Digitize business processes successfully

Accelerate digital transformation with the X4 BPMS low code platform

X4 Control Center



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1 Introduction

1.1 What is the X4 Control Center?

The X4 Control Center is the central information, control and configuration center of the X4 BPMS. The X4 Control Center combines various functionality expanding the X4 BPMS core functions. These functions are constantly extended.

The control center currently comprises following functionality:

- Monitoring
- Administration
- Development

Different user groups - from developers to specialist departments - can monitor their X4 processes via the X4 Control Center gaining valuable insights into the process flows in real time. This helps to continuously improve the processes.

Developers and the different departments can control and improve X4 processes and apps at runtime. The X4 Control Center is operated conveniently via a browser.

The X4 Control Center includes basic applications such as user management and the API gateway. Additional apps to extend the X4 Control Center are available in a package for installation on our download page or individually via the SoftProject Marketplace. Even your own Web Apps be integrated into the X4 Control Center.

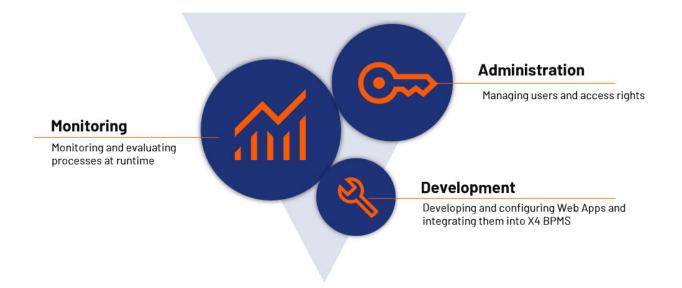
The following applications are included in the standard:

- User Management: Management of users, access rights, roles and groups as well as authentification/authorization
- X4 API: API Gateway
- Task Management: Web App for managing tasks

The following applications are available as extensions:

- Process Monitor: Monitoring and evaluation of X4 processes
- Process Scheduler: Process planning, e.g. starting X4 processes at scheduled times
- App Configuration: Configuration of X4 Web Apps
- Parameter Editor: Configuration of parameters in X4 processes
- 3rd Party License Report: Overview of 3rd party licenses used in X4 BPMS

Extend the X4 Control Center with self-created web apps and create a customized starting page for your users.



2 Installation of preconfigured X4 Web Apps

O Note:

The preconfigured X4 Web Apps are available in the following installation package on the SoftProject Website **X4 BPMS > Downloads**.

- All-in-One Interaktive Installation If you install the All-in-One - Interaktive Installation package, the Apps are installed automatically and can be used immediately.
- X4 Control Center Package ZIP-Archiv This package contains the preconfigured Web Apps only and requires a separate installation of the Web Apps.

Installing the preconfigured X4 Web Apps

- Download the zip package for the X4 Control Center from the SoftProject Website X4 BPMS > Downloads.
- 2. Unzip the files in the zip atchive.
- Copy the files with the file extension *.sealed to the folder <Server Directory>\deployments.
- 4. Start Keycloak, the X4 Server and the X4 Designer. The Apps are now available in the X4 Control Center (https://localhost80:80)

3 **Standard Functionality**

This chapter contains general information on how to use the preconfigured Web Apps.

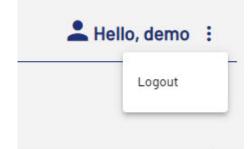
Ø Additional information:

- Logout User
- Change Language of User Interface
- Working with Lists
- Working with Diagrams

3.1 Logout User

In the User section, the user can logout of the system.

1. Click on the three dots beside the user name.



2. Select Logout.

You are logout of the system and a new login window is opened.

3.2 Changing User Interface Language

The preconfigured x4 Web Apps are available in German and English.

You can change the language of the user interface directly in your current session.



- 1. Click on the globe icon in the bottom left corner.
- 2. Select the desired language. The UI language is changed.

3.3 Working with Lists

3.3.1 Show/Hide columns

1. Click on the three dots between two columns. A sub-menu is opened.

2. Select Column.

A list of all available columns is opened.

- 3. Click the checkbox before the column you want to hide/show.
- 4. Click Apply.

To show hidden columns mark the checkbox before the respective column name.

(i) Note:

Showing or hidding columns is only valid for the current session. Closing the App resets the settings to standard.

3.3.2 Change Column Order

The order in which the columns are displayed can be changed by Drag&Drop.

- 1. Click on the column titel and keep the mouse button pressed.
- 2. Move the selected column to the desired position.

(i) Note:

The changed column order is only valid for the current session. Closing the App resets the settings to standard.

3.3.3 Navigating through lists

The number of items displayed in a list is limited to a certain number per page. If there are more items to be displayed, a navigation is displayed below the list with which you can scroll through the list.

O H → 1 F H 100 ▼ Items per page

| Ċ | Update list |
|---|--|
| H | Navigate to the the individual list and page to the first/last list. |
| 06.06.2023 5 10 06.06.2023 20 20 00.06.02.2023 50 100 100 | Define number of items to be displayed. |

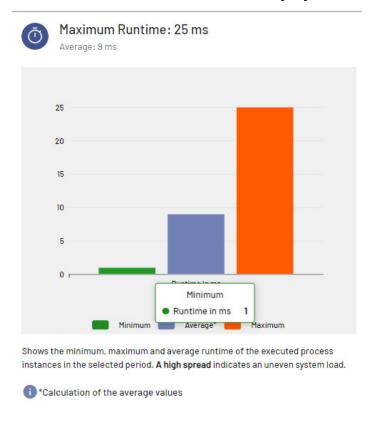
1 - 15 from 15 Items

| 1 - 15 from 15 Items | Total number of items. |
|----------------------|------------------------|
| | |

3.4 Working with Diagrams

3.4.1 Show detailed information for individual sections

If you want to get more detailed information for a diagram, simply move the mouse pointer over the desired section. The section will then be highlighted and more information will be displayed.



