



# Red Hat Process Automation Manager 7.7

## Building custom dashboard widgets



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## Abstract

This document describes how to build custom pages including dashboards and reports in Red Hat Process Automation Manager 7.7.

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## PREFACE

As a business analyst or business rules developer, use the **Page Editor** tool to design and define your page and specify the information to be displayed on it. You can decide which components are a part of your page. You can also customize the component properties of a page according to your requirements. Optionally, before creating a page, you can define a data set to feed the reporting components of the page.

### Prerequisites

- You have sufficient permissions for creating pages.

## CHAPTER 1. DATA SETS AUTHORIZING

A data set is a collection of related sets of information. It can be stored in many ways, such as in a database, in a Microsoft Excel file, or in memory. A data set definition instructs Business Central methods to access, read, and parse a data set. Business Central does not store data. It enables you to define access to a data set regardless of where the data is stored.

For example, if data is stored in a database, a valid data set could contain the entire database or a subset of the database as a result of an SQL query. In both cases, the data is used as input for the reporting components of Business Central which then displays the information.

To access a data set, you must create and register a data set definition. This data set definition specifies the location of the data set, the ways to access it, read it, and parse it, and the columns that it contains.



### NOTE

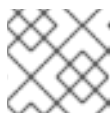
The **Data Sets** page is visible only to users with the **admin** role.

### 1.1. ADDING DATA SETS

You can create a data set to fetch data from an external data source and use that data for the reporting components.

#### Procedure

1. In Business Central, go to **Admin** → **Data Sets**. The **Data Set Explorer** page opens.
2. Click **New Data Set** and select one of the following provider types:
  - **Bean**: Use to generate a data set from a Java class
  - **CSV**: Use to generate a data set from a remote or local CSV file
  - **SQL**: Use to generate a data set from an ANSI-SQL compliant database
  - **Elastic Search**: Use to generate a data set from Elastic Search nodes
  - **Execution Server**: Use to generate a data set using the custom query feature of an Execution Server



### NOTE

**KIE Server** must be configured with this option.

3. Complete the **Data Set Creation Wizard** and click **Test**.



### NOTE

The configuration steps differ based on the provider you chose.

4. Click **Save**.

### 1.2. EDITING DATA SETS



You can edit existing data sets to ensure that the data fetched to the reporting components is up-to-date.

### Procedure

1. In Business Central, go to **Admin** → **Data Sets**. The **Data Set Explorer** page opens.
2. In the **Data Set Explorer** pane, search for the data set you want to edit and click **Edit**.
3. In the **Data Set Editor** pane, use the appropriate tab to edit the data as required. The tabs differ based on the data set provider type you chose.  
For example, the following changes are applicable for editing a **CSV** data provider:
  - **CSV Configuration:** Enables you to change the name of the data set definition, the source file, the separator, and other properties.
  - **Preview:** Enables you to preview the data. After you click **Test** in the **CSV Configuration** tab, the system executes the data set lookup call and if the data is available, a preview appears. Note that the **Preview** tab has two sub-tabs:
    - **Data columns:** Enables you to specify what columns are part of your data set definition.
    - **Filter:** Enables you to add a new filter.
  - **Advanced:** Enables you to manage the following configurations:
    - **Caching:** See [Section 1.4, "Caching"](#) for more information.
    - **Cache life-cycle** Enables you to specify an interval of time after which a data set (or data) is refreshed. The **Refresh on stale data** feature refreshes the cached data when the back-end data changes.
4. After making the required changes, click **Validate**.
5. Click **Save**.

## 1.3. DATA REFRESH

The data refresh feature enables you to specify an interval of time after which a data set (or data) is refreshed. The **Refresh on stale data** feature refreshes the cached data when the back-end data changes.

## 1.4. CACHING

Business Central provides caching mechanisms for storing data sets and performing data operations using in-memory data. Caching data reduces network traffic, remote system payload, and processing time. To avoid performance issues, configure the cache settings in Business Central.

