USU Analytics
User Manual

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Product version 10.2.0

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1. Introduction

The purpose of this guide is to teach business users how to use the User Console and all its features. The instructions herein assume that the Business Analytic Server has been properly configured for users, roles, and data sources. If you need help configuring the BA Server, refer to the Administration Manual.

2. User Console Basics

Ensure that you have the Web address and login credentials for the User Console. If you do not have them you must contact your system administrator, IT manager, or supervisor.

2.1. How to Log in to the User Console

Follow these steps to log into the User Console:

1. Open a Web browser and type in the address of the server. You'll see an introductory screen with a Login button in the middle.
2. Click Login. A login-related pop-up appears.
3. Type your user name and password in the appropriate fields and click Login.

You are now logged into the User Console, and ready to start creating and running reports and dashboards.

2.2. Navigating the User Console

If you use file management tools or any web browser, you should feel right at home with the **User Console**. To familiarize yourself with the different pages and controls of User Console, let us take you through a quick tour.

2.2.1. Home

The first thing you see after your login to the console is the **Home** page, which serves as the starting place for the **User Console** and all the tasks that you do with it.
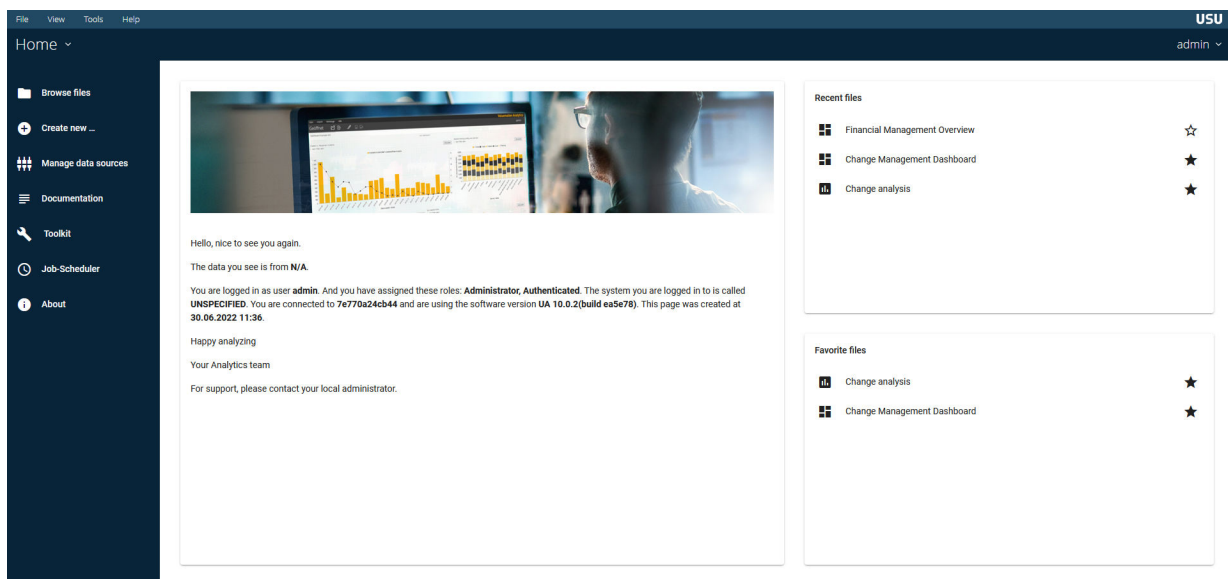
	Name	Function
1.	**Home view**	The **Home** drop-down menu lets you flip easily from page to page or return to your **Home** page.

	Name	Function
2.	Current User and Log Out	Shows the name of the person currently logged in to the User Console. Clicking the arrow next to the name lets you log out of the User Console.
3.	Browse Files	Brings you to the **Browse Files** window, where you can locate your files using the **Browsing** and **Files** panes and manage them using the **Actions** pane. Any files that you open appear in a new window.
	Create New	Gives you choices to create a new Analysis report or Dashboard.
	Manage Data Sources	Gives an administrator access to the **Data Sources Wizard**. This button does not appear if you are not logged in with an administrator role.
	Documentation	Leads you to the **documentation** page, which contains end user **documentation**.
	Toolkit	Gives an administrator access to the **Toolkit** application. This button does not appear if you are not logged in with an administrator role.
	Job-Scheduler	Gives access to the **Job-Scheduler** application. This button does not appear if you are not logged in with appropiate user rights.
4.	Recents and Favorites	Shows a list of your most recently opened files. Clicking on the star next to a recently opened file adds it to your **Favorites** list.

If this is your first time using the console, these two windows will be empty.

If this is your first time using the console, these two windows will be empty. |

2.2.2. Browse Files

The **Browse Files** page helps you keep your files organized and makes them easier for you to find and work with.
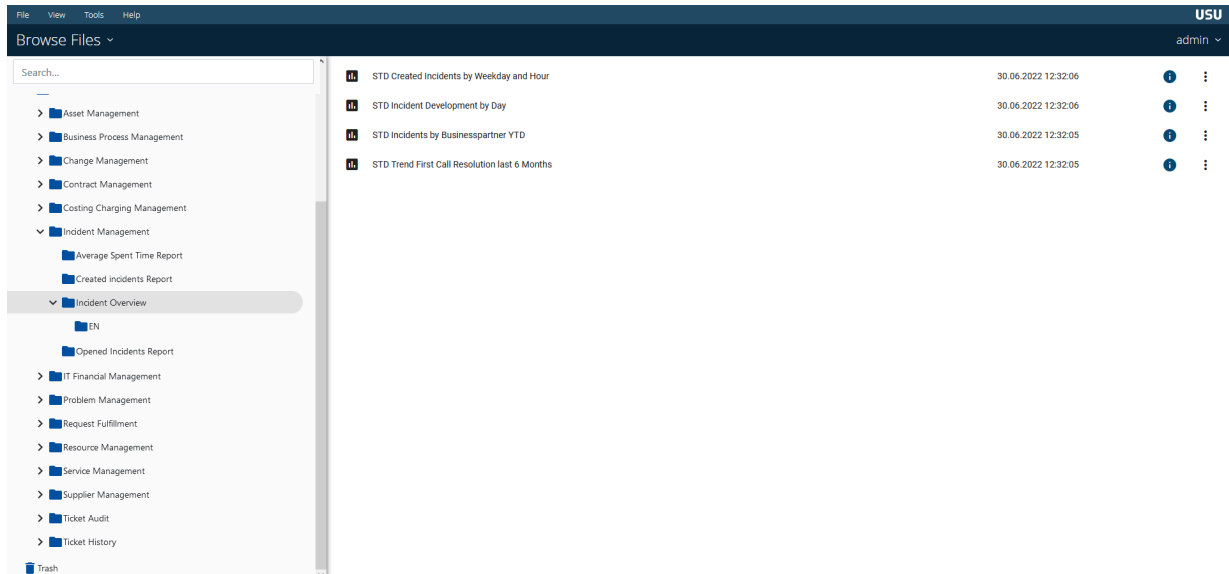
With the Search functionality you can search in Browse Files dialog. It searches in the file name. The file can be opened from search result.

> ⚠️ To implement this, we used the API provided by our framework, which is case sensitive.
>
> Be aware that you might get different results if you search for e.g. Ticket or ticket.

2.2.3. Opened

The **Opened** page activates after you open a file from the **Browse Files** page and provides a simple space to work with your files.

2.2.4. Schedules

All your active scheduled reports appear in the list of schedules, which you can get to by clicking the **Job-Scheduler** button on **Home** screen. You can also access your list of schedules from the **Browse Files** pane, if you have a report selected.

The list of schedules shows which reports are scheduled to run, the recurrence pattern for the schedule, when it was last run, when it is set to run again, and the current state of the schedule. You can edit and maintain each of your schedules.

3. Analyzer

Analyzer is an intuitive analytical visualization tool that filters and drills down into business information contained in the applications OLAP models.

Analyzer has an easy to use, web-based, drag-and-drop design environment that can be used by anyone who wants to dynamically explore data and drill down to discover previously hidden details. You do not need any special expertise to use Analyzer. You can display Analyzer reports in a Dashboard in the User Console.

Before you can use Analyzer, you must have access to a data source. Only system administrators can create data sources. The data source for Analyzer is based on the Mondrian multidimensional data model. The Mondrian data model enables you to choose which dimensions and measures you want to explore in your data.

3.1. Tour the Analyzer Panels

To create a new Analyzer Report, follow these steps:

1. From User Console **Home**, click **Create New**, then **Analysis Report**.
2. Choose a data source for the report from the **Select Data Source** dialog box. Click **Ok**.