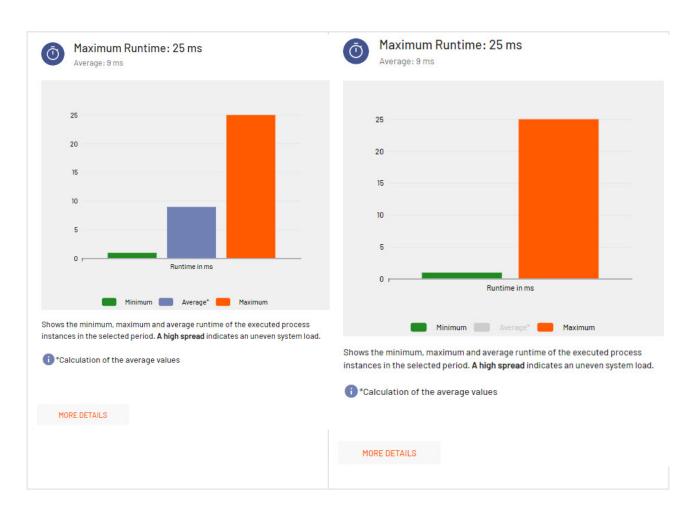
3.4.2 Hide/Show diagram sections

MORE DETAILS

If you want to hide/show individual information in a diagram, click on the respective entry in the legend below the diagram. The selected section is grayed-out and the information is no longer displayed in the diagram.

| All diagram sections | Hidden diagram sections |
|----------------------|-------------------------|
|----------------------|-------------------------|

X4 Control Center



3.4.3 Show additional diagram details

If you want to see more detailed information for the diagram, click on the button **More Details** below the diagram.

A separate window is opened with the respective diagram.

In this window you can display more detailed information on individual sections or show/hide individual diagram information as described.

4 App Configuration

This preconfigured X4 Web App allows users to easily adapt e.g. colors, fonts or other configurations of their X4 BPMS Web Apps during runtime without restarting the application. It is possible to adapt the Web Apps to any company-specific design guidelines.

Opening the App displays a list of all Web Apps available in the current instance of X4 BPMS. These include the pre-configured X4 Web Apps as well as any Web Apps, you have created in the X4 Designer.

The list shows workspace in which the Web App is stored and the name of the project.

If you create a new Web App in the X4 Designer or change the name of an existing one, simply refresh the App Configuration Web App to reflect the changes.

| X4 App Configuration | | L Welcome demo | : |
|---|-------------------------|-----------------|-----|
| List of Web Apps | | | |
| Repository | Project | 1 | |
| ParameterEditor | ParameterEditor | | • |
| AppConfiguration | AppConfiguration | | |
| ProcessMonitor | ProcessMonitor | | |
| ProcessScheduler | ProcessScheduler | | |
| ThirdPartyLicenseReport | ThirdPartyLicenseReport | | |
| | | | |
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| | | | |
| | | | Ψ. |
| O H 1 ► 10 ✓ Items per page | | 1 - 5 from 5 lt | ems |

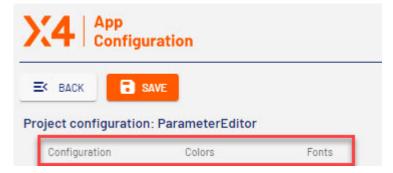
Select a Web App to open the Project Configuration dialog.

Additional information:

- Defining Configuration Options
- Defining Fonts
- Defining Colors

4.1 Project Configuration

The **Project configuration**: *Project Name* has three tabs to change the configuration, color and font of the selected Web App during runtime.



4.1.1 Defining Configuration Options

The tab **Configuration** has diffrent sections to define the configuration options of your Web App.

| Sec tion | Description |
|-------------|---|
| | Path: |
| | In this field you can define a path that will be displayed as part of the URL in the browser. |

| | ription |
|------------------------------|---|
| Disp | ay name: |
| | an enter the display name of the Web App in this field. The display name is shown in the ser tab or title bar. |
| Logo | : |
| | s field you can enter the path to a graphic file (.gif, .png or .svg) or a material icon that w ed as the logo of the Web App. To do so, activate the corresponding radio button. |
| i | Note: |
| | The material icon must be specified with the icon prefix, e.g. (icon: <materialiconname>.</materialiconname> |
| | • The graphic file must be contained in the Resources folder directly below the Web |
| | App Project.The logo has always a height of 45 pixels and the graphic file is automatically scale |
| This can e | color : field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. |
| This can e (see | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette |
| This can e (see | field defines the color of the logo which was added in the field Logo as Material icon. Yo hither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. |
| This can e (see The | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. color if graphic files cannot be changed. Note: • This setting overwrites the default color of the color scheme! |
| This can e (see The | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. color if graphic files cannot be changed. Note: This setting overwrites the default color of the color scheme! Do not use a hash before the hexadecimal color code or a shortened notation of the color code! |
| This can e (see The e) | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. color if graphic files cannot be changed. Note: This setting overwrites the default color of the color scheme! Do not use a hash before the hexadecimal color code or a shortened notation of the color code! |
| This can e (see The e) | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. color if graphic files cannot be changed. Note: This setting overwrites the default color of the color scheme! Do not use a hash before the hexadecimal color code or a shortened notation of the color code! con: r the path of the graphic file (.gif, .ico, .png oder .svg) to be used as a Favicon of the Web |
| This can e (see The e) | field defines the color of the logo which was added in the field Logo as Material icon. Yo ither use a hexadecimal color code (e.g. ff5a00) or a color code from the color palette Theming) of the Web App e.g. A200. To do so, activate the corresponding radio button. color if graphic files cannot be changed. Note: This setting overwrites the default color of the color scheme! Do not use a hash before the hexadecimal color code or a shortened notation of the color code! |

| ec on | Description |
|----------|---|
| | Show Footer: |
| | Enable/Disable the checkbox to display/hide the footer of the Web App. The check box is enabled by default. |
| | ③ Note: |
| | If the displayed component contains Actions, the footer will be displayed in the mobile view regardless of whether the checkbox is enabled or disabled. |
| | Blurred overlay background: |
| | Enable/Disable the checkbox to display the background blurred or clear when displaying overlay structure elements. |
| | The check box is enabled by default. This means that the parts of the Web App still in the background will be blurred for overlays. |
| | Show cookie consent pop-up: |
| | Enable/Disable the checkbox to define if the Cookie consent pop-up is displayed. The check box is enabled by default. |

