascading Style Sheet option is only available from within the Domains area.
 - ☐ **WebFOCUS StyleSheet.** Creates a new WebFOCUS StyleSheet.

- ☐ **Text Document.** Creates a new text document.
- ☐ **Other.** The Other submenu is only available when you right-click a file or folder in the Domains area. The Other submenu contains the following options.
 - ☐ **Reporting Object.** Creates a new reporting object.
 - ☐ **Portal Page.** Creates a new portal page, in a tab within App Studio, using the Page Designer.
 - ☐ **Collaborative Portal.** Creates a new portal, in a tab within App Studio, using the Portal Designer.
 - ☐ **URL.** Creates a new URL.
 - ☐ **Blog.** Opens the Blog Viewer, in a tab within App Studio, where you can manage and read your blog posts.
- ☐ **XML Document with ESRI Configuration.** Opens the ESRI Configuration Utility. This option is only available from within the Data Servers area.
- ☐ **Folder.** Creates a new folder. This option is available from within the Domains and Web Applications areas.
- ☐ **Application Directory.** Creates a new application folder. This option is only available from within the Data Servers area.

Engine Component Enhancements

The Engine component in a procedure uses an `ENGINE SET` statement to specify an adapter connection, connection attributes, and override connection parameters for a procedure. The Engine component can be used, for example, to create an SQL report against a specified database connection.

The Engine canvas has been updated to include a list of common actions with dynamic menus, simplifying the input of ENGINE statements. The Engine canvas is shown in the following image.

The screenshot shows a configuration window for the Engine canvas. It contains the following elements:

- Select Adaptor:** A dropdown menu with "Vertica" selected.
- Action:** A dropdown menu with "Connection Attributes" selected.
- Connection:** A dropdown menu with "CON01" selected.
- Parameters:** An empty text input field.
- SQL Statement:** The text "ENGINE SQLVRT SET CONNECTION_ATTRIBUTES CON01" is displayed below the parameters field.
- Test Button:** A button labeled "Test" is located at the bottom center of the canvas.

Different actions are available for different adaptors. These actions add complete commands to the ENGINE SET statement, create commands for you to supply values to, or allow you to type a command in the text box. The resulting syntax is shown below the available settings. Once you've supplied the necessary information, click *Test* to confirm that the command can execute properly.

The list of adapters available in an Engine component has also been updated. More adapters are now available for use in the Engine component, and the list of available adapters in the Engine canvas and SQL Report Wizard now only shows adapters and connections that are configured in your environment.

In addition to your configured adapters, you can also select *System Setting* to execute ENGINE INT commands.

For more information about the ENGINE commands that you can use with different adapters, see the *Adapter Administration* technical content.

Creating Accordion Reports in App Studio

Accordion reports allow you to control the amount of sorted data that displays in a report using an HTML, HTML table, default, or user output format by expanding and collapsing multiple sort values.

To create an accordion report, create a report that has multiple sort or BY fields and, on the *Format* tab, in the *Features* group, click *Accordion Report*.

In the Accordion dialog box, you can specify the type of accordion functionality, and control additional settings depending on the type.

You can select one of the following options from the Type section:

- ☒ **By Row Tree.** Uses the enhanced Accordion By Row interface, which includes the same behavior of Accordion By Row reports, as well as additional functionality such as responsive column width and the ability to change the button to expand a row from a plus sign to an arrow. The following image shows an example of an enhanced Accordion By Row report.

	Quantity Sold	Revenue	Cost of Goods	Gross Profit
▶ 2013	173,417	\$48,965,069.21	\$34,631,123.00	\$14,333,946.21
▼ 2014	204,615	\$61,140,962.97	\$43,840,341.00	\$17,300,621.97
▶ 1	48,009	\$14,376,427.31	\$10,314,288.00	\$4,062,139.31
▼ 2	46,714	\$13,865,714.79	\$9,939,523.00	\$3,926,191.79
▶ Accessories	7,323	\$1,827,354.16	\$1,264,225.00	\$563,129.16
▶ Camcorder	6,475	\$2,073,189.24	\$1,391,888.00	\$681,301.24
▼ Computers	2,726	\$555,012.38	\$338,626.00	\$216,386.38
Smartphone	2,726	\$555,012.38	\$338,626.00	\$216,386.38
▶ Media Player	10,264	\$3,313,925.34	\$2,560,704.00	\$753,221.34
▶ Stereo Systems	15,855	\$4,221,474.37	\$2,979,703.00	\$1,241,771.37
▶ Televisions	1,331	\$1,074,107.17	\$847,804.00	\$226,303.17
▶ Video Production	2,740	\$800,652.13	\$556,573.00	\$244,079.13
▶ 3	50,635	\$15,240,046.81	\$10,941,101.00	\$4,298,945.81
▶ 4	59,257	\$17,658,774.06	\$12,645,429.00	\$5,013,345.06
▶ 2015	300,678	\$89,561,595.40	\$64,159,146.00	\$25,402,449.40
▶ 2016	423,103	\$126,675,660.19	\$90,376,789.00	\$36,298,871.19
▶ 2017	935,496	\$282,541,804.48	\$202,610,814.00	\$79,930,990.48
▶ 2018	1,472,582	\$452,307,832.95	\$325,821,316.00	\$126,486,516.95

- ❑ **By Row.** Creates an Accordion By Row report, which allows you to expand sort values to navigate into the report. Totals for measure fields in the report are shown for each visible sort value down to the lowest-level sort value. The following image shows an example of an Accordion By Row report.

	Quantity Sold	Revenue	Cost of Goods	Gross Profit
⊞ 2013	173,417	\$48,965,069.21	\$34,631,123.00	\$14,333,946.21
⊞ 2014	204,615	\$61,140,962.97	\$43,840,341.00	\$17,300,621.97
⊞ 1	48,009	\$14,376,427.31	\$10,314,288.00	\$4,062,139.31
⊞ 2	46,714	\$13,865,714.79	\$9,939,523.00	\$3,926,191.79
⊞ Accessories	7,323	\$1,827,354.16	\$1,264,225.00	\$563,129.16
⊞ Camcorder	6,475	\$2,073,189.24	\$1,391,888.00	\$681,301.24
⊞ Computers	2,726	\$555,012.38	\$338,626.00	\$216,386.38
Smartphone	2,726	\$555,012.38	\$338,626.00	\$216,386.38
⊞ Media Player	10,264	\$3,313,925.34	\$2,560,704.00	\$753,221.34
⊞ Stereo Systems	15,855	\$4,221,474.37	\$2,979,703.00	\$1,241,771.37
⊞ Televisions	1,331	\$1,074,107.17	\$847,804.00	\$226,303.17
⊞ Video Production	2,740	\$800,652.13	\$556,573.00	\$244,079.13
⊞ 3	50,635	\$15,240,046.81	\$10,941,101.00	\$4,298,945.81
⊞ 4	59,257	\$17,658,774.06	\$12,645,429.00	\$5,013,345.06
⊞ 2015	300,678	\$89,561,595.40	\$64,159,146.00	\$25,402,449.40
⊞ 2016	423,103	\$126,675,660.19	\$90,376,789.00	\$36,298,871.19
⊞ 2017	935,496	\$282,541,804.48	\$202,610,814.00	\$79,930,990.48
⊞ 2018	1,472,582	\$452,307,832.95	\$325,821,316.00	\$126,486,516.95

- ☐ **By Column.** Creates an Accordion By Column report, which reveals additional sort field values as higher-level sort field values are expanded. Measure values are not revealed until the lowest-level sort value is expanded for display. The following image shows an Accordion By Column report.

Sale Year	Sale Quarter	Product Category	Product Subcategory	Quantity Sold	Revenue	Cost of Goods	Gross Profit
2013							
2014	1						
	2	Accessories					
		Camcorder					
		Computers	Smartphone	2,726	\$555,012.38	\$338,626.00	\$216,386.38
		Media Player					
		Stereo Systems					
		Televisions					
		Video Production					
	3						
	4						
2015							
2016							
2017							
2018							

- ☐ **Off.** Accordion functionality is disabled in the report.
- ☐ **Not Set.** Accordion functionality is not set in the report. By default, this means it is off.

When By Row or By Row Tree are selected, additional settings are available in the Options section.
- ☐ **Expand.** Available for Accordion By Row and enhanced Accordion By Row (By Row Tree) reports. Specifies how many sort field columns are expanded initially at run time. You can choose one of the following options:
 - ☐ **Not Set.** The report is fully collapsed at run time.
 - ☐ **All.** The entire report is initially expanded at run time.
 - ☐ ***n* Levels.** Creates an Accordion report in which *n* sort field levels are initially expanded. To roll up an expanded sort field level, click the minus sign (-) next to one of the sort field values on that level. You can change the initial number of expanded levels by using the arrow control or typing a number value.

- ☐ **Expansion Icons.** Available for enhanced Accordion By Row (By Row Tree) reports. Allows you to select the icon used to expand rows of the report.
- ☐ **Not Set.** Expansion icons are not set. The default plus and minus signs are used, unless otherwise specified in the StyleSheet.
- ☐ **Plus/Minus Signs.** Uses plus signs to expand sort values and minus signs to collapse them.
- ☐ **Right/Down Arrows.** Uses right-pointing arrows to expand sort values and downward-pointing arrows to collapse them.

Grouping Reports in PPTX Output

By default, when a report is run using a PowerPoint output format, each grid line, header row, and cell value in a report is created as a separate element in the presentation.

If you enable grouping for PowerPoint PPTX output, you can group table elements together, allowing you to move, resize, and format all of the report output on a slide at once, as shown in the following image.

Customer Country	Sale Year	Sale Month	Quantity Sold	Revenue	Gross Profit
Argentina	2012	1	84	\$27,498.30	\$7,838.30
		2	31	\$7,943.89	\$2,316.89
		3	6	\$1,529.83	\$460.83
		4	13	\$4,608.14	\$1,319.14
		5	15	\$6,217.41	\$1,495.41
		6	8	\$2,397.39	\$649.39
		7	11	\$4,038.71	\$1,166.71
		8	9	\$2,385.91	\$712.91
		9	11	\$4,201.81	\$1,266.81
		10	18	\$7,915.10	\$1,820.10

When grouping is enabled, individual report components in the PowerPoint presentation can still be selected to modify them individually.

There are two ways to group PowerPoint PPTX report output from App Studio. From the Report canvas, you can set the Group tables and components option to *On* in the Output Format Options dialog box, or, from the Set canvas, you can select the *ON* setting for the PPTXGROUP command.

***Procedure:* How to Enable PowerPoint PPTX Report Grouping From the Report Canvas**

If you set the output format of a report to PowerPoint PPTX, you can use the Group tables and components output format option to group report components in a PowerPoint .pptx presentation, allowing you to select and edit all of the components on a slide at once.

1. Create a report in App Studio.

Add the fields that you wish to use to the report.

2. On the *Format* tab, in the *Output Types* group, click *PowerPoint* and then click *PowerPoint PPTX*.

The Output Format Options window opens.

3. In the Output Format Options window, select *On* for the Group tables and components option.

If you wish to use a template, slide master, and slide layout, supply values for these options as well.

4. Click *OK* to apply your output format changes.
5. Run the report.

The browser that you have set as your default output viewer opens and prompts you to open the .pptx report output.

6. Open the PowerPoint presentation.

Click the report. All of the report components on the selected slide are selected as a single element. You can move or resize all of the selected elements at once.

If you click again on a line or text in the report, you can edit the element individually.

***Procedure:* How to Enable PowerPoint PPTX Report Grouping From the Set Canvas**

If you set the PPTXGROUP property to *ON*, report components will be grouped for collective selection and editing in the PowerPoint .pptx output.

1. Create a new procedure.

Right-click a domain or folder in the Environments Tree panel, point to *New* and click *Procedure*. A new procedure opens.

2. In the Procedure View panel, right-click the Comment component, point to *New* and click *Set*.

The Set canvas opens.

3. In the Set canvas, in the Available Settings area, click *PPTXGROUP*. In the Current Value area, click *ON*.
4. In the Procedure View panel, right-click the Set component, point to *New*, and click *Report*. The Select Data Source dialog box opens.
5. In the Select Data Source dialog box, select a Master File and click *OK*.

The Report canvas opens.

6. On the *Format* tab, in the *Output Format* group, click *PowerPoint* and then click *PowerPoint PPTX*.

The Output Format options dialog box opens. You do not need to change the Group tables and components setting.

Note: If you set the Group tables and components setting to *No*, it will override the setting for the PPTXGROUP command, and report elements will not be grouped.

7. Finish creating the report by adding fields and applying styling and formatting options.
8. Run the procedure.

The browser that you have set as your default output viewer opens and prompts you to open the .pptx report output.

9. Open the PowerPoint presentation.

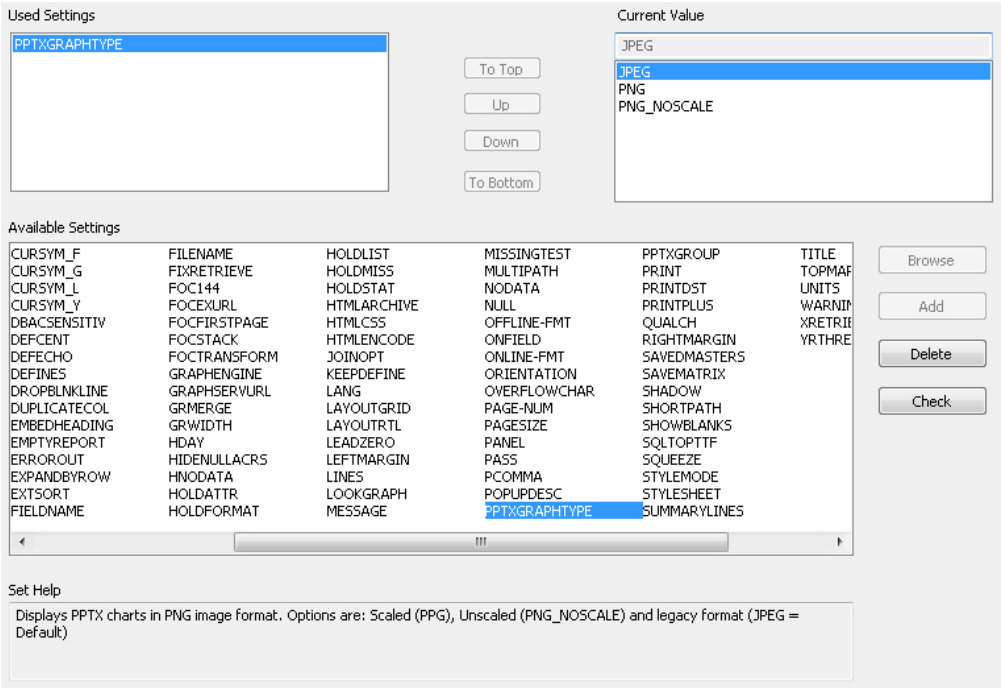
Click the report. All of the report components on the selected slide are selected as a single element. You can move or resize all of the selected elements at once.

If you click again on a line or text in the report, you can edit the element individually.

Using the PPTXGRAPHTYPE Command to Configure PPTX Chart Output

When charts are run using the PowerPoint .pptx output format, they are embedded as images. You can use the SET PPTXGRAPHTYPE command to specify the type of image that is used, allowing you to enhance image and text quality and support transparency.

The PPTXGRAPHTYPE command has been added to the SET canvas, as shown in the following image.



Available values are:

- ☐ **JPEG.** Indicates legacy format. This is the default value.
- ☐ **PNG.** Scales the PNG image to twice its dimensions for significantly improved quality. This may cause problems if you have non-scalable items in the chart, such as text with absolute point sizes (including embedded headings). The output file is also larger due to the larger bitmap. Text within the chart is noticeably sharper than the legacy JPEG format.

PNG preserves font sizes in the chart when it is internally rescaled, for increased resolution. It converts absolute font sizes set in the StyleSheet (*GRAPH_SCRIPT section of the request) to sizes expressed in virtual coordinates (which are relative to the dimensions of the chart), and generates font sizes for embedded headings and footings in virtual coordinates.
- ☐ **PNG_NOSCALE.** Renders in PNG, but does not scale. This produces slightly better quality than JPEG. Going from JPEG to PNG_NOSCALE makes the chart sharper, but has only a slight effect on text.

For more information on SET commands, see the *Developing Reporting Applications* technical content.

Displaying Slider Values Without an Edit Box

By default, slider controls include an edit box that displays the selected value and allows you to type a value to change the selection as an alternative to clicking the slider or arrow buttons.

When you select a slider control in the HTML canvas, the Properties panel includes the Show Input property. You can change the value for this property to hide the edit box and not display the selected value or hide the edit box and show the selected value above the slider, allowing you to see the value selected in the slider without providing the additional editable control.

To hide the edit box but still show the value selected in the slider, set the Show Input property to *Read only*. When you run the page and select a value on the slider, the value that you selected appears above it.

This option is available for all sliders, including vertical sliders and double-head sliders.

Procedure: How to Display Slider Values Without an Edit Box

You can set the Show Input property for a slider control to *Read only* to display the value selected on the slider without including an edit box.

1. Create an HTML page.
2. Add a report or chart object to the HTML canvas.
3. Create, import, or reference a chart or report that includes a parameter that accepts numeric values.

The New Parameters dialog box opens.

4. In the Control Type column of the New Parameters dialog box, right-click the parameter, point to *Slider*, and select an option.
5. Click *OK* to close the New Parameters dialog box and add the slider control to the HTML page.
6. Select the slider control from the newly created form and open the Properties panel.

The Show Input property is set to Yes, by default. This option displays an edit box associated with the slider control.

7. Change the Show Input value to *Read only*.
8. Run the HTML page.

When you use the slider control, the selected value appears above it. This value cannot be edited by typing. When you refresh the chart or report, it is filtered by the selected value.

Calculating Percentages in an Analytic Document

When creating an Analytic Document in App Studio, you can add calculations to columns in the report. These calculations appear in the report at run time above or next to the column with which they are associated.

To add calculations to an Analytic Document, in the *Analytic Document Options* tab, in the *Calculations* group, click *Calculation Options*. For numeric fields, you can select *Percent* from the drop-down menu in the Calculation column to create a new column that calculates the percent of total for each field value. The Percent calculation appears as a new column in the Analytic Document at run time, as shown in the following image.

Product Category ▼	Sale Quarter ▼	Quantity Sold ▼	% of Total Revenue ▼	Gross Profit ▼	% of Total
Accessories	1	597	4.29%	\$141,775.21	3.78%
	2	576	4.14%	\$140,163.98	3.76%
	3	624	4.48%	\$157,842.56	4.31%
	4	237	1.70%	\$59,769.65	1.57%
Camcorder	1	572	4.11%	\$187,821.55	5.49%
	2	577	4.14%	\$201,832.33	5.13%
	3	568	4.08%	\$190,513.46	5.25%
	4	239	1.72%	\$87,087.14	2.46%
Computers	1	276	1.98%	\$56,574.00	1.87%
	2	255	1.83%	\$53,018.53	1.77%
	3	242	1.74%	\$51,071.08	1.74%
	4	92	0.66%	\$19,097.85	0.65%
Media Player	1	1,009	7.25%	\$323,806.99	6.70%
	2	855	6.14%	\$281,586.14	5.27%
	3	910	6.54%	\$291,557.04	5.51%
	4	366	2.63%	\$112,840.39	2.22%
Stereo Systems	1	1,372	9.85%	\$352,208.28	8.94%
	2	1,445	10.38%	\$381,721.69	9.64%
	3	1,317	9.46%	\$329,911.83	8.34%
	4	545	3.91%	\$152,552.09	3.85%

28 of 28 records, Page 1 of 2 ▶▶▶▶

Procedure: How to Add Percentages to an Analytic Document

1. Create a report in App Studio.

Because the Percent calculation can only be applied to numeric fields, make sure to include at least one in your report.

2. On the *Format* tab, in the *Output Types* group, click *PDF Analytic Document*.

The Analytic Document Options tab appears on the ribbon.

3. On the *Analytic Document Options* tab, in the *Calculations* group, click *Calculation Options*. The Calculations dialog box opens.

4. Expand the drop-down menu in the Calculation column for a numeric field in the report and select *Percent*.

You can select calculations for multiple fields.

5. Click *OK* to apply your selections.

The calculations are not visible in the Report canvas, but will appear at run time.

6. Run the report.

A column called % of Total appears next to any columns for which you selected the Percent calculation. The values for any other calculations appear above the associated columns.

Using the Hyperstage Output Format for Reports

When creating a report in App Studio, you can use the Hyperstage (SQLHYPG) output format. This generates a HOLD file against a Hyperstage table that you can use as a data source to create content.

To use the Hyperstage output format, create a report and, on the *Format* tab, in the *Output Types* group, click *Output Format*. In the Output Format menu, point to *Database formats* and click *Hyperstage database table (SQLHYPG)*. When you run the report, the HOLD file is generated.

To use the Hyperstage output format, you must have an adapter connection configured for Hyperstage. If not, you will receive an error message indicating that you must configure a connection.

If a Hyperstage connection is available, then the Output Format Options dialog box appears. You can specify the following properties:

- ☐ **Persistence.** Specifies how to create intermediate tables that will be used only during UPLOAD and EBL requests to accelerate performance by keeping all processing on the DBMS server instead of downloading data into a HOLD file. Available values are:
 - ☐ **VOLATILE.** Specifies that the table is local to the Hyperstage session. A temporary synonym (a Master File and Access File), is generated automatically. It expires when the server session ends.
 - ☐ **GLOBAL_TEMPORARY.** Specifies that while the table exists, its definition will be visible to other database sessions and users, though its data will not be. A permanent synonym is generated automatically.
 - ☐ **Permanent.** Specifies that a regular permanent table will be created. A permanent synonym is generated automatically. This is the default value.
 - ☐ **<not set>.** A persistence value is not specified.
- ☐ **Tablename.** Type a name to use for the generated HOLD file.
- ☐ **Connection.** Select a Hyperstage adapter connection.

Using Simplified Character, Date and Date-Time, and Numeric Functions in App Studio

A selection of simplified character functions, simplified date and date-time, and simplified numeric functions have been added to the Function Arguments dialog box in App Studio.

To access the Function Arguments dialog box, add a Define component to a procedure and, in the Define canvas, click *Functions*, or create a report and, on the *Data* tab, in the *Calculation* group, click *Summary (Compute)* or *Across Compute* to add a compute or across compute field. In the Computed Field Creator dialog box, click *Functions*.

In the Function Arguments dialog box, select the function that you want to use from the Select a function list. You can filter the functions listed there by selecting a function category from the Select a category menu. You can then specify the argument values for the function in the area below the Select a function list. These arguments can be constant values, or you can use values from a field selected from the field list.

The following functions have been added to the Function Arguments dialog box:

- ☐ Character - Simplified functions:
 - ☐ CHAR_LENGTH

- ☐ CONCAT
- ☐ DIGITS
- ☐ LAST_NONBLANK
- ☐ LOWER
- ☐ LPAD
- ☐ LTRIM
- ☐ POSITION
- ☐ REGEX
- ☐ REPLACE
- ☐ RPAD
- ☐ RTRIM
- ☐ SPLIT
- ☐ SUBSTRING
- ☐ TOKEN
- ☐ UPPER
- ☐ Date/Date-Time - Simplified functions:
 - ☐ DT_CURRENT_DATE
 - ☐ DT_CURRENT_DATETIME
 - ☐ DT_CURRENT_TIME
- ☐ Numeric - Simplified functions:
 - ☐ CEILING
 - ☐ EXPONENT
 - ☐ FLOOR
 - ☐ MOD
 - ☐ POWER

For more information about WebFOCUS functions, including what each one does and the required arguments, see the *Using Functions* technical content.

Using the D.M.YY Date Format in a Calendar Control

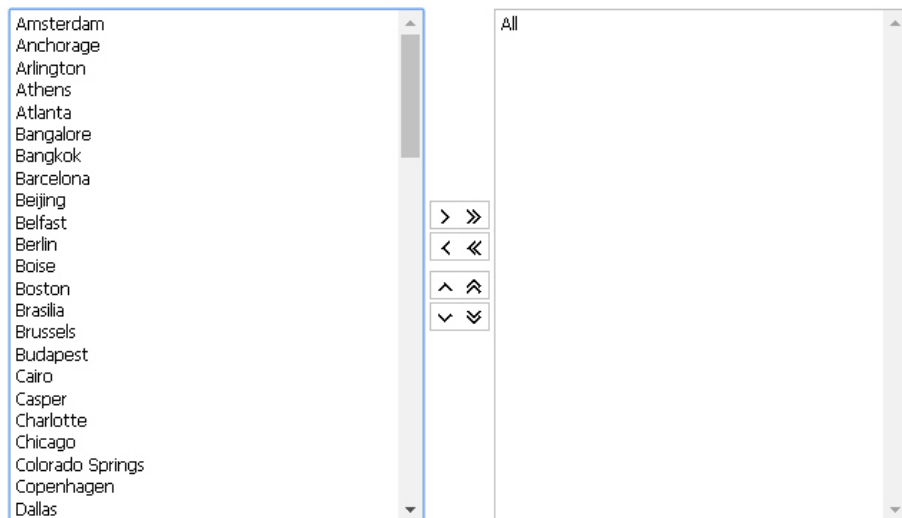
Calendar controls in an HTML page have been enhanced to use the D.M.YY date format, which is a dot-separated, day-month-year format.

To use a calendar control to select a date in D.M.YY format, select a calendar control on an HTML page and expand the *Settings* panel. In the Settings panel, in the Popup Calendar Settings section, select the *D.M.YY* option from the Date format in data source menu.

When you run the page and select a value from the calendar control, the selection is applied as a D.M.YY date value.

Using the Double List Control in an HTML Page

A double list control displays values in two lists. The list on the left shows available values that are not being used, while the list on the right shows values that have been selected for use as parameter values. You can move values within lists or between lists by using the arrow buttons between them. You can select multiple values at once by holding the Ctrl key while selecting values and then clicking the single right arrow button, or add each value one at a time. A double list control is shown in the following image.



In order to use a double list box with a parameter, the parameter must be set up to accept multiple values. Ensure that the Variable Type for the parameter value is Multiselect OR or Multiselect AND in the procedure.

The double list control contains the following buttons:

- ☐ **Single right arrow.** Adds the selected value or values from the available list to the selected list. You can also double-click a value in the available list to add it to the selected list.
- ☐ **Double right arrow.** Adds all values from the available list to the selected list.
- ☐ **Single left arrow.** Removes the selected value or values from the selected list to the available list. You can also double-click a value in the selected list to remove it. When you remove a value from the selected list, it is returned to its original order in the available list.
- ☐ **Double left arrow.** Removes all values from the selected list to the available list. The values are returned in their original order.
- ☐ **Single up arrow.** Moves the selected value or values up one spot in the selected list.
- ☐ **Double up arrow.** Moves the selected value or values to the top of the selected list.
- ☐ **Single down arrow.** Moves the selected value or values down one spot in the selected list.
- ☐ **Double down arrow.** Moves the selected value or values to the bottom of the selected list.

Procedure: How to Create a Double List Box in an HTML Page

1. From the HTML canvas, insert a report with parameters that accept multiple values.
For example, create a report with *Multiselect OR* as the variable type for the parameter, accepting a dynamic list of values from a Master File.
2. When the New Parameters dialog box is displayed, right-click the value in the Control Type column and click *Double list control*, and then click *OK*.
A list box is created in the layout and assigned the Unique Identifier `listbox(n)`, where *(n)* is a number.
3. Save and run the HTML page.
4. Select any values selected in the available list by using the single right arrow, or select all values from the available list by using the double right arrow. Deselect values selected in the selected list by clicking the single left arrow, or deselect all values by clicking the double left arrow. When you deselect a value, it returns to the available list in the order it was originally sorted in.

You can reorder values in the selected list by using the up and down arrows. Move the selected value up or down one spot by using the single up or single down arrow. Move the selected item to the top or bottom of the list by clicking the double up or double down arrow.

5. Click the *Run* button to run the report with the selected value parameters.

Changing the Format of Sort Down and Sort Across Fields

When creating a report in App Studio, you can apply formatting changes to sort down and sort across fields in addition to aggregate fields.

To change the formatting of a field, right-click it and click *Format*, and then use the Format dialog box to make formatting changes. The available options depend on the type of field selected. For example, alphanumeric, integer, decimal, and date fields each have a unique set of formatting options.

For numeric fields, there are also format options available on the *Appearance* tab in the *Format* group. These options allow you to add a currency or percent symbol, determine whether thousands separators appear, and, for non-integer numeric fields, change the number of decimal points displayed.

Navigating to a Page in a Collaborative Portal

You can use a JavaScript function to navigate to a specified page within the same a collaborative portal. Create an HTML page with a trigger for the `IbComposer_goToPortalPage` function, configure the `IbComposer_goToPortalPage` function to target a portal page, and add the HTML page to a portal page in the same collaborative portal as the targeted portal page.

Syntax: How to How to Navigate to a Page in a Collaborative Portal

```
IbComposer_goToPortalPage( " Page_Name" );
```

where:

Page_Name

Is the name of another portal page within the same collaborative portal as the HTML page containing the `IbComposer_goToPortalPage` function, in double quotation marks.

Make sure to type the portal page name instead of the title. You can see the name of a portal page in the Name field of the File/Folder Properties panel in App Studio. Do not include the `.page` extension in the `IbComposer_goToPortalPage` function.

Example: Navigating to a Page in a Collaborative Portal

In the following example, clicking a button with the unique identifier `button1`, which is available on a portal page, opens the page named `Page_1`, contained in the same collaborative portal.

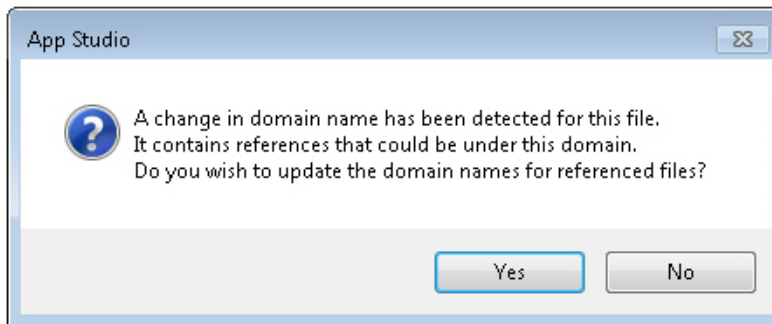
```
function button1_onclick(event) {
var eventObject = event ? event : window.event;
var ctrl = eventObject.target ? eventObject.target : eventObject.srcElement;
// TODO: Add your event handler code here

IbComposer_gotoPortalPage("Page_1");

}
```

Resolving File References When an HTML Page Is Moved to a Different Folder

When you copy and paste or move an HTML page from one domain folder to another, App Studio recognizes that the location has changed. When you open the HTML page, an alert message appears, allowing you to update the file paths of content referenced in the HTML page, as shown in the following image.