The new Analyzer report appears in the **Opened** page. Click the **Add More Fields** and

Rearrange Fields icons on the toolbar to expand the **Available Fields** and **Layout** panels if they are hidden.
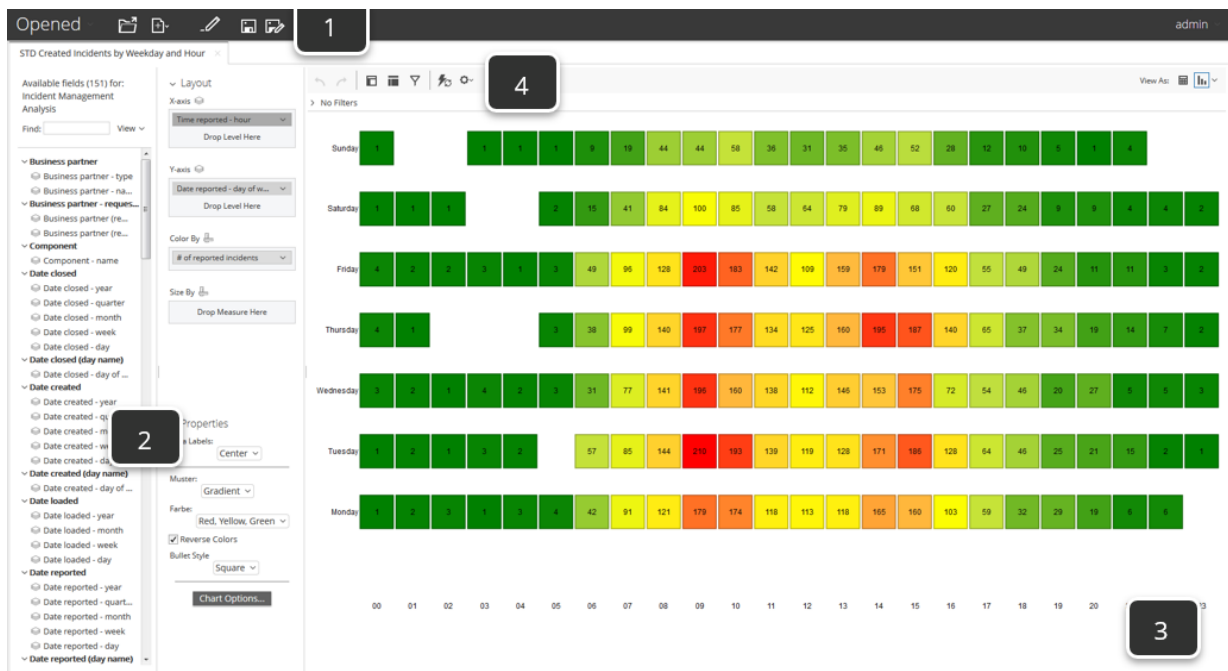
	Name	Function
1.	**Opened** view	Displays quick access buttons across the top to create and save new Analysis reports and Dashboards. Opened reports and files show as a series of tabs across the page.

	Name	Function
2.	**Available Fields** and **Layout** panels	Use the **Available Fields** and **Layout** panels to drag levels and measures into a report. Your report displays changes in the **Report Canvas** as you drag items onto the **Layout** panel. Delete a level or measure from your report by dragging it from the Layout panel to the trashcan that appears in the lower right corner of the **Report Canvas**.
3.	**Report Canvas**	Shows a dynamic view of your report as you work to build it. The look of your report changes constantly as you work with **Available Fields** and **Layout** panels to refine it. The **Report Canvas** shows different fields based on the chart type selected.
4.	**Analyzer Toolbar** and **Filters**	Use the **Analyzer Toolbar** functions to undo or redo actions, hide lists of fields, add or hide filters, disable the auto-refresh function, adjust settings, and change the view of your report. Use the **Filters** panel to display a list of filters applied to the active report or edit or delete filters.

3.2. Create a New Analyzer Report

You can create a report that allows you to easily compare data. For example, you could display the actual versus budgeted expenses by region for each of your departments.

1. From User Console **Home**, click **Create New**, then **Analysis Report**.
5. Choose a data source for the report from the **Select Data Source** dialog box. Click **Ok**.
6. From the **Available Fields** pane on the left, click and drag an object to the **Rows** or **Columns** area in the **Layout** panel. The data row or column appears in the table workspace.
7. In the list of fields, click and drag a measure to the **Measures** area in the Layout pane. The measure appears as a column in the table workspace.
8. Right-click a column and choose **Column Name and Format** from the menu. The **Edit Column** window appears.
9. Choose a format from the **Format** drop-down box. Click **OK**. The data updates automatically and is displayed selected.
10. Click **Save As**. Type a file name for your report and choose a location to save it in.

The new **Analyzer** report is created and saved in a location of your choice.

3.2.1. Add Filters to an Analyzer Report

Filters are used to restrict or limit data in a report, building the report to show only the information that you want to view.

For example, a typical report shows sales by product line. A time filter on Quarter restricts the data so that only sales for the one quarter are shown.

If you add a regional filter for Europe, the report would display data pertaining to European sales for that quarter. If you add a filter on another field to exclude a product, the report would display data pertaining to European sales in that quarter, which are also not a part of the excluded product line.

Use these steps to add a filter to your Analyzer report.

1. Login to the User Console, and click **Browse Files** to browse to the location of your Analyzer report.
2. Open the report. Expand the Filters canvas by clicking the Show Filters icon. Click and drag a field from the Available Fields panel into the filter canvas.

3. The **Filter** dialog box appears. Notice that the values associated with the field are listed in the dialog box. You can choose one of these values, or you can enable **Match a specific string** to filter the report on a specific string of data.

4. Select the value or values that you want from the **Add Selected** list and click the arrow to move it into the right pane. The value appears with a green check mark next to it in the right pane.

5. After you have selected all of the values that you need from the list, click **OK** to exit the dialog box. Your Analyzer report displays data for the chosen values only.

6. Save your report.

The Analyzer report is filtered and saved. You can click Undo or Reset to return ↰ to the previous ↱ version of the report.

3.2.1.1. Create Date Range Filters

Date range filters enable you to show only data that meets the conditions of the filter in a report. For example, you can create filters to display data between 2010 and 2013, or data after 2010.

1. Log in to the User Console, choose **New Analysis**. The **Select Data Source** dialog appears.

2. Select the data source that you want to use and click **OK**.

3. Create an Analyzer report with a time dimension, such as year or quarter.

4. Right-click the column or row header for the time dimension and choose **Filter**. The **Filter** dialog appears.

5. Choose **Select a range**.

6. From the drop-down menus, choose **Between (and incl.)**, **After (and incl.)**, or **Before (and incl.)** and the dates that you want to appear as a result of filter.

7. Click **OK**.

The Analyzer report filters data according to data ranges you specified.

When you create a date range filter using the **Between (and incl.)** operator and parameterize it, as described in chapter Add Query Parameters to Analyzer Reports (page 12) , you specify one parameter name, but two parameters are created. One parameter controls the start of the range, and another control the end of the range. The start date parameter is **<YourParameterName>_START**, and the end date parameter is **<YourParameterName>_END**.

3.2.2. Add Query Parameters to Analyzer Reports

You must be logged in to the User Console. Open the Analyzer report you created in *Adding Filters to an Analyzer Report*.

You can parameterize a query in Analyzer.

1. Right-click the dimension member you want to create a parameter for, and select **Filter** from the context menu.

2. Select the level you want to set as the default parameter value and then click the right arrow to move it to the list on the right.

3. Click the check box at the bottom of the window, then enter a name for the parameter in the **Parameter Name** field.

4. Click **OK**.

Your parameter is a filter in Analyzer. Whenever this Analyzer report is run, users will have a selection of columns to filter by

3.2.3. Export an Analyzer Report

You can export a report as a PDF, XLSX, or CSV file.

1. In the Analyzer toolbar, click **More actions and options** ⚙ > **Export Report**, and choose the desired output format. The **Export** dialogue box appears.
2. If you export to a PDF, specify how you want the page formatted and then choose one of the following options.

Option	Description
Done	Saves export settings but does not export.
Export	Applies options and generates output. If your report includes a chart, it is included in the report, along with the table view.
Cancel	Discards all changes.

You must save the report if you want to keep the export settings. Metadata for report author, source files location, fields used, and filter summary are included in the report.

3.2.4. Disable Auto Refresh Mode

When you disable the **Auto Refresh Report** feature in Analyzer you can design your report layout first, including calculations and filtering, without querying the database automatically after each change. You can enable the Auto Refresh Report option at any time. When you enable data retrieval, your report will display the requested data.

Use these steps to disable auto refresh and build a report.

1. Login to the User Console, then from the **Home** page, click **Create New**, then **Analysis Report**.
2. When the **Select Data Source** dialog box appears, clear the **Auto Refresh Report** check box.
3. Click **OK**. The Analyzer workspace appears.
4. To begin creating your report layout, select a field and drag it to the **Layout** panel at the left of the workspace. A message appears when you place the first field allowing you to refresh the report. Right-click menus are available for each of the fields you have dragged to the field layout area. They also indicate the position of the fields once they are placed in the report. Notice that the Analyzer workspace is disabled (greyed out) if you are not in live query mode. You can click the enable/disable **Auto Refresh** ⚡ button in the toolbar to toggle between the two modes.
5. Continue to build your report and query the database when the layout is complete. You may only build your report in the field layout area when Auto Refresh is disabled.
6. When your report is complete, click **Refresh** in the pink band of the field layout area. Alternatively, use the toggle button.

The Analyzer report updates based on the report definition and display the results. You can continue to edit the report as needed and click **Refresh** or enable the **Auto Refresh** ability to run the query again.

3.2.5. Define Hyperlinks

Presenting too much information in one report can overwhelm readers with distracting details, causing them to miss information that is important to them. You can manage the amount of information displayed in a report by hyperlinking from one report to other related reports,

charts, dashboards, and URLs. For example, you can present basic information in an easy-to-comprehend report with hyperlinks to reports that contain details.

For charts, hyperlinks take precedence over the drill-down chart feature. For example, when readers click a bar in a chart, it displays data related to the hyperlink you define, not the drill-down chart.

For reports, you can define a hyperlink on any row label or column header. When you define a hyperlink, the link is applied to all members within the row or column. In this source report, hyperlinks have been defined for the Positions row label and the Region column header. Notice how each of the row and column members have a blue underlined hyperlink.

When defining hyperlinks to a destination report that has parameters, you can map row labels and column headers in the source report to parameters in the destination report. This enables you to constrain the hyperlink result to display *only* data for the mapped parameters. If you do not restrain the results, all the data appears, and no filter applies.