| Desc | ription |
|-----------------------|---|
| Auth | orization Flow: |
| Seleo | ct from the dropdown list which Authorization flow should be used. |
| D | ublic Access : efines that log-in is not required. User accessing the Web App without login are identifie s anonymous users. These users cannot have special rights. |
| The a | urce Owner Password Flow : authorization flow Resource Owner Password Flow defines that a user with a temporary wort cannot access the Web App. |
| i | Note: |
| | If you use temporary passwords, use the authorization flow Authorization Code Flow. |
| | Resource Owner Password Flow is deprecated with the next version For security reasons, we recommend using Authorization Code Flow. |
| | orization Code Flow : loak needs to be configured according to the selected authorization flow. |
| i | Note: |
| | To use Single-Sign-On functionality, select the authorization flow Authorization Code Flow . |
| 0 | Additional information: |
| | Additional information can be found on the official Auth0® Inc. website |
| | https://auth0.com/docs/authorization/flows/resource-owner-password-flow https://auth0.com/docs/authorization/flows/authorization-code-flow |
| Realı Defir | n : es which Realm is used with Keycloak. |
| i | Note: |
| | The specification of the realm is required if the authorization flow Authorization Code Flow or Resource Owner Password Flow is selected and a realm different from the |

Defines which Keycloak client is to be used.

| Sec tion | Descr | iption | |
|-------------|---|---|--|
| | i | Note: | |
| | | The client name is required if the authorization flow Authorization Code Flow or Resource Owner Password Flow is defined and a client different from the standard is to be used. | |
| | Client Secret : Defines the client log-in information for the specified client. | | |
| | Local Only : Enable/Disable the checkbox to define if a project should only be available locally or not. The check box is disabled by default. | | |
| | check | | |
| | | | |

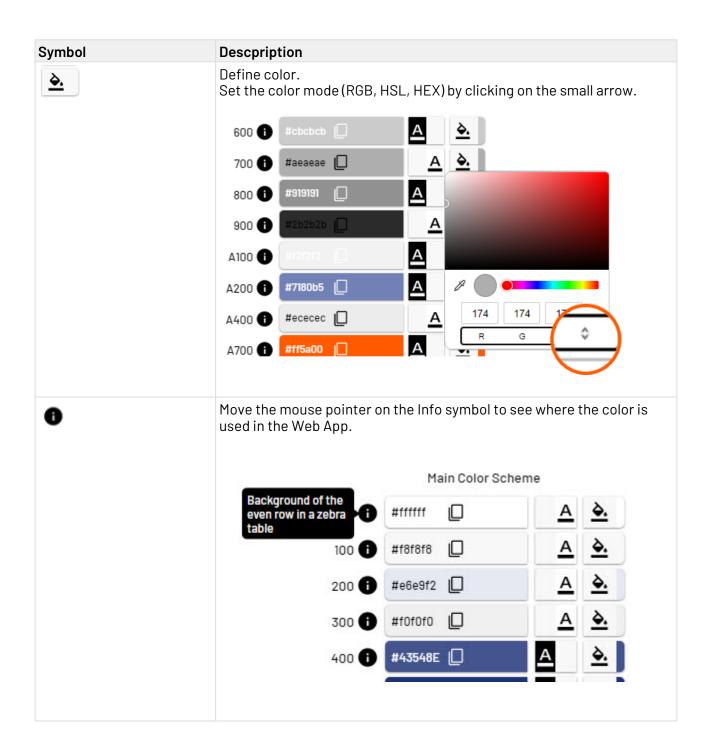
| n | Description |
|---|--|
| | Data protection: |
| | Linking external Data privacy policy pages. |
| | Imprint: |
| | Linking external Imprint pages. |
| | Logout redirect: |
| | Redirecting users to the specified URL when logging out of the system. You can enter any vali URL with any valid protocol (http://, https:// etc.), e.g. https://www.softproject.de/. |
| | Map API key: |
| | If Google Maps is used as a map provider, the following APIs need to be activated: |
| | Maps JS API Locations (for search and routing) Directions (for routing) |
| | Project is active: |
| | |
| | Enable/Disable the checkbox to define if a project is active/inactive. The checkbox is disabled by default. |
| | Enable/Disable the checkbox to define if a project is active/inactive. The checkbox is disabled by default. |

| ec on | Description | | | | |
|----------|---|--|--|--|--|
| | X-Frame Options: | | | | |
| | Select from the dropdown list if a browser may embed the target page in a <frame/> , <iframe>, embed> or <object>.</object></iframe> | | | | |
| | Possible options: | | | | |
| | DENY: Targrt page must not be embedded. SAMEORIGIN: Targrt page can be embedded. | | | | |
| | Max Age | | | | |
| | Specify the time in seconds for the browser to remember that the web app may only be accessed via HTTPS. | | | | |
| | HTTP Strict Transport Security Header is enabled | | | | |
| | Defines wether the HTTP Strict Transport-Security Header is enabled/disabled. | | | | |
| | HTTP Strict Transport Security Header is preloaded | | | | |
| | Defines if the HTTP Strict Transport Security Header is preloaded. | | | | |
| | Strict Transport Security is supplied to subdomains | | | | |
| | Defines if the settings for the HTTP Strict Transport Security Header are also valid for the subdomains of the Web App. | | | | |

4.1.2 Defining Colors

The **Colors** tab contains the color schemes for the main colors and the chart colors of the Web App.

| Symbol | Descpription |
|--------|------------------|
| A | Set the contrast |



4.1.3 Defining fonts

The Fonts enthält die Auswahlmöglichkeiten für Schriftarten.

- Select the **Edit** button to open the section for configuring the font.
- Select the **Save** button to save the configuration.
- If you made no changes, click on the **Edit** button again.

| X4 App Configu | uration | | | |
|-----------------------|--------------------|-------|--------|--|
| EK BACK | SAVE | | | |
| Project configuration | n: AppConfiguratio | n | | |
| Configuration | Colors | Fonts | | |
| Main Font | | Clear | 🖍 Edit | |
| Font 01 | | Clear | 🖍 Edit | |
| Font 02 | | Clear | 🖍 Edit | |

Main is the font used as the main font of the Web App. By clicking on **Edit** a new window opens where you can select the main font as well as different substitue fonts (fallback) from the dropdown menu.

| Main | | | |
|------------|-------------|------|--|
| | Resource | | |
| Fallback 1 | System | | |
| | Web | | |
| Fallback 2 | Generic | | |
| | | | |
| Fallback 3 | · · · · · · | | |
| | - | | |
| Fallback 4 | · · · · · | | |

| Option | Description | |
|----------|---|--|
| Resource | Fonts which are stored in the folder Resources in the Web App project. | |
| System | System fonts from the operating system, e.g. Arial. | |
| Web | <pre>Fonts which can be called via an URL, e.g. https:// fonts.googleapis.com/css?family=Barlow&display=swap.</pre> | |
| Generic | Standard fonts used by the browser e.g. sans-serif. | |

5 Parameter Editor

This preconfigured X4 Web App allows users to modify the parameters defined for X4 BPMS processes at runtime without any development effort.

