ENFOCUS

SWITCH 2023 Fall

Reference Guide

12 - 2023

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1. What's new?

1.1. New in Switch 2023 Fall

This release includes the following features:

- Configurators have been converted into apps and are now available for download from the Enfocus Appstore. They behave like other apps. Refer to *Working with apps in Switch* on page 252. Note that when upgrading from a previous Switch version, the app versions of the configurators that were installed on your Switch are deployed automatically.

  Note: Some configurators have not been migrated to the Enfocus Appstore, because they have become obsolete or are no longer supported. For an overview, refer to the Switch 2023 Fall release notes on our website.

  The PitStop Server configurators have not yet been converted. If you have installed and licensed PitStop Server, the PitStop Server configurators are still available in the Flow elements pane, in the Configurators category. Refer to *Enfocus PitStop Server* on page 129 and *Enfocus PitStop Server PDF2Image* on page 135.

- The Configurator Module is no longer needed to run (app versions of) configurators. This module disappears.
- Switch is now compatible with macOS Ventura (macOS 13).

2. Understanding Switch

2.1. About Enfocus Switch

Enfocus Switch is a **modular software solution** that allows you to **automate tasks**, such as receiving files or folders, sorting them and routing them to a particular process or folder.

Modules

Switch consists of different modules:

- A core engine module, which offers the basic functionalities, and
- A number of additional modules that you can purchase if you need more advanced functionality.

The table below gives an overview of the different modules.

Module	Description
Switch Core Engine	• Provides the basic functionality for receiving, sorting, routing and tracking of files. • Enables PDF-specific handling like splitting and merging of PDF files.

Database Module	• Automates the communication between databases and Switch, without the need for additional scripting.
	• If you have purchased the Database Module, the **Database connect** flow element becomes available and allows you to integrate a database into your Switch flow, i.e.:
	  • Use values from a database.
	  • Read, write, update and delete information in a database.
	  • View database values through the Switch Web Portal.

Metadata Module	• Allows you to use metadata information stored in XML, JSON or JDF tickets, stored as XMP data, or stored as a dataset in some custom file format (opaque dataset).
	• If you have purchased the Metadata Module, the **Metadata flow elements** become available, allowing you to:
	  • Use metadata wherever Switch uses variables, for example to route files or process jobs dynamically.
	  • Update or add information in XMP packages.

Scripting Module	• Allows you to use scripts and script expressions in Switch. • Scripts can be developed with SwitchScripter, a Switch application component that comes with the Switch core engine. You don't need an active license for the Scripting Module to develop scripts; however, to use them in Switch (using the Script element), you do need such a license.

Module	Description
	• If you want to write scripts for the integration of third-party applications in Switch or to add specific functionality to Switch, and make these scripts available to other Switch users, you can consider becoming an app creator. For more information, refer to *https://www.enfocus.com/en/appstore/about*.

SwitchClient Module	• Allows you to access the Switch Server remotely. You can:
	  • Submit jobs to Switch flows (via Submit points)
	  • Review and route jobs (via Checkpoints)
	• You can either use this functionality through the Switch Web Portal, or through your own custom job client.
	• The SwitchClient Module comes with 5 concurrent user licenses, meaning that 5 users can access Switch through a web interface *at the same time*. Additional client licenses can be purchased if necessary.

Switch Web Services Module	• Allows you to design custom Switch client interfaces with existing applications or web-based interfaces. For example, you could build an interface to allow your customers to submit files straight from your company website. • Allows you to submit and check jobs through the Switch Web Portal. • The API is well-documented and can be found on *the Enfocus website*.
Performance Module	• The Performance Module offers additional processing capabilities, i.e. an *unlimited* number of concurrent processes as well as advanced performance tuning. **Note:** The Switch Core Engine allows up to 4 concurrent processes; you can also buy a specific product key for additional concurrent processes. For more information, please contact your local Enfocus reseller or sales@enfocus.com.
Reporting Module	• The Reporting Module allows you to create and display dashboards on the Switch Web Portal. You can configure the data you want to use (by defining job boards) and choose from different widgets to display live data or historical data (to get statistics).

Note: When you install Switch, all modules are installed by default, but you have only access to those for which you have entered a product key.

2.2. Switch application components

Switch consists of 5 applications components that are all installed at once when running the Switch installer.

Switch Server

The Switch Server is the core engine of Switch. It runs in the background to execute all processes and does not have its own interface.

Switch Server is started and terminated by the Switch Watchdog, an application designed to monitor Switch Server. The Switch Watchdog doesn't have an interface either and is started and terminated by the Designer, unless the *Switch Watchdog is set up as a Windows service*. In that case, the Switch Server is started automatically when a user logs in, and Switch can continue processing even if the Switch Designer is closed.

Switch Designer

The Switch Designer is the Switch user interface. It allows you to design, activate, and monitor Switch workflows. The Designer communicates with and manages the Switch Server.

The Designer and the Server can run on the same computer to establish a one-on-one communication, but this is not mandatory.

If you install Switch on multiple computers, you can launch the Designer from another computer and manage the flows remotely. In that case, do not forget to define which users have the right to connect to a given Switch Server by means of the Remote Designer (See *Setting up Switch users* on page 62).

For a detailed overview, refer to the chapter about the *Switch graphical user interface*.

Switch Web Portal

The Switch Web Portal allows you to connect to the Switch Server through a web browser interface, for example to view log messages and active jobs or to submit and check jobs without having to use a Switch Designer. You can also create job boards to keep an eye on your production and dashboards with counters and different kinds of graphs.

Note that submitting and checking jobs through the Web Portal requires a SwitchClient or a Web Services license; creating dashboards requires a license for the Reporting Module.

Access rights for individual users or user groups can be set through the Users pane.

For more information, refer to *Using the Switch Web Portal* on page 260.

Switch Web Services

The Switch Web Services take care of all data communication between Switch and its client applications such as the Switch Web Portal, our customers' own clients etc. It's part of the default Switch installation.

SwitchScripter

SwitchScripter offers a scripting development environment, that is, it allows creating and testing scripts for use with Switch.

The Switch installer automatically installs SwitchScripter. Although there is no technical requirement, SwitchScripter usually runs on the same computer as the Designer.

For more information, see *Scripting Module* on page 407.

2.3. Getting started

Switch Quick Start Guide

If you are new to Switch, we recommend reading the Switch Quick Start Guide.

This Guide explains the basic concepts of Switch and helps you to create and design your first flows. It also contains a number of exercises: you can try to make them yourself, and afterwards check the sample solution or watch a video about the topic concerned.

The Switch Quick Start Guide is available on the *Manuals section of the Enfocus website*.

Training

You can also take an eLearning course (with interactive exercises), or watch a product movie or a recorded webinar.

All training material can be found on the *Learn section of the Enfocus website*. Make sure to select "Switch" and "Beginner".

A good start are the "Getting Started with Switch" eLearning modules:

- **Module 1**: Installation, activation and configuration
- **Module 2**: Creating your first flow
- **Module 3**: Exercise
- **Module 4**: Metadata
- **Module 5**: Working with folders and subfolders
- **Module 6**: Tips and tricks

3. Installing, activating and starting Switch

This section contains all you need to know about installing, activating and starting Switch.

3.1. Before you start the installation

General setup

Before you can use Switch, you must:

1. *Install the application*, by running the Switch Installer. The Switch Installer installs Switch Designer and the other Switch components (Switch Server) with all the different Switch modules (Core Engine, Metadata Module, Database Module ...).
2. *Install the components that should run on a different system (optional).* All components can perfectly run on one system. However, for performance reasons, you may want to run the Dashboard Service (needed to create job boards and dashboards on the Switch Portal) on a different server. Or you may want to use Remote Designer (to be able to access the Switch Server remotely). In that case, some extra steps are required.
3. *Activate the modules* on the server that is running Switch Server, by entering a valid product key.

Note: Afterwards, you can still activate additional Switch modules.

System requirements

Before installing Switch, make sure to check the *system requirements* on the Enfocus website.

Security measures

For security reasons, we highly recommend to...

- Use a firewall to **block inbound traffic** by default as Switch uses a bunch of network daemons for its operation. For more information on which ports should be made available and in which cases, check *Configuring Switch user preferences* on page 33.
- Always **install** all latest supported OS **security updates**.

Some tips to optimize the performance of Switch

Use multiple processors

As Switch is a multi-threaded application, it takes full advantage of multiple processor systems. Also, if you're working with third-party applications, they too will require processing time (cycles). More processors can help improve the overall performance.

The number of concurrent processing tasks is however limited by default in Switch Core Engine (see the preference 'Concurrent processing tasks'). If you have a multi-core powerful system, you may want to buy additional concurrent processes licenses or even the Performance module to have an unlimited number of concurrent tasks.

Ensure sufficient disk space and speed

Switch will be managing many files in and out of the Switch workflow. As well, 3rd-party applications will need to open and work with files on the local Switch Server. To increase

performance of the system, selecting faster access (read/write) disk drives will help speed up the performance of each application. Also ensure to allow for enough disk space to accommodate your highest possible workload.

Provide sufficent system memory (RAM)

Although Switch is not RAM intensive, be sure to take into account third-party application requirements as well. In general, the more RAM available, the better and it will help improve the overall system performance.

Make sure to meet all network requirements

Given Switch will work with files from all over your network as well may be receiving or sending information or jobs to other systems within your workflow, be sure the Switch Server can easily access to all your shared systems.

3.2. Installing Switch

Prerequisites: You must have administrator rights on your local computer to install and run Switch.

Note: If you have already installed an older version of Switch, refer to *Upgrading to a new version of Switch* on page 27.

To install Switch

1. Download Switch using the link you received from your local reseller.

   Switch is only sold via local resellers. Note that you can also download the installer through My Enfocus, our customer portal.

2. If necessary, double-click the Switch installer.

3. Follow the onscreen installation instructions.

   Important: It's important to pay attention to all messages shown during the installation.

   At some point Windows users will be asked to disable UAC. For more information, refer to *Disabling UAC (Windows only)* on page 13.

4. During the 'Installation Type' step, select **Switch Service**.

   This component installs the Switch Server, the Designer, the Dashboard Service and the Switch Processor. This is the default setup, required for the system that will run the main Switch processes. Do not clear this checkbox, unless you're installing a Remote Designer or a Dashboard Service on a different system (see further).

If relevant, now *install the components that should run on a different system.*

Once you have finished the installation, Switch is started automatically (unless you have turned off the *Start Switch Server automatically at login* preference). Remember that you still have to activate your Switch license(s) before you can start using Switch.