This is the result when the reader clicks on the Datacenter service.
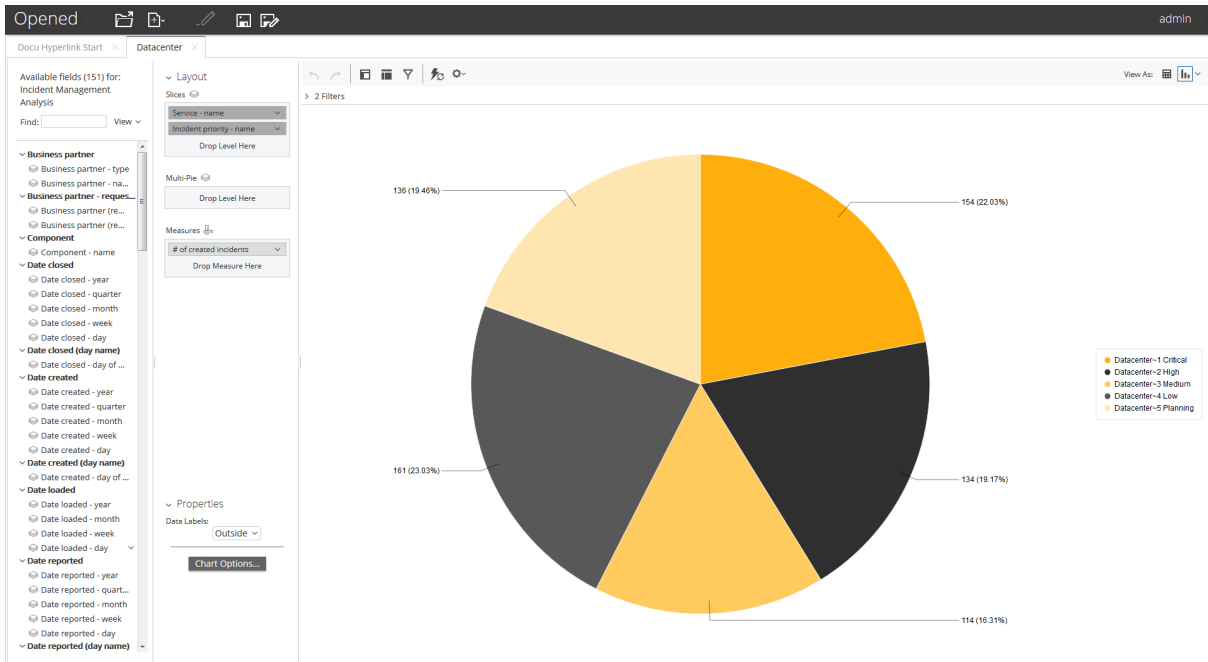
Each parameter added to the mapping constrains the data further. You can map any row labels that appear to the left, and column headers that appear above the member data.
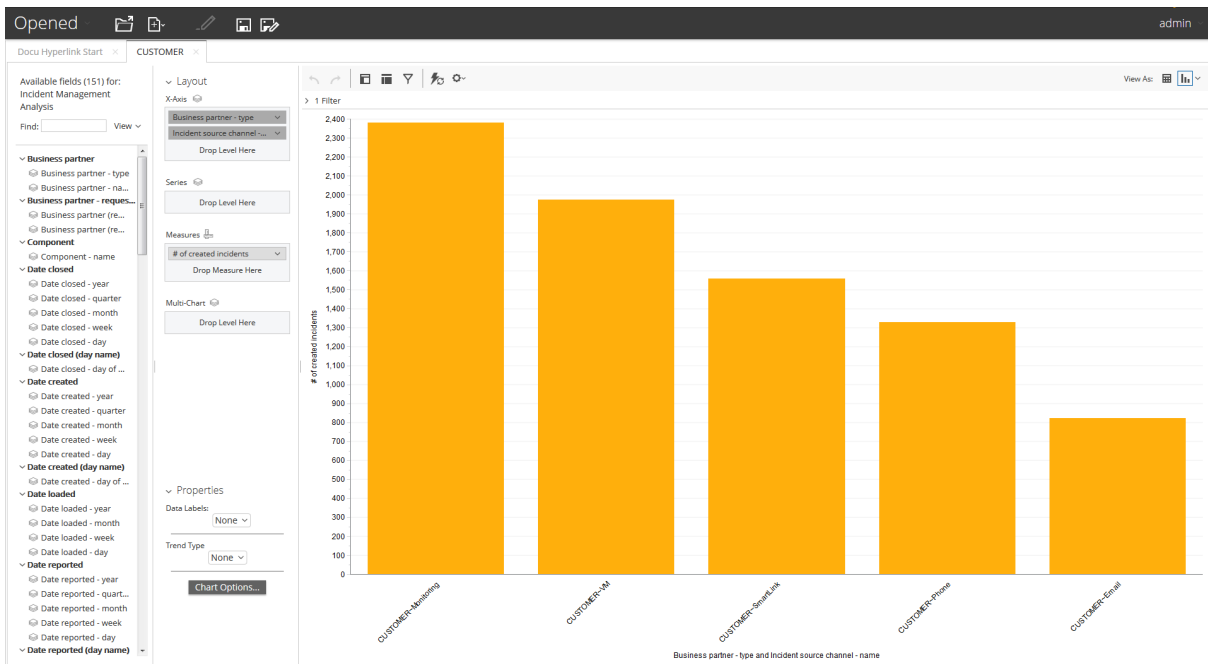
ℹ️ If you did not constrain the data with parameters, readers would see data for all Administrative Assistant Positions in all Departments.

3.2.5.1. Create Hyperlinks to a Report in the BA Repository

1. Create an Analyzer report or open an existing one.
2. Right-click a row label or column header and select **Hyperlink**. The **Link on** dialog box appears.
3. Click **Enable Link** to activate the hyperlink feature. You can disable linking by clearing the **Enable Link** check box.
4. In the **Link To** drop-down menu, select **Repository File**.
5. Click **Browse** to locate a report, chart, or dashboard in the BA repository and click **Open**.
   1. If the destination report has parameters, they automatically appear in the **Destination Parameter** list on the left. Map parameters to related row labels or column headers by selecting the check box for each parameter you want to use to constrain the resulting data. Enter the related names of the row labels or column headers within curly brackets.
   2. If the destination report does not have parameters, the Destination Parameter list does not appear. Go to the next step.
6. Specify how hyperlink content displays by clicking the **Open in:** drop-down menu and selecting **New Tab**, **New Window**, or **Current Window**.
7. Enter a **Tool Tip** to be displayed when you hover over hyperlinks and click **OK.** Hyperlinks appear in the Analyzer report.
8. Click the links to ensure the content associated with them appears correctly and save the report.

3.2.5.2. Hyperlinking to a URL

This feature requires certain rights. Ask your local administrator for permission.

Follow these steps to create a hyperlink to a URL:

1. Create an Analyzer report or open an existing one.
2. Right-click a row label or column header and select **Hyperlink**. The **Link on** dialog box appears.
3. Click **Enable Link** to activate the hyperlink feature. You can disable linking by clearing the **Enable Link** check box.
4. In the **Link To** drop-down menu, choose **URL** from the dropdown menu.
5. In the **URL** field, enter the full web address you want the hyperlink to launch.
6. Choose how the URL displays by clicking on the **Open in:** drop-down menu and selecting **New Tab**, **New Window**, or **Current Window**.
7. Enter a **Tool Tip** to be displayed when you hover over hyperlinks.
8. Click **OK.** The new hyperlinks appear in the Analyzer report.
9. Click the links to ensure the website associated with them appears correctly and save the report.

Example: If you want to search google for a city, the hyperlink to URL could look like this:

> ℹ If you want to hand over a parameter to the linked URL look up the technical name of the dimension you want to create the link for. This is because of the multi-language implementation of USU Analytics . Do **not** use the name of the dimension (here Location - city).

You can get this information, if you right-click on the dimension and choose **Tell me more…** . In this example you would copy **locationCity** from line MDX to your clipboard.

3.2.5.3. Service Management Runlink

> ℹ This is not required for USU Analytics for Software Asset Management installations.

To use this functionality, it is needed to configure Toolkit and set connection to Valuemation database in Config.

Follow these steps to create a Service Management Runlink:

1. Create an Analyzer report or open an existing one.

2. Right-click a row label or column header and select **Hyperlink**. The **Link on** dialog box appears.

3. Click **Enable Link** to activate the hyperlink feature. You can disable linking by clearing the **Enable Link** check box.

4. In the **Link To** drop-down menu, choose **URL** from the dropdown menu.

5. Click **VM Link** to activate the Service Management Runlink feature. You can disable linking by clearing the **VM Link** check box.

6. Select if **CATALOG** or **VIEW** should be opened in Service Management after clicking on the link.

7. Select **Boobject** which should be opened in Service Management.

8. Select parameter which should be used to filter catalog or view in section **Param.**

9. Enter a **Tool Tip** to be displayed when you hover over hyperlinks.

10. Click **OK.** The new hyperlinks appear in the Analyzer report.

Example: If you want to open a catalog with tickets filtered by status, the configuration should look like this:

Link on Incident status - name

Show a hyperlink on Incident status - name values that opens a Valuemation Analytics Repository File or URL. To dynamically substitute the current Incident status - name value into a parameter or URL, use the string: **{Incident status - name}**

☑ Enable Link

Link To: URL

E.g. http://search.yahoo.com/search?p={Incident status - name}

VM Link: ☑
VM Link Type: CATALOG
Boobject: Ticket
Param: status
Tool Tip:

OK   Cancel

⚠ This functionality only works within the Service Management context as an InfoObject. This means that if you open the hyperlink to Service Management within the console, it will not work.

3.2.6. Simple Conditional Formatting of Measures

Conditional formatting in the Analyzer data grid means that cells will be physically affected by the data they contain. The most common form of conditional formatting is stoplight reporting, where cell backgrounds are colored red, green, or yellow depending on user-defined thresholds. Analyzer offers some simple pre-defined methods of conditionally formatting numeric data. Follow the directions below to implement conditional cell formatting.

1. Right-click a measure in the grid, then select **Conditional Formatting** from the context menu. A sub-menu with conditional formatting types will appear.

2. Select your preferred number format from the list.

The analyzer report will refresh and apply the formatting choice you specified.

Conditional Formatting Types

Indicator Type	Description
Color scale	The background cell color will be shaded according to the value of the cell relative to the highest and lowest recorded values in that measure. There are several color progressions to choose from.
Data bar	The cell background is partially filled with a solid color proportional to the scale of the cell's value relative to the highest and lowest recorded values in that measure.
Trend arrow	An upward or downward arrow is displayed to the right of the cell value depending on whether it contains a positive or negative value.