Opening the App displays a list of all projects for which you have created a .param file in X4 Designer to configure project parameters via the **Project Parameter Configuration**.

Additional Information

For more information, see ESB manual > Creating and using parameters > Project parameters.

The list shows the workspace where the project is stored and the name of the project.

When creating a new project with a .param file in X4 Designer or change the project name, simply reload the app to display the changes.

| eter | | 💄 Welcome demo | : | | | |
|--------------------|-------------------|----------------|-------------|--|--|--|
| Projects on Server | | | | | | |
| ÷ | Project | I | | | | |
| | MyfirstESBproject | | | | | |
| | | | | | | |
| | | | | | | |
| | | : Project | E Project : | | | |

5.1 Adapting Project Parameters

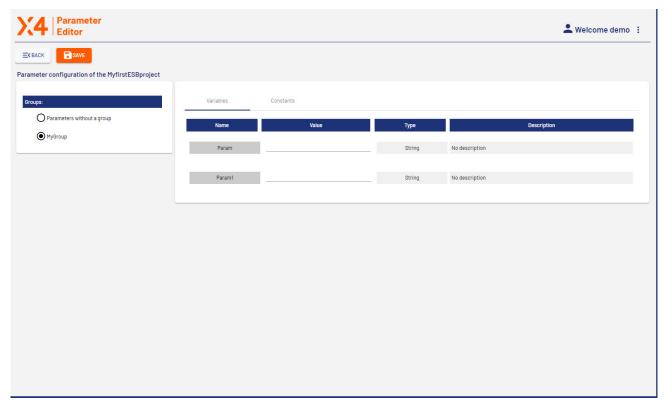
(i) Note:

You can change the value for all project parameters for which you have activated the check box **Changeable** in the .param file in X4 Designer. Activating the check box means that the parameters have the type **Variable**.

| 6 | Add Rename/Refactor | 🗵 Delete | Manage Custom Types | | | |
|----|---------------------|----------|---------------------|------------|-------------|-------------|
| | Name | Туре | Value | Changeable | Access Role | Description |
| 8 | Parameter1 | String | testwert | | | |
| ii | Parameter2 | Boolean | V | | | |
| 8 | Parameter3 | String | | v | | |
| | | | | | | |

Click on the project for which you want to adapt the project parameters during runtime. The adaptable project parameters are shown on the **Variables** tab.

Project parameters of the type Constant cannot be changed at runtime and are shown on the **Constants** tab.



6 Process Monitor

With this pre-configured Web App, users can monitor the status of all processes executed by X4 BPMS. All executed processes can be displayed in lists or in process diagrams showing process information in statistical dashboards. The dashboards also provide information on individual processes. In this way, deviations can be detected early and processes can be corrected and seamlessly continued.

When opening the app, a list of process instances running on a host is displayed. When you run a process in the X4 Designer, you can refresh the display in the Process Monitor.

| FILTER | ALL C ERRORS | 🔿 ACTIVE 🏚 👱 EXPORT CSV | | | |
|--------------|-------------------------|--|---|--------------------------------------|--------------|
| cess Instand | ces on Host SP-WS-386 | | | | |
| tatus | Start : | Process Path | : | Process ID | Runtime (ms) |
| 2 | 06.06.2023 08:06:56,081 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 619cc576-ae11-4b8b-8638-303917362e7f | 0 |
| | 06.06.2023 08:05:56,032 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 3877dfa9-b1ba-4229-ae1b-30f908974971 | 0 |
| 0 | 06.06.2023 08:04:55,966 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 03ed380f-a8de-4686-a1f6-2824983a7a1f | 15 |
| | 06.06.2023 08:03:55,910 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 34681fd4-cfc3-4ea5-8e3f-018555e9b905 | 0 |
| | 06.06.2023 08:02:55,857 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 7dcab79e-2e05-473a-a397-8f43abe6e3d9 | 0 |
| | 06.06.2023 08:01:55,785 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 1373db21-986e-4c94-80e0-31d751ff6a07 | 11 |
| | 06.06.2023 08:00:55,737 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 4d24d3f6-31d4-4d22-84f7-ba1840895d2c | 0 |
| | 06.06.2023 07:59:55,675 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 00569ec7-c42b-4afa-a221-e1256445d0b3 | 16 |
| | 06.06.2023 07:58:55,628 | 1/TestCases_neu/Processes/EXECUTED.wrf | | f77b9de3-fea1-4e37-8d56-5bd7c9361cb2 | 0 |
| | 06.06.2023 07:57:55,555 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 98fb430b-0497-432f-af01-f19f55e5aeb2 | 15 |
| | 06.06.2023 07:56:55,495 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 769eaf72-310e-4057-bc07-0b1860bf1edf | 0 |
| 2 | 06.06.2023 07:56:43,576 | 1/TestCases_neu/Processes/EXECUTED.wrf | | 5e614614-188e-4e48-b28f-882e9908d403 | 0 |

One: Note:

When using the BAM Log Adapter with the Log status operation, an additional column **BAM Status** is available. This column displays the BAM status of the process instance.

6.1 Profiling

By default, all execution information of the processes is logged using a profiling mechanism. If you do not want this logging to be performed by default, you can add a profiling file(.profiling) to your project. You can configure the profiling in this file, e.g. by excluding specific processes from the profiling.

 For more information on creating and configuring a profiling file in the X4 Designer, see Proce ss Monitoring.

There are two methods to store profiling information:

1. Profiling with In-Memory Persistence

This profiling method uses an in-memory persistence to store the profiling information. This means that all information is lost when the X4 Server is shut down. If the memory is full the oldest entries will be deleted automatically.