For any data lookup call that results in a data set, the caching method determines where the data lookup call is executed and where the resulting data set is stored. An example of a data lookup call would be all the mortgage applications whose locale parameter is set as "Urban".

Business Central data set functionality provides two cache levels:

- Client level

- Back-end level

### Client cache

When the cache is turned on, the data set is cached in a web browser during the lookup operation and further lookup operations do not perform requests to the back-end. Data set operations like grouping, aggregations, filtering, and sorting are processed in the web browser. Enable client caching only if the data set size is small, for example, for data sets with less than 10 MB of data. For large data sets, browser issues such as slow performance or intermittent freezing can occur. Client caching reduces the number of back-end requests including requests to the storage system.

### Back-end cache

When the cache is enabled, the decision engine caches the data set. This reduces the number of back-end requests to the remote storage system. All data set operations are performed in the decision engine using in-memory data. Enable back-end caching only if the data set size is not updated frequently and it can be stored and processed in memory. Using back-end caching is also useful in cases with low latency connectivity issues with the remote storage.



### NOTE

Back-end cache settings are not always visible in the **Advanced** tab of the **Data Set Editor** because Java and CSV data providers rely on back-end caching (data set must be in the memory) in order to resolve any data lookup operation using the in-memory decision engine.

## CHAPTER 2. PAGE AUTHORIZING

Pages, also known as perspectives, are collections of following components:

- Core components
- Navigational components
- Reporting components

Also, a page can have none or any number of components. The **Page Editor** tool is used to edit the pages.

A page has either the **Fluid** style or the **Page** style. The **Fluid** style is a classical web page with a vertical scroll bar, when the page exceeds the available height. The **Page** style is a web page that will always fit to the windows height.

### 2.1. CREATING PAGES

You can use the Pages perspective to create a page that consists of different types of components. After a page has been created and all the components in it defined, use the **Page Editor** to save, delete, rename, or copy pages as required.

The following procedure describes how to create a page and add the required components to it:

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. In the **Pages** panel, click **New**. Alternatively, click **New Page** on the **Page Editor** pane.
3. In the **New Page** dialog box, enter a value in the **Name** field and select the required style.
4. Click **Ok**. The new page opens in the **Page Editor**.
5. In the **Components** pane, expand the components and drag the required component types to the editor canvass.
6. After placing the components on the page, edit its properties from the **Properties** pane.
7. Click **Save** and then click **Save** again.

### 2.2. SAVING, DELETING, RENAMING, OR COPYING PAGES

After you have created and defined a page, use the **Page Editor** to save, delete, rename, or copy pages as required.

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. Select a page from the **Pages** panel. The page opens in the **Page Editor**.
3. Perform the desired operation and select **Save**, **Delete**, **Rename**, or **Copy** from the upper right corner of the **Page Editor**.

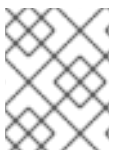
Figure 2.1. Save, delete, rename, or copy pages



## 2.3. NAVIGATION TREE

The **Workbench** navigation tree contains the entries that are displayed in Business Central's **Main** menu. Changes to this navigation tree structure will be reflected in the **Main** menu on the Home page. Such mechanism can be used, for example, to publish new pages.

Also, additional navigation trees can be created. These custom trees can be used to configure the navigation components within a page. You cannot delete the **Workbench** tree from the **Navigation** panel but you can edit the **Workbench** tree hierarchy to suit your requirements. This feature helps users customize the **Main** menu of Business Central with new pages.



### NOTE

The **Workbench** tree, which appears by default in the **Navigation** panel, is the main **Menu** of Business Central.

### 2.3.1. Creating a navigation tree

You can create as many custom navigation trees as required. A custom navigation tree differs from the default **Workbench** navigation tree in one aspect. The custom navigation trees can be deleted but the default tree can not be removed from Business Central. They can contain the default groups and entries from the **Workbench** tree as well as user created groups and trees.

#### Prerequisites

- You have sufficient user permissions for creating a navigation tree.