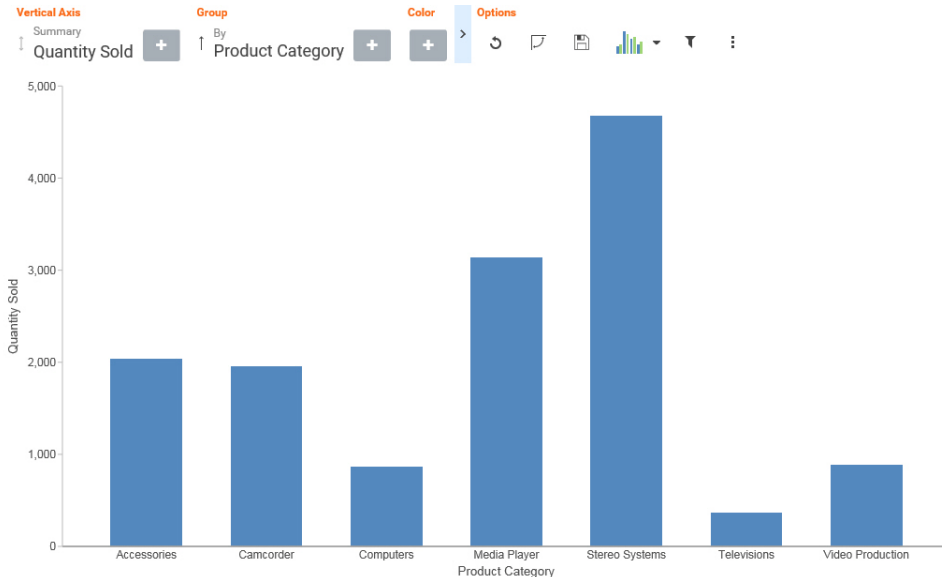
Click **Yes** to update the file paths of content referenced by the HTML page. Click **No** to continue using the original file paths of all content referenced by the page. If you click **No**, referenced content may not work as expected.

Using Insight to Analyze Dynamic Charts From App Studio

Insight is a visualization tool that allows for the interactive selection of measures and dimensions, filters, and formatting options in a chart at run time, so you can create dynamic charts that refresh as you make changes.

Using a Widescreen Page Size for a Report or Document

When you run a chart that has Insight enabled, a toolbar appears above the chart, allowing you to make modifications to it. If you run the chart from the Environments Tree panel or from the WebFOCUS Home Page, you can save separate versions of the chart to access them later. The following image shows a simple chart with Insight enabled.



To enable Insight for a chart, in the Chart canvas, on the *Format* tab, in the *Run with* group, click *Insight*. When you run the chart, the Insight toolbar is available and allows you to make run-time modifications. You can disable Insight by clicking *Insight* again.

Using a Widescreen Page Size for a Report or Document

Starting with Office 2013, the default size of PowerPoint presentations is a widescreen 16:9 ratio. You can create reports and documents that output at this size by selecting the *Widescreen* page size option.

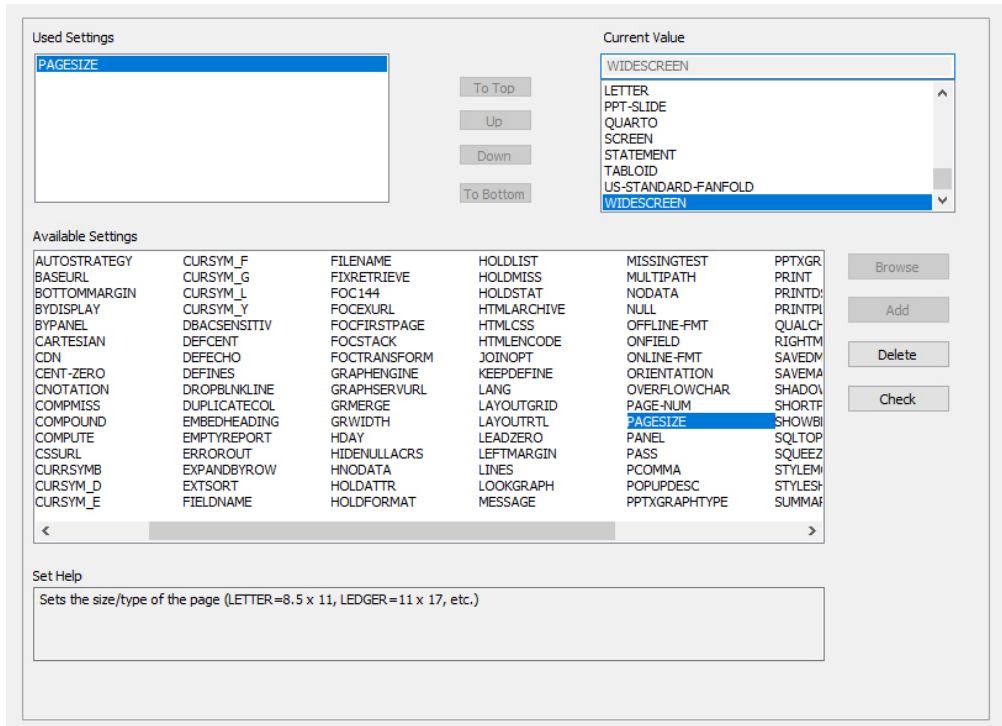
To use the widescreen layout when creating a report from the Report canvas, on the *Layout* tab, in the *Page Setup* group, click *Paper Type* and then click *Widescreen*. On the *Layout* tab, in the *Page Setup* group, set the page orientation to landscape by clicking *Report Page* and then clicking *Landscape*.

To use the widescreen layout for a document, from the HTML/Document Wizard, open the Page Size menu and click *Widescreen*, or from the Document canvas, in the Properties panel, set the Page size property for the compound document to *Widescreen*, then set the page orientation to *Landscape*.

Setting the Page Size to WIDESCREEN

The SET PAGESIZE command allows you to specify the output size of report requests. If the container or paper containing the report does not match the PAGESIZE setting, the report is either cropped or contains extra blank space.

The WIDESCREEN option has been added to the Set canvas for the PAGESIZE command, as shown in the following image.

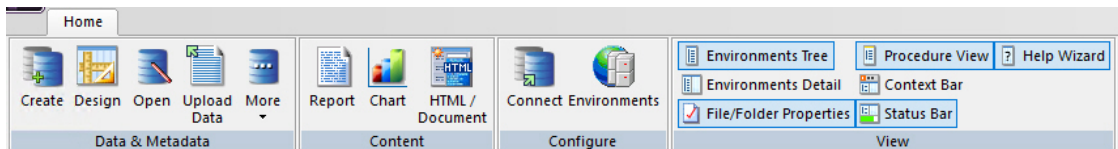


WIDESCREEN produces report output at 13.333 x 7.5 inch dimensions, which is the default size in Microsoft PowerPoint presentations, starting with Office 2013.

For more information on SET commands, see the *Developing Reporting Applications* technical content.

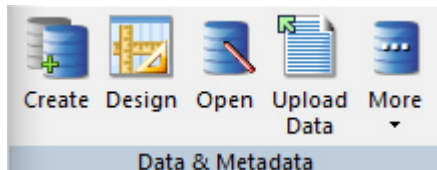
Accessing Metadata and Environment Options From the Home Tab

The Home tab on the ribbon contains options to manage data and metadata, create content, configure your environment, and control your view in App Studio. In Release 8205, metadata management options have been moved to a new group, the Data & Metadata group, and are available directly from the Home tab, with some more specific options available in an expandable menu. Configuration options have also been grouped together, and the View group now contains panel buttons to control the panels and on-screen components visible in App Studio. The Home tab is shown in the following image:



The following groups of tools and options are available from the Home tab:

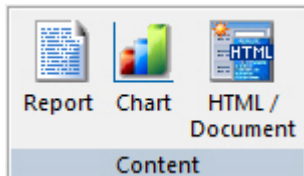
- ❑ **Data & Metadata.** Includes tools that you can use to connect to and upload data, create and edit synonyms, and manage data access. The Data & Metadata group is shown in the following image.



The commands in the Data & Metadata group are:

- ❑ **Create.** If you click *Create*, the Select Server Node dialog box opens. Navigate to the application folder where you want to create your synonym and click *Select*. After the location of the synonym is determined, the Select Adapter dialog box opens. Double-click the adapter connection that you want to use. You will then be able to select tables and other objects to create synonyms for.
- ❑ **Design.** Allows you to create a new synonym using the Metadata canvas. Navigate to the location where you want to create the new synonym and click *Select*.
- ❑ **Open.** Allows you to edit an existing synonym using the Metadata canvas. Navigate to the synonym that you want to edit and click *OK*.
- ❑ **Upload Data.** Allows you to upload data from a file on your machine, such as a delimited, Excel, JSON, or XML file. Select the type of file that you want to upload, then select a file and edit the metadata for the resulting synonym.

- ❑ **More.** Contains the following options:
 - ❑ **Passwords.** The Password dialog box opens. You can enter the password for the data source you have selected in your Environments Tree panel.
 - ❑ **Rebuild a Connection.** The Rebuild dialog box opens. You can rebuild a disorganized file, index a specific field from a file, or check the integrity of a file.
 - ❑ **Command Console.** Opens a command tab for editing and enables you to send commands directly to a server from App Studio.
- ❑ **Content.** The Content group contains the components or tools that you can use to create an application, such as a report, chart, HTML page, or document. The Content group is shown in the following image.



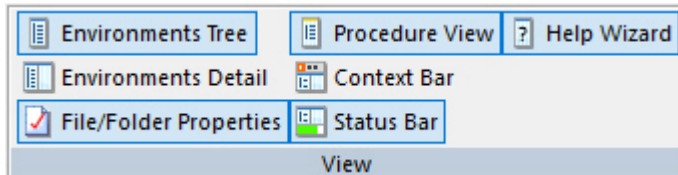
The commands in the Content group are:

- ❑ **Report.** Opens the Report canvas in report mode after you enter a procedure name and select a location for your report from the Report Wizard.
- ❑ **Chart.** Opens the Chart canvas after you enter a procedure name and select a location for your chart from the Chart Wizard.
- ❑ **HTML/Document.** Opens the HTML/Document Wizard. You can choose the type of page that you want to create from the following options: HTML Page, Guided Report Page, or Document. Depending on your selection, the corresponding canvas will open.
- ❑ **Configure.** The Configure group enables you to create or edit an environment and to configure an adapter. The Configure group is shown in the following image.



The commands in the Configure group are:

- ☐ **Connect.** The Select Server Node dialog box opens. Navigate to a valid server location to begin configuring a new adapter or edit the settings of an existing adapter.
- ☐ **Environments.** Opens the Environments List dialog box. A WebFOCUS environment consists of a web server, a WebFOCUS Client, and a Reporting Server. Adding WebFOCUS environments allows you to create and manage multiple environments, such as development, test, and production instances. You can set a new development environment, add a new environment, edit an existing environment, or remove an environment.
- ☐ **View.** The View Group enables you to control what displays on your screen. For example, you can choose whether to display or hide the Environments Tree or Help Wizard. The View group now contains panel buttons instead of check boxes, as shown in the following image.



The commands in the View group are:

- ☐ **Environments Tree.** Displays or hides the Environments Tree panel, which displays on the left side of the screen and displays environment information.
- ☐ **Environments Detail.** Displays or hides the Environments Detail panel.
- ☐ **File/Folder Properties.** Displays or hides the File/Folder Properties panel.
- ☐ **Procedure View.** Displays or hides the Procedure View panel.
- ☐ **Context Bar.** Displays or hides the Context Bar. The Context Bar displays under the ribbon.
- ☐ **Status Bar.** Displays or hides the Status Bar. The Status Bar displays along the bottom of the screen.
- ☐ **Help Wizard.** Displays or hides the Help Wizard. By default, the Help Wizard panel opens in the bottom-right corner of the interface. The Help Wizard content dynamically changes, depending on where you are in the interface.

Editing HTML Pages as Text

In addition to using the HTML canvas, you can edit HTML pages saved in the Data Servers, Domains, and Web Applications nodes as text, using WordPad.

To open an HTML page in WordPad, right-click the file in the Environments Tree panel or Environments Detail panel and click *Open in Text Editor*.

If you make changes to an HTML page using a text editor and re-open it using the HTML canvas, a warning message appears to inform you that changes were made outside of the canvas.

Duplicating and Copying Folders in App Studio

You can duplicate and copy and paste folders in App Studio, which also duplicates or copies and pastes all of the files within that folder.

To duplicate a folder, right-click it and click *Duplicate*. This creates a copy of the folder within the same parent folder, with *_1* appended to the folder name. Any files within the folder are also duplicated within the new folder.

To copy and paste a folder, right-click a folder and click *Copy*, and then right-click the location in which to paste the folder and click *Paste*. Any of the files within the folder are copied and pasted to the new location as well.

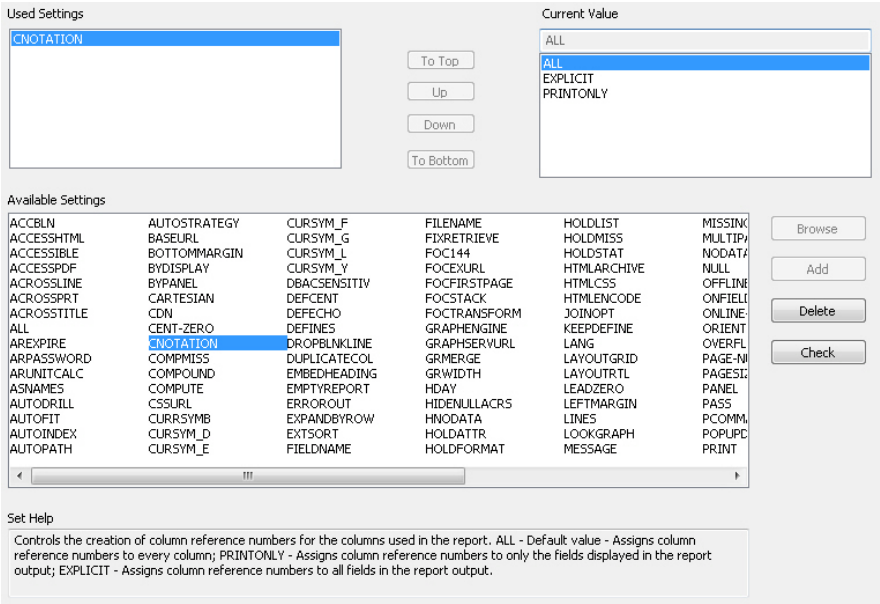
You can copy and paste folders to different nodes within an environment, for example, from Domains to Data Servers, or from one environment to another. When copying and pasting folders from one environment to another, content may be affected if the metadata in the source environment does not match the metadata in the target environment. The use of Change Management packages is recommended to move folders and files from one environment to another in App Studio.

Using the SET CNOTATION Command

Column notation assigns a sequential column number to each column in the internal matrix created for a report request. Column notation can be used in COMPUTE and RECAP commands to refer to columns in your request, without explicitly naming them each time. The CNOTATION command specifies whether column notation reference numbers are assigned to every column in the internal matrix or only those that are visible in the chart output.

Adding an RSS Feed to an Esri Map

The CNOTATION parameter has been added to the Set canvas, as shown in the following image.



Possible values are:

- ☐ **ALL.** Assigns column reference numbers to every column in the internal matrix. ALL is the default value.
- ☐ **PRINTONLY.** Assigns column reference numbers only to columns that display in the report output.
- ☐ **EXPLICIT.** Assigns column reference numbers to all fields referenced in the request, whether or not they are displayed.

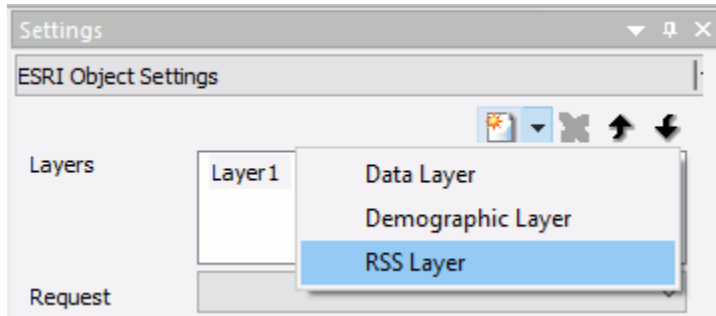
Adding an RSS Feed to an Esri Map

You can add an RSS (Rich Site Summary) Feed to an Esri map to show real-time data that is regularly updated, such as weather or news headlines.

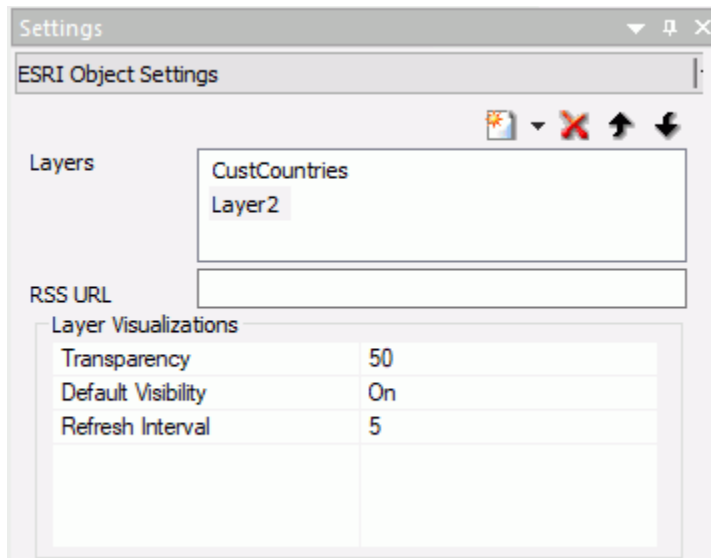
Procedure: How to Add an RSS Feed to an Esri Map

The RSS feed is added as an RSS layer on the map.

1. Add a new layer to the Esri map using the Settings panel, and select *RSS Layer*, as shown in the following image.



An RSS layer is added, as shown in the following image.



The layer name cannot be changed by the user, the default name must be used.

2. Configure the following properties.
 - ☐ **RSS URL.** Enter the URL to the RSS feed that you want to display on the map.
 - ☐ **Transparency.** Enter a transparency percentage (where 0 is totally transparent, and 100 is totally opaque), or accept the default transparency, 50%.

- ☐ **Default Visibility.** The default is On. To make the layer not visible, select *Off*.
- ☐ **Refresh Interval.** Enter a number of seconds for the interval to refresh the RSS layer. The default value is 5.

3. Run the map.

RSS feed symbols display on locations that have data for the RSS feed. Clicking an RSS feed symbol displays the feed data for that location.

Example: Adding an RSS Layer to an Esri Map

The following map has a data layer with the geographic role Country that uses the following WebFOCUS request, customer_countries1b.fex.

```
TABLE FILE WF_RETAIL_LITE
SUM
    COGS_US
    QUANTITY_SOLD
BY COUNTRY_NAME
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT XML
END
```

The Settings panel for the data layer is shown in the following image.

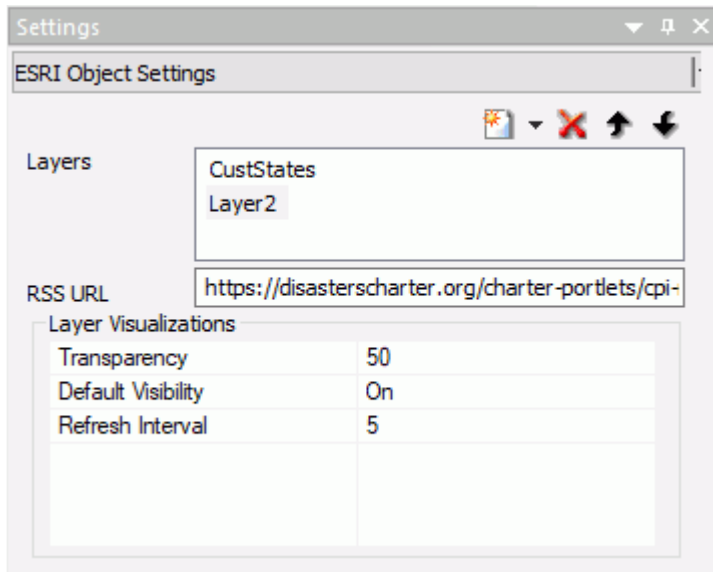
The screenshot shows the 'Settings' window for an ESRI Object. The title bar says 'Settings'. Below it is a tab labeled 'ESRI Object Settings'. The panel is divided into several sections:

- Layers:** A list box containing 'CustCountries' and 'Layer2'.
- Request:** A dropdown menu set to 'customer_countries1b'.
- Geographic Role:** A dropdown menu set to 'Country'.
- Column(s) that match the role:** A table with two columns: 'COUNTRY' and 'COUNTRY_NAME'.
- Layer Attributes:** A list box containing 'COUNTRY_NAME (Customer,Country)', 'COGS_US (Cost of Goods)', and 'QUANTITY_SOLD (Quantity,Sold)'.
- Unique Id:** A text input field and a button with three dots.
- Layer Visualizations:** A table with four rows: 'Transparency' (50), 'Enable Popups' (On), 'Default Visibility' (On), and 'Default Extent' (On).
- Symbol Settings:** A section with several controls:
 - Use:** A dropdown menu set to 'Single'.
 - Color:** A color picker showing a teal color.
 - Fill Style:** A dropdown menu set to 'Solid'.
 - Outline Color:** A color picker showing a dark green color.
 - Outline Thickness:** A text input field set to '1'.
 - Outline Style:** A dropdown menu set to 'Dash'.

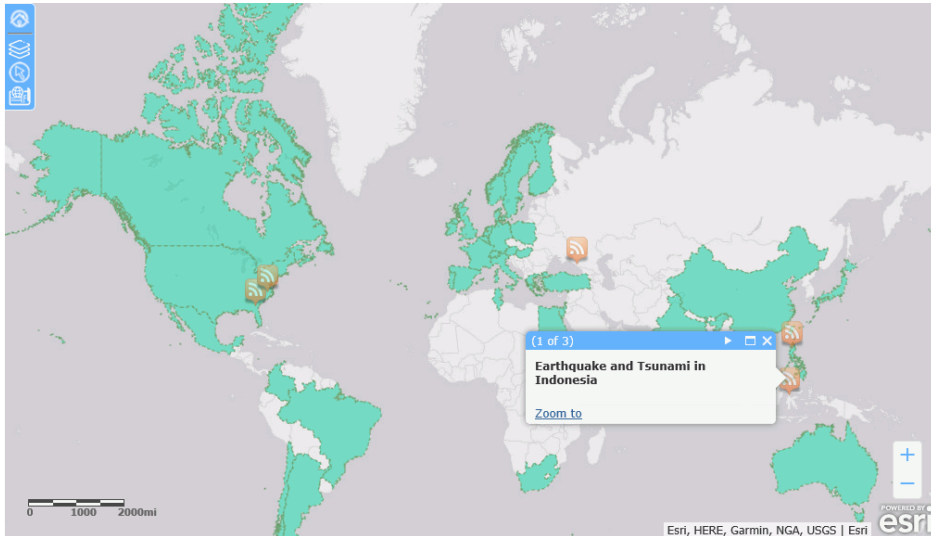
An RSS layer is added pointing to the following URL, which is a disaster RSS feed, and the remaining properties are set to the defaults.

<https://disasterscharter.org/charter-portlets/cpi-mvc/activations/feed/rss/>

The RSS Layer properties are shown in the following image.



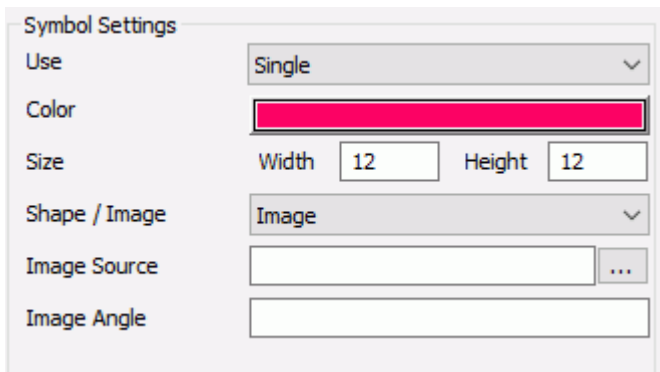
The output is shown in the following image, with one of the RSS symbols clicked to show the disaster information for that location.



Changing the Orientation of Point Images on an Esri Map

When you use an image as a marker on a point data layer of an Esri map, you can change the orientation of the image by entering an angle between zero and 360 degrees in the Image Angle text field.

The Image Angle text field is available for single, unique, and dynamic symbology that displays images instead of standard shapes. The Symbol Settings section of the Settings panel for Single Image symbology is shown in the following image.



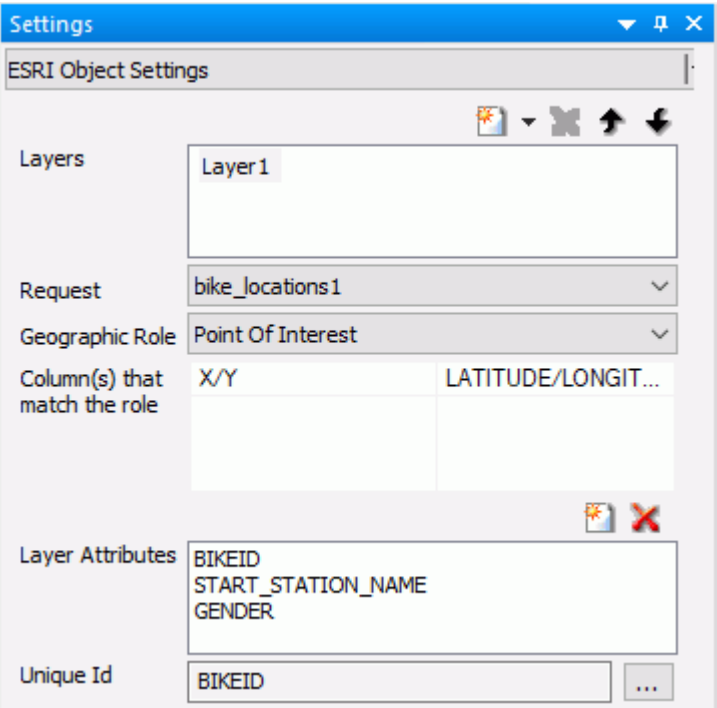
Leaving the Image Angle field blank, or entering 0 (zero) or 360, displays the images at their default orientation.

Example: Changing the Orientation of a Point Image Using Single Image Symbolology

The following request, bike_locations.fex, is used to generate a point of interest layer.

```
DEFINE FILE ESRI_CITIBIKE
GENDER1/A10 = IF GENDER EQ 0 THEN 'None' ELSE IF GENDER EQ 1 THEN 'Male'
ELSE 'Female';
LATITUDE/D20.8 = START_STATION_LATITUDE;
LONGITUDE/D20.8 = START_STATION_LONGITUDE;
END
TABLE FILE ESRI_CITIBIKE
PRINT START_STATION_NAME GENDER1
LATITUDE LONGITUDE
BY BIKEID
ON TABLE PCHOLD FORMAT XML
END
```

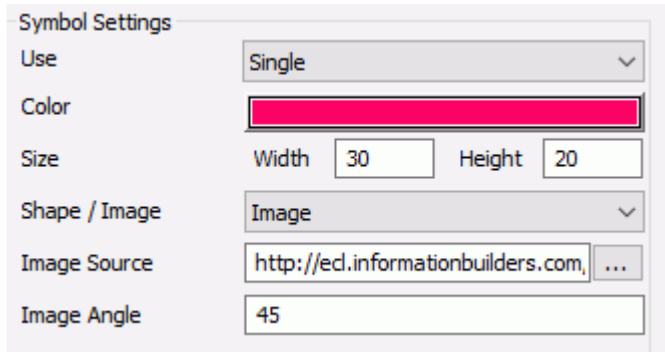
The HTML page has an Esri component that uses this request, as shown in the following image.



The symbol used to identify the point locations will be a bicycle image displayed at a 45 degree angle. The URL to the image is:

<http://ecl.informationbuilders.com/jschart/bicycle.png>

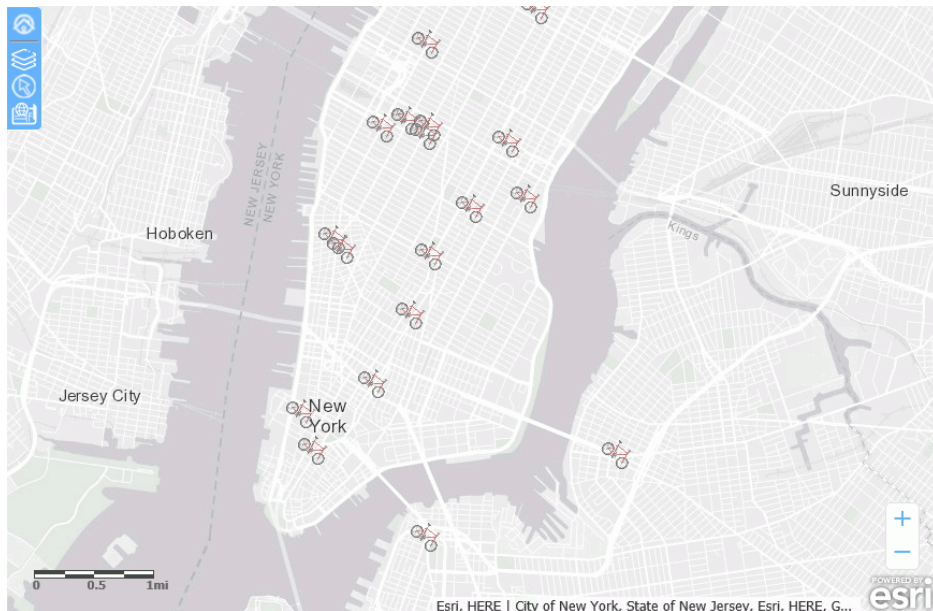
The symbol settings are shown in the following image.



The image shows a 'Symbol Settings' dialog box with the following fields:

- Use:** A dropdown menu set to 'Single'.
- Color:** A color selection bar showing a bright pink/magenta color.
- Size:** Two input fields: 'Width' set to 30 and 'Height' set to 20.
- Shape / Image:** A dropdown menu set to 'Image'.
- Image Source:** A text input field containing the URL 'http://ecl.informationbuilders.com/' followed by a browse button '...'.
- Image Angle:** A text input field set to '45'.

Run the HTML page. The output is shown in the following image.