If you use this profiling method all profiling information is stored in log files. The following types of log files are available:

| Log File | Description |
|--|--|
| X4 Server Log | By default, this log file is displayed in the server console. |
| LUG | The sub-string containing debug mode <false true> must be displayed for each process execution.</false true> |
| | Example: |
| | 11:41:46,796 INFO [X4-Profiling] (pool-43-thread-1) Process "1/ ProfilerAdapterSprintReview/Processes/ProcessInformation.wrf" with PID 3cb216e3-0b44-4e1f-92c4-b0431755ed82 finished, with debug mode 1, with status false after 5011ms |
| X4 Profiling log file in the file system | This log file is available in the file system in the wildfly\standalone\log\profiling.log folder and can be used as a fallback in case the server log fails. |
| | In order to enable this log file you must uncomment the configuration block in lines 90 to 136 in the standalone.xml file in the wildfly\standalone\configuration\ folder. |
| | When the server is restarted the latest information from the log files is reloaded into the memory. Thus, the in-memory profiling of the latest process is always available and accessible. |

2. Profiling using the SQL Profiling Plug-in

Note

When using the Process Monitoring App the profiling via the SQL Profiling plug-in is the recommended profiling method for use cases including a large number of processes which cause a high server load.

The SQL Profiling plugin is used to store profiling data into a relational SQL database. To do so, you need to connect the SQL Profiling plugin to a relational SQL database.

🕂 Warning

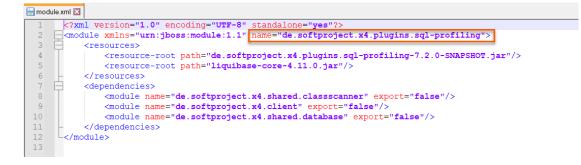
The first start of the profiling must be executed by a database user who has the permission to create database tables. After all tables required have been created, a user with fewer permissions can take over.

\rm A Note

When you enable the SQL Profiling, the default profiling in the memory is turned off.

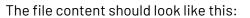
How to install the plug-in

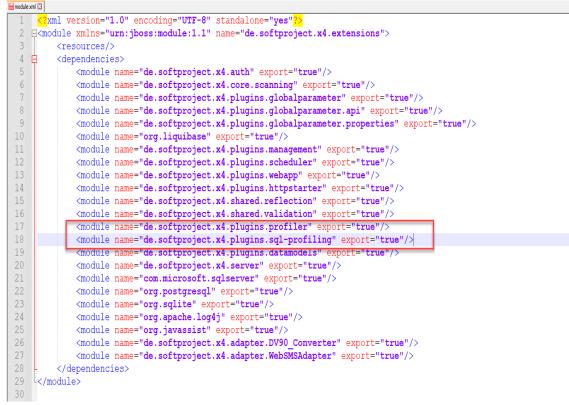
- a. Open the module.xml file in the <server directory>\wildfly\modules\system\layers\base\de\softproject\x4\plugins \sql-profiling\main folder.
- b. Copy the plug-in name specified in line 2:



- c. Open the module.xml file in the <server installation
 path>\wildfly\modules\system\layers\base\de\softproject\x4\extensions\m
 ain folder.
- d. Add the following line to the module.xml file:

```
<module name="de.softproject.x4.plugins.sql-profiling" export="true"/>
```





e. Restart the server. The plug-in is available after the server restart.

How to configure the SQL Profiling

- a. Create the sql_profiling_config.xml file in the <server_directory>/ configurations folder.
- b. Insert the following content.

```
<?xml version="1.0"?>
<Configuration>
    <ConnectionString></ConnectionString>
    <UserName></UserName>
    <Password></Password>
    <WriteCycle>
        <Duration></Duration>
        <TimeUnit></TimeUnit>
    </WriteCycle>
    <KeepLogs>
        <Duration></Duration>
        <TimeUnit></TimeUnit>
    </KeepLogs>
    <KeepCrashedProcessLogs>
        <Duration></Duration>
        <TimeUnit></TimeUnit>
    </KeepCrashedProcessLogs>
    <RunCleanUp>
        <Duration></Duration>
        <TimeUnit></TimeUnit>
    </RunCleanUp>
</Configuration>
```

c. Enter the required values in the sql_profiling_config.xml file.

6.1.1 Configuration

| Element | Description | Possible values |
|------------------|---|---|
| ConnectionString | JDBC connection string to connect to the database | Connection URL for the JDBC database |
| | For more information, see the official JDBC database documentation. | |
| UserName | Username for the login to the database | Any string |
| Password | Password for the login to the database | Any string |
| WriteCycle | Specifies the cycles in which data is written to the SQL database. | The element contains the following elements: • Duration • TimeUnit |

| Element | Description | Possible values |
|----------------------------|---|---|
| KeepLogs | Specifies how long entries are stored before they are cleared automatically. | The element contains the following elements: • Duration • TimeUnit |
| KeepCrashedProcessLo gs | Sets the period of time for which entries for crashed processes are stored before they will be cleared automatically. | The element contains the following elements: • Duration • TimeUnit |
| | Crashed processes are not covered by the KeepLogs eleme nt. | |
| RunCleanUp | Sets the cycles in which the automatic cleanup is performed. | The element contains the following elements: • Duration • TimeUnit |

6.1.2 WriteCycle

| Element | Description | Possible values |
|----------|----------------------------|--|
| Duration | Period of time | Integer |
| TimeUnit | Unit of the period of time | SECONDSMINUTESHOURSDAYS |

6.1.3 KeepLogs

| Element | Description | Possible values |
|----------|----------------------------|--|
| Duration | Period of time | Integer |
| TimeUnit | Unit of the period of time | SECONDSMINUTESHOURSDAYS |

| Element | Description | Possible values |
|----------|----------------------------|--|
| Duration | Period of time | Integer |
| TimeUnit | Unit of the period of time | SECONDSMINUTESHOURSDAYS |

6.1.4 KeepCrashedProcessLogs

6.1.5 RunCleanUp

| Element | Description | Possible values |
|----------|----------------------------|--|
| Duration | Period of time | Integer |
| TimeUnit | Unit of the period of time | SECONDSMINUTESHOURSDAYS |

(i) Note:

You can also access the profiling information displayed in the Process Monitor App via an API. To do so, you can use the **Process Profiler** adapter for a process to get all runtime information for a process or a process instance and embed it in your own applications. Alternatively, you can call the X4 API via localhost:8080 and manage the profiling information in the **Profiling Management** section at runtime.