#### Procedure

1. Log in to Business Central and go to **Menu** → **Design** → **Pages**.
2. Select the **Navigation** panel and then click **New**.
3. Enter the name of the new navigation tree and click the check mark icon or, press Enter.
4. Click **Save**.

### 2.3.2. Editing a navigation tree

You can use the **Navigation** panel from the Pages perspective to edit the custom navigation trees. You can further customize the trees by adding groups, dividers, and page entries, deleting the specific entries of the tree, and reordering, renaming, or deleting them.

#### Prerequisites

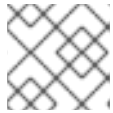
- You have sufficient user permissions for editing a navigation tree.

### 2.3.3. Adding groups, dividers, and page entries to a navigation tree

You can add groups, dividers, and page entries to a navigation tree.

### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. Click the **Navigation** panel and then select the navigation tree you want to add the entries to.
3. Click the gear icon of the tree and then select **New Group, New Divider, or New Page**.
4. Enter the name of the new group or page and click the check mark icon or press Enter.



#### NOTE

Divider entries do not have a name property.

5. Click **Save**.

### 2.3.4. Reordering a navigation tree

In the **Navigation** panel you can reorder the navigation trees as well as its entries.



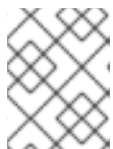
#### NOTE

The reordering options of tree entries will differ according to their position in the tree hierarchy.

### Reordering navigation trees

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. Click the **Navigation** panel and then select the navigation tree you want to reorder.
3. Click the gear icon of the tree and then move up or down as required.



#### NOTE

First and last entries of a navigation tree have only two reordering options available.

4. Click **Save**.

### Reordering the entries of a navigation tree

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. Click the **Navigation** panel and then expand the navigation tree.
3. Click the gear icon of the entry you want to reorder and then move up or down as required.

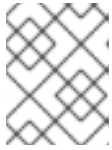
4. Optionally, click **Goto Page** to view the selected page.
5. Click **Save**.

### 2.3.5. Renaming a navigation tree

You can rename all navigation trees except the Workbench tree.

#### Procedure

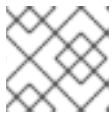
1. In Business Central, go to **Menu → Design → Pages**.
2. Click the **Navigation** panel and then select the custom navigation tree you want to rename.



#### NOTE

To rename an entry of a tree, expand the tree and select the entry that you want to rename.

3. Click the edit icon of the tree or the tree entry.
4. Enter the new name of the tree and click the check mark icon.



#### NOTE

You cannot rename divider entries.

5. Click **Save**.

### 2.3.6. Deleting a navigation tree

You can delete any navigation tree except the **Workbench** tree from the **Navigation** panel of the Pages perspective.

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. In the **Navigation** panel, select the navigation tree that you want to delete, then click the delete icon.
3. Click **Save**.

### 2.3.7. Deleting the entries of a navigation tree

You can delete the entries of a navigation tree.

#### Procedure

1. In Business Central, go to **Menu → Design → Pages**.
2. Click the **Navigation** panel.

3. Expand the tree that contains the entries you want delete.
4. Click the delete icon of the entry.
5. Click **Save**.

## 2.4. COMPONENTS

A page contains different types of components. You can use the following component types in a page:

- **Core** components: Used to specify custom HTML information or display existing pages. There are two types of core components.

**Table 2.1. Core component sub-types**

Core component sub-types	Description
HTML	This component opens an HTML editor widget. This can be used to create HTML pages using text, images, tables, links, colors, and so on. You can customize the page as per your requirements.
Page	This component allows you to add previously created pages to a new dashboard. You can use this component to nest custom pages you have already created in your dashboard.



### NOTE

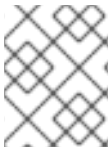
Core components are not mandatory.

- **Navigation** components: Used for navigating between pages. There are six types of navigation components.