Example: Changing the Orientation of Point Images Using Dynamic Symbology

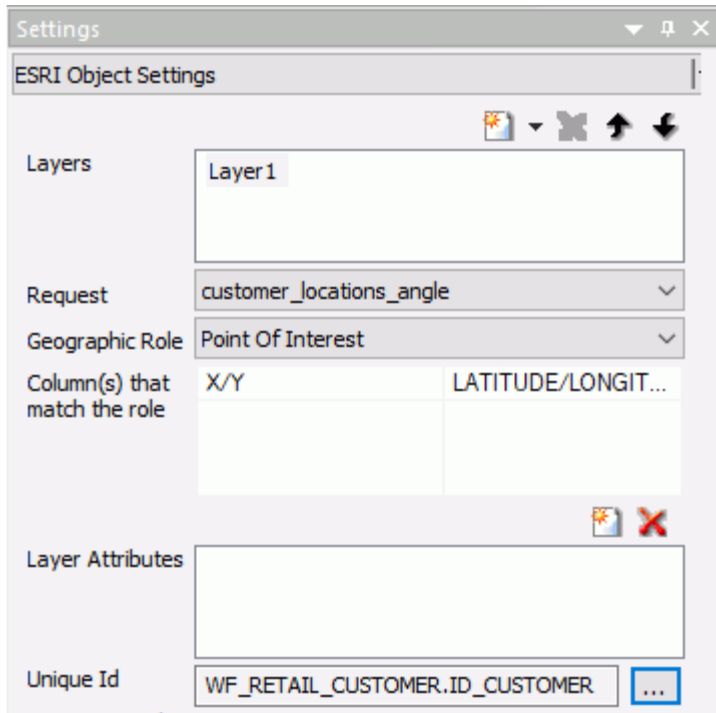
The following request, `customer_locations_angle.fex`, defines labels, image URLs, sizes, and image angles for France, Italy, and the UK. For France, the flag image is displayed with its default orientation (angle is zero), for the UK, the flag is displayed at a 45 degree angle, and for Italy, the flag is displayed at a 65 degree angle.

```

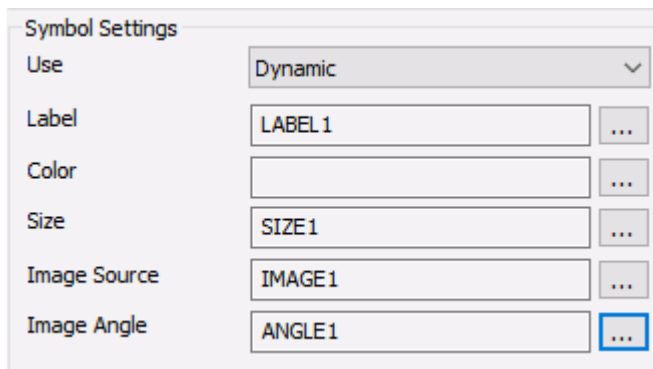
DEFINE FILE WF_RETAIL_LITE
SIZE1/I4 = IF COUNTRY_NAME EQ 'France' THEN 15
           ELSE IF COUNTRY_NAME EQ 'UK' THEN 15
           ELSE IF COUNTRY_NAME EQ 'Italy' THEN 20
           ELSE 20;
LABEL1/A20 = IF COUNTRY_NAME EQ 'France' THEN 'France'
             ELSE IF COUNTRY_NAME EQ 'UK' THEN 'UK'
             ELSE IF COUNTRY_NAME EQ 'Italy' THEN 'Italy'
             ELSE 'UK';
IMAGE1/A80 = IF COUNTRY_NAME EQ 'France' THEN 'http://
ecl.informationbuilders.com/jschart/france.gif'
            ELSE IF COUNTRY_NAME EQ 'UK' THEN 'http://
ecl.informationbuilders.com/jschart/uk.gif'
            ELSE IF COUNTRY_NAME EQ 'Italy' THEN 'http://
ecl.informationbuilders.com/jschart/italy.gif'
            ELSE 'http://ecl.informationbuilders.com/jschart/uk.gif';
ANGLE1/I4 = IF COUNTRY_NAME EQ 'France' THEN 0
            ELSE IF COUNTRY_NAME EQ 'UK' THEN 45
            ELSE IF COUNTRY_NAME EQ 'Italy' THEN 65
            ELSE 135;

END
TABLE FILE WF_RETAIL_LITE
SUM
    WF_RETAIL_LITE.WF_RETAIL_CUSTOMER.ID_CUSTOMER
    WF_RETAIL_LITE.WF_RETAIL_SALES.COGS_US
    QUANTITY_SOLD
    LABEL1
    SIZE1
    ANGLE1
    IMAGE1
    COMPUTE LONGITUDE/D12.2 = FST.CUSTOMER_LONGITUDE;
    COMPUTE LATITUDE/D12.2 = FST.CUSTOMER_LATITUDE;
BY COUNTRY_NAME
BY WF_RETAIL_LITE.WF_RETAIL_CUSTOMER.ID_CUSTOMER NOPRINT
WHERE COUNTRY_NAME EQ 'France' OR 'Italy' OR 'United Kingdom' ;
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT XML
END
    
```

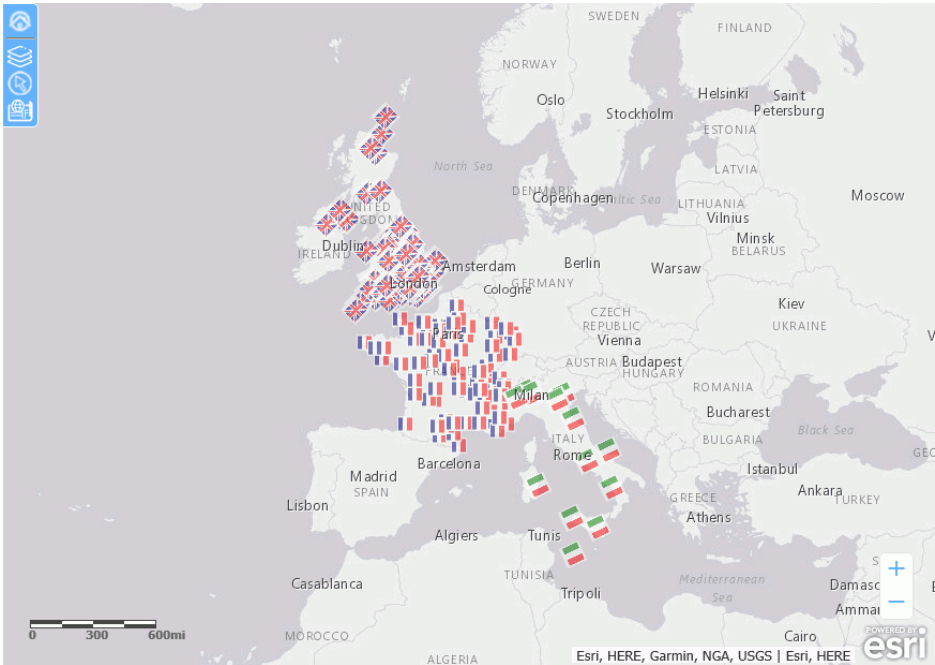

The Esri component on the HTML page uses this request to generate a point of interest layer, as shown in the following image.



The Symbol Settings section of the Settings panel selects Dynamic symbology and uses the fields defined in the request, as shown in the following image.



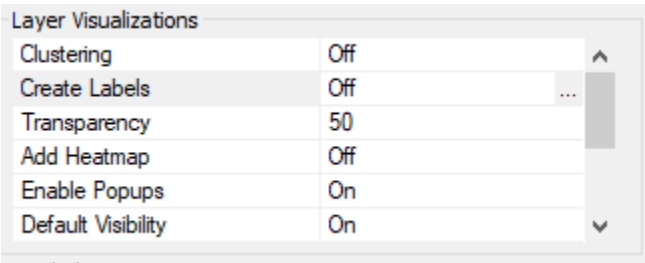
Run the HTML page. The output is shown in the following image.



Adding Labels to Point of Interest Layers on an Esri Map

When you generate a point layer on an Esri map, you can add a Labels visualization to display a field value at each point location.

The Layer Visualizations section of the Settings panel for an Esri map component is shown in the following image.



By default, Create Labels is set to Off. Click the ellipsis (...) next to Off to open the Labels dialog box, as shown in the following image.

The image shows a 'Labels' dialog box with a blue title bar and a close button (X). The 'Label Features' section at the top has two radio buttons: 'Off' (selected) and 'On'. Below this, there are several configuration options:

- Field:** A text input field with an ellipsis (...) button to its right.
- Font:** A drop-down menu currently showing 'MS Serif'.
- Font Size:** A text input field showing '12'.
- Font Weight:** A drop-down menu showing 'Normal'.
- Font Color:** A color picker showing a red color.
- Font Style:** A drop-down menu showing 'Normal'.
- Alignment:** A drop-down menu.
- Angle:** A text input field showing '0'.
- Min Scale:** A text input field.
- Max Scale:** A text input field.
- Halo:** A section with two radio buttons: 'Off' (selected) and 'On'. To the right are 'Color' and 'Size' text input fields.

 At the bottom right are 'OK' and 'Cancel' buttons.

Click the On radio button and configure the following label properties.

- ☐ **Field.** Click the ellipsis (...) to select a field whose value will display for each point.
- ☐ **Font.** Select a font family from the Font drop-down list. The default font family is MS Serif.
- ☐ **Font Size.** Enter a point size for the font, or accept the default size (12 points).
- ☐ **Font Weight.** Select a font weight from the Font Weight drop-down list. Possible values are Bold, Bolder, Lighter, or Normal. The default value is Normal.
- ☐ **Font Color.** Click the Font Color field to open a color picker, or accept the default color (Red).
- ☐ **Font Style.** Select a font style from the Font Style drop-down list. Possible values are Italic, Normal, or Oblique. The default value is Normal.
- ☐ **Alignment.** Select an alignment for the labels relative to the point locations, from the Alignment drop-down list. Possible values are Above Center, Above Left, Above Right, Below Center, Below Left, Below Right, Center Center, Center Left, Center Right.
- ☐ **Angle.** Enter an angle in degrees for the orientation of the labels. The default value is 0 (zero).

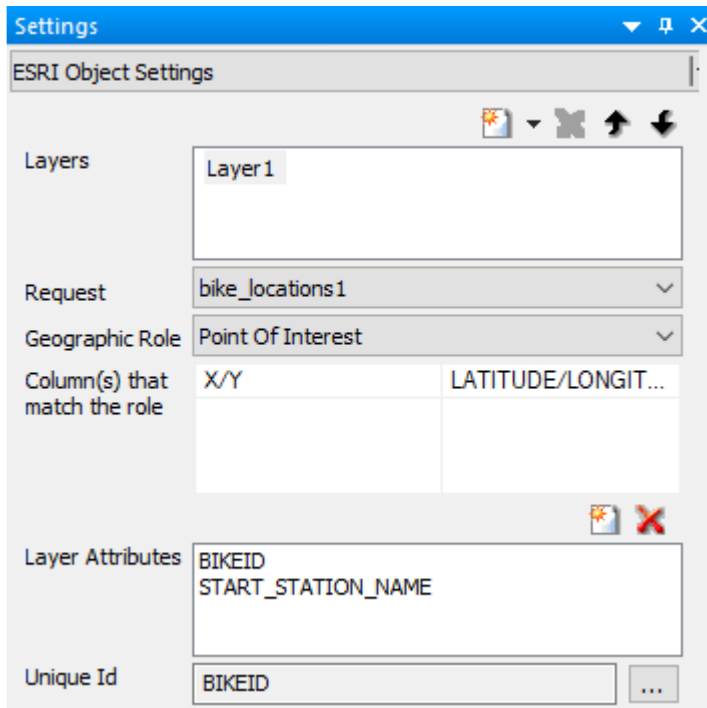
- ☐ **Min Scale.** Enter the minimum map scale for which the labels should display, or leave this field blank for no minimum.
- ☐ **Max Scale.** Enter the maximum map scale for which the labels should display, or leave this field blank for no maximum.
- ☐ **Halo.** These fields define the properties of a color band in which the labels are inserted.
 - ☐ **Off/On.** Click the *On* radio button to turn on halos.
 - ☐ **Color.** Click the color field to open a color picker for selecting the halo color.
 - ☐ **Size.** Enter a size in pixels for the halo. The default value is 1.

Example: Generating Labels for a Point of Interest Layer

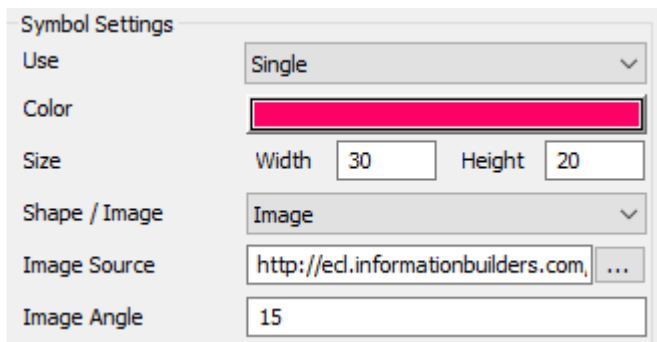
The following request, `bike_locations1.fex`, provides point locations based on the start station latitudes and longitudes for bicycle trips.

```
DEFINE FILE ESRI_CITIBIKE
GENDER1/A10 = IF GENDER EQ 0 THEN 'None' ELSE IF GENDER EQ 1 THEN 'Male'
ELSE 'Female';
LATITUDE/D20.8 = START_STATION_LATITUDE;
LONGITUDE/D20.8 = START_STATION_LONGITUDE;
END
TABLE FILE ESRI_CITIBIKE
PRINT START_STATION_NAME GENDER1
LATITUDE LONGITUDE
BY BIKEID
ON TABLE PCHOLD FORMAT XML
END
```

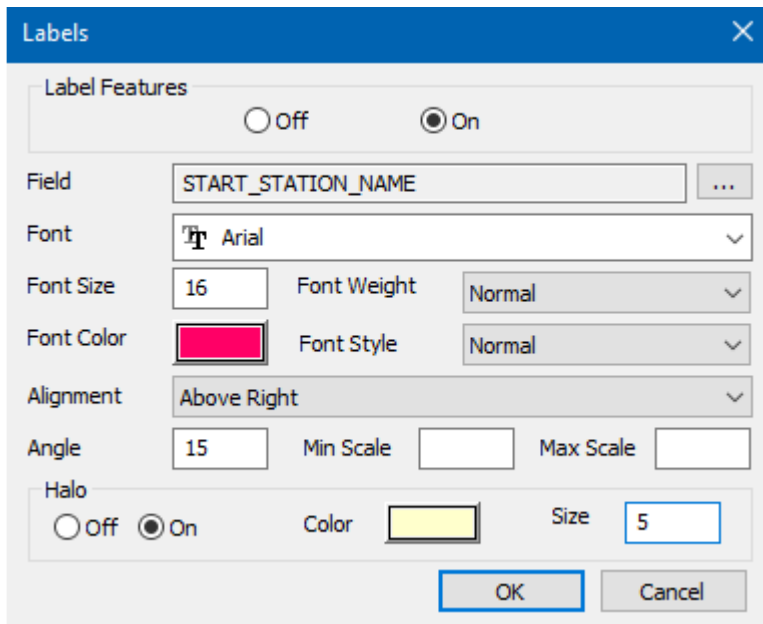
The HTML page has an Esri component that uses this request to generate a point of interest layer, as shown in the following image.



The symbol used for the point locations is a bicycle image (at URL <http://ecl.informationbuilders.com/jschart/bicycle.png>) angled at 15 degrees, as shown in the following image.



The labels are turned on and set to use the value of the field START_STATION_NAME as the label text for each point. The labels are displayed at a 15-degree angle, above and to the right of the point symbols. The font is red 16-point Arial. The halo is turned on. Its color is yellow and its size is 5. The Labels dialog box with these properties set is shown in the following image.



Run the HTML page. The output is shown in the following image.



Visualization and Analytics Enhancements

WebFOCUS allows all users to easily conduct data preparation, visually analyze complex data sets, and quickly generate compelling data visualizations, dashboards, and reports that can be shared with other users. This gives you an edge in using content and developing real-world scenarios derived from your source data.

Learn about the new capabilities and enhancements available for visualization and analytics in this release of WebFOCUS.

In this chapter:

- ❑ [HTML5 Chart Syntax Enhancements](#)
 - ❑ [Axis Annotation Anchors](#)
 - ❑ [Connecting the Markers in Scatter Charts](#)
 - ❑ [Hiding ACROSS Group Columns Containing Only Null Values in Active Reports](#)
-

HTML5 Chart Syntax Enhancements

The following enhancements have been made to the HTML5 chart syntax. For details, see the *Creating HTML5 Charts With WebFOCUS Language* manual.

- ❑ **Color Scales.** For all color modes, the `colorScale:colors` property now supports "start" and "stop" color values for transitions between colors. This replaces the `colorScale:colorBands` property, which has been deprecated.
- ❑ **Data Grid Layout.** Using the `dataGrid:cell:layout` properties, you can format the widths of the cells and the padding within cells in a data grid.
- ❑ **Sizing Riser Width to Axis Label Font Size on a Horizontal Bar Chart.** When a few risers are displayed on a horizontal bar chart, the bars can be much wider than the height of the labels. Using the `groupFit labelHeight` rule, you can size the width of the bars to the font size of the group labels and specify a padding factor.
- ❑ **Named Line Styles.** The `dash` property for lines and borders now supports named styles such as "dash-dot" to define the dash and dot sequences of the generated lines.

- ❑ **Axis Scopes for Matrix Charts.** Using the axis "min" and "max" properties, you can set the scope of values on a numeric axis in a matrix chart separately for each matrix row or column. The scope can be set to specific minimum and maximum values or be automatically calculated separately for each row or column.
- ❑ **New Marker Shape.** The new marker shape "ring" has been added to the list of available marker shapes.
- ❑ **Enhancement to Marker Size Property.** The marker size property accepts a percentage value string in addition to a size in pixels.
- ❑ **Enhancement to Sort Interface for a Data Grid Column.** The sort option for a column is initially a two-headed arrow in the column heading, which indicates that the output in that column is displayed in its original order. Clicking the arrow toggles the sort order between ascending, descending, and original order. The direction of the arrow changes to indicate the sort order shown in the column.
- ❑ **Support for Split Axes on Bubble and Scatter Charts.** Support has been added for split x-axes, as well as split y-axes.

Axis Annotation Anchors

Axis annotations can be positioned relative to an object on the chart. This feature adds the parent anchoring positions "xaxis" and "yaxis". If an axis annotation is placed beyond the normal axis domain of a numeric axis, the axis will be stretched to fit the annotation. The new annotation marker shape, "axisArrow", when used as the annotation marker on an axis, will automatically be rotated to point in the positive direction of the axis. The axisArrow color and style are set using the border properties. If the axisArrow marker does not include a border, the relevant axis body line style is used instead.

Syntax: **How to Use an Axis as an Annotation Anchor**

```

"annotations": [{
  "position": {
    "parent": "string",
    "y": value
  },
  "marker": {
    "visible": true,
    "shape": "string",
    "rotation": number,
    "size": number,
    "border": {"width": number, "color": "string", "dash": "string"}},
    "label": {"visible": boolean, "text": "string", "font": "string",
    "color": "string", "position": "string"},
  }
}]

```

where:

"position"

Specifies the position properties for the annotation.

"parent": "string"

Can be "xaxis" or "yaxis".

"y": value

Can use either "x" or "y", they are equivalent. If both are specified, the one pointing along the chosen axis is used. The value can be either percent or pixel strings ('1%', '1px'), or numbers or values on the axis.

"marker"

Specifies the properties of the annotation marker.

"shape": "string"

Specifies the marker shape, which can be a standard marker shape or SVG path data string. Use "axisArrow" to draw an arrow along the axis.

"rotation": number

Is a number between 0 and 360 that defines the rotation angle of the marker, in degrees.

"size": number

Is the size, in pixels, of the diameter of the annotation marker.

`"border"`

Defines the properties of the marker border.

`"width": number`

Defines the width of the border in pixels.

`"color": "string"`

Is a color specification string that defines the color of the marker border.

`"dash": "string"`

Is a string that defines the border dash style. Use a string of numbers that defines the width of a dash followed by the width of the gap between dashes. The default is no dash ("").

`"label"`

Defines the properties of the annotation label.

`"visible": boolean`

Defines whether the annotation label is visible. Valid values are true and false. The default value is false.

`"text": "string"`

Defines the annotation label text. The default value is no label text.

`"font": "string"`

Defines the annotation label font. The default value is "10pt Sans-Serif"

`"color": "string"`

Is a color specification string that defines the color of the label. The default value is "black".

`"position": "string"`

Defines a position for the annotation label relative to the annotation marker. Valid values are:

- ☐ "top", which places the annotation label above the annotation marker.
- ☐ "bottom", which places the annotation label below the annotation marker.
- ☐ "left", which places the annotation label to the left of the annotation marker.
- ☐ "right", which places the annotation label to the right of the annotation marker.
- ☐ "center", which places the annotation label centered on the annotation marker.
This is the default value.

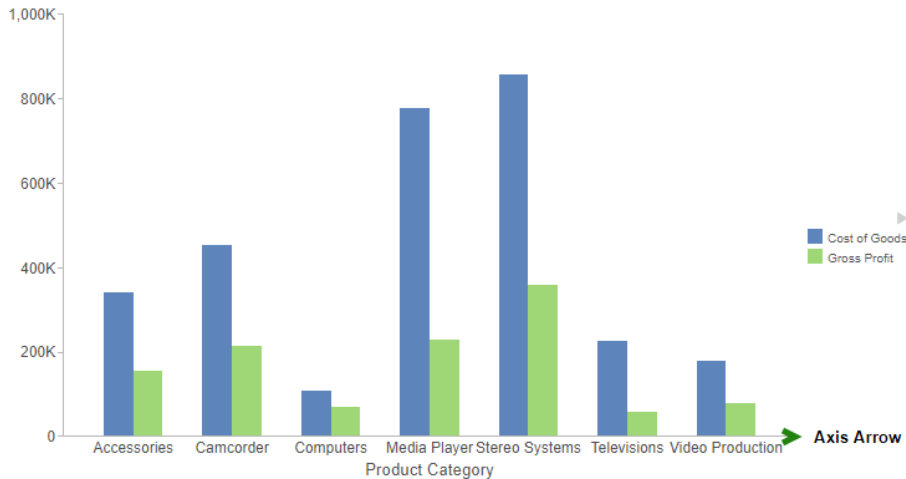
Note: Annotations are not considered in the chart layout, so it is not possible to change the size of the axis or any chart object to accommodate annotation text. If the text is too long to fit in the space, it is truncated.

Example: Using an Axis Annotation Anchor

The following request anchors the annotation on the x-axis. The annotation marker is a 20-pixel green axisArrow marker with a 5-pixel wide border, which is placed at the end of the x-axis. The label text *Axis Arrow* is positioned to the right of the marker.

```
GRAPH FILE WF_RETAIL_LITE
SUM COGS_US GROSS_PROFIT_US
BY PRODUCT_CATEGORY
ON GRAPH PCHOLD FORMAT JSCHART
ON GRAPH SET LOOKGRAPH BAR
ON GRAPH SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
type=data, column=cogs_us, bucket=y-axis,$
type=data, column=gross_profit_us, bucket=y-axis,$
type=data, column=n1, bucket=x-axis,$
*GRAPH_JS
"annotations": [{
  "position": {
    "x": "100%",
    "parent": "xaxis"},
  "marker":
    { "visible": true,
      "shape": "axisArrow", "rotation": 0,
      "size": 20,
      "border": { "width": 5, "color": "green", "dash": "" }
    },
  "label": { "visible": true, "text": "Axis Arrow",
    "font": "bold 10pt Arial", "color": "black", "position": "right"},
}]
*END
ENDSTYLE
END
```

The output is shown in the following image.



Connecting the Markers in Scatter Charts

When analyzing patterns in scatter charts, lines connecting the points can help illustrate the pattern in the data. You can connect the points in a scatter chart using the `connectMarkers` property when the BY field is assigned to the detail attribute category, not the color category.

Syntax: How to Connect Markers in a Scatter Chart

```
"series":  
  [{  
    "series": 0,  
    "connectMarkers": boolean,  
    "border": {  
      "width": number,  
      "color": "string"  
    }  
  }  
]
```

where:

`"connectMarkers": boolean`

Specifies whether the markers should be connected. Valid values are *true*, which connects the markers, and *false*, which does not connect the markers. *False* is the default value.

Note that the BY field must be assigned to the detail attribute category in order for markers to be connected.

`"border"`

Defines the properties of the line connecting the markers.

`"width": number`

Specifies the width of the line in pixels.

`"color": "string"`

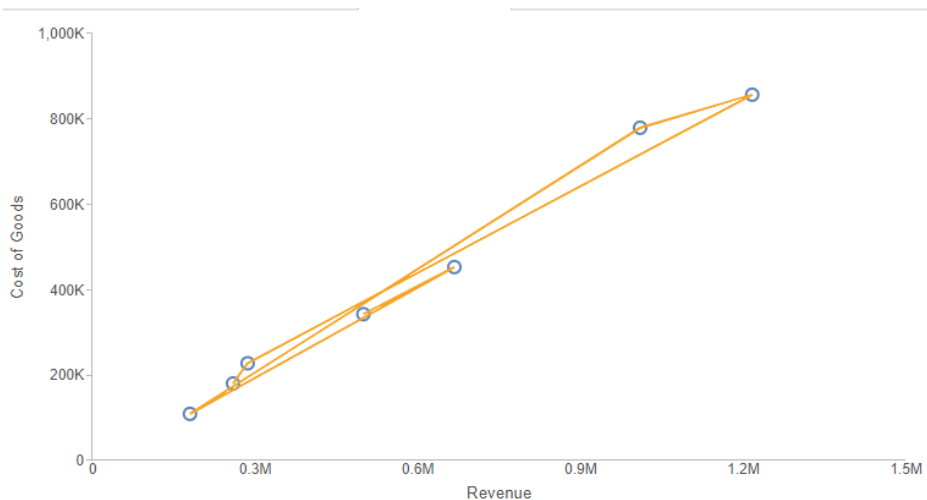
Is a color specification string that defines the color of the line.

Example: Connecting markers on a Scatter Chart

The following request generates a scatter chart with a 2-pixel wide orange line connecting the markers.

```
GRAPH FILE WF_RETAIL_LITE
SUM COGS_US
REVENUE_US
BY PRODUCT_CATEGORY
ON GRAPH PCHOLD FORMAT JSCHART
ON GRAPH SET LOOKGRAPH SCATTER
ON GRAPH SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/combine_templates/
ENWarm.sty,$
TYPE=DATA, COLUMN=COGS_US, BUCKET=y-axis, $
TYPE=DATA, COLUMN=REVENUE_US, BUCKET=x-axis, $
TYPE=DATA, COLUMN=PRODUCT_CATEGORY, BUCKET=detail, $
*GRAPH_JS
"series": [{
  "series": 0,
  "connectMarkers": true,
  "border": {
    "width": 2,
    "color": "orange"
  }
}]
*END
ENDSTYLE
END
```

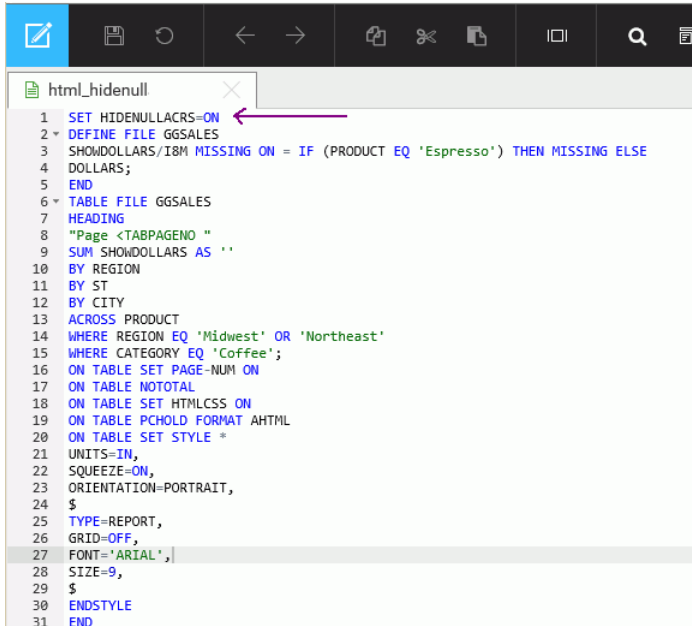
The output is shown in the following image.



Hiding ACROSS Group Columns Containing Only Null Values in Active Reports

When working with active reports in AHTML format, you can use the `HIDENULLACRS` parameter to hide the display of ACROSS groups containing only null columns. This feature allows you to display only the columns of the report that contain data. In this way, you display only the information that is needed, saving report space while presenting a more visually appealing report.

You can use the SET HIDENULLACRS=ON command to hide null ACROSS columns. The default is OFF. In the Preprocessing Other component of a reporting Object, include the SET HIDENULLACRS=ON command. If you are using App Studio, use the Set tool to set the HIDENULLACRS=ON command. The following image shows the command in a WebFOCUS Editor window.



```

1 SET HIDENULLACRS=ON
2 DEFINE FILE GGSales
3 SHOWDOLLARS/I8M MISSING ON = IF (PRODUCT EQ 'Espresso') THEN MISSING ELSE
4 DOLLARS;
5 END
6 TABLE FILE GGSales
7 HEADING
8 "Page <TABPAGENO "
9 SUM SHOWDOLLARS AS ''
10 BY REGION
11 BY ST
12 BY CITY
13 ACROSS PRODUCT
14 WHERE REGION EQ 'Midwest' OR 'Northeast'
15 WHERE CATEGORY EQ 'Coffee';
16 ON TABLE SET PAGE-NUM ON
17 ON TABLE NOTOTAL
18 ON TABLE SET HTMLCSS ON
19 ON TABLE PCHOLD FORMAT AHTML
20 ON TABLE SET STYLE *
21 UNITS=IN,
22 SQUEEZE=ON,
23 ORIENTATION=PORTRAIT,
24 $
25 TYPE=REPORT,
26 GRID=OFF,
27 FONT='ARIAL',
28 SIZE=9,
29 $
30 ENDSTYLE
31 END
  
```

To illustrate, the following image shows the hidden column, with HIDENULLACRS=ON. Notice that the Espresso column is hidden.

6 of 6 records, Page 1 of 1					
Page 1					
			Product		
			Cappuccino Latte		
Region	State	City			
Midwest	IL	Chicago			\$978,340
	MO	St. Louis			\$966,981
	TX	Houston			\$938,245
Northeast	CT	New Haven	\$158,995	\$926,052	
	MA	Boston	\$174,344	\$917,737	
	NY	New York	\$208,756	\$928,026	

If you run the same procedure with SET HIDE NULLACRS=OFF, the Espresso column displays.

6 of 6 records, Page 1 of 1

Page 1

			Product		
			Cappuccino	Espresso	Latte
Region	State	City			
Midwest	IL	Chicago	.	.	\$978,340
	MO	St. Louis	.	.	\$966,981
	TX	Houston	.	.	\$938,245
Northeast	CT	New Haven	\$158,995	.	\$926,052
	MA	Boston	\$174,344	.	\$917,737
	NY	New York	\$208,756	.	\$928,026

Web Development Enhancements

WebFOCUS provides you visual access to tools, functions, properties and features that WebFOCUS offers through the WebFOCUS Home Page. The modern, mobile-friendly design features an innovative user interface and intuitive layout. WebFOCUS Designer is a web-based development tool, allowing you to create interactive, responsive pages and meaningful InfoApps with content that you or other members of your organization create. Embedded Business Intelligence (BI) provides the capability of incorporating WebFOCUS content and functionality (features) into an external application.