3.3. Analyzer Visualizations

Analyzer offers many ways to visually display data. These graphics are called **visualizations**, and include maps, charts, and grids.

3.3.1. Set Chart Options

You can modify the aesthetics of a chart in Instaview by clicking Chart Options in the Properties panel in View mode. These options enable you to define how to display a chart; change a chart's colors, add a legend, and more. You can also access the Chart Options dialog box by clicking

More actions and options ⚙⌄ on the Analyzer toolbar and choose Chart Options.

3.3.1.1. General

Option	Description
Background	Fill type defines the background color of the chart and the specific fill colors used. A Gradient will result in a gradual color transition in the fill color. Choose the color you want from the available color pickers (Fill Color, End Color) You can choose not to have a fill color (None) or choose a single background color (Solid).
Labels	Allows you to choose a font type, size, formatting, and color of the labels in your chart.
Domain Limit	Allows you to adjust the number of values that are laid on the report.

3.3.1.2. Axis

Option	Description
Primary Axis: Auto Range	When selected, allows you to define the range shown on the primary axis.
Primary Axis: Scale	Allows you to choose the scale used on the primary axis.
Primary Axis: (Scatter and Column-Line Combo charts only) Auto Range	When selected, allows you to define the range shown on the secondary axis.
Secondary Axis: Scale	Allows you to choose the scale used on the secondary axis.

3.3.1.3. Legend

Option	Description
Show Legend	Allows you to enable to disable the legend display.
Position	Allows you to choose the placement (Top, Right, Bottom, Left) of the legend on the chart.
Background Color	Allows you to choose a background color for the legend.

Option	Description
Font	Allows you to set the font type, size, format, and color associated with your legend.

3.3.1.4. Other

Option	Description
Multi-Charts	Allows you to define the number of charts that display per row, when using the Multi-Charts feature, and the axis range for the charts.
Size by Measure	Define how to treat negative values
Empty Cell Treatment (Line and Area charts only)	Choose how to define the way points with no value appear.

3.3.2. Display Multi-Charts in Analyzer

The Analyzer multi-chart feature allows you to display multiple charts in a single Analyzer report. For example, use this feature when you want to display the same data over different years. The multi-chart feature prevents you from having to create separate filters and reports.

You must have Auto-Refresh Mode disabled to use the Multi-Chart feature.

1.   Create or open an Analyzer report.
2.   Click the **Switch to Chart Format** button to change to chart format.
3.   Move the appropriate fields into the **Multi-Chart** section. The field auto populates with the different charts dependent upon the level placed in the **Multi-Chart** field.
4.   Save the report.

3.3.3. Geography Map Visualizations in Analyzer

Geo maps enable you to visualize data on a geographic map. This visualization type will plot a pin on a map based on the location attribute used. You can then use a measure to color-code the pen and/or use a measure to specify the size of the pin. If your model has geographic annotations, then the location information will be retrieved by the geoservice automatically.
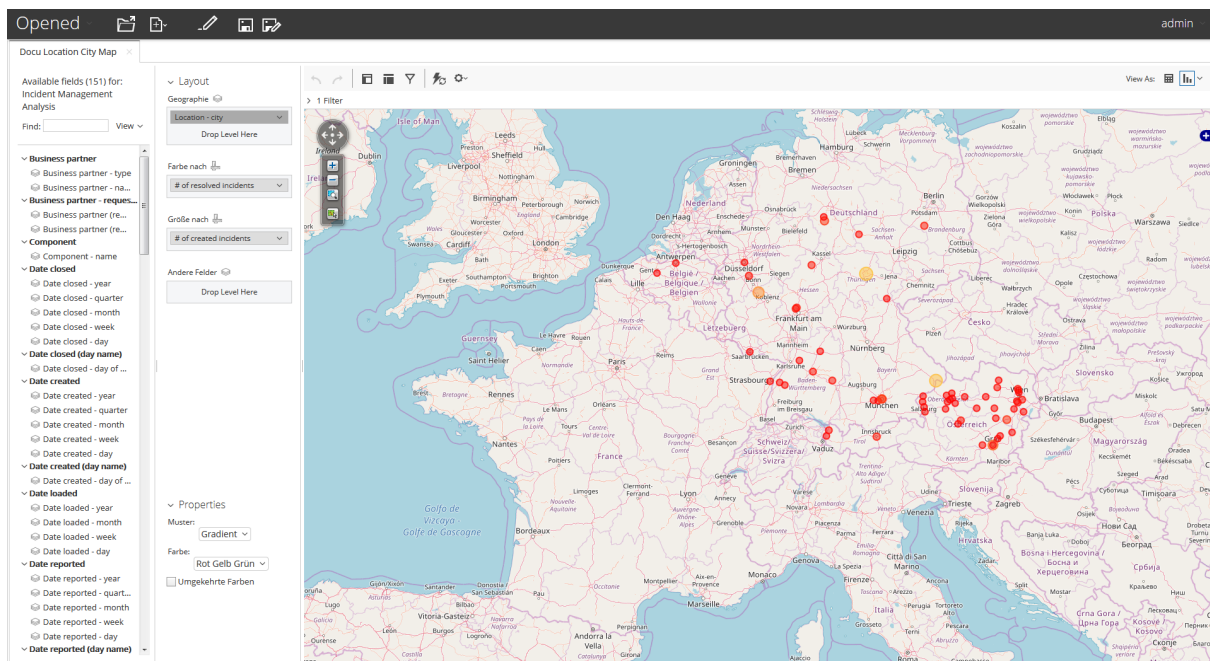
A license from Google might be required if Google Maps are used.

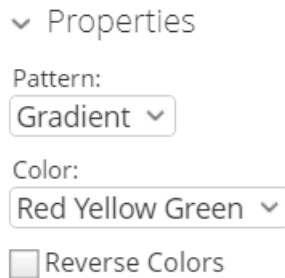### 3.3.4. Change Geography Map Visualizations in Analyzer

The **Properties** panel enables you to customize the appearance of map visualizations.

The **Pattern** drop-down box allows you to decide the way the colors of the pins populate. The appearance does not denote any of the data, it is solely for aesthetics. You have the option of choosing:

- Gradient
- 3 Step
- 5 Step

The **Color** drop-down box allows you to decide which colors denote large measures and which colors denote smaller measures. The color denotes the size of the data, from small to large. You have the option of choosing:

- Red Yellow Green
- Red Yellow Blue
- Blue Scale
- Gray Scale

You also have the option of checking the **Reverse Colors** box, which will allow you to choose the inverse colors, so they appear from large to small.

3.3.5. Scatter Chart Visualizations in Analyzer

Scatter charts allow users the ability to visualize data on a graph. This visualization type will plot a bubble on a graph based on the attributes used. You can then use a measure to color-code the bubble and/or use a measure to specify the size of the bubble.
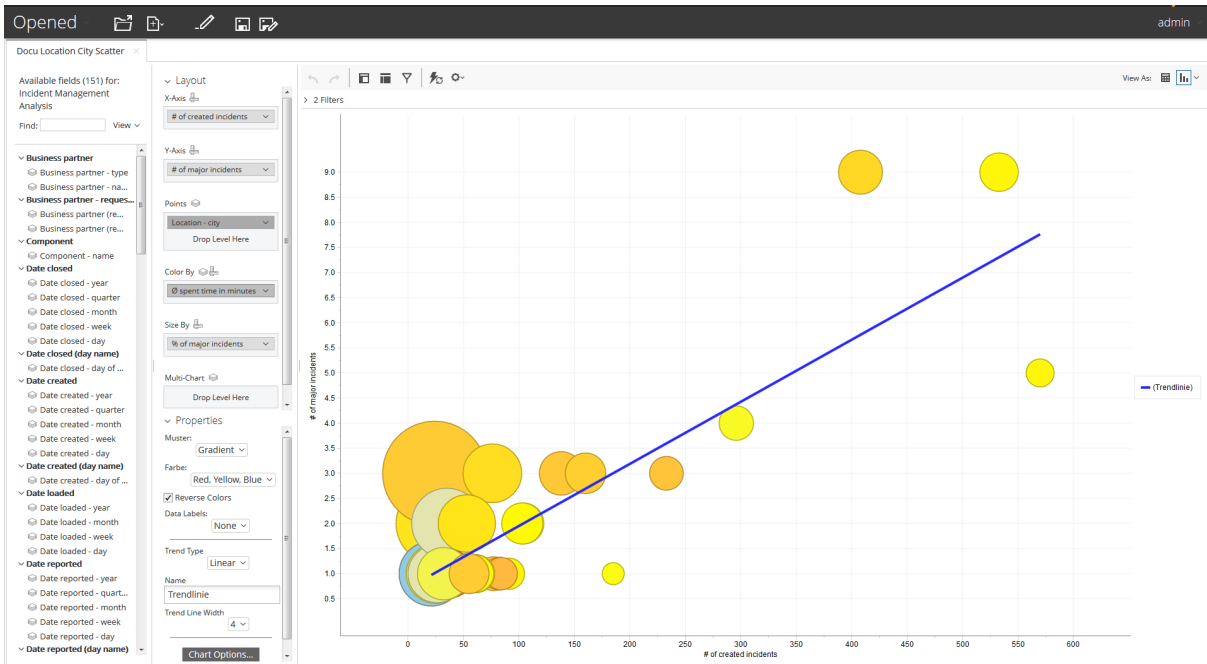
3.3.5.1. Change Scatter Chart Visualizations in Analyzer

The **Properties** panel enables you to customize the appearance of scatter chart visualizations.

Table 1. Pentaho Table

Property	Definition
Data Labels	Use this to label the data features of your report with what is represented. You can also choose no Data Labels or specify where you want them to appear.
Trend Type	Shows a trend type of none or linear. If you choose linear, you can name your trend line and set the width of it.