3.2.1. Disabling UAC (Windows only)

User Account Control (UAC) is a security feature in Windows. It allows you to determine whether or not you want to be notified if changes that require administrator permission are made to your system.

During the installation of Switch, you are asked to disable UAC. If you don't, you will not be able to install Switch, nor will you be able to work with it. You must leave UAC disabled, also after you have finished the installation.

Note: This warning may pop up even if you have already disabled UAC. In that case, just ignore the warning and click **Next** to proceed.

To disable UAC

1. Open the User Account Control Settings panel.

   If you don't know where to find it, open the Windows start screen and search for 'User Account Control'.

2. Drag the slider to the bottom, to the option **Never notify**.

3. Click **OK**.

4. Restart the computer.

3.3. Installing Switch components on a different server

3.3.1. Remote installation of the Dashboard Service

The Dashboard Service is the Switch service that is needed to create job boards and dashboards on the Switch Portal. It is possible to install this service on a different system than Switch Server. For more info concerning the dashboard functionality, refer to *Finding Switch jobs through the Switch Web Portal* on page 272.

Installation

1. Start the Switch installer on the system where you want to install the Dashboard Service.
2. During the 'Installation Type' step, clear the **Switch Service** checkbox and select the **Dashboard Service** checkbox.

   After installation, the Dashboard Service is started automatically.

Configuration

1. On the system where you installed the Dashboard Service, the **PortsSettings.prefs file** contains the port for communication between Switch Server and the Dashboard Service. If necessary, you can change the default port (55092).

Location of PortsSettings.prefs:

- Windows: C:\Users\<Username>\AppData\Roaming\Enfocus\Switch\
- Mac: /Users/<Username>/Library/Application Support/Enfocus/Switch/).

2. On the system where Switch Server is installed, configure the Dashboard Service Location in the Switch User preferences (*Reporting preference*).

3.3.2. Remote installation of Switch Designer

Local Designer versus Remote Designer

By default, Switch is installed and activated on **one system**, and this one system will be used to configure Switch flows (with Switch Designer) and to run processes (with Switch Server).

However, it's also possible to access Switch Server remotely, so you can configure flows and administer Switch on another computer than the one that is running the processes. This is called a Remote Designer.

You can have several Remote Designers managing one particular Switch Server; just make sure that you're using the same version of Switch on all systems.

Installation

1. Start the Switch installer on the system on which you want to install a Remote Designer.
2. Follow the installation instructions; during the 'Installation Type' step, clear the **Switch Service** checkbox and select the **Designer** checkbox.

   When starting Switch, you will be asked if you want to connect to a local or a remote Switch Server.

   See also *Starting Switch* on page 28.

Configuration

Do not forget to *configure the users and/or users groups* that will have the right to use Remote Designer. This must be done on the system that runs Switch Server.

3.4. Activating Switch

Once you have installed Switch, you must activate the application on the system that runs Switch Server.

Trial version

If you want to try the application before you buy it, you can activate a **trial version**. A trial version remains active for 30 days.

The Switch Core Engine doesn't have a **built-in** trial version; contact your local Enfocus reseller and request a trial version. You will receive a product key which can be activated in the same way as a purchased license (see further).

The Switch additional modules do have a built-in trial version. Once you have activated the Switch Core Engine, you can activate trial versions of the other modules, without having to

contact a reseller. Refer to *Activating a Switch trial for additional modules (online method)* on page 20 or *Activating a Switch trial for additional modules (offline method)* on page 21.

Licensed version

If you have bought the application, you can **activate the modules for which you have a license**:

- If you installed Switch on a computer *with internet access*, refer to *Activating Switch (online method)* on page 15.
- If you installed Switch on a computer *without internet access*, refer to *Activating Switch (offline method)* on page 16.

Note: In this case, you need another computer with internet access to communicate with the Enfocus web server.

Remember that you can only activate licenses with a local Designer. When using Remote Designer, you can view the license information, but you cannot change it.

3.4.1. Activating Switch (online method)

Once you have installed Switch, you must activate the modules for which you have a license.

Note:

- You need at least a license for the Switch Core Engine. Other modules are optional.
- If you're using a firewall, make sure to allow Switch to communicate with *https://licensingservices.esko.com* using ports 80 and 443.

This procedure describes how to activate Switch *on a computer with internet access*.

To activate Switch

1. Start Switch and connect to the local Switch Server.

   Activation is only possible on a local Switch Server.

   The **About Enfocus Switch** dialog appears.

2. Enter your Enfocus ID and password.

   If you don't have an Enfocus ID yet, click the **Create Enfocus ID** link and enter the required information. Your account is created immediately, so you can proceed with the activation procedure.

   Note: If your system environment requires HTTP connections to pass through a proxy server, Switch will ask you to enter the details of your proxy server. Note that, to be able to use external services with Switch, you will also have to turn on *the HTTP proxy user preferences*.

3. Click **Sign In**.
   A dialog pops up. Here you should enter your product key(s) or your product key license file.

4. To supply your product key(s), do one of the following:
   - Enter the product keys in the text area.
   - Drop the product key file into the text area.

- Click **Browse** to select the product key license file from a location on your local system.

A green check mark next to the product key indicates that the key is valid.

5. Click **Activate**.
   The **Manage licenses** dialog appears, providing you with an overview of the Switch modules and their current activation status. If you have activated a time-limited license, you'll see a yellow icon ; a permanent license results in a green icon next to the module concerned.
6. Click **Close**.

3.4.2. Activating Switch (offline method)

This procedure describes how to activate Switch *on a computer without internet access*.

Prerequisites:

- You must have an additional computer with internet access to communicate with the Enfocus web server.
- You need an Enfocus ID.

  To create an Enfocus ID (on a computer with internet access), go to *https://my.enfocus.com/en/user/register* and follow the on-screen instructions. Your account is created immediately, so you can proceed with the activation procedure.

How it works:

Activating Switch offline consists of three steps:

1. Create an activation request on the computer on which you installed Switch.
2. Save this file on another computer with internet access and upload it to the Enfocus activation website. Enfocus will check your licenses and, if the license is valid, provide you with a response file.
3. Upload the response file to the computer on which you installed Switch and activate it.

Each of these steps is explained below.

To activate Switch

1. On the computer on which you installed Switch:
   a. Start Switch and connect to the local Switch Server.

      Activation is only possible on a local Switch Server.

      The Enfocus Software Activation dialog appears.
   b. Enter your Enfocus ID and password.
   c. Enter your product key by doing one of the following:
      - Type or copy-paste your product key in the Product key field.
      - Browse to your product key license file or drag and drop it into the Product key field.
   d. Select the **Off-Line Mode** checkbox.
   e. Click **Activate**.
   f. In the Off-Line Activation dialog, click **Save** and save the activation request file requestactivate.xml on your local computer.
2. On a computer with internet access:

a. Make requestactivate.xml available.

> **Tip:** You can copy requestactivate.xml to a USB stick, and connect the USB stick to your online system.

b. Go to *http://www.enfocus.com/products/activation?lang=en*
c. Select **Offline Product Activation**, and click **Continue**.
d. Upload requestactivate.xml, and click **Continue**.
e. Fill in your Enfocus ID password, and click **Continue**.
f. Click **Continue** to confirm.
The Enfocus web server creates a file: response.xml.
g. Download the file.

3. On the computer on which you installed Switch:
a. Make response.xml available on this computer.
b. In the Off-Line Activation dialog (see step 1f), in the right part, click **Load** and upload response.xml.
c. Click **Activate**.
You have activated Switch.
d. Click **Close**.

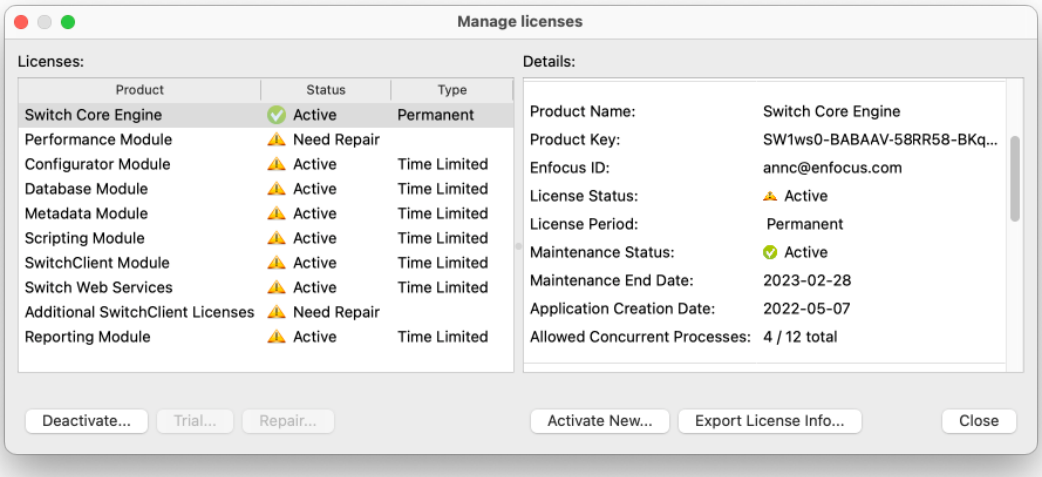
3.5. Managing your Switch licenses

Once you have installed Switch, you can manage your licenses from within the application. You can for example check the status of your licenses, activate additional modules, deactivate modules, export license information, and so on.

3.5.1. About the Switch licenses

Switch modules are activated via licenses or product keys. For each module you want to use, you need a separate license.

> **Note:** An overview of your licenses can be found in the Manage licenses pane (**Help** > **Manage Licenses**).



Trial licenses

If you are new to Switch, you can try the software for a period of 30 days. Request a trial key via *the form on the Enfocus website*.

You will receive a key for the Switch Core Engine. The other modules can be activated separately via the **Trial** button in the Manage Licenses panel (see *Activating a Switch trial for additional modules (online method)* on page 20).

Module licenses

At the time of the purchase, you receive an HTML file with a key for each module you have bought.

The Switch Core Engine license is mandatory. The other modules are optional and can be activated afterwards when you need them. If the Switch Core Engine license expires before a module's trial period or time limit, then the modules will stop working too.

License Status versus Maintenance Status

The **License Status** indicates the validity of the license; if the license status is active, you have the right to use the Switch module.

The **Maintenance Status** (only shown in the details of the Core Engine) indicates if your maintenance contract for Switch is expired or about to expire. Maintenance is mandatory during the first year and includes free updates of the software and priority tech support.