This means you can activate the profiling at runtime without having to access the X4 BPMS itself. This is, for example, useful in case of a process for which the profiling is turned off, but you still need information about this process.

6.2 Process Overview

The Process Overview shows a list of all executed process instances.

Additional information:

- Filtering process instances
- Defining settings
- Exporting data

6.2.1 Filtering Process Instances

You can use the radio buttons ALL, ERROR and ACTIVE to filter process instances

- ALL Displays all process instances.
- ERROR Displays process instances in ERROR, TERMINATED or CRASHED status.
- ACTIVE Displays process instances in RUNNING or PAUSED status.

| FILTER | • ALL | O ACTIVE | \$ EXPORT CSV |
|---------------|-------|----------|------------------|
| | | | |

To define more detailed filter criteria, click the **FILTER** button opening the **Filter process instances** dialog.

| By Status | | By Time Interval All | |
|--------------------------------------|--------------|----------------------|---|
| RUNNING | ✓ ERROR | from | Ē |
| PAUSED | ✓ TERMINATED | to | Ē |
| FINISHED | CRASHED | | |
| | | | |
| By Path or ID No path or ID filte | er | | |

CANCEL

REMOVE

APPLY

| Element | Description |
|------------------|---|
| By Status | Use the check boxes to select which process statuses are to be displayed. If you do not make a selection, all processes will be displayed regardless of the status. |
| By Time Interval | Define the period for which process instances are to be displayed. Possible values are Alle, Vergangene Stunde, Vergangene 24 Stunden, Vergangene 7 Tage, Vergangene 30 Tage, Benutzerdefinierter Zeitraum. |
| By Path or ID | This drop-down list contains various options for filtering by path or process ID. By default, No path or ID filter is selected. |
| | The drop-down list contains the following options: |
| | Select process path : Displays a drop-down list with all process paths from the current X4 repository (root folder: X4DB). Only process instances that match the process path are loaded. |
| | Enter process path manually : Opens the Enter process path field where you can search for deleted or renamed processes. Only process instances that match the process path are loaded. |
| | Filter by root process ID - Returns all sub-processes of the main process: Displays the Process Root ID field. Only process instances that are subprocesses of the main process are displayed. |
| CANCEL | Cancels the defition of filter criterias. |
| | If you have already set and applied filter criteria before, they will be kept even if you select CANCEL . |
| REMOVE | Resets all filters. |
| APPLY | Executes the selected filter/s. |

6.2.2 Defining Configurations

You can define various settings by selecting the **Gear** icon. This opens the **Configuration** dialog.



Configuration

| | | | |
|----------------|-----------|------|------|
| Max. number of | processes | | |
| 500 | | | * |
| | | | |
| Automatic Data | Refresh | | |
| Off | | | * |
| | | | |
| | | | |

| Element | Description |
|-----------------------------|---|
| Include Debug processes | Select if you want to display executed process instances in Debug mode. |
| Max. number of processes | Select the number of processes to be loaded on Server-side. Possible values: 10, 50, 100, 200, 500, 1.000, 2.000, 5.000, 10.000. |
| Automatic Data refresh | Select whether the data should be updated automatically and in which intervall. Possible values: OFF, Every 5 minutes, Every 10 minutes, Every 15 minutes, Every 30 minutes. |
| CANCEL | Cancel the definition of settings. |
| RESET | Reset the defined settings. |
| APPLY | Apply the defined settings. |

6.2.3 Exporting Data

You can export and download all listed process instances to a CSV file with the **EXPORT CSV** button.



6.3 Process Details

Clicking on a process instances opens the Procoess Specification which displays more detailed information about the selected process.

(i) Note:

When using the BAM Log Adapter with the operation Log Message, Log Batch Message or Log Data an additional **BAM log** tab is available besides the **Details**, **Process Steps** and **Statistics** tabs.

On this tab, you can view the key, level, and message for each adapter version.

Additional information:

- Displaying process details
- Displaying process steps
- Displaying statistics

6.3.1 Displaying Process Details

The **Details** tab displays detailed information about the process and the process instance as well as an image of the process and the status of the individual process steps.

| BACK TO OVERVIEW | | | | | |
|---|--------------------------------|-------------------------------|---|---------------------------------------|-------------------------------------|
| Details Pr | rocess Steps Statistics | | | | |
| Process Specifi EXECUTED.wrf | ication | | Process Instance: 81486927-ae11-46f8-adda- | Status and Runtime | |
| I Path: FestCases_neu/Processes/I | EXECUTED.wrf | | Technical Status: FINISHED | BAM Status N/A | |
| rkspace: | Project Name: TestCases_neu | Host: SP-WS-386 | Runtime [ms]: 9 ms | Start: 31/05/2023, 13:52:10.283327 | End: 31/05/2023, 13:52:10.292864 |
| | | | | | |
| tje.Husk Process Image | | X4 Version: 7.3.0-SNAPSHOT | This process has no savepoints. | ► PE5 | UME 📋 DELETE 🖬 DELETE A |
| tje.Husk Process Image | 30/05/2023, 11:55:48 | | This process has no savepoints. | ▶ res | UME DELETE E |

(i) Note:

If you use the BAM Log Adapter with the Log Status operation, the logged status is displayed in the field **BAM Status** on the tab **Process Instance: Status and Runtime.**

6.3.2 Displaying Process Steps

The **Process Steps** tab shows an overview of the process steps for the selected process instance.