3.3.6. Heat Grid Visualizations in Analyzer

Heat Grids allow you the ability to visualize data, so you can identify patterns of performance. This visualization type will color-code your results, so you view complex business analysis in an easy-to-understand visualization.
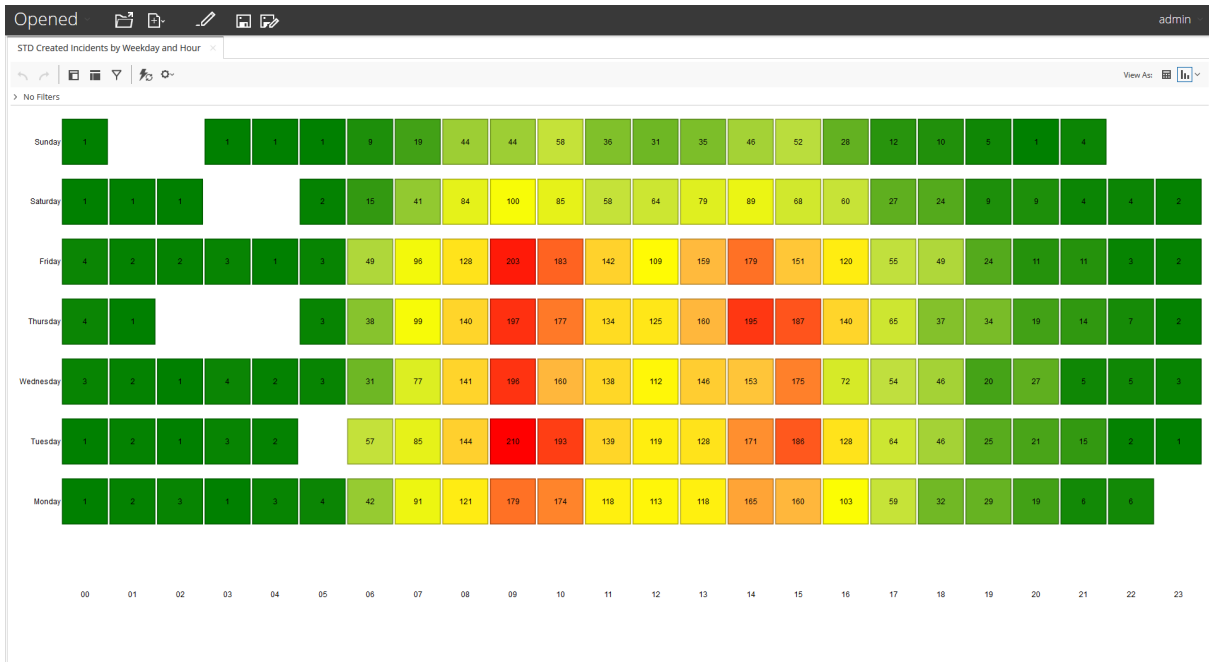
3.3.6.1. Change Heat Grid Visualizations in Analyzer

The **Properties** panel enables you to customize the appearance of map visualizations.

Use the **Data Labels** drop-down box to label the data features of your report with what is represented. You can also choose no Data Labels or specify where you want them to appear.

The **Pattern** drop-down box allows you to decide the way the colors of the pins populate. The appearance does not denote any of the data, it is solely for aesthetics. You have the option of choosing:

- Gradient
- 3 Step
- 5 Step

The **Color** drop-down box allows you to decide which colors denote large measures and which colors denote smaller measures. The color denotes the size of the data, from small to large. You have the option of choosing:

- Red Yellow Green
- Red Yellow Blue
- Blue Scale
- Gray Scale

You also have the option of checking the **Reverse Colors** box, which will allow you to choose the inverse colors, so they appear large to small. You may also change shape of the measures in the **Shape:** drop-down box. The measures can be alternated between **Square** to **Circle**.

The **Properties** panel enables you to customize the appearance of scatter chart visualizations.

4. Dashboard Designer

Dashboard Designer allows you to create dashboards with little or no training. The dashboard is several different reports brought together inside one screen. Use Dashboard Designer if you want to create an interface to view many different reports at once, have quick access to web pages that you visit often, or view dynamic charts and graphs within a space while you create reports in another.

Creating a dashboard in Dashboard Designer is as simple as choosing a layout template, theme, and the content you want to display. In addition to displaying content generated from Analyzer or Report Designer, Dashboard Designer can also include these content types.

- **Charts**: simple bar, line, area, pie, and dial charts created with Chart Designer
- **Data Tables**: tabular data
- **URLs**: Web sites that you want to display in a dashboard panel

Dashboard Designer has dynamic filter controls, which enable dashboard viewers to change a dashboard's details by choosing different values from a drop-down list, and to control the content in one dashboard panel by changing the options in another. This is known as content linking.

4.1. Create a New Dashboard

You must be logged into the User Console. Use these steps to create a new dashboard.

1. From the User Console **Home** page, click **Create New** and then select **Dashboard**.
2. On the bottom of the page, click the **Properties** tab, and enter a title for your dashboard page in the **Page Title** text box. The name you entered appears on the top left corner of the dashboard. This name helps you identify the page if you want to edit, copy, or delete it later.
3. Click **Templates** to choose a dashboard layout. A blank dashboard with the layout you selected appears.
4. Click **Theme** to choose a theme for your dashboard. The theme you selected is applied to your dashboard.

You now have the basic framework for a dashboard.

4.1.1. Tour the Dashboard Panels

	Name	Function
1.	**Opened** view	Displays quick access buttons across the top to create and save new Analysis reports, Interactive reports, and Dashboards. Opened reports and files show as a series of tabs across the page.
2.	**Prompts** panel	The **Prompts** panel gives you a way to add filters to the individual parts of your dashboard.
3.	**Browse Folders and Files** panel	Locate your files using the **Browse** and **Files** panels and add them to dashboards.
4.	**Dashboard** canvas	Shows a dynamic view of your Dashboard as you work to build it. The look of your dashboard refreshes as you add content from the **Browse Folders and Files** panels, and work with the **Prompts** or **Objects** panels.
5.	**Objects** panel	Refine the look of your dashboard with the **Objects** panel by choosing a dashboard template or changing the titles for each object in the dashboard.

4.1.2. Add a Report Designer Report to a Dashboard

Use these steps to add a report created with Report Designer.

1. Select a panel in the Dashboard Designer.
2. Click 🗗˅ (Insert) and choose **File**. A browser window opens.
3. Locate the appropriate report file.
4. Click **Select** to place the report inside the dashboard panel. A pagination control arrow at the top of a report allows you to scroll through long reports. Notice that the report file name appears under **Content:** in the dashboard edit pane. If your report contains parameters you can enter values manually and link them to a dashboard filter in the text boxes under **Source**. When the report renders again, the parameter value(s) you entered are included in the report.

> ❗ If you choose a Report Designer file to place in a dashboard, but do not supply values for required parameters, the report will show up blank.

4.1.3. Add an Analyzer Report to a Dashboard

Use these steps to display an Analyzer report in a dashboard.

1. Select a panel in the Dashboard Designer.
2. Click **Insert** and choose **File**.
3. Locate the appropriate Analyzer report and click **Select**. The Analyzer Report appears inside the dashboard panel.

4.1.4. Add a Web Site to a Dashboard

Use these steps to display contents of a Web site in a dashboard panel.

1. Select a panel in the Dashboard Designer.
2. Click ⬚˅ (Insert) and choose **URL**. The **Enter Web site** dialog box appears.
3. Enter the Web site URL in the text box and click **OK**.
4. If applicable, click ✎ (Edit) to make changes.
5. Save your dashboard when you are done.

4.2. Use Prompts on Dashboards

Prompts display a subset of data based on the dashboard user's point of view. For example, a European user may only want to see EMEA region sales data, whereas the dashboard's default region is the NA region. To ensure that a prompt links to the correct content in a dashboard, the content to which you are linking must contain at least one parameter.

Below are general instructions for adding prompts to your dashboard:

1. In the dashboard page, choose **Edit** (the pencil icon), which will make the **Objects** pane appear.
2. Under **General Settings**, choose **Prompts**. The **Prompts** pane appears on the right. No prompts are listed if this is the first time you are assigning prompts.
3. To display a prompt toolbar to users of the dashboard, enable **Show Prompt Toolbar**. The prompt toolbar appears at the top of the dashboard.
4. Click the **Add** button to start adding prompts. The **Prompts** dialog box appears.
5. In the **Prompts** dialog box, enter a display name for the control label. For example, "Region."
6. Enable **Display Name as Control Label** if you want users to see the display name in the prompts toolbar.
7. Select your control type. Control types define how your prompt values are selected; for example, in a drop down list, radio button, check box, and so on.

The table below contains a description of each control type.

Control Type	Description
Drop Down	Users choose a prompt value from a drop-down list.
List	Users choose a prompt value from a scrolling list. This prompt control supports multiple selections.
Radio button	Users click a radio button to choose a prompt value.
Check box	Users enable a check box to choose a prompt value. This prompt control supports multiple selections.
Button	User click a button to choose a prompt value. This prompt control supports multiple selections.
Text Field	Users enter a text string or number into a text field manually.
Date Picker	Users examine prompt values based on calendar date.

Your dashboard now has a prompt.

If you plan to provide hard-coded names and values for your dashboard users, or produce a dynamic prompt list, continue to the next few sections.

4.2.1. Add a Prompt to a Dashboard

You can create a prompt tool bar that enables users to refine report results in a dashboard. First create the **Prompt Toolbar**. Then customize the toolbar so that the appropriate options appear.

4.2.1.1. Creating a Prompt Toolbar for Dashboards

1. Open a dashboard that contains at least one parameterized report.
2. Click the **Edit Content** icon to open the editing options in the dashboard.
3. In the bottom section, inside the **Objects** pane, choose **Prompts** to access the Prompt pane.
4. Click **Show Prompt Toolbar** to display the prompt toolbar to dashboard users.
5. Click **Add** to add a prompt. The **Prompt** dialog box appears.
6. In the **Name** field, enter the title for the prompt toolbar.
7. In the **Control** box, click the format for the prompt options. For example, you can choose the **Drop Down** control if you want a list that appears when users click the first option.
8. Ensure that **Static List** is selected under **Type**.