Learn about the new capabilities and enhancements available for the WebFOCUS web development tools in this release of WebFOCUS.

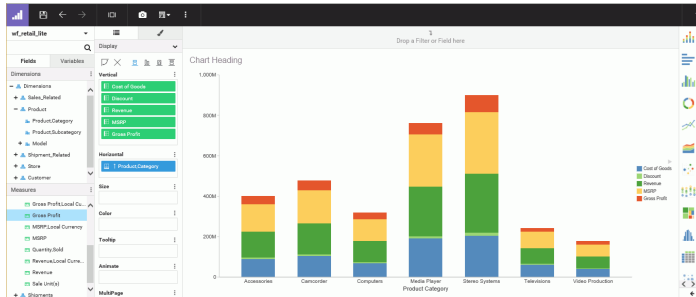
In this chapter:

- ☐ [Creating Content in WebFOCUS Designer](#)
 - ☐ [Editing Bins From a Bucket](#)
 - ☐ [Using the Esc Key to Exit Preview Mode](#)
 - ☐ [Chart Support for Multi-Line Headings and Footings](#)
 - ☐ [Summarizing Numeric Data in Charts Using Filters](#)
 - ☐ [Viewing Source Code When Working with a Chart](#)
 - ☐ [Setting Color Ranges in Charts](#)
 - ☐ [Creating Workbooks](#)
 - ☐ [New WebFOCUS BI Portal](#)
 - ☐ [Enhanced Home Page Layout and Organization](#)
-

Creating Content in WebFOCUS Designer

Using WebFOCUS Designer, you can create charts, maps, and styled tabular content to illustrate trends in your data. This allows you to see your data in graphical form, showing hotspots and outliers so that you can make quick decisions.

You can start creating and formatting your content with a few simple clicks. You can easily add data fields by double-clicking or dragging the field to a bucket or right to the canvas, where WebFOCUS Designer makes an automatic bucket assignment based on the type of field that you select. You can then experiment with different chart types, including tabular grids and maps to change how you see your data, as shown in the following image.



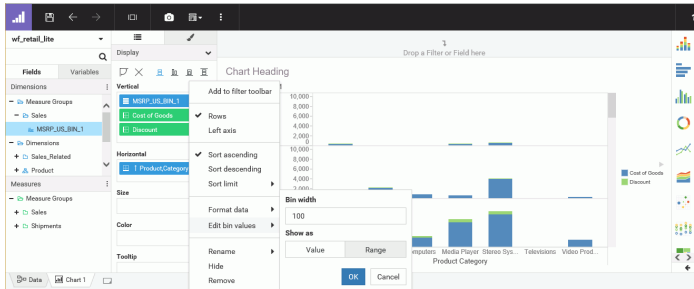
Once you are finished adding your data, you can format your chart, including color, theme, font, and other options. For example, if you are working with a map, specific formatting options are available. As you gain familiarity with the formatting options, formatting charts will be second nature.

You can also modify the view of your data using a variety of quick transform options, aggregations, calculations, and filters. You can also use Insight to review and analyze a chart that shows the data fields that you choose in real-time.

You can create content in formats that you choose using robust formatting options that enhance your chart. When you are ready, you can share your chart on the Home page, on a page, or burst to a distribution list using ReportCaster.

Editing Bins From a Bucket

You can now edit existing bins from within a data bucket in the Display tab. Once you create a bin and place it in a bucket for use in your chart, you can modify it directly from the bucket, as shown in the following image. This makes it easy examine how different combinations of bin width and format present your data in the chart on the canvas.



The modifications appear in real time.

Using the Esc Key to Exit Preview Mode

You can now exit the Preview using the Esc key, when creating charts in WebFOCUS Designer. This enhancement provides a quicker way to toggle between preview and development.

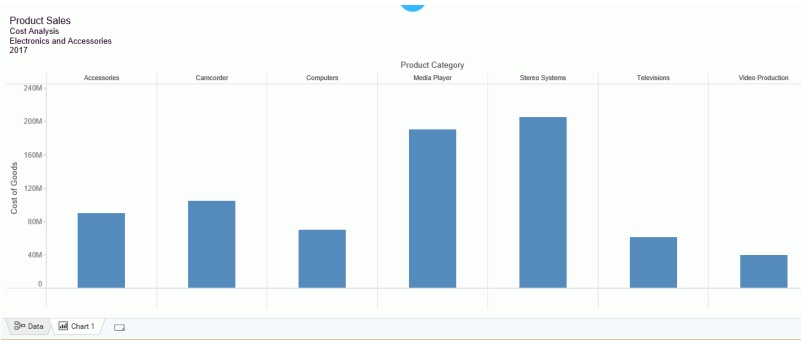
For charts that contain prompts for parameters, in the prompting facility activated in Autoprompt mode, the Esc key causes the parameter panel to open and close. In this case, you can still use the blue dot to return from the preview to the design view of your chart, as shown in the following image.

The screenshot shows the 'Filter Values' dialog box. It contains four parameter prompts: 'Cost of Goods From' (764074), 'Cost of Goods To' (130860), 'Discount From' (356268), and 'Discount To' (529639). Each prompt has a blue slider bar. To the right of the prompts, there are two instructions: '1. Specify values for all parameters.' and '2. Select the run button to submit the request.' At the bottom, there are buttons for 'Data', 'Chart 1', and a 'Run' button (represented by a blue dot).

Chart Support for Multi-Line Headings and Footings

When working with headings and footings in your chart, you can add multiple lines of information into the heading and footing areas. This accommodates thorough explanations and additional information, while offering the most readable presentation.

You add a new line in the heading and footing by pressing Enter. The number of lines of heading and footing you can add to a chart is only limited by the available real estate on the chart. The chart body will adjust to fit within the available space with the heading/footing lines inserted. You can change the font size or other presentation aspect using the editing toolbar that displays. When you are finished editing the heading and footing and edit mode is closed, the chart canvas adjusts to ensure that all lines of the heading or footing are visible, as shown in the following image.

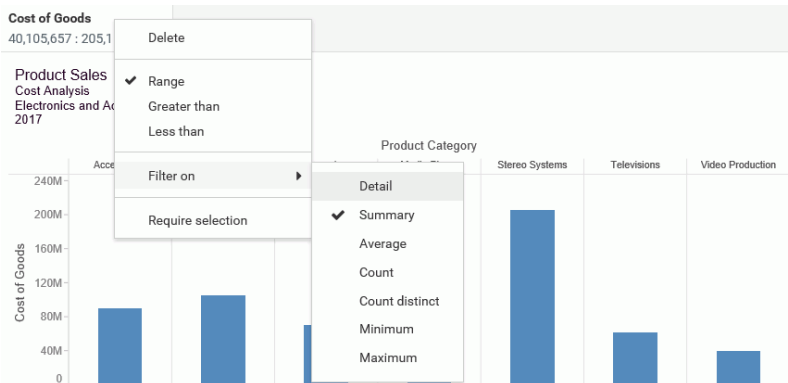


Summarizing Numeric Data in Charts Using Filters

You can now use the advanced Summary and Detail filter options to filter your data by aggregated values or by individual records. This allows you to review data from a high level or a more granular view. You can use these filter options to view summary or detailed information to make decisions and review different scenarios with your data, depending on how much information you want to see. You can also add additional fields or filters to expand your analysis.

The Summary option, which is the default, allows you to select records based on the aggregated value of a field. You can also filter using the Detail view, which shows the individual breakdown of items in each row of your chart, and enables you to select only the data that you want by excluding all unwanted data.

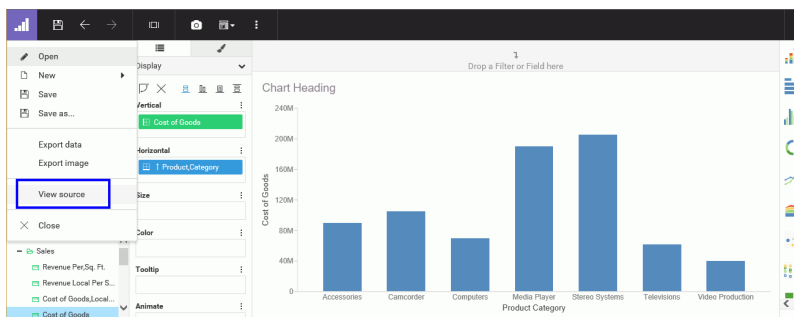
In addition, when working with numeric filters, you can select the type of aggregation to be used in the Summary filter. By default, a Summary filter uses the sum aggregation. You can also apply any of the standard aggregation methods including average, count, count distinct, minimum, and maximum to your Summary filter. These options are shown in the following image.



Viewing Source Code When Working with a Chart

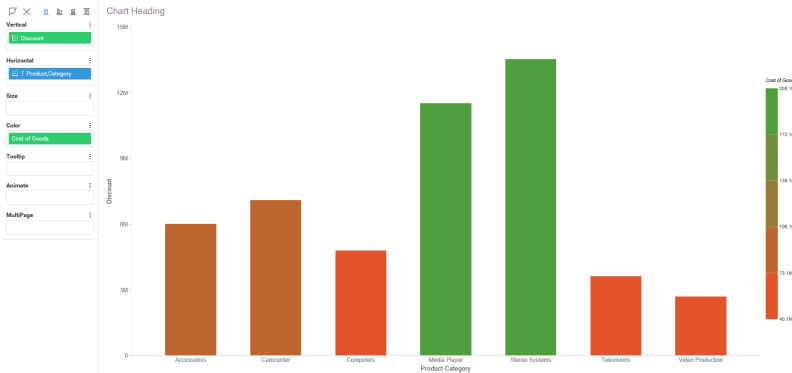
You can now view the underlying source code of a chart. This allows you to see how the chart is built by exposing the code that comprises it. Specially, it is used by support technicians to help you with debugging charts. Within View Source, you can examine the contents of the procedure in a view only window. Clicking the *Export* button places a copy of the procedure as a .fex file into your download directory.

You access the View source option on the Application menu, as shown in the following image.



Setting Color Ranges in Charts

You can now set a color range when working with chart. You can use the default "Theme" styling or specify one of the available primary colors or combinations, which allows you to specify hues or ranges of color for use in your chart. The following image shows the Red/Green color range.



When you make a selection, you can override the default colors presented by the theme, giving you flexibility in presenting your data with the color hues of your choice.

Creating Workbooks

A workbook is a portfolio that lets you assemble embedded content, combine it with external content from anywhere in WebFOCUS, and build a powerful display, all in the same tool. The ability to create workbooks extends the role of the advanced user, empowering this user to build data narratives while employing the powerful combination of chart and page modes of WebFOCUS Designer. Workbooks can be run as content items directly from a browser, they can be published or shared with specific users and groups.

New WebFOCUS BI Portal

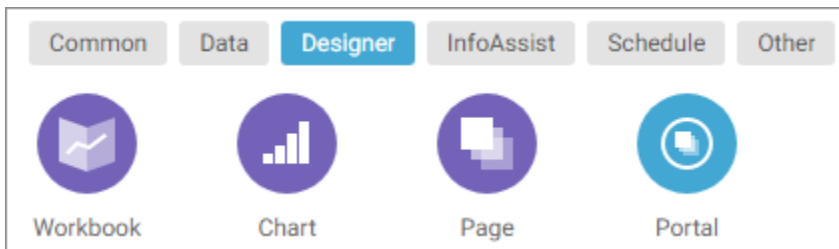
The new WebFOCUS BI portal is a flexible and interactive content management system that users can use to access and share content, customize their portal experience, collaborate, and build sophisticated structures for data storytelling. They key benefits of the new portal include multi-level page navigation, flexible page layout options for dashboards and InfoApps™, mobile-friendly design that ensures responsive behavior on any device and with any type of content, built-in page filter that is automatically enabled whenever users display parameterized content, and modern styling that features clean and streamlined UI and customizable themes.

Enhanced Home Page Layout and Organization

From the Home Page, you can create WebFOCUS content using the Action Bar in the Content View. Create analytical content, upload files and spreadsheets, connect to data, build portals and pages, schedule procedures, generate sample content, and more.

Different action items are organized into the following categories, so you can quickly create the content you need:

- ☐ **Common.** Displays buttons for actions you would most commonly use.
- ☐ **Data.** Displays buttons for using different WebFOCUS data workflows.
- ☐ **Designer.** Displays buttons for content that can be created using WebFOCUS Designer.
- ☐ **InfoAssist.** Displays buttons for content that can be created using InfoAssist.
- ☐ **Schedule.** Displays buttons for using WebFOCUS ReportCaster.
- ☐ **Other.** Displays buttons for additional WebFOCUS actions, such as creating links, shortcuts, blogs, and collaborative portals.



Access to options and categories on the Action Bar is subject to permissions and determined by your role in a domain. Contact your administrator to obtain access to additional options.

Security and Administration Enhancements

The WebFOCUS Client repository and authorization security model uses an implementation of Role-Based Access Control (RBAC) to enforce security across all resources in the repository. The flexibility of this model enables an administrator to implement security at a granular level for every resource in the WebFOCUS repository, if needed. User actions can be permitted for individual combinations of users and resources. Access can be granted or specifically denied on a group or individual level, and it can be inherited from higher folders.

Learn about the new capabilities and enhancements available for security and administration in this release of WebFOCUS.

In this chapter:

- ☐ [Creating, Viewing, and Editing Source Code](#)
 - ☐ [WebFOCUS Designer Privileges](#)
 - ☐ [Application Caches](#)
 - ☐ [Enhanced Custom Autoprompt Template Configuration](#)
 - ☐ [Session Viewer Caching List](#)
 - ☐ [LRU Cache Statistics Page](#)
 - ☐ [Repository Database Replication Utility](#)
 - ☐ [Preserve Created, Modified and Last Access Information \(IBI_CM_PRESERVE_SOURCE_INFO\)](#)
 - ☐ [Change Management Scenario Dialog Box With Library Check Box](#)
 - ☐ [Disable Service Provider \(SP\) Initialized Single Sign-On](#)
 - ☐ [Usage Analytics \(IBI_ANALYTICS_ENABLE\) Setting](#)
 - ☐ [Enable javascript Error Reporting \(IBI_JS_TRACE\) Setting](#)
 - ☐ [Distribution Directories](#)
 - ☐ [Log File Entry Color Coding](#)
 - ☐ [Enabling Mobile Voice](#)
-

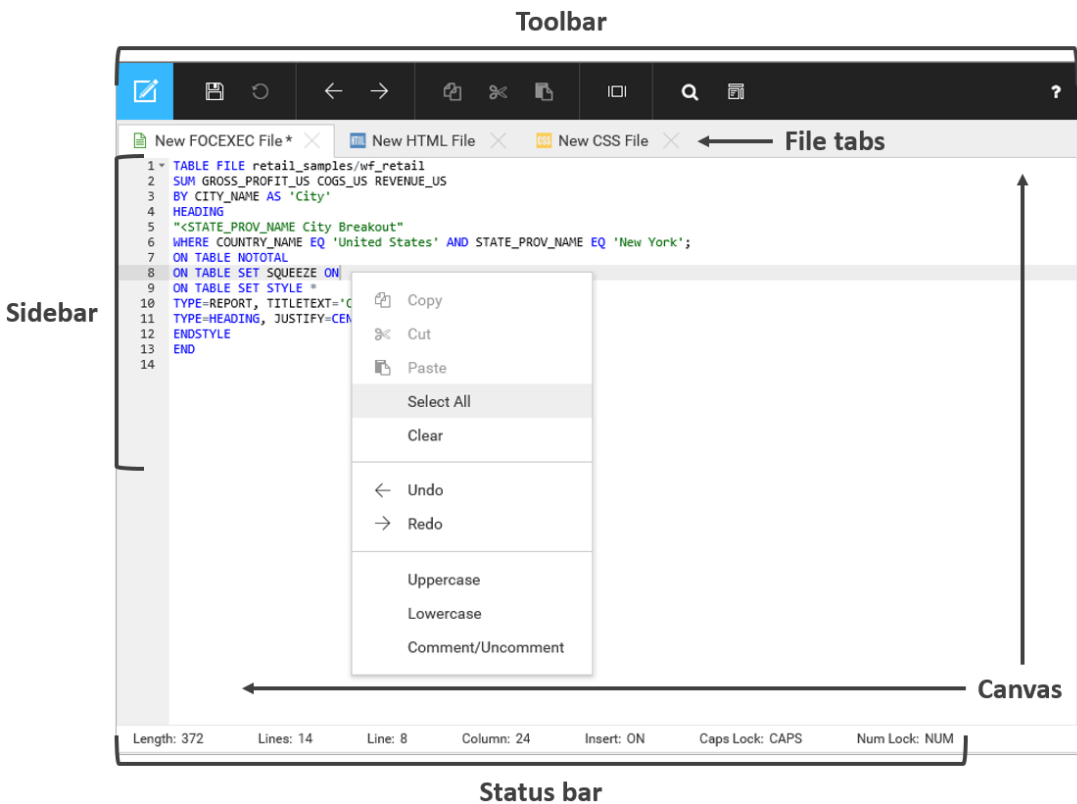
Creating, Viewing, and Editing Source Code

The Editor enables you to create, view, and edit the source code for WebFOCUS procedures (FOCEXECs), Master, HTML, JavaScript, WebFOCUS StyleSheet, Cascading Style Sheet, Text, SQL, R, and Python files.

The Editor supports user-friendly features, such as syntax highlighting, line numbering, code folding, autocomplete, and the display of a status bar and indent guides. These features speed productivity by enabling better clarity in helping you understand, debug, and work with your source code.

The Editor offers the ability to run WebFOCUS procedures (FOCEXECs) or HTML pages directly from the Editor.

The components of the Editor are shown in the following image.



WebFOCUS Designer Privileges

In WebFOCUS Release 8205, the following new privileges were added to the Advanced Reporting privilege category of the Security Center Edit Role dialog box:

- ☐ Designer Workbook (opWorkbookDesigner)
- ☐ Designer Content from Metadata (opDesignerMetadata)
- ☐ Designer Content from Reporting Object (opDesignerReportingObject)

These new privileges grant access to the new WebFOCUS Designer capabilities that were made available in Release 8205.

The Designer Workbook (opWorkbookDesigner) privilege makes WebFOCUS Designer available for use in the creation of workbooks, which are pages that contain a collection of embedded charts that were created within WebFOCUS or referenced from external sources. The ability to incorporate independently-created content directly into a workbook without having to recreate it within WebFOCUS is a distinct advantage, and is available only in WebFOCUS Release 8205.

The Designer Content from Metadata (opDesignerMetadata) and the Designer Content from Reporting Object (opDesignerReportingObject) privileges make Master Files or Reporting Objects available to users as a source for the creation of charts and embedded charts within workbooks. These two privileges affect the type of files that can be displayed in the list of source files in the Open dialog box within WebFOCUS Designer. Users that have both privileges can see the Sever tab, which displays a list of master files, and the Repository tab, which displays a list of Reporting Objects, when they create a chart or workbook. Users that have only one privilege will be able to see only the tab and files that match the format of the privilege assigned to them.

In addition, the existing privilege named Designer (opAppDesigner) that appears in the Advanced Reporting privilege category was renamed to Designer Page (opAppDesigner). This privilege gives users the ability to create pages in WebFOCUS Designer.

These privileges are assigned to the DomainAdvancedUser, DomainDeveloper, SystemFullControl, and WebFOCUSManager roles, by default. Administrators have these privileges in all domains and folders. Users working in a domain in which they are a member of the Developer group have these privileges when working anywhere in that domain. However, users working in a domain in which they are a member of the Advanced User group have these privileges only when they are working within the My Content folder. When these four privileges are included in a user role, they grant access to all of the features within WebFOCUS Designer, and give administrators, domain developers, and advanced users complete access to WebFOCUS Designer and all of its capabilities.

Learn More

For more information, see the *Managing WebFOCUS Designer Privileges* topic in the *WebFOCUS Security and Administration* technical content.

Application Caches

The Application Caches page, located on the Administration Console Configuration tab, is new in WebFOCUS Release 8205. The Metadata Cache settings on this page improve system performance by caching metadata retrieved when users work in Insight mode or with WebFOCUS Designer. The Data Value Cache settings on this page enable administrators to improve system performance by caching data values retrieved from procedures that use the Find parameter syntax, which is typically seen with autoprompt reports, Insight charts, or with output developed using WebFOCUS Designer. Settings within this page identify the maximum amount of memory allocated to the cache, paths to application folders containing resources from which data can be cached, and paths to resources whose data should be excluded from the cache.

Learn More

For more information about the Application Caches Page, see the *Application Caches Settings* topic in the *WebFOCUS Security and Administration* technical content.

Enhanced Custom Autoprompt Template Configuration

In WebFOCUS Release 8205, the new aptemplates.xml file, which is located in *drive: \ibi \WebFOCUS82\client\wfc\etc\prod*, replaces the APTemplates.xml file, which was located in *drive:\ibi\WebFOCUS82\config*, as the file to configure custom autoprompt templates.

The directory in which this new file is located contains both a \prod (production) folder and a \custom folder. Organizations that use custom templates can maintain a copy of the new aptemplates.xml file in the \custom folder and add the list of their custom autoprompt interface templates to it. When the aptemplates.xml file exists in the \custom folder, it overrides the aptemplates.xml file in the \prod folder as the source for the list of custom templates displayed in the Default Autoprompt Template (IBI_DESCRIBE_TEMPLATES) setting, which is located on the Parameter Prompting Settings page of the Administration Console Configuration tab.

The aptemplates.xml file in the custom folder remains unchanged after upgrades, freeing administrators from the requirement to re-enter the list of custom templates after each product upgrade.

Learn More

For more information, see the *How to Add Customized Autoprompt Templates* procedure and the *How to Test Customized Autoprompt Templates* procedure located in the *WebFOCUS Security and Administration* technical content.

Session Viewer Caching List

The Caching list, located in the header of the Session Viewer page, is new in WebFOCUS Release 8205. The options in this list override the default configuration of data caching operations for an individual session. They enable administrators and developers to suspend caching, to discard data cached during the current session, to clear the cache, or to return to the default caching configuration. Administrators can use these options to suspend or modify caching operations for sessions devoted to application development or to clear the cache when master file changes or updates to data have taken place that makes cached data obsolete.

Learn More

For more information about the Session Viewer Caching list, see the *Reviewing the Session Viewer Main Page* topic in the *WebFOCUS Security and Administration* technical content.

LRU Cache Statistics Page

The LRU Cache Statistics page, located on the Administration Console Diagnostics tab, is new in WebFOCUS Release 8205. This page displays statistics describing cache usage and activity for the Insight Metadata cache, the Data Values cache, and the Server Configuration Cache.

These statistics gives administrators an overview of the current amount of resources allocated to the each cache, the number of entries they contain, and the memory allocated to them. They also identify the number of objects or events that added data to the cache, retrieved data from it, cleared data from it, or removed old and unused data from it to make way for new data. Based on these statistics, administrators can infer the current status of activity in a cache, determine if metadata or data source values are successfully loading into a cache, identify when a cache is operating at peak capacity, and learn if data or metadata was removed or cleared from the cache.

The name LRU Cache is derived from the fact that all caches follow a Least Recently Used rule. Under this rule, resources that have been unused the longest are the first to be cleared from the cache when the addition of new resources would cause the cache to exceed the amount of memory allocated to it.

Learn More

For more information about the LRU Cache Statistics page, see the *Working with LRU Cache Statistics* topic in the *WebFOCUS Security and Administration* technical content.

Repository Database Replication Utility

In WebFOCUS Release 8205, the Repository Database Replication utility transfers a copy of the WebFOCUS Repository from a source database to an empty target database. Because the utility preserves the integrity of the Repository database structure and contents during the transfer, you can use it to replicate the WebFOCUS Repository to a variety of Relational Database Maintenance Systems (RDBMS) whenever required to do so by your organization. For example, you can use it to transfer the WebFOCUS Repository from Derby™ to Oracle®, or from Db2® to Derby.

The Database Replication Utility runs outside of the WebFOCUS user interface in the Command Prompt window. For Windows users, the file that runs the database replication utility is named `db_replicate.bat`, and it is located in `drive:\ibi\WebFOCUS82\client\wfc\etc\prod`. For UNIX or Linux users, the file that runs the database replication utility is named `db_replicate.sh`, and it is located in `install_directory/ibi/WebFOCUS82/utilities/dbupdate`.

In order to use the utility, you must first configure source and target database information and credentials in the supporting `db_replicate_settings` file that is also found in the `dbupdate` directory. If you intend to use the replicated repository database as your principal repository, you must also replace the settings for the default WebFOCUS Repository database in the `install.cfg` file with those that identify the replicated WebFOCUS Repository database.

Learn More

For more information about the Repository Database Replication Utility and its configuration requirements, see the *Replicating the WebFOCUS Repository Database* topic in the *WebFOCUS Security and Administration* technical content.

Preserve Created, Modified and Last Access Information (IBI_CM_PRESERVE_SOURCE_INFO)

In WebFOCUS Release 8205, the new Preserve Created, Modified and Last Access Information (IBI_CM_PRESERVE_SOURCE_INFO) setting is located on the Change Management settings page of the Administration Console Configuration tab. This new setting gives administrators the option to preserve or discard values that reflect the full history of items imported through the change management utility.

When the check box in this setting is selected, the date, time, and user ID values assigned to the Created, Modified, and Accessed fields when an item is added to an export scenario are preserved during the import and assigned to the Created, Modified, and Accessed fields in the Properties panel of those items after the import is complete. If cleared, the Change Management Import replaces these original values with the date and time of the import and the ID of the user who ran it.

The check box in this setting is selected, by default, and this is the recommended value for this setting. However, if your organization does not wish to retain the original values assigned to the Created, Modified, and Accessed fields of items imported using the Change Management utility, clear this check box after installing or upgrading to Release 8205.

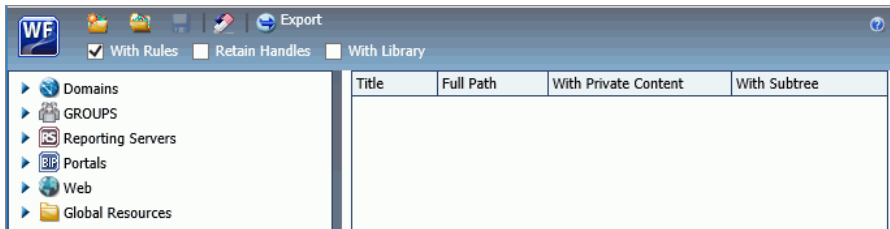
Note: In the Properties dialog box that opens from the Legacy Home Page, these values appear in the Created On, Created By, Last Modified On, Last Modified By, Last Accessed On, and Last Accessed By fields.

Learn More

For more information, see the definition for the new Preserve Created, Modified and Last Access Information (IBI_CM_PRESERVE_SOURCE_INFO) setting in the *Change Management Settings* topic of the *WebFOCUS Security and Administration* technical content.

Change Management Scenario Dialog Box With Library Check Box

In WebFOCUS Release 8205, the new With Library check box appears beneath the menu bar of the Scenario dialog box, as shown in the following image.



When this check box is selected, the change management export scenario automatically includes Report Library content in all folders you add to the export scenario. When it is cleared, the default value, the change management export scenario does not include Report Library content. Even when this check box is cleared, you can select individual Report Libraries and include them in an export scenario.

Learn More

For more information, see the *Understanding Change Management Export Options* in the *WebFOCUS Security and Administration* technical content.

Disable Service Provider (SP) Initialized Single Sign-On

In WebFOCUS Release 8205, the Advanced tab of the Edit SAML Authentication Settings dialog box, which opens from the Authentication page of the Administration Console Security tab, contains the new Disable Service Provider (SP) Initialized Single Sign-On check box. When this check box is selected, the only way to sign in to WebFOCUS is through an identity provider-initiated sign-on request. Any attempt to sign in to WebFOCUS, without first signing in to the identity provider, creates a service provider-initiated sign-on request that produces an HTTP 403 Forbidden error code instead of redirecting you to the identity provider that supports SAML authentication.

Learn More

For more information about the Disable Service Provider (SP) Initialized Single Sign-On check box, see the *How to Download and Configure the Identity Provider Metadata File to the SAML Configuration* in the *WebFOCUS Security and Administration* technical content.

Usage Analytics (IBI_ANALYTICS_ENABLE) Setting

The new Usage Analytics (IBI_ANALYTICS_ENABLE) setting is located on the Other Settings page of the Administration Console Configuration tab. When the check box in this setting is selected, a feature that records WebFOCUS events and URLs using Google Analytics is activated. Information Builders uses statistics derived from these events and URLs to analyze usage of product features. This is the default setting.

When this check box is cleared, the feature that records WebFOCUS events and URLs using Google Analytics is not activated.

Learn More

For more information, see the *Enable Usage Analytics* setting definition in the *WebFOCUS Security and Administration* technical content.

Enable javascript Error Reporting (IBI_JS_TRACE) Setting

In WebFOCUS Release 8205, the new Enable javascript Error Reporting (IBI_JS_TRACE) setting, located on the Other settings page of the Administration Console Configuration tab, activates the inclusion of JavaScript error messages in logs and traces. When the default value of On is assigned to this setting, entries recording JavaScript errors are added to the event.log file, Session Viewer traces, and the Session Monitor. When the value Off is assigned, JavaScript errors are added to traces in the Session Viewer and the event.log file only if the Session Viewer is in use. The value Never disables this feature entirely. As a best practice, we recommend that administrators include JavaScript errors in logs and traces to enhance system performance analysis and troubleshooting.

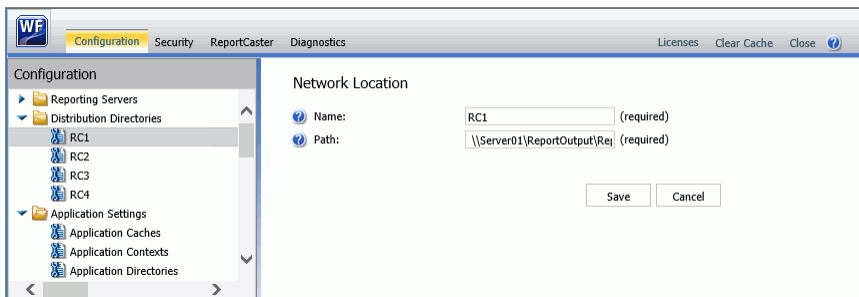
Learn More

For more information about the Enable javascript Error Reporting (IBI_JS_TRACE) setting, see the *Other Settings* topic in the *WebFOCUS Security and Administration* technical content.