The **Maintenance End Date** indicates the end of the maintenance period (not of the license!): after that date, the software will continue to work, but you will no longer be entitled to free updates and support. The Maintenance End Status will be "Expired" and the Maintenance End Date will be a date in the past.

If you renew your maintenance contract, you will receive a Switch Maintenance key. This key will have a new Maintenance End Date that will be taken into account to determine whether or not you have the right to upgrade. Do not forget to activate this new maintenance key, so the details and the new Maintenance End Date become visible in the Manage Licenses panel.

Upgrading to a new Switch version

To determine whether or not you are entitled to a new Switch version, the *Application Creation Date* is used.

The *Application Creation Date* is the release date of the Switch version installed on your computer. This date is compared to the *Maintenance End Date*: if that version of Switch was released before the Maintenance End Date, you're entitled to use it.

For example, if your maintenance expired on 28/06/2020, you have the right to upgrade to Switch 2020 (released on 23/06/2020), no matter what the current date is and although the Maintenance Status is "Expired".

However, if your maintenance expired on 28/05/2020, you do not have the right to upgrade to Switch 2020 (released on 23/06/2020); if you want to upgrade (from Switch 2018 or 2019), you must renew your maintenance contract.

For more information, refer to *Upgrading to a new version of Switch* on page 27.

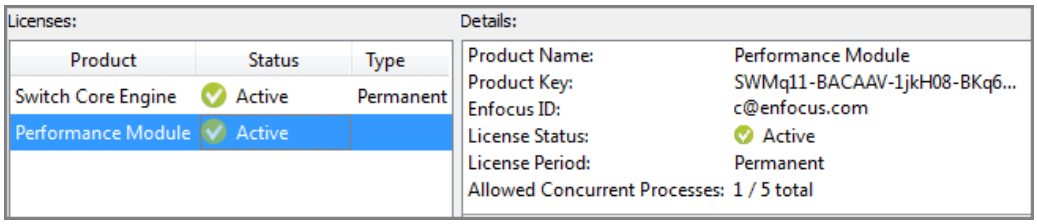
Note: The Switch 2021 license is backward compatible to Switch 2019, meaning that you can use the Switch 2021 key to run previous versions of Switch if required.

Additional concurrent processes

The Switch Core Engine allows for up to 4 concurrent processes. If that's not sufficient, you can buy a number of additional concurrent processes through a license of the Performance Module.

To know how many concurrent processes have been licensed, check the value of the "Allowed Concurrent Processes" field in the details of the Core Engine or the Performance Module license.

The first number represents the number of allowed concurrent processes based on the selected module, the second number represents the total number of concurrent processes for the whole Switch installation. In the below example, 1 additional license for the Performance Module has been purchased (in addition to the 4 included in the Core Engine).



3.5.2. Checking the status of your Switch licenses

Check the status of your licenses, if you want to know which Switch modules are activated, when your licenses expire or when your maintenance contract ends. The end of your maintenance contract is important, because it determines whether or not you can upgrade to a new version of Switch.

To check the status of your Switch licenses

1. Open Switch.
2. On the **Help** menu, click **Manage licenses**.
3. In the left part of the Manage licenses dialog, select the module of which you want to see the status.

The details of the selected module are shown in the Details pane on the right. For more information, refer to *About the Switch licenses* on page 17.

The table below explains the icons that represent the License Status.

Icon	Meaning
	The license is time-limited. You can use the module concerned during a certain period of time. Check the License Period in the right part of the dialog.
	The license is permanent.
	The license has expired. You will not be able to use the module concerned.

3.5.3. Activating a Switch trial for additional modules (online method)

You can activate a 30-day trial for one or more additional modules.

Note: Contact your local reseller if you want to try the Switch Core Engine.

Trial versions cannot be deactivated; they become inactive once the trial period has expired.

This procedure describes how to activate Switch *on a computer with internet access*.

To activate a Switch trial for additional Switch modules

1. Start Switch and connect to the local Switch Server.

   Activation is only possible on a local Switch Server.

2. On the **Help** menu, click **Manage licenses**.
   The Manage licenses dialog appears.

3. Select the module(s) you want to activate.

4. Click **Trial**.

5. If you're not signed in in Switch yet, a dialog will pop-up. Enter your Enfocus ID and password.

   You should have created an Enfocus ID when activating the Switch Core Engine. If you don't remember your password, click the **Forgot Password?** link.

6. In the dialog that appears, click **Activate**.
   You have activated a Switch trial version. All information about the activated version (for example the validity period) is displayed in the right part of the **Manage licenses** dialog.

7. Click **Close**.

3.5.4. Activating a Switch trial for additional modules (offline method)

You can activate a 30-day trial for one or more additional modules.

Note: Contact your local reseller if you want to try the Switch Core Engine.

Trial versions cannot be deactivated; they become inactive once the trial period has been expired.

This procedure describes how to activate Switch *on a computer without internet access*.

Prerequisites:

- You must have an additional computer with internet access to communicate with the Enfocus web server.

How it works:

Activating Switch modules offline consists of three steps:

1. Create an activation request on the computer on which you installed Switch.
2. Save this file on another computer with internet access and upload it to the Enfocus activation website. Enfocus will provide you with a response file.
3. Upload the response file to the computer on which you installed Switch and activate it.

Each of these steps is explained in detail below.

To activate a Switch trial for additional Switch modules

1. On the computer on which you installed Switch:
   a. Start Switch and connect to the local Switch Server.

      Activation is only possible on a local Switch Server.
   b. On the **Help** menu, click **Manage licenses**.
      The Manage licenses dialog appears.
   c. Select the module(s) for which you want to activate a trial.
   d. Click **Trial**.
   e. In the Enfocus Software Activation dialog, select the **Off-Line Mode** checkbox.
   f. Enter your Enfocus ID and password.

      You should have created an Enfocus ID when activating the Switch Core Engine. If you don't remember your password, on your computer with internet access, go to *https://my.enfocus.com/en/user/password*.
   g. Click **Activate**.
   h. In the Off-Line Activation dialog, click **Save** and save the activation request file requestactivate.xml on your local computer.

2. On a computer with internet access:
   a. Make requestactivate.xml available.

      Tip: You can copy requestactivate.xml to a USB stick, and connect the USB stick to your online system.

b. Go to *http://www.enfocus.com/products/activation?lang=en*
c. Upload requestactivate.xml, and click **Continue**.
d. Fill in your Enfocus ID password, and click **Continue**.
e. Click **Continue** to confirm.
The Enfocus web server creates a file: response.xml.
f. Download the file.

3. On the computer on which you installed Switch:
   a. Make response.xml available on this computer.
   b. In the Off-Line Activation dialog (see step 1h), in the right part, click **Load** and upload response.xml.
   c. Click **Activate**.
   You have activated a Switch trial version. All information about the activated version (for example the validity period) is displayed in the right part of the Manage licenses dialog.
   d. Click **Close**.

After updating the license keys, you must restart the application.

3.5.5. Activating additional Switch modules (online method)

If you have purchased one or more additional modules, you have to activate them by entering the product keys you received from your local reseller.

This procedure describes how to activate additional modules *on a computer with internet access*.

To activate additional modules

1. Start Switch and connect to a local Switch Server.
   Activation is only possible on a local Switch Server.
2. On the **Help** menu, click **Manage licenses**.
   The **Manage licenses** dialog appears.
3. Click **Activate New**.
4. If you're not signed in in Switch yet, a dialog appears. Enter your Enfocus ID and password.
   You should have created an Enfocus ID when activating the Switch Core Engine. If you don't remember your password, click the **Forgot Password?** link.
5. To supply your product key(s), do one of the following:
   - Enter the product keys in the text area.
   - Drag and drop the product key license file into the text area.
   - Click **Browse** to select the product file from a location on your local system.

   A green check mark next to the product key indicates that the key is valid.
6. Click **Activate**.
   In the right part of the dialog, a green icon (in case of a permanent license) or a yellow icon (in case of a time-limited license) appears next to the activated module(s).
7. Click **Close**.

After updating the license keys, you must restart the application.

3.5.6. Activating additional Switch modules (offline method)

This procedure describes how to activate additional modules *on a computer without internet access*.

Prerequisites: You must have an additional computer with internet access to communicate with the Enfocus web server.

If you have purchased one or more additional modules, you have to activate them by entering the product keys you received from your local reseller.

Activating Switch modules offline consists of three steps:

1. Create an activation request on the computer on which you installed Switch.
2. Save this file on another computer with internet access and upload it to the Enfocus activation website. Enfocus will check your licenses and, if the license is valid, provide you with a response file.
3. Upload the response file to the computer on which you installed Switch and activate it.

Each of these steps is explained in detail below.

To activate additional modules

1. On the computer on which you installed Switch:
   a. Start Switch and connect to a local Switch Server.

      Activation is only possible on a local Switch Server.
   b. On the **Help** menu, click **Manage licenses**.
      The Manage licenses dialog appears.
   c. Click **Activate New**.
   d. Enter your Enfocus ID and password.

      You should have created an Enfocus ID when activating the Switch Core Engine. If you don't remember your password, on your computer with internet access, go to *https://my.enfocus.com/en/user/password*.
   e. Enter your product key(s) by doing one of the following:
      - Type or copy-paste your product key in the Product key field.
      - Browse to your product key license file or drag and drop it to the Product key field.
   f. Select the **Off-Line Mode** checkbox.
   g. Click **Activate**.
   h. In the Off-Line Activation dialog, click **Save** and save the activation request file requestactivate.xml on your local computer.

2. On a computer with internet access:
   a. Make requestactivate.xml available.

      Tip: You can copy requestactivate.xml to a USB stick, and connect the USB stick to your online system.
   b. Go to *http://www.enfocus.com/products/activation?lang=en*
   c. Upload requestactivate.xml, and click **Continue**.
   d. Fill in your Enfocus ID password, and click **Continue**.

e. Click **Continue** to confirm.
The Enfocus web server creates a file: response.xml.
f. Download the file.

3. On the computer on which you installed Switch:
   a. Make response.xml available on this computer.
   b. In the Off-Line Activation dialog (see step 1h), in the right part, click **Load** and upload response.xml.
   c. Click **Activate**.
   You have activated the requested Switch modules.
   d. Click **Close**.

After updating the license keys, you must restart the application.

3.5.7. Deactivating Switch modules (online method)

Deactivate a Switch module if you want to move the license for this module to another computer, or if for any reason you don't need it anymore.

This procedure describes how to deactivate additional modules *on a computer with internet access*.