**Table 2.2. Navigation component sub-types**

Navigation component sub-types	Description
Target Div	This component is used by the Tab list, Menu bar, and the Tree navigator components to display their entries and keep track of the last item clicked.
Menu Bar	This component displays the entries of a navigation tree in the form of a menu bar. There is no limit to the number of levels supported by Business Central.
Tile Navigator	This component displays the navigation group in the form of tiles. Groups are displayed as folders but for single entries, its content is displayed instead when selected.

Navigation component sub-types	Description
<b>Tree</b>	This component displays the entries in a vertical tree structure format.
<b>Carousel</b>	This component displays or cycles through the selected pages like a carousel or a slide show.
<b>Tab List</b>	This component displays selected menu pages as tabs at the top of the component.

**NOTE**

The target div setting is **not** needed for non-target div components such as Carousel or Tile navigator.

- **Reporting** components: Used for displaying data from data sets (see [Data sets authoring](#) section) in the form of graphs, tables, maps, and so on. There are ten types of reporting components. The reporting components can be configured using the **New Displayer** widget, which has the following three tabs:
  - **Type**: Choose how to display custom data graphically.
  - **Data**: Choose a data set from the list of custom data sets that you had created from the **Data Sets** section available in the **Settings** menu.
  - **Display**: Edit and customize how the content is displayed by adding titles, changing colors, size, and so on.

### 2.4.1. Placing components on the page editor to create a page

To create pages, you must drag the components to the **Editor** canvas of the Pages perspective. After placing all of the required components on the page, click **Save**.

### 2.4.2. Using the Preview tab to preview pages

While creating or editing pages, click the **Preview** tab on the **Page Editor** to preview a page before saving it.

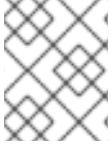
### 2.4.3. Component properties

The components used in a page have different properties associated with them. The **Properties** panel enables you to customize a component by editing the following properties:

- **Panel** properties: Used to customize component panel properties such as **Width**, **Height**, and **Background Color**.
- **Margin** properties: Used to customize component margin properties such as **Top**, **Bottom**, **Left**, and **Right**.



- **Padding** properties: Used to customize component padding properties such as **Top**, **Bottom**, **Left**, and **Right**.

**NOTE**

HTML components also have additional text properties to customize component **Alignment**, **Decoration**, **Color**, **Size**, and **Weight** properties.

## CHAPTER 3. SECURITY MANAGEMENT

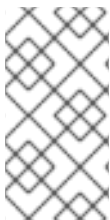
Security management is the process of managing users, groups, and permissions. You can control access to Business Central resources and features from the Business Central Security management page.

Business Central defines three types of entities for security management: users, groups, and roles. You can assign permissions to both roles and groups. A user inherits permissions from the groups and roles that the user is a member of.

### 3.1. SECURITY MANAGEMENT PROVIDERS

In the context of security management, a realm restricts access to different application resources. Realms contain information about users, groups, roles, and permissions. A concrete user and group management service implementation for a specific realm is called a security management provider.

If the built-in security management providers do not meet the requirements of your application security realm, then you can build and register your own security management provider.



#### NOTE

If the security management provider is not installed, the user interface for managing the security realm is not available. After you install and configure a security management provider, the user and group management features are automatically enabled in the security management user interface.

Business Central includes the Red Hat JBoss EAP security management provider which supports realm types based on the contents of the **application-users.properties** or **application-roles.properties** property file.

#### 3.1.1. Configuring the Red Hat JBoss EAP security management provider based on property files

You can build and register your own Red Hat JBoss EAP security management provider. To use the Red Hat JBoss EAP security management provider based on property files, complete the steps in this procedure.

##### Prerequisites

- Red Hat JBoss EAP is installed.