Distribution Directories

In WebFOCUS Release 8205, the new Distribution Directories folder appears on the Configuration tab of the Administration Console. Features in the Distribution Directories folder make it easy to open, review, manage, and secure all Distribution Directory configurations within the WebFOCUS User Interface.

Distribution Directories define those folders within the IBFS subsystem that capture output from scheduled report distributions, and are mapped to file system directories that are accessible to the ReportCaster Distribution Server, as shown in the Name and Path values illustrated in the following image.



The ReportCaster Distribution Server uses the Repository method to send scheduled report output to these nodes within the IBFS system and their associated network locations. The output is then available for use by other tools or applications that can retrieve it from the designated location.

Because they are folders within the IBFS system, Distribution Directories are subject to the same security configuration as any other IBFS resource. Administrators can therefore use these directories to limit the availability of the files that support scheduled report distributions to authorized groups and users.

Learn More

For more information, please see the *Managing Distribution Directories* topic in the *WebFOCUS Security and Administration* technical content.

Log File Entry Color Coding

In WebFOCUS Release 8205, log file entries for WARN, ERROR, and FATAL events are now highlighted using the following color code:

☐ **WARN.** Yellow

☐ **ERROR.** Orange

☐ **FATAL.** Coral

Color-coded highlights support reviews and troubleshooting by distinguishing log entries of events capturing errors or problem conditions from those capturing routine system events. The use of a consistent color for each of the three event categories helps narrow the search for problem events of a specific level of severity.

Learn More

For more information, see the *Working With Log Files* topic in the *WebFOCUS Security and Administration* technical content.

Enabling Mobile Voice

A new setting, Enable Mobile Voice (IBI_MOBILE_VOICE), appears on the Magnify Settings page of the Administration Console Configuration tab. When the check box in this setting is selected, Mobile Voice is available for use. Users who have the new Display Ask WebFOCUS for Mobile Voice (opMobileVoice) privilege, and access to dimensionally-indexed resources that define Intent phrases in their properties, can then open the Ask WebFOCUS view by clicking the *Ask WebFOCUS* sidebar option. Additionally, the What Can I ask? button is available to launch voice-based searches for reports, charts, and other content resources that contain data or metadata that matches their query. This check box is selected, by default. When it is cleared, none of these features can be made available to any user within the organization.

Learn More

For more information about this setting, see the *Enable Mobile Voice* setting definition in the *WebFOCUS Security and Administration* technical content.

Server Enhancements

The server provides a wide range of capabilities and tools for adapter configuration, metadata creation, application and path management, security control, communications configuration, and for monitoring, tuning, and troubleshooting server performance. Authorized users can perform most server administration tasks from a graphical Web Console. The server supports WebFOCUS reporting functions, extraction, load and transformation functions, and analysis and data access control functions.

In this chapter:

- ☐ [Adapter Enhancements](#)
 - ☐ [DataMigrator Enhancements](#)
 - ☐ [Resource Analyzer and Resource Governor Enhancements](#)
 - ☐ [Reporting Language Enhancements](#)
 - ☐ [Data Type Icons](#)
 - ☐ [Data Management Console: Group and Replace](#)
 - ☐ [Data Management Console: Additional Functions Available](#)
 - ☐ [Installation: New Language Options on Windows](#)
 - ☐ [Setting Defaults for Upload Target Parameters](#)
-

Adapter Enhancements

This section describes new adapter features. All adapters can be used for WebFOCUS Reporting and SQL requests, and as sources for DataMigrator flows.

The server supports adapters designed to access a wide variety of data sources. Using the graphical Web Console, you can configure these adapters and create the metadata you need to seamlessly access the corresponding types of data.

On the Web Console, adapters are grouped as SQL, XML-based, ERP, OLAP, Procedures, Sequential and Indexed, DBMS, and Social Media.

SQL Adapters

This section provides descriptions of new features for SQL adapters.

SQL Adapters: Improved Optimization of MATCH Logic

Streamlined SQL is now generated for MERGE requests against those adapters, such as Spark, whose INSERT statement does not support a list of columns. The generated SQL now does not issue redundant SELECT statements.

SQL Adapters: Support for SET HOLDATTR for Formats SAME_DB and SQL_SCRIPT

The SET HOLDATTR command propagates TITLE and DESCRIPTION attributes from a source Master File to a HOLD Master File. This command is now supported for formats SQL_SCRIPT and SAME_DB.

Example: Propagating TITLE and DESCRIPTION Attributes to a HOLD File in Format SQL_SCRIPT

The following request propagates TITLE and DESCRIPTION attributes to a HOLD file generated as format SQL_SCRIPT.

```
APP HOLD ibisamp
SET HOLDATTR=ON
TABLE FILE wf_retail_lite
SUM BUSINESS_REGION STATE_PROV_CODE_ISO_3166_2
BY BUSINESS_REGION NOPRINT
BY STATE_PROV_CODE_ISO_3166_2 NOPRINT
WHERE BUSINESS_REGION EQ 'North America' OR 'EMEA'
WHERE STATE_PROV_CODE_ISO_3166_2 EQ 'AR' OR 'IA' OR 'KS' OR 'KY'
OR 'WY' OR 'CT' OR 'MA' OR '04' OR '11' OR '14' OR 'NJ'
OR 'NY' OR 'RI'
ON TABLE HOLD AS HOLDATTR2 FORMAT SQL_SCRIPT
END
```

The generated Master File, holdattr2.mas follows. The TITLE and DESCRIPTION attributes were propagated from the wf_retail_lite Master File.

```
FILENAME=HOLDATTR2, SUFFIX=DATREC , IOTYPE=BINARY, $
SEGMENT=HOLDATTR, SEGTYPE=S0, $
FIELDNAME=BUSINESS_REGION, ALIAS=E01, USAGE=A15V, ACTUAL=A15V,
MISSING=ON,
TITLE='Customer,Business,Region', DESCRIPTION='Business Region', $
FIELDNAME=STATE_PROV_CODE_ISO_3166_2, ALIAS=E02, USAGE=A5V,
ACTUAL=A5V, MISSING=ON,
TITLE='Customer,State,Province,ISO-3166-2,Code', DESCRIPTION='The
ISO-3166-2 Code for the State or Province', $
FIELDNAME=NULLFLAG, ALIAS=__NULLFLAG__, USAGE=A2, ACTUAL=A2B,
ACCESS_PROPERTY=(INTERNAL), $
```


SQL Adapters: Optimization of Simplified Statistical Functions

Simplified statistical functions can now be optimized to SQL for those adapters that support statistical functions. To determine which adapters support optimization of the simplified statistical functions, run the SQL Optimization Report from the Web Console Connect to Data page.

Adapter for Microsoft SQL Server OLE DB: Additional Connection String

The configuration page for the Adapter for Microsoft SQL Server OLE DB now has a text box for adding additional connection keywords.

Adapter for MongoDB: Support for Connector for Business Intelligence JDBC Adapter

Support has been added for the MongoDB Enterprise Server, with the Business Intelligence Connector that provides SQL access to data and added view support in MongoDB with a MySQL client and JDBC Driver. The Business Intelligence Connector is distributed by MongoDB and supports Version 3.4 and up of MongoDB. This new adapter replaces the Adapter for MongoDB available in prior releases.

Adapter for Oracle: Support for Version 18c

The Adapter for Oracle now has support for Version 18c.

Adapter for Snowflake Cloud Data Warehouse

The Adapter for Snowflake Cloud Data Warehouse is new in this release. It can be found in the SQL category.

This adapter accesses data stored in the Snowflake Cloud through SQL query operations.

While Snowflake provides both ODBC and JCBC drivers, in the initial release, only the JDBC version is certified and provides Extended Bulk Load functionality.

Adapter for Stratio Crossdata

A new adapter for Crossdata provides access to data using the Stratio JDBC driver. This adapter is in the SQL category.

OLAP Adapters

This section contains descriptions of features for OLAP adapters.

Adapter for Microsoft SQL Server Analysis Services Tabular Data Model

The Adapter for Microsoft SQL Server Analysis Services Tabular Data Model is new in this release. It can be found under OLAP adapters on the New Adapter drop-down list.

The adapter provides access to Analysis Services data sources that are deployed using the Microsoft SQL Server Analysis Services Tabular protocol, whose underlying architecture is an in-memory columnar database. The main metadata object of a Tabular database is a Model, which is a set of joined tables. A Perspective is a subset of a model.

Note that the Adapter for Microsoft SQL Server Analysis Services Tabular Data Model is for use only with Analysis Services data sources that are deployed in tabular mode. For access to Analysis Services data sources that are deployed in Multidimensional mode, use the Adapter for SQL Server Analysis Services (SSAS) available in prior releases.

The underlying language, Data Analysis Expressions (DAX), is radically different from the Multidimensional Expressions (MDX) language used with the multidimensional model.

Data within the model is not pre-aggregated, as it is with the multidimensional cube. A tabular model always contains tables and columns, while OLAP elements (such as measures, KPIs, and hierarchies) are optional. When you generate a synonym for a tabular model or perspective, the synonym describes tables as segments and columns (as well as optional measures and KPIs) as fields. If the model contains hierarchies, their structure is reflected in the synonym by properly organizing the fields that describe hierarchy levels. WebFOCUS requests against these synonyms are similar to requests against a relational data source in the sense that DAX queries generated by the adapter reference tables and columns rather than cubes and their OLAP elements (such as dimension attributes), and data selection is expressed in terms of filter predicates rather than sets of dimension members.

ERP Adapters

This section describes new features for ERP adapters.

Adapter for Salesforce.com: Support for Bulk Retrieval

In prior releases, the Adapter for Salesforce.com used a REST API to issue SOQL (Salesforce Object Query Language) commands to retrieve data. This technique is acceptable for direct reporting against Salesforce or for migrating modest data volumes.

However, Salesforce.com recommends using the BULK API capability *bulk query* to efficiently query large data sets and reduce the number of API requests

Bulk Query can now be enabled from the settings panel for the adapter under *Bulk Services* by selecting ON from the new BULKQUERY pull-down menu. Additional options allow you to enable PK (Primary Key) chunking and to set the chunk size.

Bulk query can also be enabled or disabled with the following command:

```
ENGINE SFDC SET BULKQUERY {ON|OFF}
```

When this option is selected, queries that meet the salesforce.com requirements (such as no aggregation) use bulk query.

To extract extremely large data sets, the Bulk API capability *PK Chunking* can be enabled with the following command:

```
ENGINE SFDC SET PKCHUNKING {ON|OFF}
```

When this option is enabled, the Primary Key of the object is used to retrieve data in chunks, allowing retrieval of larger data volumes.

When PK chunking is enabled, the chunk size can be set using the following command:

```
ENGINE SFDC SET PKCHUNKSIZE {n|100000}
```

where:

n

Where *n* is an integer between zero (0) and 250000. When PKCHUNKSIZE is set to zero or not set, the default chunk size (100,000) is used.

Procedures Adapters

This section provides descriptions of new features for procedures adapters.

OAuth 2.0 Authentication Support for the Adapter for REST

The OAuth 2.0 authentication protocol for granting access to REST APIs is now supported for the Adapter for REST.

Prior to configuring OAuth 2.0 authentication, developers must establish the development environment for the application to obtain the client ID and client secret used for grant authorization code and grant client credentials.

The Adapter for REST is under Procedures on the New Datasource drop-down list of the Web Console Connect to Data page. Right-click the adapter and click *Configure*.

The configuration parameters are shown in the following image.

The screenshot shows a configuration window titled "Connect parameters". It contains several input fields and dropdown menus. The "Connection Name" field is pre-filled with "CON01". The "Base Url" field is empty, with a sample URL "http://search.twitter.com/" provided. The "Security" dropdown is set to "OAuth", and the "OAuth Grant Type" dropdown is set to "Client Credentials". The "Chained Authentication" checkbox is unchecked. The "Client ID", "Client Secret", and "Token URL" fields are empty. Below the "Connect parameters" section is a section titled "Advanced HTTP connection options", which is currently collapsed. Underneath is an "Environment" section with a "Select profile" dropdown and a text input field with the placeholder "(type in a new one or select one from the list)". At the bottom of the window are three buttons: "Back", "Configure", and "Test".

Enter or select values for the following parameters.

Connection Name

Is the logical name used to identify this particular set of connection attributes. The default is CON01.

Base URL

Is the part of the URL that is common for calling the various functions within a specific REST API.

Security

Select *OAuth* from the Security drop-down list.

The OAuth Grant Type drop-down list appears.

OAuth Grant Type

Can be one of the following three grant types.

☐ **Authorization Code.**

This is used for obtaining an Access Token and Refresh Token using an Authorization Code returned from an Authorization request. The Access Token is automatically renewed using the configured Refresh Token when a request is run.

- ❑ **Client Credentials.** This is used when the OAuth implementation requires only a Client ID and Client Secret. Once it is selected, the Client ID, Client Secret, and Token URL fields appear. The values for these fields come from the application development environment created as a prerequisite to configuring the adapter. For example, OAuth configuration for the Twitter API is done through the Twitter Developers environment accessed from <https://developer.twitter.com>.
- ❑ **Password.** This is used when the OAuth implementation requires only a User ID and Password

The relevant parameters display when you select the Grant Type. Enter or select values for the relevant parameters. The list of OAuth parameters follows.

Service Provider

Is the web service provider. Select *custom*.

Service URL

Is the URL to the web service when not configured as a REST adapter connection.

Client ID

Is the Client ID provided by the OAuth implementation of the application being accessed.

Client Secret

Is the Client Secret provided by the OAuth implementation of the application being accessed.

Authorization URL

Is the URL used for OAuth authorization to a specific application.

For example, the Authorization URL for the Google set of APIs is <https://accounts.google.com/o/oauth2/auth>.

Token URL

Is the URL used for obtaining an Access Token to a specific application using the Authorization Code obtained from the OAuth Authorization request.

For example, the Token URL for the Google set of APIs is <https://accounts.google.com/o/oauth2/token>.

Additional Authentication Parameters

Are additional parameters needed for the OAuth Authorization request to a specific application.

Additional Token Parameters

Are additional parameters needed for the OAuth Token request to a specific application.

Access Token

Is the Access Token returned from the OAuth Token request.

Refresh Token

Is the Refresh Token returned from the OAuth Token request.

User

Is the user ID used to perform OAuth authentication using the Authorization URL.

Password

Is the password used to perform OAuth authentication using the Authorization URL.

When you have configured the OAuth authentication parameters, click *Test* to test the connection.

When the test shows that the connection is configured correctly, click *Configure*.

Adapter for REST: Support for an XML String in a GET Request Parameter

An XML string that is constructed from WHERE statements can now be passed as a parameter value in a GET request for those web services that need to pass XML strings within a query parameter of a GET request.

Sequential and Indexed Adapters

This section provides new feature descriptions for sequential and indexed adapters.

Adapter for Delimited Files: Skip Rows Before Header

When you upload or create a synonym for a delimited file, you can indicate that a header row exists that provides column names. Sometimes, delimited files have other rows above the header row. These rows may be blank or may contain general heading information that do not provide attributes that should be included in the synonym. The synonym creation parameters screen for delimited files now provides an option for indicating the number of rows that need to be skipped before the header row, as shown in the following image.

Create Synonym for Delimited Files (CSV/TAB)

?

Scan All rows

☐

?

Header row

☒

?

Number of first rows to skip

?

Field Delimiter

,(comma)

(Select or type in a delimiter)

?

Field Enclosure

"(double quote)

(Select or type in an enclosure)

?

CODEPAGE

1252 - Windows (Latin 1) - Server Default

(Select file codepage)

?

CDN

OFF - Server Default

(Select file Continental Decimal Notation)

Enter the number of rows to skip in the field labeled *Number of first rows to skip*.

For example, in the following image, the header row is row 5.

	A	B	C	D	E	F
1	Data Source	World Development Indicators				
2						
3	Last Updated	8/28/2018				
4						
5	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961
6	Aruba	ABW	Population, total	SP.POP.TOTL	54211	55438
7	Afghanistan	AFG	Population, total	SP.POP.TOTL	8996351	9166764
8	Angola	AGO	Population, total	SP.POP.TOTL	5643182	5753024
9	Albania	ALB	Population, total	SP.POP.TOTL	1608800	1659800
10	Andorra	AND	Population, total	SP.POP.TOTL	13411	14375
11	Arab World	ARB	Population, total	SP.POP.TOTL	92490932	95044497
12	United Arab Emirates	ARE	Population, total	SP.POP.TOTL	92634	101078
13	Argentina	ARG	Population, total	SP.POP.TOTL	20619075	20953077
14	Armenia	ARM	Population, total	SP.POP.TOTL	1874120	1941491
15	American Samoa	ASM	Population, total	SP.POP.TOTL	20013	20486

Entering 4 in the Number of first rows to skip field adds the following attribute in the Access File.

`SKIP_ROWS=4`

This number is used both when creating the synonym and reading the data. The *Show File* option that is available when creating a synonym now shows all lines, including blank lines, to aid you in determining how many lines should be skipped.

Adapter for Excel: Creating a Synonym for Crosstabbed Data

Synonyms can now be automatically created in a crosstab format for data in Excel Worksheets.

When you create a synonym using the Adapter for Excel, there is now a check box labeled Crosstab for each Worksheet, as shown in the following image.

Select the Excel worksheet(s) to upload by selecting the corresponding checkbox(s).

Create Synonym for Excel

? Scan All rows

☐

? Number of header rows

1

(Enter number of topmost rows containing column headers)

Advanced

Customize data type mappings

Workbook: ibisamp/retail_cross.xlsx

<input type="checkbox"/> Default Name (editable)	Worksheet Name	Named Range	Rows/Columns	Crosstab	Multiple Measures
<input checked="" type="checkbox"/> sheet1	Sheet1		93/22	<input type="checkbox"/>	<input checked="" type="checkbox"/>

When selected, the header rows, up to the number specified, are un-pivoted to become data values.

The following shows a partial Excel Spreadsheet open in the Data Management Console. The headers include Product Category, a value for Product Category, Product Subcategory, and a value for Product Subcategory.

LOOPBACK: Related									
	ROWID	REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX	FIELD_2	FIELD_3	FIELD_4	FIELD_5	FIELD_6	FIELD_7	FIELD_8
1	2	.	Product,Category	.	.	.	.	.	.
2	3	.	Accessories	.	.	Camcorder	.	.	Computers
3	4	.	Product,Subcategory	.	.	.	.	.	.
4	5	.	Charger	Headphones	Universal Remote Controls	Handheld	Professional	Standard	Smartphone
5	6	Store Name	.	.	.	.	.	.	.
6	7	Amsterdam	2724	5738	4471	6276	339	4649	4881
7	8	Anchorage	575	1269	966	1309	72	1039	1169
8	9	Arlington	420	857	750	1037	67	774	849
9	10	Athens	39	81	47	98	4	65	47
10	11	Atlanta	820	1708	1356	1923	97	1475	1674
11	12	Bangalore	79	187	144	196	7	168	121
12	13	Bangkok	1	3	4	8	2	20	7
13	14	Barcelona	92	239	145	204	10	164	130
14	15	Beijing	3	12	7	11	.	8	2
15	16	Belfast	1	6	5	2	.	6	1
16	17	Berlin	2477	5286	4370	6118	292	4558	4901
17	18	Boise	163	249	182	305	18	229	205
18	19	Boston	397	1022	723	1026	55	771	899

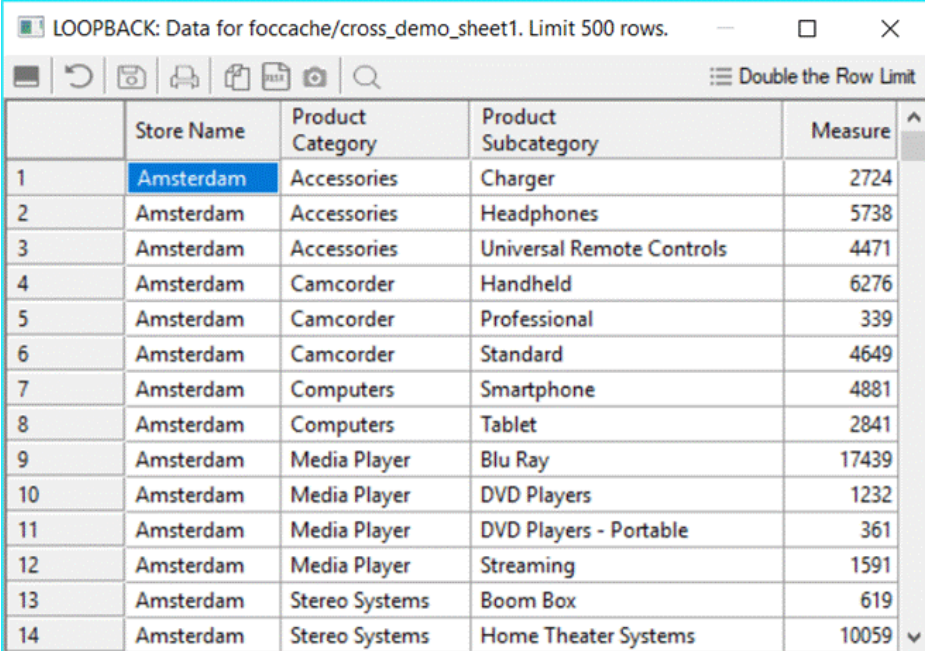
With Crosstab not checked, the resulting Master File has a field for column on the Spreadsheet. The following is a partial list of fields for the Spreadsheet:

```

FIELDNAME=PRODUCT_CATEGORY_ACCESSORIES_PRODUCT_SUBCATEGORY,
ALIAS='Product,Category_Accessories_Product,Subcategory', USAGE=A8V,
ACTUAL=A8V,
    MISSING=ON,
    TITLE='Product,Category_Accessories_Product,Subcategory', $
FIELDNAME=FIELD_3, ALIAS=FIELD_3, USAGE=A12V, ACTUAL=A12V,
    MISSING=ON,
    TITLE='FIELD_3', $
FIELDNAME=FIELD_4, ALIAS=FIELD_4, USAGE=A31V, ACTUAL=A31V,
    MISSING=ON,
    TITLE='FIELD_4', $
FIELDNAME=CAMCORDER, ALIAS=Camcorder, USAGE=A10V, ACTUAL=A10V,
    MISSING=ON,
    TITLE='Camcorder', $
FIELDNAME=FIELD_6, ALIAS=FIELD_6, USAGE=A15V, ACTUAL=A15V,
    MISSING=ON,
    TITLE='FIELD_6', $
FIELDNAME=FIELD_7, ALIAS=FIELD_7, USAGE=A10V, ACTUAL=A10V,
    MISSING=ON,
    TITLE='FIELD_7', $
FIELDNAME=COMPUTERS, ALIAS=Computers, USAGE=A12V, ACTUAL=A12V,
    MISSING=ON,
    TITLE='Computers', $
FIELDNAME=FIELD_9, ALIAS=FIELD_9, USAGE=A7V, ACTUAL=A7V,
    MISSING=ON,
    TITLE='FIELD_9', $
FIELDNAME=MEDIA_PLAYER, ALIAS='Media Player', USAGE=A8V, ACTUAL=A8V,
    MISSING=ON,
    TITLE='Media Player', $

```

With Crosstab checked, multiple measures unchecked, and five header rows specified, PRODUCT_CATEGORY becomes one dimension field, PRODUCT_SUBCATEGORY becomes a second dimension field, and the numeric values in the Spreadsheet become a measure field. The first column (containing store names) becomes an alphanumeric field. For example:



	Store Name	Product Category	Product Subcategory	Measure
1	Amsterdam	Accessories	Charger	2724
2	Amsterdam	Accessories	Headphones	5738
3	Amsterdam	Accessories	Universal Remote Controls	4471
4	Amsterdam	Camcorder	Handheld	6276
5	Amsterdam	Camcorder	Professional	339
6	Amsterdam	Camcorder	Standard	4649
7	Amsterdam	Computers	Smartphone	4881
8	Amsterdam	Computers	Tablet	2841
9	Amsterdam	Media Player	Blu Ray	17439
10	Amsterdam	Media Player	DVD Players	1232
11	Amsterdam	Media Player	DVD Players - Portable	361
12	Amsterdam	Media Player	Streaming	1591
13	Amsterdam	Stereo Systems	Boom Box	619
14	Amsterdam	Stereo Systems	Home Theater Systems	10059

The resulting Master File follows:

```
FILENAME=RETAIL_CROSS_CROSS_ON, SUFFIX=DIREXCEL,
DATASET=ibisamp/retail_cross.xlsx, BV_NAMESPACE=OFF, $
SEGMENT=RETAIL_CROSS_CROSS_ON, SEGTYPE=S0, $
  FIELDNAME=DHL1, ALIAS=DHL1, USAGE=A20V, ACTUAL=A20V,
  MISSING=ON,
  TITLE='DHL1', $
  FIELDNAME=DVL1_PRODUCT_CATEGORY, ALIAS='Product,Category',
  USAGE=A20V, ACTUAL=A20V,
  MISSING=ON,
  TITLE='Product,Category', $
  FIELDNAME=DVL2_PRODUCT_SUBCATEGORY, ALIAS='Product,Subcategory',
  USAGE=A31V, ACTUAL=A31V,
  MISSING=ON,
  TITLE='Product,Subcategory', $
  FIELDNAME=REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX,
  ALIAS='Report retail/wf_retail_lite_rpt.fex',
  USAGE=I9, ACTUAL=A11V,
  MISSING=ON,
  TITLE='Report retail/wf_retail_lite_rpt.fex', $
FOLDER=MG_RETAIL_CROSS_CROSS_ON, PARENT=.,
  DV_ROLE=MEASURE,
  DESCRIPTION='Measure Groups', $
FOLDER=RETAIL_CROSS_CROSS_ON, PARENT=MG_RETAIL_CROSS_CROSS_ON,
  DESCRIPTION='Retail_cross_cross_on', $
  FIELDNAME=REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON, $
FOLDER=DIM_RETAIL_CROSS_CROSS_ON, PARENT=.,
  DV_ROLE=DIMENSION,
  DESCRIPTION='Dimensions', $
FOLDER=RETAIL_CROSS_CROSS_ON1, PARENT=DIM_RETAIL_CROSS_CROSS_ON,
  DESCRIPTION='Retail_cross_cross_on', $
  FIELDNAME=DHL1, BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON, $
FOLDER=DVL, PARENT=RETAIL_CROSS_CROSS_ON1,
  DESCRIPTION='DVL', $
  FIELDNAME=DVL1_PRODUCT_CATEGORY,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON,
  DV_ROLE=LEVEL, $
  FIELDNAME=DVL2_PRODUCT_SUBCATEGORY,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON,
  DV_ROLE=LEVEL, $
```

You can now issue a request similar to the following:

```
TABLE FILE RETAIL_CROSS_CROSS_ON
PRINT REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX AS Measure
BY DHL1 AS Store
BY DVL1_PRODUCT_CATEGORY AS Category
BY DVL2_PRODUCT_SUBCATEGORY AS Subcategory
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Partial output is shown in the following image.

<u>Store</u>	<u>Category</u>	<u>Subcategory</u>	<u>Measure</u>
Amsterdam	Accessories	Charger	2724
		Headphones	5738
		Universal Remote Controls	4471
	Camcorder	Handheld	6276
		Professional	339
		Standard	4649
	Computers	Smartphone	4881
		Tablet	2841
	Media Player	Blu Ray	17439
		DVD Players	1232
		DVD Players - Portable	361
		Streaming	1591
	Stereo Systems	Boom Box	619
		Home Theater Systems	10059
		Receivers	3833
		Speaker Kits	6257
		iPod Docking Station	7939
	Televisions	CRT TV	333
		Flat Panel TV	2293
		Portable TV	517
	Video Production	Video Editing	4897
Anchorage	Accessories	Charger	575
		Headphones	1269
		Universal Remote Controls	966
	Camcorder	Handheld	1309
		Professional	72
		Standard	1039
	Computers	Smartphone	1169
		Tablet	962
	Media Player	Blu Ray	3588
		Streaming	343
	Stereo Systems	Home Theater Systems	2191
		Receivers	805
		Speaker Kits	1441
		iPod Docking Station	1651
	Televisions	Flat Panel TV	459
	Video Production	Video Editing	1066

Statistics Adapters

This section contains descriptions of features for statistics adapters.

Python Support

Python is a high-level, easy to use, powerful, interpreted programming language suitable for scripting, as well as complex programming.

The Python standard library, an extensive collection of modules, implements the Python "batteries included" philosophy that gives programmers immediate access to sophisticated and robust capabilities that make it easy to write your own Python functions to be used in WebFOCUS.

The Adapter for Python defines a connection to the Python interpreter for executing user-written Python scripts that generate calculated fields (WebFOCUS Computes). These fields can be used in WebFOCUS Workbooks, WebFOCUS InfoGraphics, charts, reports, dashboards, and WebFOCUS portals.

The Adapter for Python also comes with a collection of statistical functions, implemented in Python, that you can call from WebFOCUS.

Reference: Guidelines for Writing Python Scripts to be Used With WebFOCUS

The following Python script, named `arithmetic_example.py` contains a function named `adder` that adds two numbers and conforms to the requirements described in this section.