To deactivate Switch modules

1. Start Switch and connect to the local Switch Server.
   Deactivation is only possible on a local Switch Server.
2. On the **Help** menu, click **Manage licenses**.
3. In the left part of the Manage licenses dialog, select the module(s) you want to deactivate.
   To select multiple modules, hold down the **Ctrl** key while clicking the modules concerned.
   The details of the selected module are shown in the Details pane on the right. For more information, refer to *About the Switch licenses* on page 17.
4. Click **Deactivate**.
5. Make sure the **Off-Line Mode** checkbox is cleared.
6. If you want to export the license file (with the key being deactivated), so that you can reactivate it on another system, proceed as follows:
   a. Select the **Export license information during deactivation** checkbox.
   b. Save the product key license file on your computer.
7. Click **Deactivate**.
   The selected license is deactivated.
8. Click **Close**.

3.5.8. Deactivating Switch modules (offline method)

This procedure describes how to deactivate additional modules *on a computer without internet access*.

You must have an additional computer with internet access to communicate with the Enfocus web server.

Deactivate a Switch module if you want to move the license for this module to another computer, or if for any reason you don't need it anymore.

Deactivating Switch offline consists of three steps:

1. Create a deactivation request on the computer on which you installed Switch.
2. Save this file on another computer with internet access and upload it to the Enfocus activation website. Enfocus will provide you with a deactivation response file.
3. Upload the response file to the computer on which you installed Switch and deactivate it.

These steps are explained in detail below.

To deactivate Switch modules

1. On the computer on which you installed Switch:
   a. Open Switch
   b. On the **Help** menu, click **Manage licenses**.
   c. In the left part of the Manage licenses dialog, select the module(s) you want to deactivate.

      To select multiple modules, hold down the **Ctrl** key while clicking the modules concerned.
   d. Click **Deactivate**.
   e. In the Enfocus Software Activation dialog, select the **Off-Line Mode** checkbox.
   f. Select the **Export license information during deactivation** checkbox.
      This enables you to export the license file (with the key being deactivated), so that you can reactivate it on another system.
   g. Click **Deactivate**.
      A dialog pops up, allowing you to select a download location and a name for the license backup file (LicensesBackup.html).
   h. Browse to a download location, and click **Save**.
      The Off-Line Deactivation dialog appears. It allows you to download a deactivation request file.
   i. In the left part of the dialog, click **Save** and save the deactivation request file requestdeactivate.xml on your computer.

2. On a computer with internet access:
   a. Make requestdeactivate.xml available.

      Tip: You can copy derequestactivate.xml to a USB stick, and connect the USB stick to your online system.
   b. Go to *http://www.enfocus.com/products/activation?lang=en*
   c. Upload requestdeactivate.xml, and click **Continue**.
   d. Fill in your Enfocus ID password, and click **Continue**.
   e. Click **Continue** to confirm.
      The Enfocus web server creates a file: response.xml.
   f. Download the file.

3. On the computer on which you installed Switch:
   a. Make response.xml available on this computer.
   b. In the Off-Line Deactivation dialog (see step 1i), in the right part, click **Load** and upload response.xml.

c. Click **Deactivate**.
   You have deactivated the selected Switch module(s).
d. Click **Close**.

3.5.9. Repairing Switch (online method)

Licenses are linked to the hardware characteristics of your computer. If the hardware characteristics change (for example: you added memory or a new network card), the license is not valid anymore and you must repair it.

This procedure describes how to repair Switch *on a computer with internet access*.

To repair Switch

1. Start Switch and connect to a local Switch Server.
   Repairing licenses is only possible on a local Switch Server.
2. On the **Help** menu, click **Manage licenses**.
   The Manage licenses dialog appears.
3. Select the module(s) that need to be repaired.
   If a module needs to be repaired, the **Repair** button is activated.
4. Click **Repair**.
   The Enfocus Software Repair dialog is opened.
5. Make sure that the **Off-Line Mode** checkbox is cleared.
6. Click **Repair**.
   Your system communicates with the Enfocus web server and repairs your license. In case of problems, please contact Enfocus:
   - activation@enfocus.com
   - *http://www.enfocus.com/en/support/request-feature-report-problem*
7. Click **Close**.

3.5.10. Repairing Switch (offline method)

This procedure describes how to repair Switch *on a computer without internet access*.

Prerequisite: You must have an additional computer with internet access to communicate with the Enfocus web server.

Licenses are linked to the hardware characteristics of your computer. If the hardware characteristics change (for example: you added memory or a new network card), the license is not valid anymore and you must repair it.

Repairing Switch offline consists of three steps:

1. Create a repair request on the computer on which you installed Switch.
2. Save this file on another computer with internet access and upload it to the Enfocus activation website. Enfocus will provide you with a deactivation response file.
3. Upload the response file to the computer on which you installed Switch and repair it.

These steps are explained in detail below.

To repair Switch

1. On the computer on which you installed Switch:
   a. Start Switch and connect to a local Switch Server.

      Repairing licenses is only possible on a local Switch Server.
   b. On the **Help** menu, click **Manage licenses**.
      The Manage licenses dialog appears.
   c. Select the module(s) that need to be repaired.

      If a module needs to be repaired, the **Repair** button is activated.
   d. Click **Repair**.
      The Enfocus Software Repair dialog is opened.
   e. Select the **Off-Line Mode** checkbox.
   f. Click **Repair**.
   g. In the Off-Line Repair dialog, click **Save** and save the repair request file requestrepair.xml on your local computer.

2. On a computer with internet access:
   a. Make requestrepair.xml available.

      Tip: You can copy requestrepair.xml to a USB stick, and connect the USB stick to your online system.
   b. Go to *http://www.enfocus.com/products/activation?lang=en*
   c. Upload requestrepair.xml, and click **Continue**.
   d. Fill in your Enfocus ID password, and click **Continue**.
   e. Click **Continue** to confirm.
      The Enfocus web server creates a file: response.xml.
   f. Download the file.

3. On the computer on which you installed Switch:
   a. Make response.xml available on this computer.
   b. In the Off-Line Repair dialog (see step 1f), in the right part, click **Load** and upload response.xml.
   c. Click **Repair**.
      You have repaired Switch. In case of problems, please contact Enfocus:

      - activation@enfocus.com
      - *http://www.enfocus.com/en/support/request-feature-report-problem*
   d. Click **Close**.

3.5.11. Upgrading to a new version of Switch

Upgrading to a new Switch version will replace your current version. As soon as you launch Switch, all your flows will be upgraded as well.

Important: Before you start, check your maintenance status (by selecting **Help** > **Manage licenses**). You can only upgrade if the Switch Maintenance End Date is more recent than the Application Creation date (i.e. the creation date of the new Switch version). If this is not the case, please contact your local reseller and request a maintenance key.

To upgrade your current version to a new version of Switch

1. Quit all Switch processes (Designer, Server, Watchdog, Scripter) (using **File** > **Stop Switch Server**).

   If the preference **Start Server automatically at login** is set to **No** and if there are no active flows, quitting the Designer will stop the Switch Server and the Watchdog automatically.

   If the preference **Start Server automatically at login** is set to **Yes**, you can stop the server manually. Refer to *Stopping the Switch Server* on page 424.

   Tip: To ensure that there are no Switch processes running, you can use the Activity Monitor on Mac or the Task Manager on Windows.

2. *Install the new version of Switch*.

   We strongly recommend making a backup of the Switch data root (after installing) but before starting Switch Designer. On Windows, you can immediately start making a backup by clicking the **Yes** button in the dialog that appears at the end of the installation process. On Mac, you should locate and start the backup tool yourself. Refer to *Making a backup of your Switch installation* on page 428.

3. Launch Switch.
   After installing a new version of Switch, when it is launched for the first time, Switch detects the version change and presents a warning dialog.

   Note: Important note for Switch 2022 Spring! As of this version, the flow elements are deployed as Switch apps. They are downloaded and installed automatically on condition that you are signed in with your Enfocus ID. You can sign in via the Switch menu: **Switch** > **About Switch** > **Sign in**. If you are not signed in, you will still find the old flow elements (with old icons) in the Flow elements pane. Note that both the old flow elements and the new ones can be used, there is currently no difference in functionality, but in the future that will change.

4. Click the **Proceed** button.

   If you click the **Cancel** button, Switch quits without making any changes to the flows. In that case, you will not be able to work with these flows in the new version.

   Switch makes a backup of existing flows and then re-imports them. While re-importing the flows, Switch adjusts all flow elements and properties so that they comply with the current version of Switch. If there are any problems, a warning appears. For more information, refer to *Importing and exporting flows* on page 224.

3.6. Starting Switch

Prerequisites: You must have administrator rights on your computer to run Switch.

When starting Switch, you are actually starting the Switch Designer. With Switch Designer you can then connect to a local Switch Server, or to a Switch Server installed (and already running) on another computer.

Note: Switch Server allows only one connection at a time, from either a local or a remote Designer. The same holds for Switch Designer: Switch Designer can only be connected to one single (local or remote) Switch Server at a time.

To start Switch

1. Do one of the following:
   - Select Switch in the Start menu (Windows)
   - Locate the application (Switch.exe or Switch.app) and double-click to start Switch.

   Switch is installed by default in the following directory:
   - Windows: C:\Program Files\Enfocus\Enfocus Switch
   - Mac OS: /Applications/Enfocus/Enfocus Switch
2. In the Connect to Switch Server dialog, do one of the following:
   - To connect to the Switch Server installed on your local computer, select the **Connect to local Switch Server** checkbox.
   - To connect remotely, i.e. to connect to a Switch Server installed on another computer, enter the required details:
     - IP address or host name of the computer on which you have installed Switch Server.

       Note: The previously used IP address (if any) is stored.
     - Port number

       Note: You can set a default value for the port number. See *Switch preferences: Internal communication* on page 50.
     - User name and password as required.

       Note: This depends on the setup in the Users pane.

   Note: To be able to connect remotely, the Switch Server must be running on the remote computer. For more information, refer to *Starting/restarting Switch Server* on page 31.

   Tip: You can automatically start the Switch Server every time you log in to the operating system, by enabling the corresponding user preference (**Start Switch Server automatically at login**). See *Switch preferences: User interface* on page 34. Note that when this preference is enabled, Switch Server will remain running even if you exit Switch Designer.

   If you connect to a local Switch Server, the Switch Server is started automatically when starting Switch.
3. To hide this dialog next time when you start Switch, clear the **Show dialog at startup** checkbox.

Note: If you hide this dialog, the selected connection (local or remote connection to a particular computer) is considered the default connection. You can afterwards still change the connection from within Switch, by selecting **File** > **Connect to Switch Server**.