| K BACK TO OV | ERVIEW PROCESS S | STEPS AS CSV | | | | | | | | | |
|--------------|-------------------------|---------------------------------|----|-----------|---|----------------|---|-----------|---|--------------|--------|
| Details | Process Steps | Statistics | | | | | | | | | |
| ocess: Issub | process.wrf (a374a17a-2 | - 7de-4d5f-bf5c-b7a16c510f02 | 2) | | | | | | | | |
| Status : | Start | Finish | ÷ | Action ID | : | Technical Name | 3 | File Name | ÷ | Runtime (ms) | : Tech |
| I | 06.06.2023 11:29:04,515 | 06.06.2023 11:29:04,515 | | 0 | | Start | | Start | | 0 | 1 |
| 0 | 06.06.2023 11:29:04,515 | 06.06.2023 11:29:04,536 | | 2 | | iXxml | | xml_2.xml | | 21 | 1 |
| > | 06.06.2023 11:29:04,537 | 06.06.2023 11:29:04,537 | | 1 | | Stop | | Stop | | 0 | 1 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | _ | | | | | | | | |

| Status | Status icon that visually represents the status from the Technical Status column. |
|------------------|--|
| Start | Date/time when process instance was started (with milliseconds). |
| Flnish | Date/time when process instance ended (with milliseconds). For running process instances, the column is empty. |
| Action ID | Action ID of process step. |
| Technical Name | Technical name of process step. |
| File Name | File name of process step. |
| Runtime (ms) | Runtime of process step (in milliseconds). |
| Technical Status | Technical status of process step. The technical status is mapped according to the following pattern: |
| | • >0 \rightarrow Completed without error. |
| | • =0 \rightarrow Completed without result. |
| | • <0 \rightarrow Executed with error. |
| | • RUNNING \rightarrow Process step is running. |

6.3.2.1 Navigate to sub-processes

If a process step contains a sub-process, you can view it by clicking on the process in the list of process steps.

(i) A subprocesse is identified by **iXWorkflow** in the **Technical Name** column.

If you have selected a sub-process, the path of this process is displayed in the title of the table.

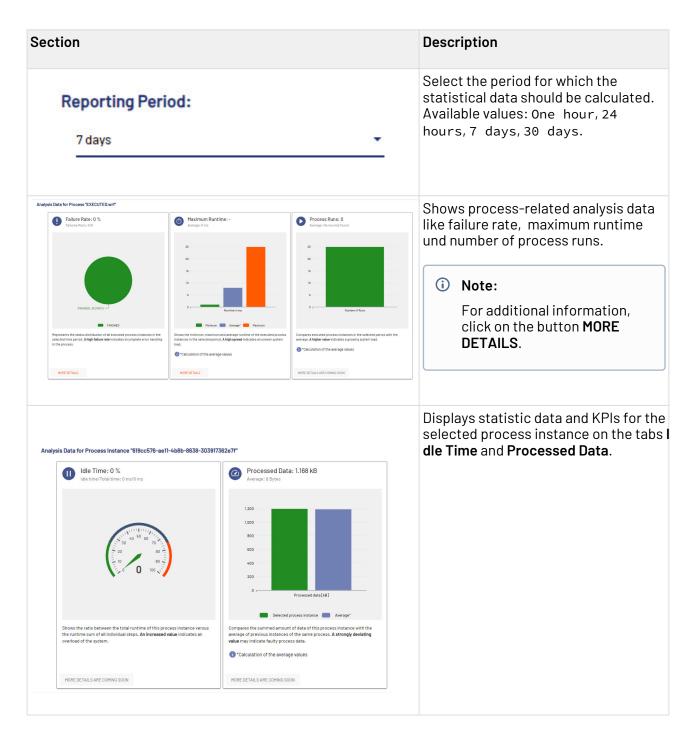
Clicking the **PARTENT PROCESS INSTANCE** button will return to the parent process instance.

| K BACK TO OV | PARENT PROCE | SSINSTANCE PROCESS | STEPS AS CSV | | | | | | | |
|--------------|-----------------------------|-----------------------------|---------------|------|----------------|---|-----------|---|--------------|-------|
| Details | Process Steps | Statistics | | | | | | | | |
| cess: Hass | ubprocess.wrf > lssubproces | s.wrf (a49b16d1-2ca2-49c6-a | Of-d1f635e2a5 | 556) | | | | | | |
| tatus | Start | Finish | Action ID | : | Technical Name | : | File Name | : | Runtime (ms) | Techn |
| 2 | 06.06.2023 14:01:57,756 | 06.06.2023 14:01:57,756 | 0 | | Start | | Start | | 0 | 1 |
| 2 | 06.06.2023 14:01:57,756 | 06.06.2023 14:01:57,779 | 2 | | iXxml | | xml_2.xml | | 23 | 1 |
| 2 | 06.06.2023 14:01:57,779 | 06.06.2023 14:01:57,779 | 1 | | Stop | | Stop | | 0 | 1 |
| | | | | | | | | | | |
| | | | | | | | | | | |
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6.3.3 Showing Statistics

The **Statistics** tab contains statistical data, charts and KPIs for the selected process and process instance on an overview screen.

This screen is divided into three sections:



6.3.4 Stopping/Terminating running Process Instances

If the execution of a process is still running while the process overview is loaded, the **STOP/ TERMINATE PROCESS** button is displayed.

STOP/TERMINATE PROCESS

In the dialog window Stop or Terminate Process, you can select a process and stop or terminate it.

Stop or Terminate Process

Stop process:

The current process step is still executed and then the process is stopped.

Terminate process:

It is tried to end the process immediately. The current process step is aborted.



6.3.5 Showing Savepoints

If Savepoints were set for a process, they will be displayed in the process details on the **Details** > **Proc** ess Instance: Status and Runtime tab.

| Process Instan f524cce3-3aa0-4e62 | ce: Status and Runti be80-f878363b10bf | me | | | |
|--------------------------------------|---|------------|-----------------------------|--|--|
| Technical Status: | | BAM Status | | | |
| PAUSED | | N/A | | | |
| Runtime [ms]: | Start: | | End: | | |
| 20.03 s | 06/06/2023, 11:40:44.844703 | | 06/06/2023, 11:41:04.873197 | | |
| Savepoints: | | | | | |
| XPath_Iterator.fa | * | ► RESUME | 🛑 DELETE 🔀 DELETE ALI | | |

You can resume the process and/or delete either the current or all savepoints.

If a process has no savepoints, the buttons are grayed out.



7 Process Scheduler

This preconfigured X4 Web App allows users to easily schedule the execution of X4 BPMS processes without any programming knowledge. It is for example possible to define the start time and timing for repeated process executions at runtime.

When opening the app, the **Projects overview** tab displays a list of projects for which you have scheduled process executions with the scheduler (.schedule file) in the X4 Designer.