```
# arithmetic_example.py

import csv

def adder(csvin, csvout):
    with open(csvin, 'r', newline='') as file_in,\
        open(csvout, 'w', newline='') as file_out:
        fieldnames = ['addition']
        reader = csv.DictReader(file_in, quoting=csv.QUOTE_NONNUMERIC)
        writer = csv.DictWriter(file_out, quoting=csv.QUOTE_NONNUMERIC,
                                fieldnames=fieldnames)
        writer.writeheader()
        for row in reader:
            addition = row['a_number'] + row['another_number']
            writer.writerow({'addition': addition})
```

A Python script must conform to the following requirements in order to be compatible with WebFOCUS.

- ❑ **csv module requirement.** The script must import the csv module because WebFOCUS sends data to the Python script using an automatically generated, temporary .csv file. The name of the file is stored in a global Python variable named `csvin`. The global Python variable `csvout` contains the name of the temporary .csv results file to be returned to WebFOCUS. WebFOCUS sets the values for `csvin` and `csvout`, and they should not be changed by the programmer. The temporary files are removed immediately and cannot be viewed by the user. The format of both files is the same. The default delimiter is a comma (,) and cannot be changed. All non-numeric fields are enclosed in double quotation marks.

The global variables `csvin` and `csvout` are defined by WebFOCUS for reading and writing .csv files.

- ❑ **csvin and csvout format parameter.** The script must open `csvin` and `csvout` with the following format parameter:

```
newline=''
```

If `newline=""` is not specified, newlines embedded inside quoted fields will not be interpreted correctly, and on platforms that use `\r\n` line endings on write, an extra `\r` will be added.

- ❑ **reader and writer format parameter.** The following format parameter should be included in the reader and writer statements, whether you are using reader and writer or DictReader and DictWriter, to enclose non-numeric values in double quotation marks and make it clear which values are numeric (they will be converted to floating point values):

```
quoting=csv.QUOTE_NONNUMERIC
```

This indicates that non-numeric (alphanumeric, text, string, and date) values are enclosed in double quotation marks and that numeric values are not. When `csvin` is read, all WebFOCUS numeric values will be automatically converted to Python floating-point numbers. If the WebFOCUS COMPUTE defines the returned field as integer, the decimal point and any decimal places will be truncated. In the `csvin` file, if a non-numeric field contains the double quotation character, it will be doubled by WebFOCUS. Python will correctly parse this because the `Dialect.doublequote` format parameter of the Python csv module defaults to `True`.

- ❑ **Output.** The function can return multiple output fields. However, each WebFOCUS COMPUTE command can only retrieve a single output field. To retrieve multiple output fields, issue multiple COMPUTE commands. In the call to the PYTHON function, the output argument (the last argument) must match the name of a field in the OUTPUT_DATA segment of the synonym generated for the Python script.

For example, in the following Master File, the output argument is called ADDITION:

```
SEGMENT=OUTPUT_DATA, SEGTYPE=U, PARENT=INPUT_DATA, $
FIELDNAME=ADDITION, ALIAS=addition, USAGE=D7.1,
ACTUAL=STRING, MISSING=ON, TITLE='Addition', $
```

Therefore, the last (output) argument name in the call to PYTHON must be ADDITION:

```
COMPUTE Anyname/I5 = PYTHON(synonym_name, anyarg1, anyarg2, ADDITION);
```

The output written to csvout must be a sequence, for example, a list, even for a single field.

For a list containing a single field, the correct syntax is:

```
writer.writerow([result])
```

The following syntax is incorrect and will return incorrect values for strings and raise an exception for numeric fields:

```
writer.writerow(result)
```

- ❑ **Functions.** The Python script can contain one or more user-defined functions. When the metadata object (synonym) is created for the script, one of these functions must be selected as the starting point for execution of the script. The definition of the user-written function used as the starting point must contain csvin and csvout as the first positional arguments.

Note: Because the Python script will be imported, the following Python programming idiom will be ignored.

```
if __name__ == '__main__':
```

However, including it may be useful for testing outside of WebFOCUS.

- ❑ **Headers.** Using a header record listing the field names (instead of using positional index numbers) is not required in the sample input data file when creating the synonym for the Python script or when sending data to and retrieving data from the Python script. However, using header records, and, therefore, field names, in the Python script makes it more readable. The following syntax shows a sample of how to implement headers. In the csv.DictReader statement, use of a header record is implied:

```
fieldnames = ['addition']
reader = csv.DictReader(file_in, quoting=csv.QUOTE_NONNUMERIC)
writer = csv.DictWriter(file_out, quoting=csv.QUOTE_NONNUMERIC,
                        fieldnames=fieldnames)
writer.writeheader()
```

The recommendation is to use header records in the input and output .csv files. If you use sample data without a header, the field names in the generated metadata will be of the form FIELD_1 through FIELD_n.

The Adapter for Python also comes with a set of predefined statistical Python functions that you can easily invoke in WebFOCUS.

Reference: Prerequisites for Using the Adapter for Python

You can access the complete list of prerequisites when you configure the adapter by right-clicking the adapter name and clicking *Prerequisites*.

In the WebFOCUS Total Access Cloud, Python will be pre-installed and configured, and the required variables will be set.

- ☐ Python must be installed on the same machine as the WebFOCUS Reporting Server, using the same bit size (32 or 64-bit).
- ☐ The Adapter for Python is available on Windows, UNIX, and Linux.
- ☐ The required Python release level is 3.6.x. Do not deselect the pip option in the install.
- ☐ The following packages must be installed in the following order (instructions are on the Prerequisites page):
 - ☐ numpy.
 - ☐ scipy (needs numpy).
 - ☐ scikit-learn (needs both of them and will add additional packages).
 - ☐ pandas.
- ☐ The system variables you may need to set are described on the Prerequisites page for the adapter.

Procedure: How to Configure the Adapter for Python

1. In the Reporting Server Web Console, go to the Connect to Data page by clicking *Connect to Data* on the sidebar.

2. Click *New Datasource* on the menu bar, the right-click *PYTHON*. Note that PYTHON can be found in the Statistics category on the *Available* drop-down list.

The Add PYTHON to Configuration page opens, as shown in the following image.

Add PYTHON to Configuration

? Prerequisites

Connect parameters

? Python Installation Directory Sample: /opt/rh/rh-python36/root/usr (Mandatory - used to locate various software components)

* - Common for all connections of the adapter

Environment

Configure Test

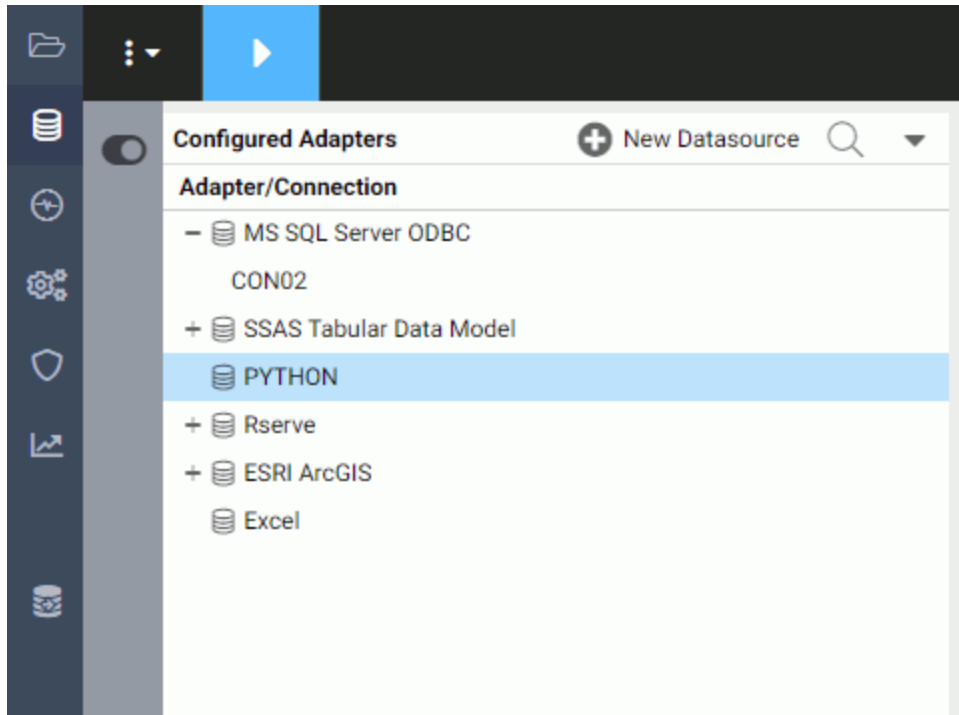
3. Enter the path to your Python installation directory, and click *Test*.

The following message displays for a successful configuration.

`Successful test for the Python environment`

4. Click *Configure*

The Adapter for Python is added to the list of Configured Adapters, as shown in the following image.



***Procedure:* How to Create a Synonym for a Python Function**

Each Python script used with the Adapter for Python must have a synonym (metadata object) that describes the input fields and output fields of the script. If a Python script contains multiple user written functions, and you want to be able to use more than one function within the script as a starting point, you must create a separate synonym for each function within the script.

The synonym will be created using a sample file that contains only the fields that are input parameters for the script. A few rows of sample data are sufficient for the Adapter for Python to determine the appropriate data types and lengths of the parameters. The sample file must be a .csv file. The data in the file does not have to contain actual data, but it should represent the highest values for numeric fields and the longest lengths for alphanumeric values that will appear the actual data. The Master File will contain the list of input fields and output fields. The Access File will contain information about the script file and sample input file.

1. Right-click PYTHON on the list of configured adapters, and click *Create metadata objects* on the context menu.

The Create Synonym for Python frame opens, as shown in the following image.

Note that a metadata object is a synonym. The synonym for a Python function will consist of a Master File (which describes the input fields and output fields needed for running the function) and an Access File (which contains information about the sample data file and the script file).

2. Enter or select values for the following parameters.

PYTHON Script

Is the Python script. Enter an application directory name and script name, or click the ellipsis (...) to navigate to an application directory and select a script, then click *OK*.

The Python script will have the extension .py.

Function Name

Select the name of the (starting) function in the script file for which to create a synonym.

For example, the Python script named `arithmetic_example.py` contains the definition for the function `adder`:

```
def adder(csvin, csvout):
```

Select file with sample input data for the PYTHON Script

Open the file picker (...) to select the application directory and file that contains the sample data for creating the synonym. Click *OK*.

This file is used to determine the field names, data types, and lengths for the data sent to the Python script in *csvin*. If the sample file has no header record, the field names will be *FIELD_1* through *FIELD_n*.

CSV files with header

If the input .csv file does not have a header row, uncheck *Input*. If the output .csv file should not have a header row, uncheck *Output*. The header requirements are contained in the function code.

For example, in the following sample code the input file contains no header record (fieldnames) and the fieldnames object is defined at runtime using the fieldnames argument for the reader. The output file will contain a header record, as defined in the fieldnames argument for the writer, and is written to the file using the statement `writer.writeheader()`:

```
with open(csvin, 'r', newline='') as file_in, \
    open(csvout, 'w', newline='') as file_out:
    reader = csv.DictReader(file_in, fieldnames=['input_field'],
                           quoting=csv.QUOTE_NONNUMERIC)
    writer = csv.DictWriter(file_out, fieldnames=['output_field'],
                           quoting=csv.QUOTE_NONNUMERIC)
    writer.writeheader()
```

Application

Enter the name of the application directory in which to create the synonym, or click the ellipsis (...) to navigate to an application directory, then click *OK*.

Synonym Name

Enter a name for the resulting synonym, or accept the default name.

3. Click the Create Synonym button on the ribbon.

The synonym is created in the specified application directory.

Note: You can generate sample Python scripts and data files in the Reporting Server Web Console. Create an application directory to contain the sample files, right-click the application folder, point to *New*, and click *Tutorials*. On the Tutorials page, select the *WebFOCUS - Retail Demo* tutorial, make sure *Create Python Example* is checked and that *Large* or *Medium* is selected for *Tutorial Data Volume Limit*. Click *Create* to create the demo files.

Syntax: How to Run a User-Written Python Function

```
PYTHON([app/]synonym, input1 [, input2 ...], output)
```

where:

`[app/]synonym`

Is the application and synonym name for the Python script.

`input1 [, input2 ...]`

Are the input arguments.

`output`

Is the output argument. This argument must match the name of a field in the OUTPUT_DATA segment in the Master File.

Example: Running a Python Script

The following is the `arithmetic_example_multiple_computes.py` Python script, which calculates four output fields, ADDITION, SUBTRACTION, MULTIPLICATION, and DIVISION in the function named *arithmetic*. All of the files for this example reside in an application directory named *python*.

```
# arithmetic_example_multiple_computes.py

import csv
import time

def arithmetic(csvin, csvout):

    with open(csvin, 'r', newline='') as file_in,\
        open(csvout, 'w', newline='') as file_out:

        fieldnames = ['addition', 'subtraction',
                      'multiplication', 'division']

        reader = csv.DictReader(file_in, quoting=csv.QUOTE_NONNUMERIC)
        writer = csv.DictWriter(file_out, quoting=csv.QUOTE_NONNUMERIC,
                                fieldnames=fieldnames)
        writer.writeheader()

        for row in reader:
            addition      = row['a_number'] + row['another_number']
            subtraction   = row['a_number'] - row['another_number']
            multiplication = row['a_number'] * row['another_number']
            division      = row['a_number'] / row['another_number']

            writer.writerow({'addition':      addition,
                            'subtraction':    subtraction,
                            'multiplication':  multiplication,
                            'division':       division})
```

The .csv file with the sample data, arithmetic_sample_input.csv, has a header record and two data records to be used to determine the data types and lengths for the input arguments.

```
"a_number", "another_number"
1,1
100000,100000
```

The synonym creation frame for this script is shown in the following image.

Create Synonym for PYTHON

Create Synonym options

? PYTHON Script: python/arithmetic_example_multiple_computes.py ...

? Function Name: arithmetic

? File with sample input data for the PYTHON Script: python/arithmetic_sample_input.csv ...

? CSV files with header: ☒ Input ☒ Output

Customize data type mappings

? Application: bisamp ... ? Prefix: ? Suffix:

? Synonym Name: arithmetic_example_syn

The generated Master File (arithmetic_example_syn.mas) follows:

```
FILENAME=ARITHMETIC_EXAMPLE_SYN, SUFFIX=PYTHON , $
  SEGMENT=INPUT_DATA, SEGTYPE=S0, $
    FIELDNAME=A_NUMBER, ALIAS=a_number, USAGE=I11, ACTUAL=STRING,
      MISSING=ON,
      TITLE='a_number', $
    FIELDNAME=ANOTHER_NUMBER, ALIAS=another_number, USAGE=I11,
  ACTUAL=STRING,
    MISSING=ON,
    TITLE='another_number', $
  SEGMENT=OUTPUT_DATA, SEGTYPE=U, PARENT=INPUT_DATA, $
    FIELDNAME=ADDITION, ALIAS=addition, USAGE=D10.1, ACTUAL=STRING,
      MISSING=ON,
      TITLE='addition', $
    FIELDNAME=SUBTRACTION, ALIAS=subtraction, USAGE=D5.1, ACTUAL=STRING,
      MISSING=ON,
      TITLE='subtraction', $
    FIELDNAME=MULTIPLICATION, ALIAS=multiplication, USAGE=D15.1,
  ACTUAL=STRING,
    MISSING=ON,
    TITLE='multiplication', $
    FIELDNAME=DIVISION, ALIAS=division, USAGE=D5.1, ACTUAL=STRING,
      MISSING=ON,
      TITLE='division', $
```

The generated Access File (arithmetic_example_syn.acx) follows:

```
SEGNAME=INPUT_DATA,
MODNAME=python/arithmetic_example_multiple_computes.py,
FUNCTION=arithmetic,
PYTHON_INPUT_SAMPL=python/arithmetic_sample_input.csv,
INPUT_HEADER=YES,
OUTPUT_HEADER=YES, $
```

The following WebFOCUS procedure, sales_multiple_computes.fex calls the arithmetic function four times in order to get a value returned for each of the four outputs:

```
-* sales_multiple_computes.fex

TABLE FILE GGSales
SUM
  DOLLARS
  UNITS

COMPUTE Addition/D7      = PYTHON(python/arithmetic_example_syn,
                                DOLLARS, UNITS, ADDITION);
COMPUTE Subtraction/D7   = PYTHON(python/arithmetic_example_syn,
                                DOLLARS, UNITS, SUBTRACTION);
COMPUTE Multiplication/D16 = PYTHON(python/arithmetic_example_syn,
                                DOLLARS, UNITS, MULTIPLICATION);
COMPUTE Division/D7.2    = PYTHON(python/arithmetic_example_syn,
                                DOLLARS, UNITS, DIVISION);

WHERE RECORDLIMIT EQ 100
HEADING
  "Arithmetic Example, Multiple Computes"
  " "

ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

Arithmetic Example, Multiple Computes

<u>Dollar Sales</u>	<u>Unit Sales</u>	<u>Addition</u>	<u>Subtraction</u>	<u>Multiplication</u>	<u>Division</u>
1343927	105860	1,449,787	1,238,067	142,268,112,220	12.70

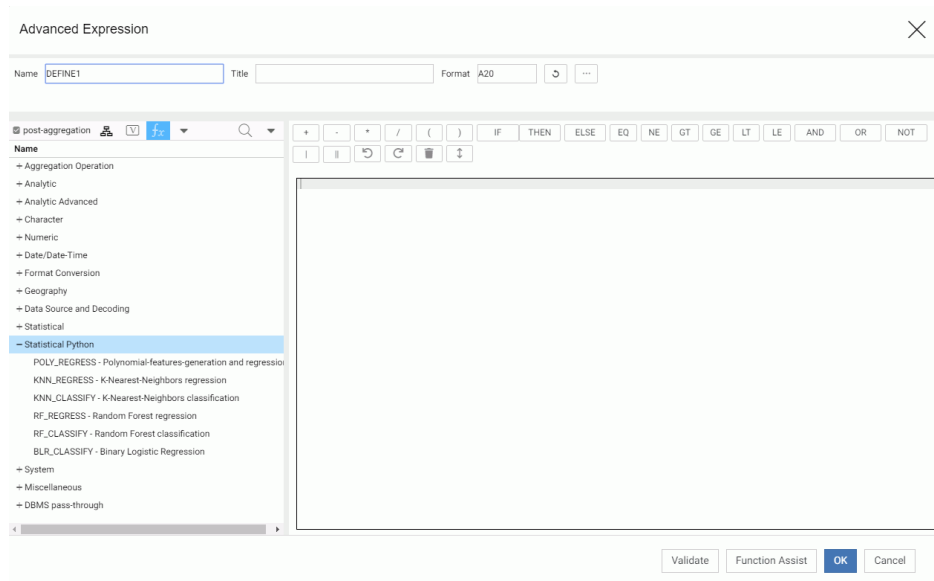
Python Functions Distributed With the Adapter for Python

The following python statistical functions are distributed with the Adapter for Python.

- ☐ BLR_CLASSIFY: Binary Logistic Regression

- ☐ KNN_CLASSIFY: K-Nearest-Neighbors Classification
- ☐ KNN_REGRESS: K-Nearest-Neighbors Regression
- ☐ POLY_REGRESS: Polynomial Regression
- ☐ RF_CLASSIFY: Random Forest Classification
- ☐ RF_REGRESS: Random Forest Regression

In the Reporting Server Synonym Editor, these functions are available when you create an expression. Right-click a measure field, point to *New Expression*, and click *Apply Function* or *Advanced Expression*. Click *post-aggregation* to gain access to the Python Statistical functions, as shown in the following image.



Double-click a function name to add the function to the expression and open a dialog box for entering parameters.

For more information about these functions, see the *Using Functions* manual.

XML Adapters

This section provides new feature descriptions for XML-based adapters.

DataMigrator Enhancements

This section describes the new features for DataMigrator.

DataMigrator represents a broad category of tools designed to facilitate and automate the extraction and integration of data. From source extraction through target load, data is transformed through the application of business rules. Once the transformation is complete, the data is loaded into table structures that have been optimized for a particular application.

For more information on any of these new features, see the *DataMigrator User's Guide*.

Adapters

The following section provides descriptions of new features for adapters.

Adapter for Excel: Creating a Synonym for Crosstabbed Data

Synonyms can now be automatically created in a crosstab format for data in Excel Worksheets.

When you create a synonym using the Adapter for Excel, there is now a check box labeled Crosstab for each Worksheet, as shown in the following image.

Select the Excel worksheet(s) to upload by selecting the corresponding checkbox(s).

Create Synonym for Excel

? Scan All rows ☐

? Number of header rows (Enter number of topmost rows containing column headers)

Advanced

Customize data type mappings

Workbook: ibisamp/retail_cross.xlsx

	Worksheet Name	Named Range	Rows/Columns	Crosstab	Multiple Measures
<input type="checkbox"/> Default Name (editable)					
<input checked="" type="checkbox"/> sheet1	Sheet1		93/22	<input type="checkbox"/>	<input checked="" type="checkbox"/>

When selected, the header rows, up to the number specified, are un-pivoted to become data values.

The following shows a partial Excel Spreadsheet open in the Data Management Console. The headers include Product Category, a value for Product Category, Product Subcategory, and a value for Product Subcategory.

LOOPBACK: Related									
	ROWID	REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX	FIELD_2	FIELD_3	FIELD_4	FIELD_5	FIELD_6	FIELD_7	FIELD_8
1	2	.	Product,Category	.	.	.	.	.	.
2	3	.	Accessories	.	.	Camcorder	.	.	Computers
3	4	.	Product,Subcategory	.	.	.	.	.	.
4	5	.	Charger	Headphones	Universal Remote Controls	Handheld	Professional	Standard	Smartphone
5	6	Store Name	.	.	.	.	.	.	.
6	7	Amsterdam	2724	5738	4471	6276	339	4649	4881
7	8	Anchorage	575	1269	966	1309	72	1039	1169
8	9	Arlington	420	857	750	1037	67	774	849
9	10	Athens	39	81	47	98	4	65	47
10	11	Atlanta	820	1708	1356	1923	97	1475	1674
11	12	Bangalore	79	187	144	196	7	168	121
12	13	Bangkok	1	3	4	8	2	20	7
13	14	Barcelona	92	239	145	204	10	164	130
14	15	Beijing	3	12	7	11	.	8	2
15	16	Belfast	1	6	5	2	.	6	1
16	17	Berlin	2477	5286	4370	6118	292	4558	4901
17	18	Boise	163	249	182	305	18	229	205
18	19	Boston	397	1022	723	1026	55	771	899

With Crosstab not checked, the resulting Master File has a field for column on the Spreadsheet. The following is a partial list of fields for the Spreadsheet:

```
FIELDNAME=PRODUCT_CATEGORY_ACCESSORIES_PRODUCT_SUBCATEGORY,
ALIAS='Product,Category_Accessories_Product,Subcategory', USAGE=A8V,
ACTUAL=A8V,
MISSING=ON,
TITLE='Product,Category_Accessories_Product,Subcategory', $
FIELDNAME=FIELD_3, ALIAS=FIELD_3, USAGE=A12V, ACTUAL=A12V,
MISSING=ON,
TITLE='FIELD_3', $
FIELDNAME=FIELD_4, ALIAS=FIELD_4, USAGE=A31V, ACTUAL=A31V,
MISSING=ON,
TITLE='FIELD_4', $
FIELDNAME=CAMCORDER, ALIAS=Camcorder, USAGE=A10V, ACTUAL=A10V,
MISSING=ON,
TITLE='Camcorder', $
FIELDNAME=FIELD_6, ALIAS=FIELD_6, USAGE=A15V, ACTUAL=A15V,
MISSING=ON,
TITLE='FIELD_6', $
FIELDNAME=FIELD_7, ALIAS=FIELD_7, USAGE=A10V, ACTUAL=A10V,
MISSING=ON,
TITLE='FIELD_7', $
FIELDNAME=COMPUTERS, ALIAS=Computers, USAGE=A12V, ACTUAL=A12V,
MISSING=ON,
TITLE='Computers', $
FIELDNAME=FIELD_9, ALIAS=FIELD_9, USAGE=A7V, ACTUAL=A7V,
MISSING=ON,
TITLE='FIELD_9', $
FIELDNAME=MEDIA_PLAYER, ALIAS='Media Player', USAGE=A8V, ACTUAL=A8V,
MISSING=ON,
TITLE='Media Player', $
```

With Crosstab checked, multiple measures unchecked, and five header rows specified, PRODUCT_CATEGORY becomes one dimension field, PRODUCT_SUBCATEGORY becomes a second dimension field, and the numeric values in the Spreadsheet become a measure field. The first column (containing store names) becomes an alphanumeric field. For example:

LOOPBACK: Data for foccache/cross_demo_sheet1. Limit 500 rows. □ ×

🖨️ ↶ 📁 🖨️ 📄 📷 🔍 ⋮ Double the Row Limit

	Store Name	Product Category	Product Subcategory	Measure
1	Amsterdam	Accessories	Charger	2724
2	Amsterdam	Accessories	Headphones	5738
3	Amsterdam	Accessories	Universal Remote Controls	4471
4	Amsterdam	Camcorder	Handheld	6276
5	Amsterdam	Camcorder	Professional	339
6	Amsterdam	Camcorder	Standard	4649
7	Amsterdam	Computers	Smartphone	4881
8	Amsterdam	Computers	Tablet	2841
9	Amsterdam	Media Player	Blu Ray	17439
10	Amsterdam	Media Player	DVD Players	1232
11	Amsterdam	Media Player	DVD Players - Portable	361
12	Amsterdam	Media Player	Streaming	1591
13	Amsterdam	Stereo Systems	Boom Box	619
14	Amsterdam	Stereo Systems	Home Theater Systems	10059

The resulting Master File follows:

```
FILENAME=RETAIL_CROSS_CROSS_ON, SUFFIX=DIREXCEL,
DATASET=ibisamp/retail_cross.xlsx, BV_NAMESPACE=OFF, $
SEGMENT=RETAIL_CROSS_CROSS_ON, SEGTYPE=S0, $
  FIELDNAME=DHL1, ALIAS=DHL1, USAGE=A20V, ACTUAL=A20V,
  MISSING=ON,
  TITLE='DHL1', $
  FIELDNAME=DVL1_PRODUCT_CATEGORY, ALIAS='Product,Category',
  USAGE=A20V, ACTUAL=A20V,
  MISSING=ON,
  TITLE='Product,Category', $
  FIELDNAME=DVL2_PRODUCT_SUBCATEGORY, ALIAS='Product,Subcategory',
  USAGE=A31V, ACTUAL=A31V,
  MISSING=ON,
  TITLE='Product,Subcategory', $
  FIELDNAME=REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX,
  ALIAS='Report retail/wf_retail_lite_rpt.fex',
  USAGE=I9, ACTUAL=A11V,
  MISSING=ON,
  TITLE='Report retail/wf_retail_lite_rpt.fex', $
FOLDER=MG_RETAIL_CROSS_CROSS_ON, PARENT=.,
  DV_ROLE=MEASURE,
  DESCRIPTION='Measure Groups', $
FOLDER=RETAIL_CROSS_CROSS_ON, PARENT=MG_RETAIL_CROSS_CROSS_ON,
  DESCRIPTION='Retail_cross_cross_on', $
  FIELDNAME=REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON, $
FOLDER=DIM_RETAIL_CROSS_CROSS_ON, PARENT=.,
  DV_ROLE=DIMENSION,
  DESCRIPTION='Dimensions', $
FOLDER=RETAIL_CROSS_CROSS_ON1, PARENT=DIM_RETAIL_CROSS_CROSS_ON,
  DESCRIPTION='Retail_cross_cross_on', $
  FIELDNAME=DHL1, BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON, $
FOLDER=DVL, PARENT=RETAIL_CROSS_CROSS_ON1,
  DESCRIPTION='DVL', $
  FIELDNAME=DVL1_PRODUCT_CATEGORY,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON,
  DV_ROLE=LEVEL, $
  FIELDNAME=DVL2_PRODUCT_SUBCATEGORY,
  BELONGS_TO_SEGMENT=RETAIL_CROSS_CROSS_ON,
  DV_ROLE=LEVEL, $
```

You can now issue a request similar to the following:

```
TABLE FILE RETAIL_CROSS_CROSS_ON
PRINT REPORT_RETAIL_WF_RETAIL_LITE_RPT_FEX AS Measure
BY DHL1 AS Store
BY DVL1_PRODUCT_CATEGORY AS Category
BY DVL2_PRODUCT_SUBCATEGORY AS Subcategory
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Partial output is shown in the following image.

<u>Store</u>	<u>Category</u>	<u>Subcategory</u>	<u>Measure</u>
Amsterdam	Accessories	Charger	2724
		Headphones	5738
		Universal Remote Controls	4471
	Camcorder	Handheld	6276
		Professional	339
		Standard	4649
	Computers	Smartphone	4881
		Tablet	2841
	Media Player	Blu Ray	17439
		DVD Players	1232
		DVD Players - Portable	361
		Streaming	1591
	Stereo Systems	Boom Box	619
		Home Theater Systems	10059
		Receivers	3833
		Speaker Kits	6257
		iPod Docking Station	7939
	Televisions	CRT TV	333
		Flat Panel TV	2293
		Portable TV	517
	Video Production	Video Editing	4897
Anchorage	Accessories	Charger	575
		Headphones	1269
		Universal Remote Controls	966
	Camcorder	Handheld	1309
		Professional	72
		Standard	1039
	Computers	Smartphone	1169
		Tablet	962
	Media Player	Blu Ray	3588
		Streaming	343
	Stereo Systems	Home Theater Systems	2191
		Receivers	805
		Speaker Kits	1441
		iPod Docking Station	1651
	Televisions	Flat Panel TV	459
	Video Production	Video Editing	1066

Adapter for Salesforce.com: Support for Bulk Retrieval

In prior releases, the Adapter for Salesforce.com used a REST API to issue SOQL (Salesforce Object Query Language) commands to retrieve data. This technique is acceptable for direct reporting against Salesforce or for migrating modest data volumes.

However, Salesforce.com recommends using the BULK API capability *bulk query* to efficiently query large data sets and reduce the number of API requests

Bulk Query can now be enabled from the settings panel for the adapter under *Bulk Services* by selecting ON from the new BULKQUERY pull-down menu. Additional options allow you to enable PK (Primary Key) chunking and to set the chunk size.

Bulk query can also be enabled or disabled with the following command:

```
ENGINE SFDC SET BULKQUERY {ON|OFF}
```

When this option is selected, queries that meet the salesforce.com requirements (such as no aggregation) use bulk query.

To extract extremely large data sets, the Bulk API capability *PK Chunking* can be enabled with the following command:

```
ENGINE SFDC SET PKCHUNKING {ON|OFF}
```

When this option is enabled, the Primary Key of the object is used to retrieve data in chunks, allowing retrieval of larger data volumes.

When PK chunking is enabled, the chunk size can be set using the following command:

```
ENGINE SFDC SET PKCHUNKSIZE {n|100000}
```

where:

n

Where *n* is an integer between zero (0) and 250000. When PKCHUNKSIZE is set to zero or not set, the default chunk size (100,000) is used.

Adapter for Snowflake Cloud Data Warehouse

The Adapter for Snowflake Cloud Data Warehouse is new in this release. It can be found in the SQL category.

This adapter accesses data stored in the Snowflake Cloud through SQL query operations.

While Snowflake provides both ODBC and JCBC drivers, in the initial release, only the JDBC version is certified and provides Extended Bulk Load functionality.

Adapter for Stratio Crossdata

A new adapter for Crossdata provides access to data using the Stratio JDBC driver. This adapter is in the SQL category.

Calculators

The following section provides descriptions of new features for calculators.

Additional Aggregate Functions Available

Two additional aggregate functions, Median and Mode, are now available from the Data Management Console. The functions can be found in the Aggregate drop-down menu for the Column Selection dialog box. To access this dialog box, right-click the SQL object in a flow and click *Column Selection*.

GET_TOKEN Function Now Available

The GET_TOKEN function is now available from the Data Management Console calculators.

GET_TOKEN extracts a token (substring) based on a string that can contain multiple characters, each of which represents a single-character delimiter.

GET_TOKEN can be optimized if there is a single delimiter character, not a string containing multiple delimiter characters.

INITCAP Function Now Available

The INITCAP function is now available from the Data Management Console calculators. INITCAP capitalizes the first letter of each word in an input string and makes all other letters lowercase. A word starts at the beginning of the string, after a blank space or after a special character.

New FOCUS Functions

Two FOCUS functions, COALESCE and NULLIF, are now available in calculators in the Data Management Console.

COALESCE evaluates the arguments in order and returns the first argument that is not MISSING. NULLIF returns a missing value when its parameters are equal. If they are not equal, it returns the first value.

Data Management Console

The following section provides descriptions of new features for the Data Management Console (DMC).

Data and Process Flows

The following section provides descriptions of new features for data and process flows.

Formatted Files With Excel Format Now Use .XLSX

As of Release 7709, DataMigrator customers that create a formatted file with a specified format of EXL2K (excel) can now create Excel files in the .xlsx format that is found in Excel 2007 and later. You can create an Excel worksheet by adding a new target to a data flow, selecting Formatted File as the adapter, and selecting EXL2K from the Format drop-down menu.

Enhancements to Join Profiling

As of Release 7709, along with the Join Profiling report option, there is a new Join Profiling Chart available. This chart shows a horizontal bar chart that represents the number of rows that would be returned from each table when a Left Outer, Right Outer, and Inner Join is run. You can access this new chart by clicking the *Join Editor* button in the Join Editor dialog box

Data Profiling

The following section provides descriptions of new features for data profiling.

Reporting

The following section provides descriptions of new features for reporting.

Resource Analyzer and Resource Governor Enhancements

This section describes the new features for Resource Analyzer.

Resource Analyzer provides Information Systems (IS) organizations with the ability to manage the growing volume and unpredictable nature of ad hoc data access.

Resource Governor controls monitoring, system configuration parameters, and governing rules. It provides preemptive governing for requests issued to both relational and non-relational data sources.

Together, Resource Analyzer and its partner product, Resource Governor, are designed specifically to help IS organizations analyze and control end user data access.

New Audit Report

A new audit report, entitled ACI Summary, has been added to Resource Management. This report provides information about changes to server configuration files and user application files. You can run the report based on user name, the type of file access allowed, and by file category. The ACI Summary report can be accessed by expanding the *Reports* folder in your Resource Management environment and running *ACI Monitoring*.

New Repository Load Type Options

Resource Management now allows you to indicate the load method that will be used to add log data to the data repository. This new setting lets you choose between loading data into a temporary on your RDBMS server using the connection adapter that was selected for the repository via either an available bulk load utility, or the TABLE command. After the data is loaded into the temporary table, regardless of which method is used, the MERGE command is used to merge the data from the temporary table into the data repository. This option is set while configuring your Resource Management environment, and is accessed from the Configure Resource Management pane.

New Scheduling Report Option

Resource Management now allows you to schedule a report to run and be automatically distributed. You can schedule the report to run at various intervals, ranging from just once to recurring on specific days. Once a scheduled report is run, you have the ability to either download or view the report content. This option is accessed by right-clicking any report and pointing to *Schedule and E-Mail*.

Reporting Language Enhancements

WebFOCUS is a complete information control system with comprehensive features for retrieving and analyzing data. It enables you to create reports quickly and easily. It also provides facilities for creating highly complex reports, but its strength lies in the simplicity of the request language. You can begin with simple queries and progress to complex reports as you learn about additional facilities.

Expanded Functionality With BY TOTAL and ACROSS

The BY TOTAL phrase is now supported for a calculated value (generated using the COMPUTE command) in a request that contains an ACROSS phrase.

Example: Using BY TOTAL on a Calculated Value With an ACROSS Phrase

The following request creates the calculated value PROFIT and uses it in the BY TOTAL phrase. The request also has an ACROSS RATING phrase.