4. Click **OK**.
   If you're signed in with your Enfocus ID already, Switch Designer is opened. You can ignore the remaining steps of this procedure. If you're not signed in yet, the **About Switch** dialog appears and you should continue with the next step of this procedure.

5. On the **Sign In** tab, enter your Enfocus ID and password.

   You should have created an Enfocus ID when activating the Switch Core Engine. If you don't remember your password, click the **Forgot Password?** link.

   Note:

   - This step is not obligatory (but highly recommended), unless you want to activate licenses or buy apps in the Enfocus Appstore. See *Working with apps in Switch* on page 252. You must also be signed in to be able to download the default apps (= the flow elements that are part of your standard installation). If you're not signed in, on a new installation, you won't have the flow elements in the Flow elements pane. In case of an existing installation, you will still have the old flow elements (with the old icons).

   - You remain signed in (until you sign out explicitly), so next time you start Switch, you won't see this dialog anymore.

6. Click **Close**.
   Switch Designer is opened. In the title bar of the Switch Designer, you can see:

   - If you're connected with Remote Designer: Your user name followed by "@" and the IP address or host name (as entered in step 2) of the computer you are connected to, for example: "user@Switch Server MAC (10.33.133.213)"
   - If you're connected with a local Designer: The name of the Switch Server followed by "(localhost)".

   Note: Remember that your access rights depend on the settings in the Users pane. Users having read-only access (this is indicated in the title bar), will not be able to edit flows or to change settings.

7. If you're launching Switch for the first time, the Switch Insight Dashboard dialog pops up. Read the text carefully and click **Yes, I'd like my Dashboard** to get your own personal dashboard.

   You can change your mind any time. For more info, refer to *The Switch Insight Dashboard* on page 425.

3.7. Starting/restarting Switch Server

Starting Switch Server

The Switch Server must be running in order to process tasks.

However, you do not have to start the Switch Server manually:

- If the Switch Server is configured to start automatically at login (see *Switch preferences: User interface* on page 34), it starts when you log in to your operating system.
- On Windows, if the Switch Watchdog is configured as a Windows service, Switch Server starts when you log in to your operating system.
- If Switch Server is not running when logging in to your operating system, the Switch Server is started when you open Switch and connect to the *local* Designer.

Note: If the Switch Server is not yet running, connecting to the Switch Server with Remote Designer is not possible! You must first connect to a local Designer (which starts the Switch Server), before you can use the local Designer.

Restarting Switch Server

Restarting the Switch Server is only necessary if there are changes in the preferences or licenses which require a Server restart.

To restart Switch Server

In Switch *local* Designer, select **File** > **Restart Switch Server**.

3.8. Troubleshooting

When installing or activating Switch, you may encounter one of the following problems.

Activation license failed

If activating the license failed, check the following:

- If you copy-pasted the product key, double-check the product key pasted in the text field. You may have forgotten part of the key, or you may have added redundant spaces by accident.
- If you uploaded a file, try with a new copy of the file. It may have been corrupted.
- If this doesn't solve the problem, contact your local reseller and ask for a new activation file.

Activation license expired

If your license has expired, contact your dealer to resolve this issue.

Not all modules are activated

If one of the modules you purchased for Switch is not activated, double-check whether you received multiple activation files, and whether you have uploaded all of them.

If that does not resolve your problem, contact your local reseller and ask for the missing licenses.

Need more help?

Contact the Enfocus support team using our Support Portal: *http://www.enfocus.com/supportportal*.

4. Configuring Switch

Once you have installed and activated Switch, we recommend setting up:

- *User preferences*

  Provide Switch with the required data to send e-mails and notifications, to use Active Directory settings etc. Furthermore, you may want to change the language of the interface, to set the preferences for error messages etc.

- *Users*

  If you have licensed the SwitchClient Module, you should define which users are allowed to access Switch through Submit points and/or Checkpoints, and assign these users the appropriate access rights.

  If you want to allow certain users to view messages and/or jobs via the Switch Web Portal, you should explicitly do so via the Users pane.

  If you want to allow certain users to rush jobs, i.e. to process jobs before other jobs that are waiting in the queue, you should do so via the Users pane.

  If you want to allow certain users to view or create job boards and/or dashboards on the Switch Web Portal, you should also do so via the Users pane.

  If you are using Remote Designer, you should define who has the right to access the Switch Server remotely.

- *Switch Watchdog (Windows only) as a Windows Service*

  Set up Switch Watchdog as a Windows Service, to allow Switch to continue processing after you have logged off from the computer.

- *Setting up custom icons for job boards* on page 72

  If you're using job boards on the Switch Portal, you may consider replacing the standard icons for file types with your own images.

4.1. Configuring Switch user preferences

Switch user preferences allow you to:

- Customize Switch to your needs.

  You can for example choose the language of the interface, determine how many processes are allowed to run in parallel etc.

- Provide Switch with data it needs for sending e-mail notifications, setting up FTP connections, connecting to databases etc.

Note: Note that, when launching Switch using Remote Designer, a number of user preferences are hidden. Furthermore, if you have limited access (read-only access), you will only be able to view the preferences; you will not be able to change them. For more information, refer to *Configuring Switch users* on page 62.

4.1.1. Setting your Switch preferences

After you have installed and activated Switch, we recommend going over the user preferences and setting them as required. Note that a number of settings are required, in order to run Switch, for example the name of the Switch Server and, if you want to use Active Directory in Switch, the Active Directory settings.

To set your Switch user preferences

1. Navigate to:
   - On Windows OS : **Edit** > **Preferences**.
   - On Mac OS: **Enfocus Switch** > **Preferences**.

   The User preferences dialog appears.
2. In the left part of the dialog, click a category, for example User interface.
   The corresponding properties are shown in the right part of the dialog. The meaning of the different options is explained further in this manual.
3. Enter the required values.

4.1.2. Switch preferences: User interface

These preferences allow you to configure some aspects of the Switch user interface.

Property	Description
Designer Language	The language of the user interface of the Switch Designer. You can select one of the following languages: • English • German • French • Spanish • Portuguese • Chinese • Japanese **Note:** • Restart the Switch Designer to apply your changes. • You can also configure the language of the Switch Server. For more information, refer to *Switch preferences: Processing* on page 41.
Large icons in elements pane	If set to **Yes**, the Flow elements pane displays large icons; otherwise it displays small icons.
Save flows automatically	• If set to **Yes**, flows are saved automatically before they are processed (activated, imported, exported).

Property	Description
	• If set to **No**, you're explicitly asked if you want to save the changes before activating, importing or exporting the flow **Note:** This preference can also be set to **Yes** by selecting the **Save flows automatically** checkbox in the **Modified flows** dialog. That is the dialog that pops up when you want to activate, import or export a modified flow.

Start Switch Server automatically at login	• If set to **Yes**, (default) the Switch Server is started automatically when the user logs in, and it remains running, even if the user exits Switch Designer.
	
	• If set to **No**, the Switch Server will be started automatically when the local Designer is started. If the local Designer exits, the behavior depends on the currently active flows:
	  • If no flows are active, Switch Server is stopped automatically.
	  • If at least one flow is active, the preference below (When exiting the flow designer) will determine what happens.

When exiting the flow designer	This option is only available if **Start Switch Server automatically at login** is set to **No**. It determines what happens to the Switch Server when the user quits Switch Designer: **Note:** This preference is taken into account only in case there are **currently active flows**; otherwise Switch Server always exits disregarding the preference value. Options: • **Ensure processing is started:** When quitting Switch Designer, Switch Server remains running in the background and continues processing the flows that are currently active. • **Ensure processing is stopped**: When quitting Switch Designer, all active flows are stopped and Switch Server exits. • **Ask the user** (default option): When quitting Switch Designer, Switch displays a dialog so the user can decide what to do. The user can choose either to continue processing the active flows in the background or stop all active flows and exit.
Render HTML in Designer (beta)	The Log Messages overview and the Script expression editor are HTML-based interfaces. They can be rendered in two ways: • If this option is set to **Yes**, the HTML-based user interface will be shown inside Switch Designer. • If this option is set to **No**, the HTML-based user interface will be shown in a separate browser window, outside the Switch Designer user interface. Your default browser will be used. In both cases, the displayed content is the same.

Property	Description
	In case of the Messages overview, this setting is applied when clicking the **Messages** button or **View** > **Messages** option or when pressing **F6** in the Switch Designer. In case of the Script expression editor, this setting is applied whenever you click **Define script expression** to define a property. See also *Associating a script expression with a property* on page 408. **Note:** This feature is not yet supported on all systems. If it doesn't work on a your system, you'll get an empty window instead of the Messages view or the Script expression editor.
Ignore Switch Web Service certificate errors	If set to **Yes**, server certificate errors will be ignored when connecting to a remote Switch Web Service via HTTPS. Examples of certificate errors: • Self-signed certificate • Invalid host name • Expired certificate **Note:** Enabling this setting makes your connection vulnerable to Man-in-the-Middle Attacks, so it should only be used as a last resort. For a more secure solution, refer to *HTTPS with self-signed certificates* on page 436.

4.1.3. Switch preferences: Mail send

These preferences allow you to configure the settings for the Mail send and the Checkpoint via mail tool. If you do not configure them, you will not be able to send e-mail notifications. You can check if the settings are configured correctly by clicking the **Test connection** button at the bottom of the dialog.

Property	Description
SMTP server address	The URL or IP address of the SMTP email relay server. Example: smtp.gmail.com
SMTP port	The port used by the SMTP server.
SMTP server requires authentication	Defines whether the SMTP server requires authentication. If set to **Yes**, following additional fields appear: • *User name*: The login name for the SMTP server, for example: user@gmail.com. Leave empty if none is required. • *Password*: The password for the SMTP server. Leave empty if none is required. • *Use secure password verification*: Defines whether or not to use secure password verification.

Property	Description

	If set to **Yes**, the *Authentication method* property appears.
	• *Authentication method:* The authentication method used to establish the connection to the mail server. The following secure authentication schemes are supported:
	  • Automatic (The element will try the different methods one by one until the connection can be established)
	  • Password
	  • NTLM
	  • CRAM-MD5
	  • KERBEROS

Encrypt connection	Defines whether or not the mail server requires an encrypted connection (TLS1, 1.1, 1.2). Options: Yes/No.
Sender name	The sender's name for outgoing email messages.
Sender address	The sender's address for outgoing email messages.