4.2.1.2. Customizing a Prompt Toolbar for Dashboards

1. In the **Data** box, click **Add**. The **List Value** dialog box appears.
2. In the **Label** field, enter the option name as you want it to appear to dashboard users.
3. In the **Value** field, enter the parameter source name. For example, using the Steel Wheels sample, enter Classic Cars.
4. Add labels and values for each parameter you want to filter. Click **Close** to exit the **List Value** dialog box. If you are filtering an Analyzer report and using a static list, you can add the option **All by creating a new Label-Value-Combination called "All" with the Value "All"**. This option drops the filter from the report and shows all values.
5. In the **Control Properties** box, under **Initially Selected:** choose which item you want to appear first in the prompt list. Choose **Use First Value** to set the default to the first value in the list, or you can choose **Specify** if you want a specific value to appear first.
6. Click **OK**.
7. In the **Objects** pane, choose the title of the report you want to filter. Click the **Parameters** tab and choose the correct **Source** for the parameter from the list. The source should be the name of your prompt.
8. Click **Save**.

4.2.2. Link Dashboard Prompts to Analyzer Parameters

This process only applies to dashboards that include parameterized Analyzer reports. You must have an Analyzer report with a query parameter in it to proceed.

The instructions below explain how to parameterize an Analyzer report as described in Add Query Parameters to Analyzer Reports (page 12).

1. In Analyzer, choose a field in your report to which you want to link; then, right-click and choose **Filter**.
2. In the **Filter** dialog box, enter a name for the parameter in the **Parameter Name** text box and click the check box to enable it.
3. Select the values you want associated with the parameter. Use the arrows to add values to the box on the right.
4. Click **OK** to exit the Filter dialog box.
5. Save your Analyzer report. In the upper left corner of the report, you can see that a filter is in use. Click ✎ (Edit) to edit your filter; click ✕ to delete the filter.
6. Create a dashboard and drag the Analyzer report into a panel. The name of the parameter appears in the lower portion of the dashboard under **Parameters**.
7. Add a filter to the dashboard based on the parameter you created in your Analyzer report. The filter appears in the dashboard.

4.3. Use Content Linking to Create Interactive Dashboards

Depending on your needs, you can create a "static" dashboard, which contains content in each panel that is separate but related. For example, you may provide users with a bar chart that contains total sales figures by region. Additionally, you may provide a data table that displays sales details for each state in a specific region. You may also want to provide sales data associated with each salesperson in a specific region. The content in your dashboard is useful to dashboard consumers, but to make it more "interactive," you may want to consider using *content linking*.

The content linking features in dashboards allow you to associate (link) content in one dashboard panel to content on another dashboard panel if query parameters have been defined. These features are particularly helpful for drilling down or for dynamic filtering; for example, when dashboard consumers explode a single slice in a pie chart to launch content in a data table associated with that pie slice. In this instance, dashboard consumers are moving from a summary view to a detailed view interactively.

You can use content linking if your dashboard panel contains an Analyzer report or Report Designer based report (.prpt).


Content Linking and Query Parameters

Query parameters are required for content inside a dashboard panel to receive values used to filter data from a filter control. They are also required when receiving values from content in other dashboard panels that are broadcasting values associated with Content Linking. The way in which query parameters are defined is different depending on the type of content you are placing inside your dashboard panels.

Link an Analyzer Chart to a Report

You can create content-to-content links between an Analyzer chart and any other parameterized report such as a Report Designer report or another Analyzer report.

Below are general instructions for linking an Analyzer chart to a report. You must adjust the instructions when working with your own data.

1. Create a simple dashboard that contains an Analyzer chart and a parameterized report. The example above displays an Analyzer chart and an Analyzer Report displayed as a table view. At this point, none of the content has been linked and you have a "static" dashboard. Hypothetically, if you want users to be able to click a bar in the bar chart and update the Analyzer table view, the table must contain at least one parameter.
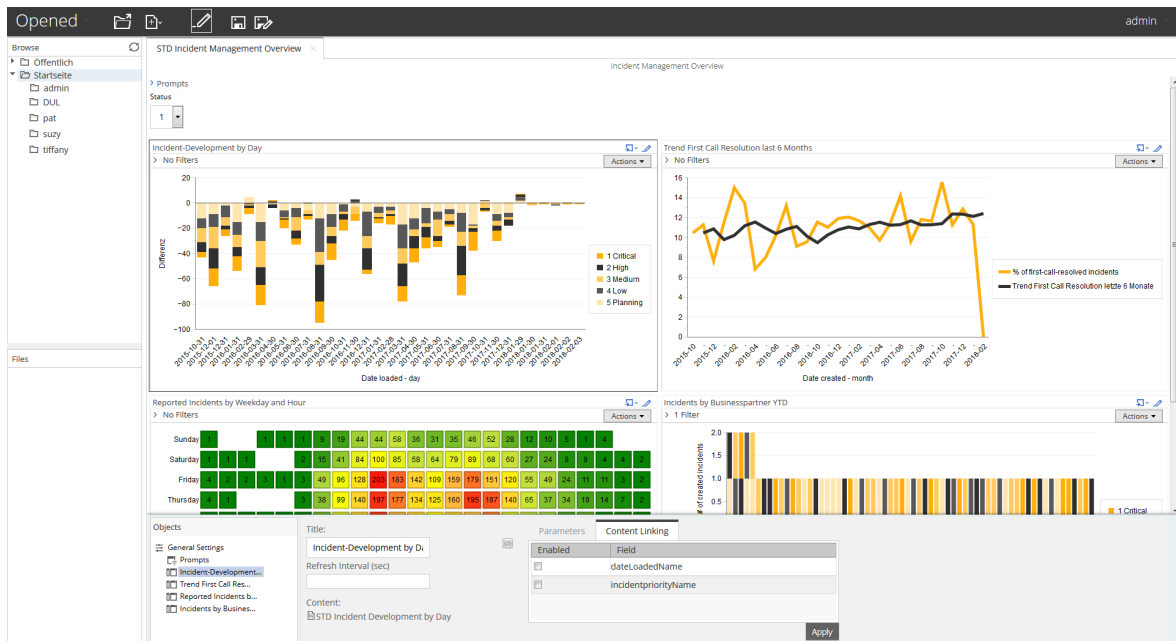
2. Under **General Settings**, choose the Analyzer chart. Click the **Content Linking** tab then click the check box (or check boxes) next to the field/column name you want enabled for content linking. Click **Apply**.
3. Under General Settings, choose the Analyzer Report (table view) and click the **Parameters** tab. Click the down arrow, in the **Source** text box to display another source for the parameters you created.
4. Save your dashboard.

5. Job-Scheduler
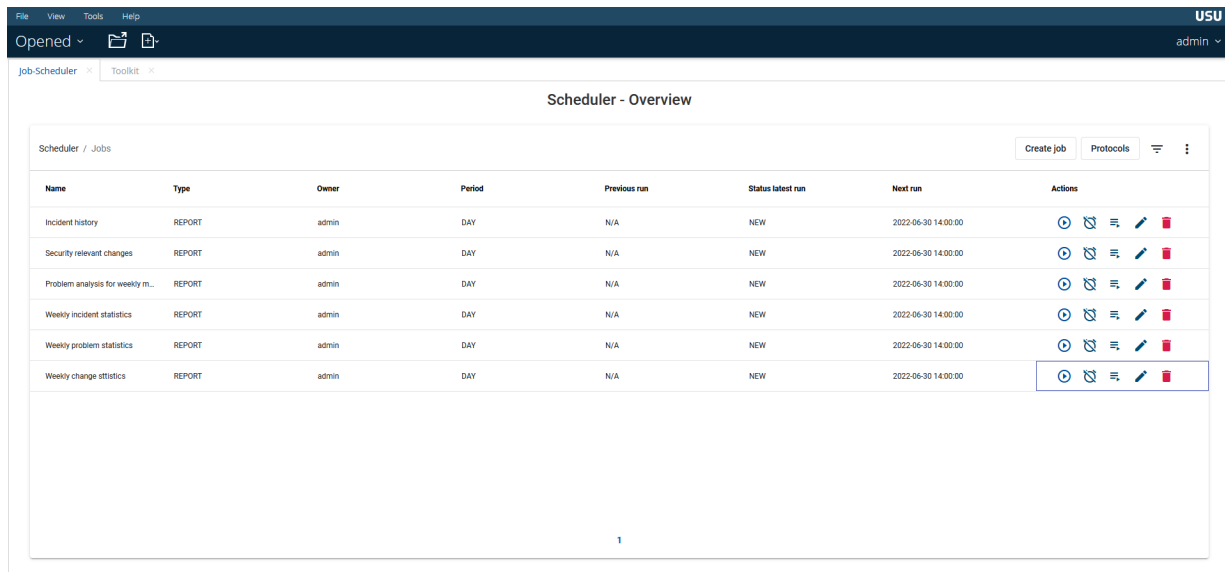
The Job-Scheduler is an application to schedule reports and publish them. The module can be accessed from Home screen.

The main functionalities are:

- Organize your schedules within user console.
- You can create, edit, activate, deactivate and delete your Scheduler jobs.
- You can define dependencies between Scheduler jobs e.g. run job B only, if job A finished successfully.
- All runs are logged.
- Send a email after the job has finished. You can decide if you want to send out this message after every run or only in case of an error. Protocol information could be attached.
- Scheduler job definitions can be exported and imported.
- You can use filters to search for specific Scheduler jobs.
- You can use filters to search in Scheduler protocols.

5.1. Create a New REPORT Scheduler Job

To create a new Scheduler job of type REPORT, please follow these steps:

1. Open Scheduler application.
2. Click the **Create job** button and choose REPORT. The **Scheduler – Create new job** dialog opens.
   Fill in the **Job name**. The job name is unique per user.
3. If your new job depends on the result of another job, you define this dependency in **Depends on**.