```
TABLE FILE MOVIES
SUM LISTPR WHOLESALPR
COMPUTE
PROFIT = LISTPR - WHOLESALPR;
BY CATEGORY
BY TOTAL PROFIT
ACROSS RATING
WHERE RATING NE 'NR' OR 'R'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *GRID = OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

CATEGORY	PROFIT	RATING		PG		PG13		PROFIT	
		LISTPR	WHOLESALEPR	LISTPR	WHOLESALEPR	LISTPR	WHOLESALEPR		
ACTION	13.92	.	.	.	34.90	20.98	13.92	.	.
CHILDREN	47.40	101.89	54.49	47.40	.	.	.	.	.
CLASSIC	48.96	89.95	40.99	48.96	.	.	.	.	.
COMEDY	58.12	.	.	.	74.83	46.70	28.13	59.99	30.00
FOREIGN	64.63	19.98	13.25	6.73	119.90	62.00	57.90	.	.
MUSICALS	25.93	29.95	15.00	14.95	19.98	13.99	5.99	14.98	9.99
MYSTERY	32.94	.	.	.	39.96	18.00	21.96	19.98	9.00
SCI/FI	18.94	.	.	.	.	.	.	54.93	35.99

COALESCE: Returning the First Non-Missing Value

Given a list of arguments, COALESCE returns the value of the first argument that is not missing. If all argument values are missing, it returns a missing value if MISSING is ON. Otherwise it returns a default value (zero or blank).

Syntax: How to Return the First Non-Missing Value

```
COALESCE(arg1, arg2, ...)
```

where:

```
arg1, arg2, ...
```

Any field, expression, or constant. The arguments should all be either numeric or alphanumeric.

Are the input parameters that are tested for missing values.

The output data type is the same as the input data types.

Example: Returning the First Non-Missing Value

This example uses the SALES data source with missing values added. The missing values are added by the following procedure named SALEMISS:

```
MODIFY FILE SALES
  FIXFORM STORE/4 DATE/5 PROD/4
  FIXFORM UNIT/3 RETAIL/5 DELIVER/3
  FIXFORM OPEN/3 RETURNS/C2 DAMAGED/C2
  MATCH STORE
    ON NOMATCH REJECT
    ON MATCH CONTINUE
  MATCH DATE
    ON NOMATCH REJECT
    ON MATCH CONTINUE
  MATCH PROD_CODE
    ON NOMATCH INCLUDE
    ON MATCH REJECT
DATA
14Z 1017 C13 15 1.99 35 30 6
14Z 1017 C14 18 2.05 30 25 4
14Z 1017 E2 33 0.99 45 40
END
```

The following request uses COALESCE to return the first non-missing value:

```
TABLE FILE SALES
PRINT DAMAGED RETURNS RETAIL_PRICE
COMPUTE
COAL1/D12.2 MISSING ON = COALESCE(DAMAGED, RETURNS, RETAIL_PRICE);
BY STORE_CODE
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. The value of DAMAGED is returned, if it is not missing. If DAMAGED is missing, the value of RETURNS is returned, if it is not missing. If they are both missing, the value of RETAIL_PRICE is returned.

<u>STORE CODE</u>	<u>DAMAGED</u>	<u>RETURNS</u>	<u>RETAIL PRICE</u>	<u>COAL1</u>
14B	6	10	\$.95	6.00
	3	3	\$1.29	3.00
	1	2	\$1.89	1.00
	0	3	\$1.99	.00
	4	5	\$2.39	4.00
	0	0	\$2.19	.00
	4	9	\$.99	4.00
	9	8	\$1.09	9.00
14Z	3	2	\$.85	3.00
	1	2	\$1.89	1.00
	1	0	\$1.99	1.00
	6	.	\$1.99	6.00
	.	4	\$2.05	4.00
	0	0	\$2.09	.00
	2	3	\$2.09	2.00
	7	4	\$.89	7.00
77F	.	.	\$.99	.99
	2	4	\$1.09	2.00
	1	1	\$2.09	1.00
K1	0	0	\$2.49	.00
	0	1	\$1.49	.00
	1	1	\$.99	1.00

FPRINT: Displaying a Value in a Specified Format

Given an output format, the simplified conversion function FPRINT converts a value to alphanumeric format for display in that format.

Note: A legacy FPRINT function also exists and is still supported. The legacy function has an additional argument for the name or format of the returned value.

Syntax: **How to Display a Value in a Specified Format**

```
FPRINT(value, 'out_format')

```

where:

value

Any data type

Is the value to be converted.

'out_format'

Fixed length alphanumeric

Is the display format.

Example: **Displaying a Value in a Specified Format**

The following request displays COGS_US as format 'D9M', and TIME_DATE as format 'YYMtrD', by converting them to alphanumeric using FPRINT.

```
DEFINE FILE WF_RETAIL_LITE
COGS_A/A25 = FPRINT(COGS_US, 'D9M');
DATE1/A25 = FPRINT(TIME_DATE, 'YYMtrD');
END
TABLE FILE WF_RETAIL_LITE
PRINT LST.COGS_US COGS_A DATE1
BY TIME_DATE
WHERE RECORDLIMIT EQ 10
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

The output is shown in the following image.

<u>Sale</u>	<u>LST</u>		
<u>Date</u>	<u>Cost of Goods</u>	<u>COGS_A</u>	<u>DATE1</u>
01/03/2009	\$234.00	\$234	2009, January 3
	\$46.00	\$46	2009, January 3
	\$380.00	\$380	2009, January 3
	\$374.00	\$374	2009, January 3
	\$310.00	\$310	2009, January 3
	\$83.00	\$83	2009, January 3
	\$312.00	\$312	2009, January 3
	\$548.00	\$548	2009, January 3
	\$400.00	\$400	2009, January 3
	\$131.00	\$131	2009, January 3

COMPACTFORMAT: Displaying Numbers in an Abbreviated Format

COMPACTFORMAT displays numbers in a compact format where:

- ☐ K is an abbreviation for thousands.
- ☐ M is an abbreviation for millions.
- ☐ B is an abbreviation for billions.
- ☐ T is an abbreviation for trillions.

COMPACTFORMAT computes which abbreviation to use, based on the order of magnitude of the largest value in the column. The returned value is an alphanumeric string. Attempting to output this value to a numeric format will result in a format error, and the value zero (0) will be displayed.

Syntax: How to Display Numbers in an Abbreviated Format

`COMPACTFORMAT(input)`

where:

input

Is the name of a numeric field.

Example: Displaying Numbers in an Abbreviated Format

The following example uses the COMPACTFORMAT function to abbreviate the display of the summed values of the DAYSDELAYED, QUANTITY_SOLD, and COGS_US fields.

```
TABLE FILE WF_RETAIL_LITE
SUM DAYSDELAYED QUANTITY_SOLD COGS_US
COMPUTE
CDAYS/A30= COMPACTFORMAT(DAYSDELAYED);
CQUANT/A30= COMPACTFORMAT(QUANTITY_SOLD);
CCOGS/A30= COMPACTFORMAT(COGS_US);
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>Days</u> <u>Delayed</u>	<u>Quantity</u> <u>Sold</u>	<u>Cost of Goods</u>	<u>CDAYS</u>	<u>CQUANT</u>	<u>CCOGS</u>
5,355	13,923	\$2,950,358.00	5,355	14K	\$3M

GET_TOKEN: Extracting a Token Based on a String of Delimiters

GET_TOKEN extracts a token (substring) based on a string that can contain multiple characters, each of which represents a single-character delimiter.

GET_TOKEN can be optimized if there is a single delimiter character, not a string containing multiple delimiter characters.

Syntax: How to Extract a Token Based on a String of Delimiters

```
GET_TOKEN(string, delimiter_string, occurrence)
```

where:

string

Alphanumeric

Is the input string from which the token will be extracted. This can be an alphanumeric field or constant.

delimiter_string

Alphanumeric constant

Is a string that contains the list of delimiter characters. For example, ';' contains three delimiter characters, semi-colon, blank space, and comma.

occurrence

Integer constant

Is a positive integer that specifies the token to be extracted. A negative integer will be accepted in the syntax, but will not extract a token. The value zero (0) is not supported.

Example: **Extracting a Token Based on a String of Delimiters**

The following request defines an input string and two tokens based on a list of delimiters that contains the characters comma (,), semicolon (;), and slash (/).

```
DEFINE FILE EMPLOYEE
InputString/A20 = 'ABC,DEF;GHI/JKL';
FirstToken/A20 WITH DEPARTMENT = GET_TOKEN(InputString, ',;/', 1);
FourthToken/A20 WITH DEPARTMENT = GET_TOKEN(InputString, ',;/', 4);
ENDTABLE FILE EMPLOYEE
PRINT InputString FirstToken FourthToken
WHERE READLIMIT EQ 1
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID = OFF,$
END
```

The output is shown in the following image. The first token was extracted using the comma (,) as the delimiter. The fourth token was extracted using the slash (/) as the delimiter.

<u>InputString</u>	<u>FirstToken</u>	<u>FourthToken</u>
ABC,DEF;GHI/JKL	ABC	JKL

GIS_REVERSE_COORDINATE: Returning a Geographic Component

Given longitude and latitude values and the name of a geographic component, GIS_REVERSE_COORDINATE returns the specified geographic component values associated with those coordinates.

Syntax: **How to Return a Geographic Component**

```
GIS_REVERSE_COORDINATE(longitude, latitude, component)
```

where:

longitude

Numeric

Is the longitude of the component to return.

latitude

Numeric

Is the latitude of the component to return.

latitude

Keyword

Is one of the following components:

- ☐ MATCH_ADDRESS, which returns the matching address.
- ☐ METROAREA, which returns the metro area name.
- ☐ REGION, which returns the region name.
- ☐ SUBREGION, which returns the subregion name.
- ☐ CITY, which returns the city name.
- ☐ POSTAL, which returns the postal code.

The value is returned as text and can be assigned to a field with text or alphanumeric (fixed or variable length) format.

Example: Returning Geographic Components Associated With Coordinates

The following request uses city longitude and city latitude to return the matching address, postal code, region, and subregion.

```
TABLE FILE WF_RETAIL_GEOGRAPHY
SUM FST.CITY_LONGITUDE AS Longitude FST.CITY_LATITUDE AS Latitude
COMPUTE MatchingAddress/A250 = GIS_REVERSE_COORDINATE(CITY_LONGITUDE,
CITY_LATITUDE, MATCH_ADDRESS);
        PostalCode/A250 = GIS_REVERSE_COORDINATE(CITY_LONGITUDE,
CITY_LATITUDE, POSTAL);
        Region/A250 = GIS_REVERSE_COORDINATE(CITY_LONGITUDE, CITY_LATITUDE,
REGION);
        Subregion/A250 = GIS_REVERSE_COORDINATE(CITY_LONGITUDE,
CITY_LATITUDE, SUBREGION);
BY CITY_NAME AS City
WHERE COUNTRY_NAME EQ 'United States'
WHERE TOTAL PostalCode NE ' '
WHERE RECORDLIMIT EQ 20
ON TABLE SET PAGE NOLEAD
END
```

The output is shown in the following image.

City	Longitude	Latitude	MatchingAddress	PostalCode	Region	Subregion
Annapolis	-76.54540000	38.98790000	Annapolis Mall, Annapolis, Maryland, 21401	21401	Maryland	Anne Arundel County
Baton Rouge	-91.09780000	30.44990000	233 E Parkland Dr, Baton Rouge, Louisiana, 70806	70806	Louisiana	East Baton Rouge Parish
Cincinnati	-84.45690000	39.16200000	2070-2098 Elm Ave, Cincinnati, Ohio, 45212	45212	Ohio	Hamilton County
Daytona Beach	-81.04740000	29.19310000	511 S Clyde Morris Blvd, Daytona Beach, Florida, 32114	32114	Florida	Volusia County
Detroit	-83.05980000	42.34630000	133 Davenport St, Detroit, Michigan, 48201	48201	Michigan	Wayne County
Harrington Park	-73.98330000	40.99070000	247 Lynn St, Harrington Park, New Jersey, 07640	07640	New Jersey	Bergen County
Johnston	-93.72040000	41.70310000	Camp Dodge	50131	Iowa	Polk County
Lake Mary	-81.33970000	28.75780000	127-129 E Plantation Blvd, Lake Mary, Florida, 32746	32746	Florida	Seminole County
Laredo	-99.50350000	27.51330000	1501-1599 Santa Ursula Ave, Laredo, Texas, 78040	78040	Texas	Webb County
Latham	-73.78040000	42.75260000	1 Lear Jet Ln, Latham, New York, 12110	12110	New York	Albany County
Louisville	-85.69180000	38.20850000	2714 Lamont Rd, Louisville, Kentucky, 40205	40205	Kentucky	Jefferson County
Medley	-80.38390000	25.85880000	33178, Miami, Florida	33178	Florida	Miami-Dade County
North Kansas City	-94.56220000	39.13000000	1201-1499 Quebec St, Kansas City, Missouri, 64116	64116	Missouri	Clay County
Rochester	-77.61560000	43.15480000	1-35 Plymouth Ave S, Rochester, New York, 14614	14614	New York	Monroe County
Waco	-97.13820000	31.55100000	1200 Austin Ave, Waco, Texas, 76701	76701	Texas	McLennan County

INITCAP: Capitalizing the First Letter of Each Word in a String

INITCAP capitalizes the first letter of each word in an input string and makes all other letters lowercase. A word starts at the beginning of the string, after a blank space or after a special character.

Syntax: How to Capitalize the First Letter of Each Word in a String

```
INITCAP(input_string)
```

where:

input_string

Alphanumeric

Is the string to capitalize.

Example: Capitalizing the First Letter of Each Word in a String

The following request changes the last names in the EMPLOYEE data source to initial caps and capitalizes the first letter after each blank or special character in the NewName field.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND COMPUTE
Caps1/A30 = INITCAP(LAST_NAME);
NewName/A30 = 'abc,def!ghi' jKL MNO';
Caps2/A30 = INITCAP(NewName);
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>LAST_NAME</u>	<u>Caps1</u>	<u>NewName</u>	<u>Caps2</u>
STEVENS	Stevens	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
SMITH	Smith	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
JONES	Jones	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
SMITH	Smith	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
BANNING	Banning	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
IRVING	Irving	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
ROMANS	Romans	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
MCCOY	Mccoy	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
BLACKWOOD	Blackwood	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
MCKNIGHT	Mcknight	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
GREENSPAN	Greenspan	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno
CROSS	Cross	abc,def!ghi'jKL MNO	Abc,Def!Ghi'Jkl Mno

NULLIF: Returning a Null Value When Parameters Are Equal

NULLIF returns a null (missing) value when its parameters are equal. If they are not equal, it returns the first value. The field to which the value is returned should have MISSING ON.

Syntax: How to Return a Null Value for Equal Parameters

`NULLIF(arg1, arg2)`

where:

`arg1, arg2`

Any type of field, constant, or expression.

Are the input parameters that are tested for equality. They must either both be numeric or both be alphanumeric.

The output data type is the same as the input data types.

Example: **Testing for Equal Parameters**

The following request uses NULLIF to test the DAMAGED and RETURNS field values for equality.

```
DEFINE FILE SALES
NULL1/I4 MISSING ON = NULLIF(DAMAGED, RETURNS);
END
TABLE FILE SALES
PRINT DAMAGED RETURNS NULL1
BY STORE_CODE
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image.

<u>STORE CODE</u>	<u>DAMAGED</u>	<u>RETURNS</u>	<u>NULL1</u>
14B	6	10	6
	3	3	.
	1	2	1
	0	3	0
	4	5	4
	0	0	.
	4	9	4
	9	8	9
14Z	3	2	3
	1	2	1
	1	0	1
	0	0	.
	2	3	2
	7	4	7
	2	4	2
77F	1	1	.
	0	0	.
K1	0	1	0
	1	1	.

Statistical Python Functions

The Statistical Python functions are FOCUS functions implemented as Python scripts. These Python scripts take advantage of Python packages such as scipy, numpy, scikit-learn, and pandas, which extends the Python capabilities to machine learning.

Before running the functions, you must configure the Adapter for Python. For information about configuring the adapter, see the *Adapter Administration* manual.

The statistical Python functions perform regression and classification using a variety of machine learning methods. The Python scripts perform a sequence of conventional machine learning tasks including scaling of the data where appropriate. They are built around a grid search with cross-validation. That is, some hyper-parameters (parameters that influence the learning process, but that are not model parameters) are identified, and models are built using a number of values for each hyper-parameter, in order to determine the optimal values. To determine optimality, cross-validation is used, which ensures that the performance is measured on a validation-subset of the data that is distinct from the training-subset. Rows with missing values in the target-column are not used for training and validation, but a predicted value is computed by the trained model.

BLR_CLASSIFY: Binary Logistic Regression

Binary logistic regression finds the best linear separation between two classes in the space spanned by the predictors. The target variable has two values (0 and 1), corresponding to the two classes. The predicted value is either a class assignment (0 or 1) or the probability of belonging to class 1.

***Syntax:* How to Calculate a Binary Logistic Regression**

```
BLR_CLASSIFY(options, proba_flag,  
             predictor_field1[, predictor_field2, ...] target_field)
```

where:

options

Reserved for future use.

proba_flag

Keyword

Indicates whether to display probabilities. Valid values are PROBA, to display the probability of belonging to class 1, and NO_PROBA, to display class assignment.

- ☐ When *proba_flag* has the value NO_PROBA, this function returns a binary-class prediction for Y (Y=0 or 1).
- ☐ When *proba_flag* has the value PROBA, this function returns the probability Y ($0 \leq Y \leq 1$), that (X0, X1, . . .) belongs to class 1.

```
predictor_field1[, predictor_field2, ...]
```

Numeric

Are one or more predictor field names.

target_field

Numeric

Is the target field.

Example: Using BLR_CLASSIFY to Predict Education Code

The DEFINE FILE command in the following request creates two education levels, doctorate level (value 1) and no college education (value 0). It also creates other virtual fields with numeric formats that can be used by the function. The TABLE request uses BLR_CLASSIFY to compute the probability that the education level belongs to class 1, doctorate level education, using predictors age, income, population range, and gender.

```

DEFINE FILE WF_RETAIL
  BINARY_EDUC_LEVEL/I2 =
  DECODE WF_RETAIL_EDUCATION_CUSTOMER.EDUCATION_DEGREE_TYPE (
    'Professional Doctorates' 1,
    'Doctorates' 1,
    'High School' 0,
    'No High School' 0,
    ELSE -1 );
  POP_CODE/I2 =
  DECODE WF_RETAIL_GEOGRAPHY_CUSTOMER.CITY_POPULATION_RANGE (
    'H: 100,001 - 250,000' 1,
    'I: 250,001 - 1,000,000' 2,
    'J: 1,000,001 - 10,000,000' 3,
    'K: 10,000,001 - 50,000,000' 4,
    ELSE 0 );
  GENDER_CODE/I2 =
  DECODE WF_RETAIL_CUSTOMER.GENDER (
    'M' 1, 'F' 0 );
  END

TABLE FILE WF_RETAIL
PRINT
  ID_CUSTOMER
  BINARY_EDUC_LEVEL
  COMPUTE PREDICTED_PROB/D6.4=BLR_CLASSIFY(' ',PROBA,
                                           AGE,
                                           INCOME,
                                           POP_CODE,
                                           GENDER_CODE,
                                           BINARY_EDUC_LEVEL);

WHERE BINARY_EDUC_LEVEL NE -1
WHERE POP_CODE NE 0
WHERE INCOME GT 12001.00
WHERE OUTPUTLIMIT EQ 12
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

The partial output is shown in the following image.

<u>ID Customer</u>	<u>BINARY_EDUC_LEVEL</u>	<u>PREDICTED_PROB</u>
99444	1	.9985
237172	1	.7626
59823	1	.9640
121373	1	.9989
106534	1	.9996
104894	1	.9989
6721	0	.0915
216378	0	.0120
227169	0	.0276
133681	1	.9823
137550	0	.2026
1896	0	.1329

KNN_CLASSIFY: K-Nearest Neighbors Classification

K-nearest neighbors classification is a method for assigning a class membership to a data point in the space spanned by the predictors. The classification is done by assigning the class most common among its k nearest neighbors. This method requires having a distance definition in this space.

***Reference:* Calculate a K-Nearest Neighbors Classification**

```
KNN_CLASSIFY(options, neighbors, power,  
             predictor_field1[, predictor_field2, ...] target_field)
```

where:

options

Reserved for future use.

neighbors

Integer

Is the number of nearest neighbors to participate in the prediction.

power

Integer

Is the power (p) of the L^p-distance.

- ❑ power=1 calculates the distance as the sum of the absolute values of the differences between the coordinates (Manhattan distance).
- ❑ power=2 calculates the distance as the square root of the sum of the squares of the differences between the coordinates (Euclidean distance).

predictor_field1[, predictor_field2, ...]

Numeric

Are one or more predictor field names.

target_field

Numeric

Is the target field.

Example: Predicting Education Level Using KNN_CLASSIFY

The following request uses KNN_CLASSIFY to predict education level using the 20 nearest neighbors and Euclidean distance, with predictors age, income, population range, and gender. The DEFINE FILE command creates virtual fields with correct numeric formats for use in the function. The data set includes rows with missing target values.

```

DEFINE FILE WF_RETAIL
POP_CODE/I2 =
  DECODE WF_RETAIL_GEOGRAPHY_CUSTOMER.CITY_POPULATION_RANGE (
    'H: 100,001 - 250,000'      1,
    'I: 250,001 - 1,000,000'    2,
    'J: 1,000,001 - 10,000,000' 3,
    'K: 10,000,001 - 50,000,000' 4,
    ELSE 0 );
GENDER_CODE/I2 =
  DECODE WF_RETAIL_CUSTOMER.GENDER (
    'M' 1, 'F' 0 );
END

```

```

TABLE FILE WF_RETAIL
PRINT ID_CUSTOMER AGE INCOME DEGREE_M EDUC_LEVEL_M
COMPUTE ED_PRED/I2=KNN_CLASSIFY(' ',20,2,
    AGE,
    INCOME,
    POP_CODE,
    GENDER_CODE,
    EDUC_LEVEL_M);

WHERE POP_CODE NE 0;
WHERE OUTPUTLIMIT IS 8;
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

Partial output is shown in the following image.

<u>ID Customer</u>	<u>Age</u>	<u>Income</u>	Customer Degree <u>w/Missings</u>	Customer Education Level <u>w/Missings</u>	<u>ED_PRED</u>
230444	41	117,209.96	Master's Degrees	6	6
11162	56	102,553.99	Bachelor's Degree	5	5
12673	66	97,259.44	Associate Degree	4	4
13567	66	86,283.38	Non Traditional Degree	1	3
13902	46	140,601.15	Master's Degrees	6	6
99444	62	187,736.31	.	.	8
237172	27	69,740.65	Professional Doctorates	8	8
207543	68	129,006.18	Master's Degrees	6	7

KNN_REGRESS: K-Nearest Neighbors Regression

K-nearest neighbors regression is a method for predicting a target value for a data point in the space spanned by the predictors. The prediction is the average of the target values of its k nearest neighbors. This method requires having a distance definition in this space.

Reference: Calculate a K-Nearest Neighbors Regression

```

KNN_REGRESS(options, neighbors, power,
            predictor_field1[, predictor_field2, ...] target_field)

```

where:

options

Reserved for future use.

neighbors

Integer

Is the number of nearest neighbors to participate in the prediction.

power

Integer

Is the power (p) of the L^p-distance.

- ☐ power=1 calculates the distance as the sum of the absolute values of the differences between the coordinates (Manhattan distance).
- ☐ power=2 calculates the distance as the square root of the sum of the squares of the differences between the coordinates (Euclidean distance).

predictor_field1[, predictor_field2, ...]

Numeric

Are one or more predictor field names.

target_field

Numeric

Is the target field.

Example: Predicting Income Using KNN_REGRESS

The following request uses KNN_REGRESS to predict income using the 10 nearest neighbors and Euclidean distance, with predictors age, education, population range, and gender. The DEFINE FILE command creates virtual fields with correct numeric formats for use in the function.

```

DEFINE FILE WF_RETAIL
POP_CODE/I2 =
  DECODE WF_RETAIL_GEOGRAPHY_CUSTOMER.CITY_POPULATION_RANGE (
    'H: 100,001 - 250,000'      1,
    'I: 250,001 - 1,000,000'    2,
    'J: 1,000,001 - 10,000,000' 3,
    'K: 10,000,001 - 50,000,000' 4,
    ELSE 0 );
GENDER_CODE/I2 =
  DECODE WF_RETAIL_CUSTOMER.GENDER (
    'M' 1, 'F' 0 );
END

```

```

TABLE FILE
WF_RETAIL
PRINT

ID_CUSTOMER
EDUC_LEVEL_M
POP_CODE
GENDER_CODE
INCOME_M
COMPUTE PRED_INCOME/D12.2 = KNN_REGRESS(' ',10,2,
AGE,
EDUC_LEVEL_M,
POP_CODE,
GENDER_CODE,
INCOME_M) ;
WHERE INCOME GT
12001.00
WHERE OUTPUTLIMIT EQ 12
WHERE POP_CODE NE 0
WHERE EDUC_LEVEL_M NE 0
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

Partial output is shown in the following image.

<u>ID Customer</u>	Customer Education Level <u>w/Missings</u>	<u>POP CODE</u>	<u>GENDER CODE</u>	Income <u>w/Missings</u>	<u>PRED INCOME</u>
230444	6	3	0	117,209.96	109,000.21
11162	5	3	0	.	118,418.98
12673	4	4	1	.	109,226.55
13567	1	3	0	.	86,180.19
13902	6	3	1	140,601.15	129,186.74
237172	8	3	1	69,740.65	86,064.81
207543	6	3	0	129,006.18	107,767.61
118562	4	4	0	103,810.97	90,417.75
59823	8	3	1	91,152.13	91,785.86
121373	8	3	1	160,477.48	172,215.45
106534	8	3	1	188,232.28	171,015.29
60202	4	3	0	46,248.75	45,179.21

POLY_REGRESS: Polynomial Regression

Polynomial regression fits the target column to a polynomial expression of the predictor columns. The degree of the polynomial is specified as an input argument to the function.

Reference: Calculate a Polynomial Regression Column

```
POLY_REGRESS(options, degree, terms_generated,  
             predictor_field1, predictor_field2, [...], target_field)
```

where:

options

Reserved for future use.

degree

Integer

Is the degree of the polynomial. Low degree polynomials are recommended.

terms_generated

Keyword

Controls the terms that are generated in the polynomial equation.

- ☐ ALL_TERMS generates the most general polynomial of degree *degree* based on the predictor fields.
- ☐ INTERACTION_ONLY generates only terms linear in each predictor X_0, X_1, \dots , and cross-terms of the form $X_0 * X_1 * X_2$ of at most *degree* predictors are used.

```
predictor_field1, predictor_field2, [...],
```

Numeric

Are at least two predictor field names.

```
target_field
```

Numeric

Is the target field.

Example: Using POLY_REGRESS to Predict Income

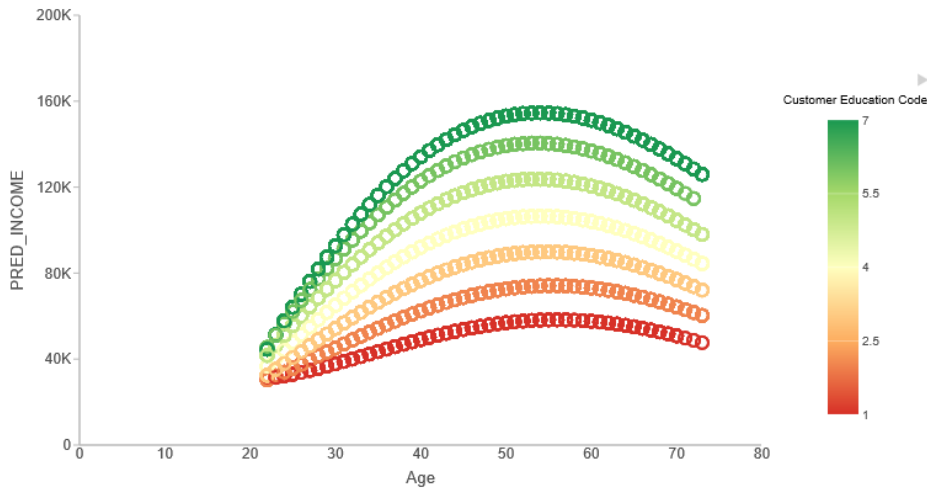
The following scatter plot shows the predicted income values using polynomial regression of degree 4, with predictors education level, and age. The DEFINE FILE command creates virtual fields with correct numeric formats for use in the function.