Note:

- The sender name and email address are used in the _From _SMTP header that is normally shown by email client applications as 'From' field of an email. If the 'Reply to' field of an email is not defined, the content of the 'From' field is used to send a reply.
- It is also possible to use a different sender name and address for a particular flow. To do so, you can specify the new name, email address and authentication parameters (i.e. the user name and password linked to this email address) in the flow element concerned. Refer to *Mail send* on page 119 and *Checkpoint via mail* on page 127.

Example: The screenshot below is an example of the *Mail send* preferences required for sending e-mails using Gmail.

Property	Value
SMTP server address	smtp.gmail.com
SMTP port	587
SMTP server requires authentication	Yes
User name	examplesend@gmail.com
Password	*******
Use secure password verification	No
Encrypt connection	Yes
Sender name	Test User
Sender address	examplereceive@gmail.com

4.1.4. Switch preferences: FTP proxy

If your system environment requires FTP connections to pass through a proxy server, you must fill in the configuration details for the proxy server. Otherwise, you will not be able to use the FTP receive and FTP send tools.

Property	Description
Type of proxy	The type of proxy: • **No proxy**: no proxy is required for FTP connections • **Tunneling proxy**: uses the HTTP protocol • **SOCKS4 proxy**: uses the SOCKS4 protocol • **SOCKS5 proxy**: uses the SOCKS5 protocol
Name or IP address of host	Name or IP address of the proxy server on your local network.
Proxy user name	The user name for logging in to the proxy server.
Proxy password	The password for logging in to the proxy server.
Proxy port	The port number for communicating with the proxy server.

Note: If you are using the FTP proxy protocol (type of proxy = No proxy), do not forget to enter the appropriate proxy information in the FTP receive and FTP send properties:

- In the **FTP server address** property, enter the name or IP address of the proxy server (instead of the FTP site being targeted).
- In the **user name** property, append an @ sign and the target FTP site address (domain or IP address) to the regular user name ("<ftpserverusername>@<ftpserveraddress>").
- The other properties, including the password, remain unchanged.

See also: *FTP receive* on page 118 and *FTP send* on page 118.

4.1.5. Switch preferences: HTTP proxy

If your system environment requires HTTP connections to pass through a proxy server, you must fill in the configuration details for the proxy server. Otherwise, you will not be able to access the internet or external services (e.g. upload files to DropBox using the HTTP request flow element or download apps from the Enfocus Appstore).

Property	Description
Use HTTP proxy	Turn on or off HTTP proxy support.

Property	Description
	If set to **Yes**, an HTTP proxy connection will be estabilished for all HTTP(S) operations in Switch. The depending properties are shown and filled in automatically if they are present in the system settings.
Proxy server	Name or IP address of the proxy server on your local network.
Proxy port	Port number for communication with the proxy server.
Authenticate	If set to **Yes**, credentials are required for logging on to the proxy server. The following dependent properties pop up: • Proxy user name • Proxy password The type of authentication is always Basic Authentication.
Bypass proxy for these servers	Define the servers for which the proxy settings should NOT be used, for example for local communication between different internal servers or between the Switch Server and the Dashboard Service. You can enter the IP addresses (one per line) or the host name. Note that you can use the wildcards "*" and "?" to denote a range of servers. Example: 192.166.4.14?

4.1.6. Switch preferences: Mac file types

Mac files not always have a filename extension. Still, filename extensions are useful, to avoid confusion and to make it possible to exchange files with other operating systems (Windows, Unix). That's why Switch offers the possibility to automatically add filename extensions to all files (without filename extension) arriving in Switch. This filename extension is based on Mac file type information associated with the file (i.e. the file type and file creator codes).

For more information, refer to to *About Mac file types* on page 39.

Property	Description
Add filename extension	If set to **Yes**, Switch automatically adds a filename extension to arriving Mac files; if set to **No** (default value), the filename is left unchanged.

4.1.6.1. About Mac file types

Background information

Microsoft Windows uses the *filename extension* (which is required) to determine a file's type.

Apple's Mac OS X uses the *filename extension* (if present) and in addition uses the *file type and creator codes* (if present) stored in the catalog entry for the file. This allows Mac OS X to be

compatible with the external world (i.e. Windows and Unix, which use filename extensions) and with Mac Classic (which exclusively used Mac file types).

Successfully exchanging files in a mixed platform environment requires performing a *mapping between Mac file types and filename extensions*, and since the catalog entries for file type and creator codes are supported only by Mac-specific file systems (such as HFS), they must be emulated on foreign file systems (such as FAT).

Mac OS X (and Mac Classic) also allows files to have a **resource fork** (a second stream of information in addition to the main data). In its most extreme form, a file may store all of its information in the resource fork and have zero data bytes (as is the case for certain types of Classic font files). Modern applications tend to rely less on the contents of the resource fork than Classic applications, but in general the resource fork cannot be ignored.

Again resource forks are directly supported only by Mac-specific file systems, and thus must be emulated on foreign file systems.

Emulation with dot-underscore file (AppleDouble)

When a Mac OS X user copies a file from a Mac-specific volume to a foreign volume, the system splits out any information that is not located in the data fork of the file and writes it to a hidden file on the destination volume. The name of this file is the same as the original file except that it has a dot-underscore prefix. For example, if the user copies a file named MyMug.jpg to a foreign volume, there will be a file named ._MyMug.jpg in addition to the MyMug.jpg file in the same location.

When a Mac OS X user copies a file from a foreign volume to a Mac-specific volume, the system looks for a matching "dot-underscore" file. If one exists, the system uses the information in the dot-underscore file to recreate the resource fork and file type attributes. If the hidden file does not exist, these attributes are not recreated.

Emulation using NTFS alternate data streams

Although this feature is not widely known, the NTFS file system (used by most modern Microsoft Windows systems) supports alternate data streams in a file. In a way this feature is a generalization of the Mac resource fork concept. Each individual stream can be opened for input or output, but otherwise the file (with all its associated streams) is managed as a single unit. The Windows user interface provides no interface to alternate data streams, and regular Windows applications never use alternate data streams.

Several AppleTalk file sharing protocol (AFP) implementations for Windows servers, including Microsoft's own implementation, emulate Mac file types and resource forks on the Windows NTFS file system using alternate data streams. Note that these AFP implementations do not support the FAT file system since it doesn't offer alternate data streams.

This mechanism has the benefit of storing the emulated information in one single file with the regular data. However the presence of this extra data is extremely hard to detect for a Windows user (i.e. only through specialized shareware utilities).

Furthermore, while the Windows file system correctly copies any alternate data streams with a file, the extra information is lost when the file is attached to an e-mail message or when it is stored in an archive such as a ZIP.

Automatically adding filename extensions

On Windows a file must have a filename extension to be correctly recognized by the applications operating on it; so there is almost never a reason for not including the extension that is appropriate for the file's type.

Even on Mac OS X, while it is not a requirement, there seem to be several factors in favor of including filename extensions when working with automated processes:

- It makes an implicit attribute explicit for the human operator, avoiding confusion (i.e. the operator and the system might interpret the file type differently if it was not made explicit).
- It allows files to be more easily interchanged with foreign systems (which may happen even if it is not currently planned).

Therefore Switch offers a function to automatically add an appropriate filename extension to arriving files, based on Mac file type information associated with the file. This feature is turned on by default (recommended), and it can be turned off in the Preferences dialog.

Specifically, when Switch detects that a new file has arrived (and the "Add filename extension" feature is enabled), Switch looks for Mac file type information in the following way:

- On Mac OS X, it looks in the file system catalog.
- On Windows, it looks for an appropriate alternate data stream attached to the file, and it looks for a dot-underscore file with the same name as the file (in other words, Switch supports both emulations discussed above).

If Switch finds meaningful Mac file type information, and if it can locate the corresponding filename extension in its built-in table, and if the file doesn't already have the appropriate filename extension, Switch will add the filename extension to the file's name. Otherwise the filename is left unchanged.

Copying files

When Switch copies or moves a file under its own control (for example, between two folders), it ensures that all available Mac file type information and resource fork data is copied along with the file. (On Mac OS X this means using the native file operations; on Windows this involves supporting the emulations discussed above).

This preserves Mac file type information (which may be superfluous if a filename extension is also present), but more importantly it also preserves any resource fork data - which allows, for example, to process Classic Mac fonts through Switch on a Windows system.

Note however that other processes and third-party applications may not carry along Mac file types and resource forks. On Windows this is almost never the case, and even on Mac some modern applications no longer support these Classic features.

Changing the file type

The file type tool allows setting a file's filename extension and/or Mac file and creator types to a specified value. This is handy if you know the correct type of a file (for example, because it was created by an application under your control) but you suspect that it may not have the appropriate filename extension or Mac file type information.

Filtering on file type

Several Switch tools offer the possibility to sort files based on file type; see *Specifying file filters* on page 194.

4.1.7. Switch preferences: Processing

These preferences allow you to configure the way jobs are processed in Switch.

A number of these preferences affect the performance of Switch. For more information, refer to *Switch performance tuning* on page 434.

Property	Description
Server language	Language used by the Switch Server for alert e-mails.You can select one of the following languages: • English • German • French • Portuguese • Spanish • Chinese • Japanese **Note:** • *Restart the Switch Server* to apply your changes. • You can also configure the language of the Switch Designer. For more information, refer to *Switch preferences: User interface* on page 34.
Language environment	Indicates the overall language environment in which Switch is installed: Western or Japanese. This setting affects the text encoding defaults for email and ZIP compression to match the legacy standards used in the selected language environment (that is, for interacting with software that does not use Unicode).
Concurrent network transfer tasks	The number of FTP and e-mail file transfers (counting both send and receive) allowed to occur in parallel.
Concurrent transfers to the same site	The number of file transfers to the same FTP site allowed to occur in parallel (counting both send and receive). If there is no limit other than the overall maximum number of concurrent file transfers (as determined by the previous preference), select **Automatic** ; otherwise select **Inline value** and enter a value between 1 and 100.