The list also shows the name of the workspace the project is stored in and the actual project name.

If you create a new project in X4 Designer or change the name of a project, it is shown in the app when updating the Process Scheduler.

| rojects overview Calendar | | | |
|---------------------------|----------------|-----------------------|------------|
| orkspace | 1 | Project name | i |
| rocessMonitor | | CheckBAMConfiguration | |
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| H 4 1 + H 10 | Items per page | | 1-1from 11 |

Note

For more information, see the BPM manual/ESB manual > Scheduler > Execute processes scheduled.

7.1 Adapting scheduled process executions

It is possible to adapt the scheduled execution of processes during runtime.

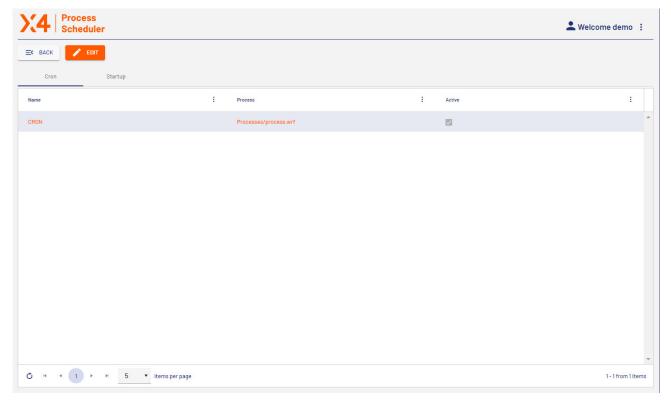
1. Select the BPM or ESB project for which you would like to adapt the scheduled execution of processes.

This opens the page for editing the scheduled execution.

2. If you select a process on the **Cron** or **Startup** tab, the **EDIT** button is active and you can adapt different values.

7.1.1 Executing processes according to specific Cron patterns

When selecting a process on the **Cron** tab list, the **EDIT** button becomes active.



The following values can be edited in the **Edit schedule** dialog window:

| ype: Minutes - Active | |
|-----------------------|--|
| ery <u>5</u> minutes | |

(i) Note:

The values for **Name** and **Process** cannot be changed during runtime.

7.1.2 Executing Processes at Server Start

When selecting a process on the **Startup** tab, the **EDIT** button becomes active.

| 4 Schedule | Process Scheduler | | | | | | L Welcome demo | |
|--------------------|----------------------|------------------------------------|-------------|--|----------|---|----------------|---|
| K BACK | | | | | | | | |
| Cron | Startup | _ | | | | | | |
| lame | 1 | Process | Start date | | End date | ÷ | Active | : |
| AMLogConfiguration | | Processes/Common/Chec | kBAMConfigu | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| H + 1 + | | Items per page | | | | | | |

You can change the values you want to adapt in the **Edit schedule** dialog:

| Edit schedule | | |
|--------------------------------|--------------|-----------|
| Name | | |
| BAMLogConfiguration | | |
| Process | | |
| Processes/Common/CheckBAMConfi | guration.wrf | |
| Start date | End date | |
| | | ä |
| ✓ Active | | |
| | 🗴 CA | NCEL SAVE |
| | | |
| O Note: | | |

7.1.3 Using the Calendar Overview

The **Calendar** tab shows an overview of the execution time for any scheduled process.

- Navigate through the the calendar with the **Today**, **Month**, **Week** and **Day** buttons.
- Select the **Legend** button to shows information on the colors used in the calendar.
- Click on a calendar entry to open the **Edit entry** dialog and edit the entries as described in the chapters Executing processes according to specific Cron patterns and Executing Ppocesses at Server Start.

| 4 Process Scheduler | | | | | | Level Welcome demo |
|------------------------|--------------|------------|-----|-----|-----|--------------------|
| Legend < Prev | > Next Today | Month Week | Day | | | |
| ojects overview C | alendar | | | | | |
| 2023 Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| 1 | 2 | 3 | 4 | 5 | 6 | |
| 8 | 9 | 10 | n | 12 | 13 | |
| 15 | 16 | 17 | 18 | 19 | 20 | |
| 22 | 23 | 24 | 25 | 26 | 27 | |
| 29 | • 03:00 Cron | 31 | | 2 | 3 | |
| 5 | 6 | 7 | 8 | 9 | | |

8 3rd Party License Report

This pre-configured X4 Web App allows users to view all third-party open-source components used in X4 BPMS and the related license information. This feature is essential to ensure a strong license management in your company.

When opening the app, a list of all third-party licenses used in X4 BPMS is displayed. The list can be sorted and filtered as needed.

- Select the link in the column **Web Link** for each component to get more detailed license information.
- Select the **EXPORT** button at the top left to export the selected licenses to a CSV file.

| EXPORT | | | | | | | | | |
|-------------------------|---|-------------------------------------|---|-----------|---|-----------------------------|---|--|---|
| d Party License Report | 1 | Artefact : | | Version | : | License | : | Web Link | : |
| palliance | | aopalliance | | 1.0 | | Public Domain | | | |
| ackport-util-concurrent | | backport-util-concurrent | : | 3.1 | | Public Domain | | http://creativecommons.org/licenses/publicdomain | |
| om.amazonaws | | aws-java-sdk-applicationautoscaling | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| m.amazonaws | | aws-java-sdk-core | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| m.amazonaws | | aws-java-sdk-dynamodb | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| om.amazonaws | | aws-java-sdk-kms | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| om.amazonaws | | aws-java-sdk-s3 | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| m.amazonaws | | aws-java-sdk-simpledb | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| m.amazonaws | | jmespath-java | | 1.11.1034 | | Apache License, Version 2.0 | | https://aws.amazon.com/apache2.0 | |
| rm.auth0 | | java-jwt | : | 3.4.1 | | The MIT License (MIT) | | <u>https://raw.githubusercontent.com/auth0/java-</u> jwt/master/LICENSE | |
| om.beust | | jcommander | | 1.78 | | Apache License, Version 2.0 | | http://www.apache.org/licenses/LICENSE-2.0.txt | |
| om.cronutils | | cron-utils | | 9.1.6 | | Apache 2.0 | | http://www.apache.org/licenses/LICENSE-2.0.html | |