Click **Next** to get to the **Actions** section.

4. Add actions you want to run in this Scheduler job. Click the **Add +** button, select one or more of the offered reports. You can sort the selected reports by dragging them around or delete a report by clicking on the waste basket icon. Define the name and output format per report.

Click **Next** to get to the **Output options** section.

5. In the Output options section, you define the output location and the output folder. When checking Add timestamp, a timestamp information will be added to the file names of all rendered report files.

    Click **Next** to get to the **Trigger** section.

6. In the Trigger section you define the period, interval and start time of you schedule.

Click **Next** to get to the **Notification settings** section.

7. Information in **Notification settings** section is optional. When a Scheduler job is finished you can define if an automatic message is sent.

Fill in a comma separated list of email addresses as **recipients**, a **subject** and a **message** text.

With **Send when status is** you can define when a message is sent, e.g. only in case of a failure.

With **Add log as an attachment** and **Add generated info** you can add log information to you email.

8. With the **Previous** button, you can always go back to other sections.

9. Save your new Scheduler job.

5.2. Maintain Scheduler Jobs in Scheduler Overview

You can maintain existing Scheduler jobs in the Scheduler overview screen. In the action's column, you find four buttons. They give you the possibility to:

- Activate /deactivate Scheduler jobs
- Run immediately
- See the protocol of a Scheduler Job
- Edit Scheduler jobs
- Delete Scheduler jobs
- Use filters to search for specific Scheduler jobs

5.2.1. Run immediately

To run a schedule immediately click on the first button in actions column. The job will be executed directly after you pressed the button.

5.2.2. Activate / Deactivate Scheduler Jobs

To activate or deactivate click on the second button in actions column. Deactivated Scheduler jobs are greyed out and the trigger is ignored.

5.2.3. See the Protocol of a Scheduler Job

When you click the third button in actions column the run history of this Scheduler job opens.

5.2.4. Edit Scheduler Jobs

When you click the fourth button in actions column the edit window opens. It is much the same interface as you use when you create a new Scheduler job. For details please see there.

5.2.5. Delete Scheduler Jobs

When you click the fifth button in actions column the deletion process starts. A security question is asked. If you not deny, the Scheduler job is deleted.

5.3. Export Scheduler Jobs

1. Open Scheduler application.
2. Click **Export** in **Options** menu, a new dialog opens.
3. The system asks you, where to save the export file. After the selection of the destination folder the export starts.

   Some browsers have a default download directory. In this case you are not asked for a destination folder and the export starts immediately.

5.4. Import Scheduler Jobs

1. Open Scheduler application.
2. Click **Import** in **Options** ⋮ menu, a new dialog opens.
3. Choose a definition file to import.
4. Select the desired mode to be used in case of merge conflict between an existing and an imported definition.
   - Overwrite existing data:
     - If not checked, jobs with same name are not imported.
     - If checked, jobs with same name are overwritten and autit is kept.
   - Overwrite ownership: As admin you are allowed to change this setting.
5. Click **Import** button and start the import of the chosen import file.

5.5. Use Filters to Search for Specific Scheduler Jobs

1. Open Scheduler application.
2. Click the **filter icon**, a new dialog opens.
3. You can set filter criteria and values for Name, Owner, Type, Status and Status latest run.
4. In **Name** and **Owner**, you can search with text.

   In **Type** you can choose ETL, REPORT or SYSTEM.

   In **Status** you search for DISABLED or ACTIVE jobs.

   In **Status last run** you have these values to filter by:
   - FINISHED: Last run was finished successfully
   - FAILED: Last run failed during execution
   - RUNNING: Still running
   - NEW: Waiting in queue for next run
   - SKIPPED: Undefined termination – usually the job was canceled manually by user
5. Click **Ok** and the filtering is activated.

   An active filter is indicated by the **blue color** of the filter icon.

6. To disable filters, click on the **filter icon** and use the red **Delete** button behind a filter criterion to disable that particular filter, or use the **Reset all** button to disable all filters. Click **Ok** to activate your changes.

5.6. Use Filters to Search in Scheduler Protocols

1. Open Scheduler application.
   Open protocols.
2. Click the **filter icon**, a new dialog opens.
3. You can set filter criteria and values for Status, Email status and Start time.
4. In **Status** you have these values to filter by:
   - FINISHED: Last run was finished successfully
   - FAILED: Last run failed during execution
   - RUNNING: Still running
   - NEW: Waiting in queue for next run
   - SKIPPED: Undefined termination – usually the job was canceled manually by user

   In **Email status** you have these values to filter by:
   - INITIALIZATION: The process of sending an email is started
   - DISABLED: Not possible to process due to missing values (e.g. recipient)
   - TRYING TO SEND: Sending email in progress
   - FAILED MAIL SERVICE IS NOT CONFIGURED: Failed due to wrong configuration
   - FAILED MAIL ENGINE: Failed while sending mail
   - SENT: Mail, was send successfully

   When filtering by start time it is also possible to define a range.
5. Click **Ok** and the filtering is activated.
   An active filter is indicated by the **blue color** of the filter icon.
6. To disable filters, click on the **filter icon** and use the red **Delete** button behind a filter criterion to disable that particular filter, or use the **Reset all** button to disable all filters. Click **Ok** to activate your changes.

6. Report Assembler
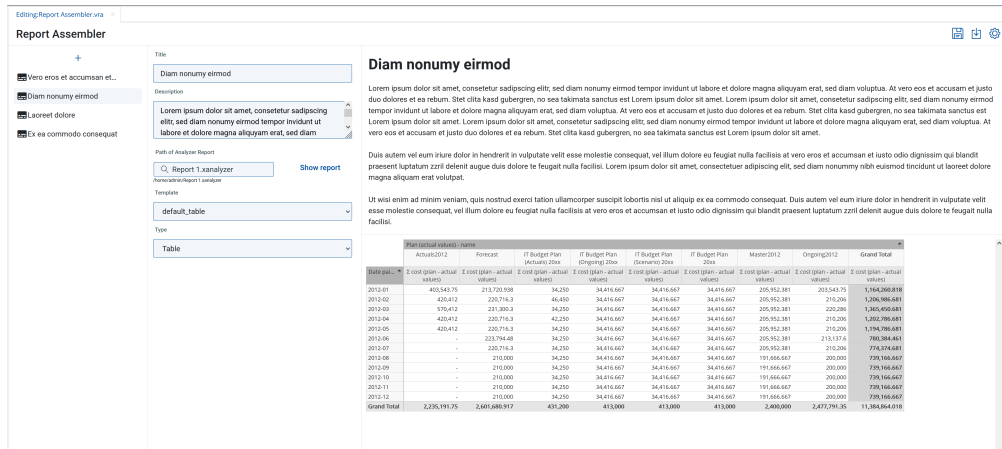
The Report Assembler is an application to combine multiple Analyzer Report to one set and create a PDF file out of it.

The main functionalities are:

- Assemble different Analyzer Reports to a set and create a PDF.
- Print chart and/or table information.
- Customize your report templates to your corporate identity.
- Enrich Analyzer Report information with texts.
- Schedule the creation and send the file via Job-Scheduler module.
- Use parameters to filter in Scheduler and use parameters in texts.
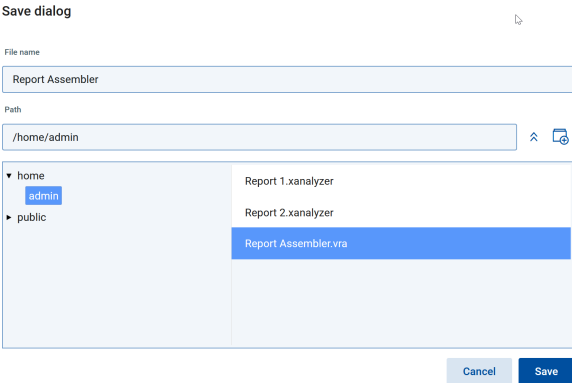
> ℹ️ This feature is an add-on with additional license fee. Please get in contact with your responsible sales person to get more information.

6.1. The Report Assembler Application

The Report Assembler has three main areas:

- On the left side you see the panel with an overview of your chosen Analyzer Reports
- one in the middle to configure information for the chosen sub report
- and on the right, you see the representation of the selected sub report.

In the following table we describe the main functionalities you can use in Report Assembler.

Object	Description
Save	When you click **Save**, a new dialog opens. **Save dialog** File name Report Assembler Path /home/admin ▼ home admin ▸ public Report 1.xanalyzer Report 2.xanalyzer Report Assembler.vra Cancel Save Select the path to store the Report Assembler Definition in and fill in the file name. Click the **Save** button. The file will be saved.
Settings	When you click the **Settings** button, the **Settings** dialog opens. **Settings** Template Landscape Header Vero eros et accumsan et iusto odio dignissim Footer Diam nonumy eirmod Cancel OK **Template:** In the template section you choose the Report Assembler template you want to use. We ship our product with two examples: Landscape and Portrait. You can add new Report Assembler templates or customize the existing (see chapter 8.3.3 and 8.3.4). **Header:** Here you define the report header information. You can use build-in parameters. For details see Build-in Parameter (page 38). **Footer:** you define the report footer information. You can use build-in parameters. For details see Build-in Parameter (page 38).
Generate report	Click the button **Generate report** and the report will be created instantly. ℹ For each Analyzer Report we defined a fixed time out of 5 minutes.

6.2. Parameter

6.2.1. Build-in Parameter

In Report Assembler definitions you can use build-in parameter, which are replaced on runtime of the PDF generation. You can use them in various areas of the application.

Implemented build-in Parameter are:

Parameter	Description
${CURRENT_TIMESTAMP}	Date and time information.
	Example: 2018-08-08 18:10:02
${VMA_CURRENT_SERVER_URL}	Server URL
	Example: http://localhost:8080/console
${CURRENT_DATE}	Date information
	Example: 2018-08-08
${VMA_CURRENT_USER}	User, which is executing the generation.
	Example: admin

6.2.2. Analyzer Report Parameter

In Report Assembler definitions you can use parameter you defined an Analyzer Report, which are replaced on runtime of the scheduled PDF generation. The parameter you can use in the Report Assembler context are shown in the blue area in settings and in the tile edit dialog.