##### Procedure

1. To use an existing users or roles property file from the Red Hat JBoss EAP instance, include the following system properties in the **EAP\_HOME/standalone/configuration/application-users.properties** and **EAP\_HOME/standalone/configuration/application-roles.properties** files, as shown in the following example:

```
<property name="org.uberfire.ext.security.management.wildfly.properties.realm"
value="ApplicationRealm"/>
<property name="org.uberfire.ext.security.management.wildfly.properties.users-file-path"
```

```
value="/standalone/configuration/application-users.properties"/>
<property name="org.uberfire.ext.security.management.wildfly.properties.groups-file-path"
value="/standalone/configuration/application-roles.properties"/>
```

The following table provides a description and default value for these properties:

**Table 3.1. Red Hat JBoss EAP security management provider based on property files**

Property	Description	Default value
<b>org.uberfire.ext.security.management.wildfly.properties.realm</b>	The name of the realm. This property is not mandatory.	<b>ApplicationRealm</b>
<b>org.uberfire.ext.security.management.wildfly.properties.users-file-path</b>	The absolute file path for the users property file. This property is mandatory.	<b>./standalone/configuration/application-users.properties</b>
<b>org.uberfire.ext.security.management.wildfly.properties.groups-file-path</b>	The absolute file path for the groups property file. This property is mandatory.	<b>./standalone/configuration/application-roles.properties</b>

2. Create the **security-management.properties** file in the root directory of your application. For example, create the following file:

```
src/main/resources/security-management.properties
```

3. Enter the following system property and security provider name as a value in the **security-management.properties** file:

```
<property name="org.uberfire.ext.security.management.api.userManagementServices"
value="WildflyUserManagementService"/>
```

### 3.1.2. Configuring the Red Hat JBoss EAP security management provider based on property files and CLI mode

To use the Red Hat JBoss EAP security management provider based on property files and CLI mode, complete the steps in this procedure.

#### Prerequisites

- Red Hat JBoss EAP is installed.

#### Procedure

1. To use an existing users or roles property file from the Red Hat JBoss EAP instance, include the following system properties in the **EAP\_HOME/standalone/configuration/application-users.properties** and **EAP\_HOME/standalone/configuration/application-roles.properties** files, as shown in the following example:

```
<property name="org.uberfire.ext.security.management.wildfly.cli.host" value="localhost"/>
<property name="org.uberfire.ext.security.management.wildfly.cli.port" value="9990"/>
```

```
<property name="org.uberfire.ext.security.management.wildfly.cli.user" value="
<USERNAME>"/>
<property name="org.uberfire.ext.security.management.wildfly.cli.password" value="
<USER_PWD>"/>
<property name="org.uberfire.ext.security.management.wildfly.cli.realm"
value="ApplicationRealm"/>
```

The following table provides a description and default value for these properties:

**Table 3.2. Red Hat JBoss EAP security management provider based on property files and CLI mode**

Property	Description	Default value
<b>org.uberfire.ext.security.m anagement.wildfly.cli.host</b>	The native administration interface host.	<b>localhost</b>
<b>org.uberfire.ext.security.m anagement.wildfly.cli.port</b>	The native administration interface port.	<b>9990</b>
<b>org.uberfire.ext.security.m anagement.wildfly.cli.user</b>	The native administration interface username.	NA
<b>org.uberfire.ext.security.m anagement.wildfly.cli.pass word</b>	The native administration interface user's password.	NA
<b>org.uberfire.ext.security.m anagement.wildfly.cli.real m</b>	The realm used by the application's security context.	<b>ApplicationRealm</b>

2. Create the **security-management.properties** file in the root directory of your application. For example, create the following file:

```
src/main/resources/security-management.properties
```

3. Enter the following system property and security provider name as a value in the **security-management.properties** file:

```
<property name="org.uberfire.ext.security.management.api.userManagementServices"
value="WildflyCLIUserManagementService"/>
```

## 3.2. PERMISSIONS AND SETTINGS

A permission is an authorization granted to a user to perform actions related to a specific resource within the application. For example, a user can have following permissions:

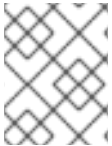
- View a page.
- Save the project.
- View a repository.

- Delete a dashboard.

You can grant or deny a permission and a permission can be global or resource specific. You can use permissions to protect access to resources and customize features within the application.

### 3.2.1. Changing permissions for groups and roles in Business Central

In Business Central, you cannot change permissions for an individual user. However, you can change permissions for groups and roles. The changed permissions apply to users with the role or that belong to a group that you changed.