```
DEFINE FILE wf_retail
EDUC_CODE/I2 TITLE 'Education Code'= DECODE
WF_RETAIL_EDUCATION_CUSTOMER.EDUCATION_DEGREE_TYPE (
'Professional Doctorates' 7,
'Doctorates' 6,
'Master's Degrees' 5,
'Bachelor's Degree' 4,
'Associate Degree' 3,
'High School' 2,
'No High School' 1,
ELSE 0);
END

GRAPH FILE wf_retail
PRINT
AGE
EDUC_CODE
COMPUTE PRED_INCOME/D20.2 =POLY_REGRESS('', 4, ALL_TERMS,
AGE,
EDUC_CODE,
INCOME);

WHERE EDUC_CODE GT 0;
WHERE INCOME GT 12001.00;
WHERE AGE GT 21
ON TABLE PCHOLD
FORMAT JSCHART
ON TABLE SET LOOKGRAPH SCATTER
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=REPORT, CHART-ORIENTATION=HORIZONTAL, $
TYPE=DATA, COLUMN=N3, BUCKET=Y-AXIS, /*PRED_INCOME*/
$
TYPE=DATA, COLUMN=N1, BUCKET=X-AXIS, /*AGE*/
$
TYPE=DATA, COLUMN=N2, BUCKET=COLOR, /*EDUC_CODE*/
$
ENDSTYLE
END
```

The output is shown in the following image. Predicted income versus age is plotted, with education level as a parameter visualized by color.



RF_CLASSIFY: Random Forest Classification

RF_CLASSIFY creates a random forest, which is an ensemble of decision trees. Each decision tree produces an independent classification prediction, and the prediction of the forest is the majority vote of the individual predictions.

Syntax:

How to Calculate a Random Forest Classification

```
RF_CLASSIFY(options, number_of_trees,  
            predictor_field1[, predictor_field2, ...] target_field)
```

where:

options

Reserved for future use.

number_of_trees

Integer

Is the number of decision trees in the forest.

predictor_field1[, *predictor_field2*, ...]

Numeric

Are one or more predictor field names.

target_field

Numeric

Is the target field.

Example: **Predicting Education Level Using RF_CLASSIFY**

The following procedure uses RF_CLASSIFY to predict education level, using a random forest with 100 decision trees, with predictors age, income, population range, and gender. The DEFINE FILE command creates virtual fields with correct numeric formats for use in the function.

```
DEFINE FILE WF_RETAIL
POP_CODE/I2 =
  DECODE WF_RETAIL_GEOGRAPHY_CUSTOMER.CITY_POPULATION_RANGE (
    'H: 100,001 - 250,000'      1,
    'I: 250,001 - 1,000,000'    2,
    'J: 1,000,001 - 10,000,000' 3,
    'K: 10,000,001 - 50,000,000' 4,
    ELSE 0 );
GENDER_CODE/I2 =
  DECODE WF_RETAIL_CUSTOMER.GENDER (
    'M' 1, 'F' 0 );
END

TABLE FILE WF_RETAIL
PRINT ID_CUSTOMER AGE INCOME DEGREE_M EDUC_LEVEL_M
COMPUTE ED_PRED/I2=RF_CLASSIFY(' ',100,
AGE,
INCOME,
POP_CODE,
GENDER_CODE,
EDUC_LEVEL_M);

WHERE POP_CODE NE 0;
WHERE OUTPUTLIMIT IS 12;
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```


Partial output is shown in the following image.

<u>ID Customer</u>	<u>Age</u>	<u>Income</u>	<u>Customer Degree w/Missings</u>	<u>Customer Education Level w/Missings</u>	<u>ED</u>	<u>PRED</u>
230444	41	117,209.96	Master's Degrees	6		6
11162	56	102,553.99	Bachelor's Degree	5		4
12673	66	97,259.44	Associate Degree	4		4
13567	66	86,283.38	Non Traditional Degree	1		4
13902	46	140,601.15	Master's Degrees	6		6
99444	62	187,736.31	.	.		8
237172	27	69,740.65	Professional Doctorates	8		8
207543	68	129,006.18	Master's Degrees	6		6
118562	40	103,810.97	Associate Degree	4		4
1447	69	106,104.18	.	.		6
59823	28	91,152.13	Professional Doctorates	8		8
121373	49	160,477.48	Professional Doctorates	8		8

RF_REGRESS: Random Forest Regression

RF_REGRESS creates a random forest, which is an ensemble of decision trees. Each decision tree produces an independent regression prediction, and the prediction of the forest is the average of the individual predictions.

Syntax: How to Calculate a Random Forest Regression

```
RF_REGRESS(options, number_of_trees,
           predictor_field1[, predictor_field2, ...] target_field)
```

where:

options

Reserved for future use.

number_of_trees

Integer

Is the number of decision trees in the forest.

predictor_field1[, *predictor_field2*, ...]

Numeric

Are one or more predictor field names.

target_field

Numeric

Is the target field.

Example: **Predicting Income Using RF_REGRESS**

The following procedure uses RF_REGRESS to predict income, using a random forest with 100 decision trees, with predictors age, education level, population range, and gender. The DEFINE FILE command creates virtual fields with correct numeric formats for use in the function.

```
DEFINE FILE WF_RETAIL
POP_CODE/I2 =
  DECODE WF_RETAIL_GEOGRAPHY_CUSTOMER.CITY_POPULATION_RANGE (
    'H: 100,001 - 250,000'      1,
    'I: 250,001 - 1,000,000'    2,
    'J: 1,000,001 - 10,000,000' 3,
    'K: 10,000,001 - 50,000,000' 4,
    ELSE 0  );
GENDER_CODE/I2 =
  DECODE WF_RETAIL_CUSTOMER.GENDER (
    'M' 1, 'F' 0 );
END

TABLE FILE WF_RETAIL
PRINT
ID_CUSTOMER
EDUC_LEVEL_M
POP_CODE
GENDER_CODE
INCOME_M
COMPUTE PRED_INCOME/D12.2 = RF_REGRESS(' ',100,
AGE,
EDUC_LEVEL_M,
POP_CODE,
GENDER_CODE,
INCOME_M);

WHERE EDUC_LEVEL_M NE 0
WHERE POP_CODE NE 0
WHERE INCOME GT 12001.00
WHERE OUTPUTLIMIT IS 12;
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Partial output is shown in the following image.

<u>ID Customer</u>	Customer Education Level	<u>POP CODE</u>	<u>GENDER CODE</u>	Income	<u>PRED INCOME</u>
	<u>w/Missings</u>			<u>w/Missings</u>	
230444	6	3	0	117,209.96	111,863.06
11162	5	3	0	.	112,104.75
12673	4	4	1	.	109,006.67
13567	1	3	0	.	88,624.32
13902	6	3	1	140,601.15	131,893.68
237172	8	3	1	69,740.65	87,870.05
207543	6	3	0	129,006.18	111,237.87
118562	4	4	0	103,810.97	91,134.26
59823	8	3	1	91,152.13	93,017.87
121373	8	3	1	160,477.48	171,263.54
106534	8	3	1	188,232.28	172,922.55
60202	4	3	0	46,248.75	43,194.98

Using IF-THEN-ELSE Logic in an Expression

IF-THEN-ELSE logic is supported as part of an expression, including arithmetic, character, and logical expressions.

Example: Using IF-THEN-ELSE Logic in an Arithmetic Expression

The following request uses IF-THEN-ELSE logic in an arithmetic expression to determine how much to add to LISTPR to calculate NEWPRICE.

```
TABLE FILE MOVIES
SUM COPIES
LISTPR
COMPUTE
NEWPRICE = LISTPR + (IF COPIES GT 10 THEN 0.00 ELSE 25.00);
BY CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. Where there are more than 10 copies, the NEWPRICE equals LISTPR, otherwise NEWPRICE is \$25.00 greater than LISTPR.

<u>CATEGORY</u>	<u>COPIES</u>	<u>LISTPR</u>	<u>WHOLESALEPR</u>	<u>NEWPRICE</u>
ACTION	14	94.82	55.46	94.82
CHILDREN	12	201.67	105.87	201.67
CLASSIC	21	404.71	201.79	404.71
COMEDY	19	154.80	90.45	154.80
DRAMA	2	19.98	10.00	44.98
FOREIGN	6	269.76	146.24	294.76
MUSICALS	5	84.89	52.97	109.89
MYSTERY	21	235.81	116.97	235.81
SCI/FI	7	114.84	79.52	139.84
TRAIN/EX	10	119.87	60.98	144.87

Example: Using IF-THEN-ELSE Logic in a Character Expression

The following request uses IF-THEN-ELSE logic to determine what characters to concatenate to MOVIECODE in order to compute NEWCODE.

```
TABLE FILE MOVIES
PRINT COPIES
MOVIECODE
COMPUTE
NEWCODE/A20 = MOVIECODE | (IF MOVIECODE CONTAINS 'DIS' THEN 'NEY;' ELSE
';');
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. If MOVIECODE contains the characters 'DIS', NEWCODE is generated by concatenating the characters 'NEY;', otherwise NEWCODE is generated by concatenating the character ';'.

<u>CATEGORY</u>	<u>COPIES</u>	<u>MOVIECODE</u>	<u>NEWCODE</u>
CHILDREN	1	031KKV	031KKV;
	2	043DIS	043DISNEY;
	1	093WOR	093WOR;
	2	306DIS	306DISNEY;
	1	309RAN	309RAN;
	1	387PLA	387PLA;
	1	476DIS	476DISNEY;
	3	732DIS	732DISNEY;

Example: Using IF-THEN-ELSE Logic in a WHERE Clause

The following request uses IF-THEN-ELSE logic in a WHERE clause to select records based on values of WHOLESALEPR where the values used for selection vary depending on the value of LISTPR in that record.

```
TABLE FILE MOVIES
PRINT COPIES
LISTPR
WHOLESALEPR
BY CATEGORY
WHERE WHOLESALEPR GT (IF LISTPR GT 20.00 THEN 15.00 ELSE 11.00)
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. In the selected records, WHOLESALPR is greater than \$15.00 if LISTPR is greater than \$20.00. WHOLESALPR is greater than \$11.00 if LISTPR is less than or equal to \$20.00.

<u>CATEGORY</u>	<u>COPIES</u>	<u>LISTPR</u>	<u>WHOLESALPR</u>
ACTION	3	19.98	11.50
	4	19.99	11.99
CHILDREN	2	44.95	29.99
	1	29.95	15.99
CLASSIC	3	39.99	20.00
	1	29.95	15.99
	3	89.95	40.99
	2	89.99	40.99
COMEDY	4	19.95	12.55
	2	19.95	12.55
	3	59.99	30.00
	4	19.98	13.75
	4	19.98	13.75
FOREIGN	1	19.98	13.25
	1	59.95	30.00
	1	29.95	15.99
	1	39.98	25.00
	1	59.95	32.00
	1	59.95	30.00
MUSICALS	1	19.98	13.99
	1	19.98	13.99
MYSTERY	4	29.98	15.99
	2	25.99	15.99
	4	59.99	30.00
SCI/FI	1	19.98	14.99
	1	19.98	14.55
	1	19.95	13.99
	1	24.95	16.00
	3	29.98	19.99

Generating Descriptive Column Titles for Prefixed Fields

By default, the column titles for prefixed fields have the name of the prefix operator added above or below the field name. Using the SET PRFTITLE command, you can generate longer, more descriptive column titles. These descriptive column titles use longer descriptions of the prefix operators, which will also be translated into any standard language for which the server is configured.

Syntax: How to Generate Descriptive Column Titles for Prefixed Fields

```
SET PRFTITLE = {SHORT|LONG}
```

```
ON TABLE SET PRFTITLE {SHORT|LONG}
```

where:

SHORT

Places the prefix operator name above the field name to generate the column title.

LONG

Generates descriptive column titles for prefixed fields that can be translated to other languages.

Example: Generating Descriptive Column Titles for Prefixed Fields

The following request uses prefix operators with the default value for SET PRFTITLE.

```
TABLE FILE WF_RETAIL_LITE
SUM COGS_US CNT.COGS_US AVE.COGS_US CNT.DST.COGS_US MIN.COGS_US MAX.COGS_US
MDN.COGS_US
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

Product	Cost of Goods	COUNT	AVE	COUNT	MIN	MAX	MEDIAN
Category	Cost of Goods	COUNT	Cost of Goods	Cost of Goods	Cost of Goods	Cost of Goods	Cost of Goods
Accessories	\$342,877.00	1484	\$231.05	50	\$16.00	\$2,850.00	\$174.00
Camcorder	\$453,205.00	1417	\$319.83	46	\$60.00	\$8,610.00	\$180.00
Computers	\$109,281.00	600	\$182.13	8	\$81.00	\$668.00	\$167.00
Media Player	\$779,593.00	2249	\$346.64	77	\$36.00	\$1,640.00	\$310.00
Stereo Systems	\$857,042.00	3338	\$256.75	100	\$48.00	\$2,700.00	\$166.00
Televisions	\$227,820.00	267	\$853.26	22	\$275.00	\$9,750.00	\$550.00
Video Production	\$180,540.00	645	\$279.91	21	\$78.00	\$1,880.00	\$190.00

The following version of the request sets PRFTITLE to LONG.

```
SET PRFTITLE = LONG
TABLE FILE WF_RETAIL_LITE
SUM COGS_US CNT.COGS_US AVE.COGS_US CNT.DST.COGS_US MIN.COGS_US MAX.COGS_US
MDN.COGS_US
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

Product Category	Cost of Goods	Count Cost of Goods	Average Cost of Goods	Count of Distinct Cost of Goods	Minimum Cost of Goods	Maximum Cost of Goods	Median Cost of Goods
Accessories	\$342,877.00	1484	\$231.05	50	\$16.00	\$2,850.00	\$174.00
Camcorder	\$453,205.00	1417	\$319.83	46	\$60.00	\$8,610.00	\$180.00
Computers	\$109,281.00	600	\$182.13	8	\$81.00	\$668.00	\$167.00
Media Player	\$779,593.00	2249	\$346.64	77	\$36.00	\$1,640.00	\$310.00
Stereo Systems	\$857,042.00	3338	\$256.75	100	\$48.00	\$2,700.00	\$166.00
Televisions	\$227,820.00	267	\$853.26	22	\$275.00	\$9,750.00	\$550.00
Video Production	\$180,540.00	645	\$279.91	21	\$78.00	\$1,880.00	\$190.00

Support for C-Style In-Line Comments

C-style comments can now be used in WebFOCUS procedures.

This type of comment is enclosed within an opening /* tag (slash followed by asterisk) and a closing */ tag (asterisk followed by slash). A C-style comment can appear anywhere and span multiple lines.

Example: Placing C-Style Comments in a Procedure

The following example places C-style comments in a procedure.

```
TABLE FILE WF_RETAIL /* this is a multi-line comment
that will not interfere with processing and will be ignored
until the comment is closed with */
SUM /* Another comment */ COGS_US
.
.
.
```


Format Display Options for Abbreviating Numeric Values

Numeric values can be displayed in abbreviated form in terms of thousands, millions, billions, or trillions, using the format options k, m, b, t, and a.

- ❑ Format option **k** displays numeric values in terms of thousands. For example, 12345 displays as 12.35K.
- ❑ Format option **m** displays numeric values in terms of millions. For example, 1234567 displays as 1.23M.
- ❑ Format option **b** displays numeric values in terms of billions. For example, 1234567890 displays as 1.23B.
- ❑ Format option **t** displays numeric values in terms of trillions. For example, 1234567890000 displays as 1.23T.
- ❑ Format option **a** calculates the appropriate abbreviated option to use depending on the magnitude of the number, and uses that option for display. This option uses the appropriate abbreviation for the specific value on the current row and, therefore, each row may have a different abbreviation. For example, 1234567890 displays as 1.23B, while 1234567890000 displays as 1.23T.

Note:

- ❑ The abbreviated value displays with the number of decimal places specified in the format of the field to which it is returned.
- ❑ The format options do not change how a value is stored, just how it is displayed.
- ❑ Numbers are rounded prior to display in an abbreviated format. Therefore, when a packed or integer formatted number is displayed in abbreviated form using the EXTENDNUM ON setting, overflow values can be mistaken for correct results.
- ❑ These display options are supported with all numeric formats and are compatible with additional display options such as -, B, R, C, c, M, and N.

Example: Using Display Options for Abbreviating Numeric Values

The following request computes numeric fields that use the display options k, m, b, t, and a.

```
TABLE FILE WF_RETAIL_LITE
SUM COGS_US
COMPUTE
COGS_K/I10k = COGS_US;
COGS_M/D20.2m = COGS_US *2000;
COGS_B/D20.3b = COGS_US *300000;
COGS_T/D20.2t = COGS_US *400000000;
COGS_A/D20.1a = IF COGS_US LT 100000 THEN COGS_US
                ELSE IF COGS_US LT 200000 THEN COGS_US *2000
                ELSE IF COGS_US LT 500000 THEN COGS_US *300000
                ELSE COGS_US *400000000;

BY BRAND
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. COGS_K has format I, which displays with no decimal places. COGS_M, COGS_B, and COGS_T have format D20.2, which displays with two decimal places. COGS_A has format D20.1, which displays with one decimal place.

<u>Brand</u>	<u>Cost of Goods</u>	<u>COGS_K</u>	<u>COGS_M</u>	<u>COGS_B</u>	<u>COGS_T</u>	<u>COGS_A</u>
Audio Technica	\$38,000.00	38K	76.00M	11.400B	15.20T	38.0K
BOSE	\$152,126.00	152K	304.25M	45.638B	60.85T	304.3M
Canon	\$110,219.00	110K	220.44M	33.066B	44.09T	220.4M
Denon	\$25,970.00	26K	51.94M	7.791B	10.39T	26.0K
Grado	\$21,930.00	22K	43.86M	6.579B	8.77T	21.9K
Harman Kardon	\$78,350.00	78K	156.70M	23.505B	31.34T	78.3K
JVC	\$180,049.00	180K	360.10M	54.015B	72.02T	360.1M
LG	\$161,800.00	162K	323.60M	48.540B	64.72T	323.6M
Logitech	\$61,432.00	61K	122.86M	18.430B	24.57T	61.4K
Niles Audio	\$73,547.00	74K	147.09M	22.064B	29.42T	73.5K
Onkyo	\$125,438.00	125K	250.88M	37.631B	50.18T	250.9M
Panasonic	\$292,871.00	293K	585.74M	87.861B	117.15T	87.9B
Philips	\$43,354.00	43K	86.71M	13.006B	17.34T	43.4K
Pioneer	\$233,330.00	233K	466.66M	69.999B	93.33T	70.0B
Polk Audio	\$64,575.00	65K	129.15M	19.372B	25.83T	64.6K
Roku	\$10,248.00	10K	20.50M	3.074B	4.10T	10.2K
Samsung	\$218,754.00	219K	437.51M	65.626B	87.50T	65.6B
Sanyo	\$43,878.00	44K	87.76M	13.163B	17.55T	43.9K
Sennheiser	\$78,113.00	78K	156.23M	23.434B	31.25T	78.1K
Sharp	\$89,570.00	90K	179.14M	26.871B	35.83T	89.6K
Sony	\$657,576.00	658K	1,315.15M	197.273B	263.03T	263.0T
Thomson Grass Valley	\$89,344.00	89K	178.69M	26.803B	35.74T	89.3K
Toshiba	\$5,214.00	5K	10.43M	1.564B	2.09T	5.2K
Yamaha	\$94,670.00	95K	189.34M	28.401B	37.87T	94.7K

SET PCTFORMAT: Displaying a Percent Sign for Percent Prefix Operators

The SET PCTFORMAT command controls whether fields prefixed with the operators PCT., RPCT., and PCT.CNT. display with a percent sign or with the format associated with the original field.

The syntax is:

```
SET PCTFORMAT = {OLD|PERCENT}
```

where:

OLD

Displays columns prefixed with PCT., RPCT., and PCT.CNT. with the format associated with the original field.

PERCENT

Displays columns prefixed with PCT., RPCT., and PCT.CNT. with a percent sign. It also allows the prefixed fields to be reformatted. This is the default value.

PCT.CNT.*field* will always display with two decimal places, unless reformatted. For PCT.*field* and RPCT.*field*, with SET PCTFORMAT = PERCENT, if the original field has a:

- ☐ Precision-based format (F, D, M, X), the column will display with length 7 and two decimal places.
- ☐ Packed format, the column will display with its original number of decimal places.
- ☐ Integer format, the column will display with no decimal places.

Example: **Displaying Columns for Fields Prefixed With PCT., RPCT., and PCT.CNT.**

The following request displays columns that use the prefix operators PCT. and PCT.CNT against fields formatted to show currency symbols. The value of the PCTFORMAT parameter is set to OLD.

```
DEFINE FILE GGSales
DOLL1/D12.4M = DOLLARS;
UNIT1/D12.6M = UNITS;
DOLL2/P12.4M = DOLLARS;
UNIT2/I7M = UNITS;
END
TABLE FILE GGSales
SUM DOLLARS UNITS PCT.UNIT2 PCT.DOLL1 PCT.DOLL2 PCT.CNT.UNIT1
BY CATEGORY
ON TABLE SET PCTFORMAT OLD
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. The columns that display prefixed fields, except for the one using the PCT.CNT. prefix, display currency symbols instead of percent signs because the formats of the original fields are used.

















<u>Category</u>	<u>Dollar Sales</u>	<u>Unit Sales</u>	PCT <u>UNIT2</u>	PCT <u>DOLL1</u>	PCT <u>DOLL2</u>	PCT.CNT <u>UNIT1</u>
Coffee	17231455	1376266	\$37	\$37.3328	\$37.3328	33.36
Food	17229333	1384845	\$37	\$37.3282	\$37.3282	33.36
Gifts	11695502	927880	\$25	\$25.3389	\$25.3389	33.29

Changing SET PCTFORMAT to PERCENT produces the following output, in which the currency symbols have been removed and all prefixed columns display percent signs.

<u>Category</u>	<u>Dollar Sales</u>	<u>Unit Sales</u>	PCT <u>UNIT2</u>	PCT <u>DOLL1</u>	PCT <u>DOLL2</u>	PCT.CNT <u>UNIT1</u>
Coffee	17231455	1376266	37%	37.33%	37.3328%	33.36%
Food	17229333	1384845	37%	37.33%	37.3282%	33.36%
Gifts	11695502	927880	25%	25.34%	25.3389%	33.29%

Data Type Icons

In the DMC, field names are shown with an icon that identifies the data type of the field. For example:

 I23	TRIPDURATION	I9	Integer
 STARTTIME		HYYMDS	Date and Time
 STOPTIME		HYYMDS	Date and Time
 I23	START_STATION_ID	I6	Integer
 Abc	START_STATION_NAME	A56V	Character
 START_STATION_LATITUDE		D20.15	Numeric
 START_STATION_LONGITUDE		D20.14	Numeric
 I23	END_STATION_ID	I6	Integer
 Abc	END_STATION_NAME	A56V	Character
 END_STATION_LATITUDE		D20.15	Numeric
 END_STATION_LONGITUDE		D20.14	Numeric
 I23	BIKEID	I7	Integer
 Abc	NAME_LOCALIZEDVALUE0	A63V	Character
 Abc	USERTYPE	A12V	Character
 Abc	BIRTH_YEAR	A5V	Character
 I23	GENDER	I3	Integer

Data Management Console: Group and Replace

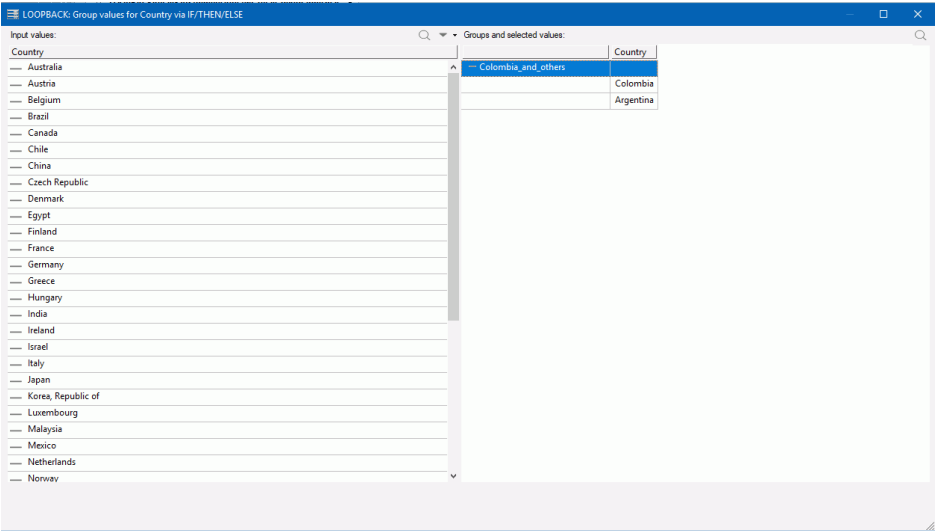
In the synonym editor, the *Group and Replace* option provides a new user interface to simplify adding a field that groups together similar related values.

To implement Group and Replace, right-click a field in the synonym editor, point to *New Expression*, and click *Group and Replace*.

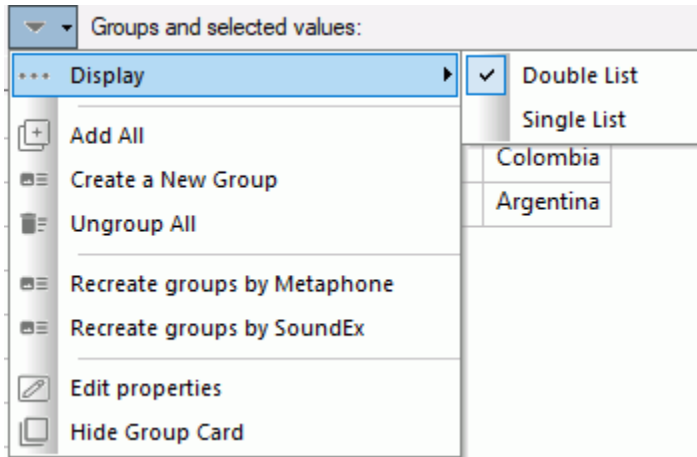
A group field is created with all values ungrouped.

You can create new subgroups either by selecting *Create a new group* from the pull-down menu, or by right-clicking a value on the list and clicking *Make a new group*.

Once you have created a subgroup, you can drag values into that subgroup, as shown in the following image. To facilitate this operation, *Double List* was selected from the *Display* option on the pull-down menu.



The options available on the pull-down menu are shown in the following image.



You can perform the following operations using this menu.

- ☐ Display the group frame as a single list or a double list.
- ☐ Add all of the values to a group.
- ☐ Ungroup all of the values.
- ☐ Recreate groups phonetically using either the Metaphone or Soundex algorithm. Soundex calculates a code for alphanumeric values so that if they sound the same but are spelled differently, they will still have the same code. Metaphone is an improved version of Soundex that takes into account anomalies in English spelling and pronunciation.
- ☐ Edit the properties of the group field, such as its name.
- ☐ Hide the group card.

Data Management Console: Additional Functions Available

The following functions are now available from the DMC:

- ☐ Aggregate functions Median and Mode are now available in the SQL object from the *Aggregate* drop-down menu.
- ☐ Character function SPLIT.
- ☐ Date and Date-Time functions DTADD and DTDIFF.

- ☐ Statistical Functions CORRELATION, STANDEV_POP, and STANDEV_SAMP.

Installation: New Language Options on Windows

The following languages are now available as options when installing the server on Windows:

- ☐ Brazilian Portuguese.
- ☐ Italian.
- ☐ Korean.
- ☐ Traditional Chinese.

Setting Defaults for Upload Target Parameters

New parameters have been added to the Settings for Web Console Preferences page to enable you to implement default targets for the Upload Wizard, Quick Copy, and Custom Copy.

To set your target parameters, go to the Web Console Workspace page, click *Settings*, point to *FOCUS Sets and Info*, then click *Settings for Web Console Preferences*.

The Settings for Web Console Preferences page opens. The new section is named Target Defaults, as shown in the following image.

Target Defaults	
? ETL-TRG-DBMS	<div><div></div><div></div></div> Default ETL Target DBMS
? ETL-TRG-SQL	<div><div>Yes</div><div></div></div> Enable SQL ETL Targets
? ETL-TRG-APP	<div><div></div><div></div></div> ... Default ETL Target Application
? ETL-TRG-BULK	<div><div>Yes</div><div></div></div> Enable Bulk Load Targets
? ETL-TRG-PROMPT	<div><div>Yes</div><div></div></div> Show Load Options prompts

You can set values for the following parameters.

- ☐ **ETL-TRG-DBMS.** Select a target adapter and connection from the drop-down list for target tables in the Upload Wizard, Upload, Quick Copy and Custom Copy.
- ☐ **ETL-TRG-SQL.** Select Yes or No to enable or disable SQL targets. The default value is Yes.
- ☐ **ETL-TRG-APP.** Enter the name of the target application directory for target tables in the Upload Wizard, Upload, Quick Copy and Custom Copy, or click the ellipsis (. . .) to select an application directory.

- ☐ **ETL-TRG-BULK.** Select Yes or No to use or disable bulk load in the Upload Wizard, Upload, Quick Copy and Custom Copy. The default value is Yes for any DBMS that supports bulk load.
- ☐ **ETL-TRG-PROMPT.** Select Yes or No to enable load option prompts. The default value is Yes.

You can also issue these settings in any supported profile, using the following syntax.

```
ENGINE INT SET ETL-TRG-DBMS dbms/connection
```

```
ENGINE ITN SET ETL-TRG-SQL {YES|NO}
```

```
ENGINE ITN SET ETL-TRG-APP appname
```

```
ENGINE ITN SET ETL-TRG-BULK {YES|NO}
```

```
ENGINE ITN SET ETL-TRG-PROMPT {YES|NO}
```

For example:

```
ENGINE INT SET ETL-TRG-DBMS SQLMSS/CON03
ENGINE INT SET ETL-TRG-APP mycompany
ENGINE INT SET ETL-TRG-PROMPT NO
```




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Release 8205

DN4501665.0119



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