Concurrent processing tasks	The number of job processing tasks allowed to run in parallel.
	Note: Recommended value = the number of CPUs of the server + 1.
	"Processing tasks" are tasks performed by the following flow elements:
	• The following elements in the Basics section:
	  • Set hierarchy path
	  • Ungroup job
	  • Split multi-job
	  • Assemble job
	  • Execute command
	• The following elements in the Tools section:

Property	Description
	• Sort by preflight state • Compress • Uncompress • Split PDF • Merge PDF • Hold job • Inject job • Rename job • Sort job • Log job info • Sort files in job • The Script element in the Scripting section: Heavy scripts affect the number of concurrent processing tasks. For more details about light and heavy scripts, see *Execution slots* on page 249. • The following elements in the Communication section: • Pack job • Unpack job • Monitor confirmation • Remote process • The Database connect element in the Database section.
Concurrent PitStop Server tasks	The number of PitStop Server tasks allowed to run in parallel. **Note:** This property is only available, if you have installed PitStop Server. The default is **Automatic**, which is the optimal value based on the hardware configuration of the server. If you want to change it manually, select **Inline value** and enter a value between 1 and 99.
Default number of slots for concurrent elements	The number of slots available for scripts and tools working in concurrent mode: • 0 = Tasks will be executed in concurrent mode and all available slots will be used. • 1 (default) = Tasks will be executed one after the other (serialized execution mode). • 2 or more = Tasks will be performed in concurrent mode. In Switch, the default value set in the Preferences can be overruled for a particular flow. Proceed as follows: **1.** Set the the *flow* property **Show advanced element properties** to **Yes**. **2.** For all flow elements (in that particular flow) that support concurrent processing, change the element property **Number of slots** from Default to any other value.

Property	Description
	Note: Be cautious when tuning performance properties; unwary use may slow down performance!
Scan user-managed folders every (seconds)	The frequency with which the user-managed folders (i.e. the folders with a path defined by the user) and Submit hierarchies (i.e. by default user-managed) are scanned for newly arrived jobs.
Process file only after (seconds)	The time for which newly arrived jobs must be stable before they are processed; to avoid picking up an input job before it has been completely written to disk, Switch ensures that the size of the file (or the total size of a job folder) has not changed for at least this amount of time before processing the job.
Reactivate flows upon startup	When starting up, if this property is set to **Yes**, Switch automatically reactivates flows that were active when Switch was closed; otherwise all flows are inactive after startup.
Stop processing if free disk space is less than (MB)	If the amount of free disk space for application data is lower than the entered amount, processing will stop, avoiding "Disk Full" processing errors.
Release acquired slots after (minutes)	When a flow is stopped, this option will determine when the acquired slots are released. The default value is 20 minutes. **Note:** In Switch 2019 Spring, so before this preference was added, acquired slots were released immediately. If you want this, set this preference to 0. This preference is relevant for flows with *remote processing* (that is, flows that contain the Remote process flow element or scripts that directly acquire and release slots). In the time period between the flow stop and the release of the acquired slots, processing continues, so that jobs that are being processed can be finished. After that time, all jobs that are still in the flow are aborted.

4.1.8. Switch preferences: Error handling

These preferences allow you to configure the way problems are handled in Switch.

Property	Description
Abort file transfers after (minutes)	Time in minutes. If an FTP or e-mail file transfer takes longer than this, it is considered crashed or locked up and it is aborted. If the value is set to 0, the transfer will never be aborted.
Abort FTP scanning after (minutes)	If an FTP directory scanning takes longer than this time, it is considered crashed or locked-up and it is aborted. The default value is 30 minutes.

Property	Description
	If the value is set to 0, the scanning operation will never be aborted.
Abort processes after (minutes)	Time in minutes. If a process other than a file transfer takes longer than this, it is considered crashed or locked-up and it is aborted. If the value is set to 0, the process will never be aborted. Note that, if Generic application's property *Abort application* is enabled, the third-party application will be aborted after the time specified by this user preference. **Note:** This preference is not compatible with debug mode. If *Enable debug mode* is turned on, Switch will ignore the value of this preference. See also *Flow properties* on page 216.
Abort FTP transfers on stopping flow	Determines whether or not ongoing FTP transfers are aborted immediately when a flow is stopped: • **Yes**: The flow is stopped immediately. FTP transfers in progress are aborted. This may result in partially uploaded and corrupt files. • **No** (default setting): The flow is stopped after the FTP transfer has been finished.
Retry mail transfers after (minutes)	Time interval in minutes. If a mail transfer fails, Switch tries again after the specified number of minutes. If the value is set to 0, Switch stops trying. (not recommended)
Retry FTP transfers after (minutes)	Time interval in minutes. If an FTP transfer fails, Switch tries again after the specified number of minutes. If the value is set to 0, Switch stops trying. (not recommended)
Retry unreachable folder after (minutes)	Time interval in minutes. If a folder cannot be reached, Switch tries again after the specified number of minutes. If the value is set to 0, Switch stops trying. (not recommended)
Retry failed external processes after (minutes)	Time interval in minutes. If an external process fails, Switch tries again after the specified number of minutes. If the value is set to 0, Switch stops trying. (in this case: the recommended value!)
Send crash reports	If Switch crashes, a detailed crash report is generated automatically. This information is useful for Enfocus to improve its software. You can choose to: • Not send this information to Enfocus (**Never**). • Automatically send the crash reports to Enfocus (**Always**).

Property	Description
	• Have the user decide whether or not to send a crash report (**Ask user**).

4.1.9. Switch preferences: Problem alerts

These preferences allow you to configure the way system administrators are notified of problems.

Property	Description
Send problem alerts to	Enter the destination e-mail addresses (one per line) and the body text for your alert message; information about the error will be appended to the body text. If at least one email address is entered, two extra properties appear: • *Retry count:* If sending an alert fails, this property determines how many times Switch will retry sending it. • *Retry delay (in minutes)*: If sending an alert fails, this property determines after how much time Switch will try again.
Problem job arrives	If set to **Yes**, an alert is sent whenever Switch moves a job to the Problem jobs folder.
Processing takes more than (minutes)	Send an alert if a process, other than the file transfer process, takes longer than the time set (in minutes) here. If set to 0, no alert will be sent.
Mail server is down for more than (minutes)	Send an alert when an email server cannot be accessed for the time (in minutes) indicated here. If set to 0, no alert will be sent.
FTP site is down for more than (minutes)	Send an alert when an FTP site cannot be accessed for the time (in minutes) indicated here. If set to 0, no alert will be sent.
Folder is unreachable for more than (minutes)	Send an alert when a backing folder is unreachable for more than x minutes.
External process fails	If set to **Yes**, an alert is sent when a process other than folder, fails (that is, its process is put in the "problem process" state).
Switch Server quit unexpectedly	If set to **Yes** an alert is sent when upon startup, Switch detects that the Switch Server quit unexpectedly (due to a hardware or software failure).
Alert if free disk space for application data is less than, MB	Send an alert when the amount of free disk space for application data is less than the defined amount.

Property	Description
When flow is automatically stopped	Send an alert when flows are automatically stopped by Switch, for example in case of a licensing issue.

4.1.10. Switch preferences: Application data

These preferences configure the cleanup mechanism for *Switch's application data*, which is stored in a nested folder hierarchy under a single root folder, which is called the **Application data root**.

Some temporary application data cannot be removed automatically. To ensure that the amount of data does not grow indefinitely, Switch performs a cleanup process at regular intervals.

Property	Description
Application data root	The location of the application data, i.e. the root folder for the hierarchy in which the Switch application data is stored. Default location: • Windows: C:\Users\<user>\AppData\Roaming\Enfocus\Switch Server • Mac OS: /Users/<user>/Library/Application Support/Enfocus/Switch Server/ **Note:** For testing purposes, you can change the location of the application data root tool using the *Application Data Root Tool*. Note that changing data in the application data folder is NOT allowed, unless explicitly requested by the Enfocus Support team!
Keep internal job tickets for (hours)	The time period (in hours) after which internal job tickets may be deleted for jobs that left the flow; Switch will not delete internal job tickets for jobs that are still active. **Note:** A job is considered inactive, if it is located in a flow output folder (i.e. a folder without outgoing connections) disregarding if the job's unique prefix has been stripped or not. This means its job ticket will be cleaned up after some time. If your workflow configuration assumes handing over jobs between flows (like described in the section on *unique name prefixes*), please, make sure the time difference between the moment a job reaches the end of the previous flow and the moment the job is picked up by the next flow is less than the value of this preference.
Keep log messages for (hours)	The time period (in hours) after which log messages will be deleted.
Run cleanup starting at (hh:mm)	The time offset from midnight at which to run the cleanup process for application data.

Property	Description
Run cleanup every (hours)	The period or frequency with which to run the cleanup process for application data.

Cleanup process: how it works

To determine the exact time of the cleanup, three elements play a role:

- **Time of the last cleanup** since Switch startup, for example: 12:00. If there hasn't been a cleanup yet, this is the Switch startup time.
- The **Run cleanup every (hours)** preference, for example: every 5 hours, *starting from the time of the last cleanup*. In this example, the first cleanup will be at 17:00 (12:00 + 5 hours). This resets the time of the last cleanup (which becomes 17:00), so the next cleanup will be at 22:00 (17:00 + 5 hours), and so on.
- The **Run cleanup starting at (time)** preference, for example: 02:00, forces Switch to perform a daily cleanup at a particular time. This preference takes priority over *Run cleanup every (hours)*. When the set time is reached (02:00), the cleanup is performed. The time of this cleanup (02:00) again determines the next cleanup (02:00 + 5 hours).

Schedule in this example:

- 12:00
- 17:00
- 22:00
- 02:00 (instead of 03:00, because 'Run cleanup starting at' has priority)
- 07:00
- 12:00

Note: Starting the cleanup from Designer (**File** > **Cleanup application data**) also resets the 'time of the last cleanup' and affects the schedule. Suppose you start the cleanup at 08:00, the next runs will be at 13:00 (08:00 + 5 hours), at 18:00 (13:00 + 5 hours), at 23:00 (18:00 + 5 hours), at 2:00 (because of *Run cleanup starting at*), ...

4.1.11. Switch preferences: Logging

These preferences allow you to configure the way (log) messages are handled in Switch.

For more information about the log messages, refer to *The Messages overview* on page 234.

Property	Description
Log to CSV file	If set to **Yes**, all execution log messages are written to a CSV file in addition to the regular log database. A new log file is created when the size of the log file has reached 2.5 MB. The name of the log file includes the date and the time (YYYYMM-DDHHmmss). **Note:** Enable this option only on request of the Enfocus technical support team or if you're debugging a script that issues debug messages.