A detailed description how to add and maintain parameter in Analyzer Report see Add Query Parameters to Analyzer Reports (page 12).

6.3. How To

6.3.1. Create a New Report Assembler Definition

To create a new Report Assembler Definition, please follow these steps:

1. Open the user console **Home** screen.
2. Click **Create New** and then click Report Assembler. The Report Assembler application opens, and an empty tile is displayed.
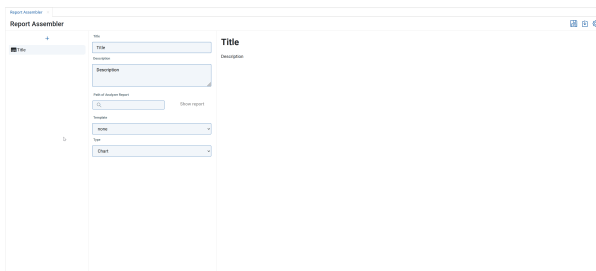
3. Fill in the fields in the middle panel

   Main settings for the selected tile are:.

   Title: Here you define the title of the selected tile. You can use build-in parameters.

   Description: Here you define the description of the selected tile. You can use build-in parameters.

   Path of Analyzer Report: In this field you can select the Analyzer Report you want to use in this tile. Click the field and a search field appears. You can search and select the AnalyzerReport you want to use here. *Show report* opens the Analyzer Report in a new tab.

   Type: An Analyzer Report can have two representations, as chart or as table. Select what you want to see.

   Template: Chose the table template you want to use. This influences the way a table will be rendered.

> ℹ️ Not all chart types are supported. We support only those chart types, which are possible to export in the standard export possibilities in Analyzer Report.

4. Click **Save** to save the Report Assembler definition. Choose the **Path** and add the **File name**. Your definition is now saved in the server repository.

6.3.2. Edit an Existing Report Assembler Definition

To edit an existing Report Assembler Definition, please follow these steps:

1. Open the user console **Home** screen.
2. Click Browse Files and select the Report Assembler definition you want to edit.
   Choose **Edit** from **More** menu.
3. The Report Assembler definition opens in edit mode.
4. You now can edit the settings of the definition.
5. To add a new tile to the definition, click on the **+** (plus) icon you see in the Report Assembler menu.
   An empty tile will be added below the active tile, and you can edit this tile like described in the former chapter with the ✏️ dialog.
6. To clone a tile, click the clone icon in the Report Assembler menu. The copy is added below the active tile.
7. To move a tile, click the tile an keep the left mouse button pressed. Drag the tile where you want it and let it drop.
8. To remove a tile, activate the tile you want to delete and click the trash icon in the Report Assembler menu.

> ℹ️ The tile is removed, and it is not possible to revert this change.

9. Save your changes by clicking on the **Save** button.

6.3.3. How to use parameters

To use parameters in Report Assembler, please follow these steps:

1. Create a filter in the Analyzer Report you want to have parametrized in Report Assembler.

Filter on Ticket status - name

○ Select from a list
○ Match a specific string

Parameter Name:

paramIncStatus

| | Currently: |
| Find | Included ▼ |

Abgeschlossen (CA)	
Abgeschlossen (IN)	✓ Angelegt (IN)
Abgeschlossen (SR)	
Angelegt (CA)	>
Angelegt (IN)	<
Angelegt (SR)	
Anwender informiert (IN)	
Anwender informiert (SR)	»
Auf Change wartend (IN)	«
Auf Kunde wartend (SR)	
Auf Major Incident wartend (IN)	

Showing all 32 values   1 value selected

❓ Help   OK   Cancel

In this example we created a filter for the dimension **Incident status – name**. The value we selected in filter is **Created (IN)**. The Name of the parameter we set to **paramIncStatus**.

2. Now we open or create a Report Assembler definition and add the Analyzer Report with the filter we created before to the definition.

3. Select the tile with the new Analyzer Report. Open the edit dialog and add the parameter to the description, e.g. like this:

   This is the parameter we defined in the Analyzer Report: ${paramIncStatus}

   Click Save.

   > ℹ️ Note that in browser view the parameters are not replaced and the chart shows the values using the value we selected in the filter in Analyzer Report.

4. Save the Report Assembler definition.

5. Open the Scheduler application.

6. Create a new Scheduler job of type Report.

   In Actions ⚙️ select the Report Assembler definition we created in the steps before.

7. Add the parameter to the Action ⚙️.

   > ℹ️ To define the parameter value you must use the business key / ID of the value you want to filter by. You can get this value if you open the Analyzer Report, open the filter and move the mouse over the filtered value. In this case the value is **IN_CLD**.

8. Save the job and test it.

9. After the report was rendered you can see that the parameter was replaced in the text and the data was filtered according the parameter value.

6.3.4. Schedule an Existing Report Assembler Definition

To schedule an existing Report Assembler Definition, please follow the steps in Create a New REPORT Scheduler Job (page 31)and How to use parameters (page 40).

6.3.5. Report Assembler Template

A Report Assembler template is a Report Designer report especially designed for the usage in the Report Assembler application. We ship two examples: Landscape and Portrait.

You can create your own templates or change the standard templates.

> ℹ️ Please be aware that adding or changing a Report Assembler template is an administrational task.
>
> You need to access the application server on file level and you must be familiar with the Report Designer tool. To create or change a template you need the Report Designer tool we ship with version 4.7 or higher. For support please contact our support team.

7. Schedule Reports

You can use the **Schedules page** of the **User Console** to schedule a report to run at regular intervals, on certain dates and times, and with different parameters. You can also set a scheduled report to be emailed automatically, if your system administrator has configured the server for emailing reports. After you schedule a report, you can pause or delete a schedule, as well as edit the schedule to change the frequency of the report, parameters, or email settings.

The system administrator may set up times when you cannot run a scheduled report, for example, to perform system maintenance, or to minimize scheduling during peak times. If any blocked-out times are set up, you can view these times, so you can choose an alternate schedule.

7.1. Schedule a Report

You can create a schedule and designate the frequency of the scheduled report, report parameters, and email settings.

1. Login to the User Console, and click **Browse Files** to browse to the location of your report.
2. Choose the folder containing your report in the **Browsing** pane on the left, then click to select the report you want to schedule from the middle pane. In More menu all actions are listed that you can do with the selected report.
3. Select **Schedule** from the **File Actions** pane. The **New Schedule** window appears.
4. Enter a name for the schedule in the **Schedule Name** field.
5. And follow the wizard.
6. Click **OK**.

The schedule is created and appears in the list in the **Schedules** window of the console.

7.2. Edit a Schedule

You can edit a schedule to change the frequency of the scheduled report, report parameters, and email settings.

1. Click the **Home** drop-down menu on the upper-left and click the link to the **Schedules**. The list of schedules appears in the **Schedules** page.
2. Click the schedule you want to edit in the list, then click **Edit** ✐ in the scheduling toolbar. The **Edit Schedule** window appears.
3. Do your changes
4. Click **OK**.

The schedule is edited and appears in the list in the **Schedules** window of the console.

7.3. Delete a Schedule

After you have scheduled a report, you can easily delete the schedule without deleting the report.

1. Click the **Home** drop-down menu on the upper-left and click the link to **Schedules**. The list of schedules appears in the **Schedules** page.
2. Click the schedule that you want to delete in the list. The schedule is highlighted.
3. Click **Delete** in the upper right of the toolbar to delete the highlighted schedule. This deletes the schedule while leaving the report intact.

The previously scheduled report no longer runs at the specified interval.

7.4. Quartz Cron Attributes

The Quartz cron engine supports a seven-attribute time declaration with many possible values. The number format is the same for every expression, even if the values are different -- it must be listed as seconds, minutes, hours, day of month, month, day of week, then the year. A space separates each attribute.

These are the possible values for each attribute: 0 to 59 for seconds and minutes, 0 to 23 for hours, 1 to 31 for days, 1 to 12 for months, 1 to 7 for day of week, and a four-digit year. Alternatively, you can use three-letter values for the day of week (MON, TUE, WED, THU, FRI, SAT, SUN), and three-letter values for the month (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC).

An asterisk (*) indicates *all values*, so an asterisk in the minute field would mean that the report runs once every minute. You can specify a range of values with the - (dash) operator, and you can specify multiple individual values with a comma. If you need to excuse a value in the day of month and day of week field from a cron job, you can use the question mark (?) character to indicate that this value doesn't matter. If you need to split values, you can do so with the slash (/) character -- this operator literally means "every," so */15 would mean "Every 15." In the day of month field, you can use the # character to indicate a certain instance of a day of the month, for instance the second Friday of the month would be 6#2. Lastly, you can use a capital L in the day of month and day of week field to indicate "Last," as in the last day of the week. A capital C in either of these fields means "Calendar," and combined with a number means that the report should execute the interval indicated by the C number according to the loaded calendar. A capital W in the day of month attribute means "Weekday," which only encompasses Monday through Friday. Most of these values can be combined to create unusual cron schedules.

Attribute	Conditionals and Operators
Seconds	, - * /
Minutes	, - * /
Hours	, - * /
Day of month	, - * ? / L W C
Month	, - * /
Day of week	, - * ? / L C #
Year	, - * /

Here is how you would execute a report at 10:15 AM on every last Friday of every month during the years 2008, 2009, 2010, 2011, 2012, and 2013.

```
0 15 10 ? * 6L 2008-2013
```

You can find more details including examples here:

http://www.quartz-scheduler.org/documentation/quartz-2.3.0/tutorials/crontrigger.html

A nice page, which helps to write and test your Quartz Cron expressions, is this:

https://www.freeformatter.com/cron-expression-generator-quartz.html#