#### NOTE

Any changes that you make to roles or groups affect all of the users associated with that role or group.

#### Prerequisites

- You are logged in to Business Central with the **admin** user role.

#### Procedure

1. To access the **Security management** page in Business Central, select the **Admin** icon in the top-right corner of the screen.
2. Click **Roles**, **Groups**, or **Users** on the Business Central **Settings** page. The **Security management** page opens on the tab for the icon that you clicked.
3. From the list, click the role or group you want to edit. All details are displayed in the right panel.
4. Set the **Home Page** or **Priority** under the **Settings** section.
5. Set the Business Central, page, editor, space, and project permissions under the **Permissions** section.

**Figure 3.1. Setting the permissions**

admin settings

Home Page ⓘ

Priority ⓘ

Permissions

---

> Workbench ⓘ

Pages ⓘ	<input type="text" value="Read"/>	<input type="text" value="Update"/>	<input type="text" value="Delete"/>	<input type="text" value="Create"/>	
<input type="text" value="- Select Page -"/>					
<input type="button" value="Add Exception"/>					
Editors ⓘ	<input type="text" value="Read"/>				
Spaces ⓘ	<input type="text" value="Read"/>	<input type="text" value="Update"/>	<input type="text" value="Delete"/>	<input type="text" value="Create"/>	
Projects ⓘ	<input type="text" value="Read"/>	<input type="text" value="Update"/>	<input type="text" value="Delete"/>	<input type="text" value="Create"/>	<input type="text" value="Build"/>

6. Click the arrow next to a resource type to expand the resource type whose permissions you want to change.

- Optional: To add an exception for a resource type, click **Add Exception** and then set the permissions as required.

**NOTE**

You cannot add an exception to the Business Central resource type.

- Click **Save**.

### 3.2.2. Changing the Business Central home page

The home page is the page that appears after you log in to Business Central. By default, the home page is set to **Home**. You can specify a different home page for each role and group.

#### Procedure

- In Business Central, select the **Admin** icon in the top-right corner of the screen and select **Roles** or **Groups**.
- Select a role or group.
- Select a page from the **Home Page** list.
- Click **Save**.

**NOTE**

The role or group must have read access to a page before you can make it the home page.

### 3.2.3. Setting priorities

A user can have multiple roles and belong to multiple groups. The Priority setting determines the order of precedence of a role or group.

#### Prerequisites

- You are logged in to Business Central with the **admin** user role.

#### Procedure

- In Business Central, select the **Admin** icon in the top-right corner of the screen and select **Roles** or **Groups**.
- Select a role or group.
- Select a priority from the Priority menu, and then click **Save**.

**NOTE**

If a user has a role or belongs to a group that has conflicting settings, the settings of the role or group with the highest priority applies.

## CHAPTER 4. CREATING A CUSTOM DASHBOARD WIDGET

In order to create custom dashboards, users must combine some of the features of the Business Central (like data sets, pages, navigation trees, and permissions) together and publish them. Dashboards are pages containing at least one reporting component.

There are four stages in the creation of a custom dashboard:

- Data set authoring - In this stage, you define a data set for accessing the data and displaying it through the pages. For more information, see [Adding data sets](#).
- Page authoring - In this stage, you create the pages which are used to display the data from the data sets, among other things. For more information, see [Creating pages](#).
- Publication - In this stage, navigation between pages are defined when you create the custom navigation trees or modify the existing default one (**Workbench** tree). For more information, see [Creating a navigation tree](#) or [Editing a navigation tree](#).
- Security management - In this stage, role and group permissions are set which defines the privileges that are granted to a user when the user is working on Business Central. For more information, see [Security management](#).



### NOTE

You will have to follow the stages listed above if you plan on migrating your dashboards from previous versions of Business Central to the latest one. Note that there is no automatic migration path or tooling to assist you in that regard. You must recreate all your dashboards from scratch.

## APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Tuesday, April 27, 2021.