Property	Description
	*The following options are only available if **Log to CSV file** is set to **Yes**.*
	CSV file delimiter The delimiter separating the records in the generated CSV log file, for example a comma or a semicolon.
	Log files folder Folder where the CSV log files will be stored. If set to **Default**, the log files are stored in the "Logs" folder of the Application data root (see *Switch preferences: Application data* on page 47).
Log debug messages	If set to **Yes**, assert and debug messages are logged. They are shown in the Messages overview and written to a CSV file. If set to **No**, the assert and debug messages are discarded. **Note:** • Enable this option only on request of the Enfocus technical support team or if you're debugging a script that issues debug messages. • Changes require a Switch restart. Refer to *The Messages overview* on page 234. **Remark about debug messages for Node.js scripts and apps** If you only want to log debug messages for a particular script or app written in Node.js, you can do so without enabling this preference (hence without having to restart Switch). To do so: **1.** In the properties of the flow, enable **Show advanced element properties**. See *Flow properties*. **2.** In the properties of the Node.js script or app, enable **Log debug messages**. See also *Script element*.
Log FTP interaction	If set to **Yes**, problems with **failed** FTP transfers are logged and saved in: • FtpSendTrace.log for FTP send • FtpWatchFolderTrace.log and FtpReceiveTrace.log for FTP receive These files can be found in the logs folder of the Switch Application Data Root (as set in the *Application data preferences*). *The following option is only available if **Log FTP interaction** is set to **Yes**.*
	Clean the log when flow is activated

Property	Description
	If set to **Yes**, the FTP interaction logs will be deleted when the flow is activated. **Note:** When logs are stored for a long time, Switch may become slow and sometimes non-responsive. Therefore, we recommend clearing logs regularly.

4.1.12. Switch preferences: Flows backup

When upgrading to a new version of Switch, the existing flows are updated automatically to that version. That's also the case, when you're installing a new version of an app: in that case, the flows in which the updated app is used, are updated as well.

The preferences in this category allow you to make an automatic safety backup (at a location of your choice) before updating the flows.

Property	Description
Flows backup folder	By default, this is a subfolder ('Backup ') of the application data root, but you can choose a different location as required. The flows are placed in a subfolder that refers to the date and time of the export.
Backup flows before updating	When set to **Yes**, a backup is made whenever an upgrade takes place. **Note:** Group information is not preserved. The flows are saved as separate flow files (*.sflow).

4.1.13. Switch preferences: Internal communication

These preferences configure advanced settings related to the communication between Switch application components. Do not change these settings unless you understand why you need to change them.

Note: The ports in the range 0 to 1023 are often managed by the IANA and should only be used by privileged users.

Property	Description
Switch Server name	The name of the instance of the Switch Server as it is displayed to users of the client application. **Note:** Changing the server name requires a restart of Switch.

Property	Description
Port for Switch Designer	The port used for communication between Switch Server and Switch Designer, in the range of 1 to 65535. **Note:** • If you intend to use Remote Designer, try to make the port accessible for trusted networks and/or addresses only. • If you don't intend to use Remote Designer, inbound connections on this TCP port should be blocked by your firewall for security reasons.
Port for Watchdog - Switch Server	The port used for communication between Switch Server and Switch Watchdog, in the range of 1 to 65535. **Note:** This port is used for local communications only, so no firewall tweaks are required.
Port for Watchdog	The port used for communication between Switch Designer and Switch Watchdog, in the range of 1 to 65535. **Note:** This port is used for local communications only, so no firewall tweaks are required.

Note: To allow outbound traffic for Switch (like HTTP, email, FTP, etc.), firewall exceptions should be set for all executables located in the Switch installation folder. This is in case you want to block outbound traffic by default on the system.

4.1.14. Switch preferences: ODBC data sources

This section of the Preferences dialog is only relevant if you have an active license for the *Databases module*.

It allows you to configure the ODBC database connection you want to use with Switch.

Property	Description
ODBC data source information	Click ... to set up the database connections. See *Setting up an ODBC database connection* on page 53.

4.1.14.1. About ODBC data sources in Switch

Guidelines

Please take into account the following guidelines when accessing ODBC data sources in Switch:

Before you set up the connection to the data source, you should have defined your database (i.e. the Database Source Name (DSN)) in the **DSN settings of your operating system**. Read the documentation of your database to learn how to set up the DSN.

Windows users can find more information on the Microsoft website: *http://msdn.microsoft.com/en-us/library/ms710252%28v=VS.85%29.aspx*

Mac users should install an ODBC Administrator, for example *http://www.odbcmanager.net/*, to be able to set up ODBC connections on Mac.

Note: Switch allows you to use both User and System DSN on Windows and Mac platforms.

Make sure to install a 64-bit ODBC driver.

- **Example Windows OS:** In case of MySQL database, the ODBC driver installer mysql-connector-odbc-5.1.8-winx64.msi is used. When you launch this installer and choose the **Custom** installation, you will see that two drivers are available: 32-bit and 64-bit. Install the 64-bit driver and preferably disable the 32-bit driver, to avoid mix-up of driver versions in the future. This will guarantee that Switch uses the correct driver.

For more information on ODBC drivers and data sources, refer to *http://msdn.microsoft.com/en-us/library/ms710285%28v=VS.85%29.aspx* .

- **Example Mac OS X:** In the MySQL database, two versions of Mac OS X ODBC drivers are available: 32-bit and 64-bit. You must use the 64-bit version (mysql-connector-odbc-5.2.7-osx10.7-x86-64bit.dmg).

Make sure to use the 64-bit version of the ODBC Administrator tool to configure your data sources (DSNs).

On 64-bit Windows computers, two ODBC Administrator tools are available:

- 32-bit version: ..\windows\sysWOW64\odbcad32.exe
- 64-bit version: ..\windows\system32\odbcad32.exe

Use the 64-bit version from \windows\system32\odbcad32.exe to configure your DSNs for Switch.

- If you install only the 64-bit ODBC driver and then launch the 32-bit version of the tool, you will not be able to configure any DSNs, because the 32-bit version of the tool does not show the 64-bit ODBC drivers.
- If you have installed the 32-bit ODBC drivers, then in the 32-bit version of the tool you will see the 32-bit driver and you will be able to configure DSNs for that driver. However, Switch will not work with these DSNs and you will get the error message The specified DSN contains an architecture mismatch between the Driver and Application".

For more information on managing data sources, refer to *http://msdn.microsoft.com/en-us/library/ms712362%28v=VS.85%29.aspx* .

Using the INGRES database in combination with Switch?

You should set the following flag (in the INGRES database):

```
return NULL for SCHEMA columns in ODBC catalog function result sets
```

Otherwise, you will get an error ("invalid table") when setting up SQL statements.

4.1.14.2. Setting up an ODBC database connection

If you want to use Switch with an ODBC data source (and you have licensed the Database module), you must set up a connection to the preferred database.

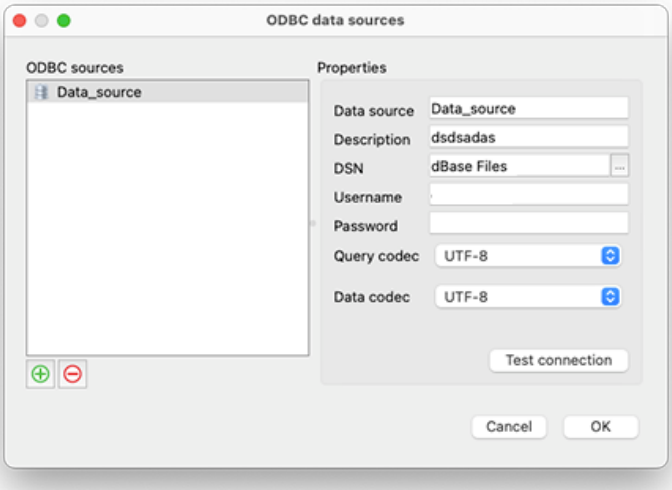
Note:

- If you have more than one database, you can configure different database connections as required.
- The database engine can run on a different computer than Switch.

To configure an ODBC database connection

1. In Switch, navigate to **Edit** > **User Preferences** > **ODBC data sources**.
2. Do one of the following:
   - Select the **ODBC data source information** field and click ...
   - Double-click the **ODBC data source information** field.

   The ODBC data sources dialog appears.
3. To add and configure an ODBC data source, click .
   The ODBC sources field now contains one data source, temporarily called *Data Source*. You can rename it in the next step of this procedure.



4. In the **Properties** pane, in the **Data Source** text field, provide a name for the data source.
5. In the **Description** text field, provide a small definition for the data source.

6. To select the DSN (Database Source Name) from the library, click ...

   The DSN must be defined in the DSN settings of your operating system. For more information, refer to *About ODBC data sources in Switch* on page 51.

7. Provide a **Username** and **Password**.

   These two fields can also be left blank if username and password are not required, or if they have already been defined for the DSN.

8. From the drop-down menus, select the appropriate **Query codec** and **Data codec**, if required.

9. To test the database connection, click **Check connection**.
   If the connection succeeded, a message box appears displaying the message Connection successful.

   Note: In case of problems, you will see an error message generated by the ODBC tool of your operating system.

10. To close the message, click **OK**.

    If you have more than one database, repeat step 3 to 10 and add as many data sources as you have databases.

11. To close the **ODBC data sources** dialog, click **OK** once more.

4.1.15. Switch preferences: Remount volumes

Note: Remount volumes is available only when Switch Server is running on Mac OS X.

The backing folders used by flow elements may be located on mounted volumes. On Mac OSX, if the network connection is interrupted, Switch automatically remounts the volumes that are used by the elements in active flows. By default, when remounting, Switch uses the volume information from the backing folder path. However it is also possible to define the additional remount information in the Switch preferences.

Property	Description
Volume remount information	List of volume paths with corresponding user name and password. The specified user name and password is used to mount these volumes. To edit the volume remount information, double-click the property. See *Setting up remount volume information* on page 55.

Property editor

This preference uses a new property editor which offers the following three columns:

Column header	Description
Volume path	The complete network path identifying a volume that may have to be remounted by Switch.
User name	The user name to be used for remounting the volume (required field).
Password	The password to be used for remounting the volume.

Leaving the user name empty is equivalent to not listing the volume at all. When user closes the property editor all items with empty user names are automatically removed. This is relevant to the suggestion feature described in the next section.

Show volume paths used by active flows

When editing the Volume list, the **Show volume paths used by active flows** can be used to list all volume paths currently in use by active flows at the end of the list. By default this checkbox is turned on. Its state is remembered between uses of the property editor and across Switch sessions. If the volume path contains a user name, this will be entered in the User name field. The password is NOT added automatically.

When turning the option off, all volume paths with an empty user name will be removed from the list.

4.1.15.1. Setting up remount volume information

If your Switch is running on Mac OS X, you can make sure that volumes will be remounted if the network connection is interrupted.

To configure remount volume information

1. In Switch, navigate to **Edit** > **User Preferences** > **Remount volumes**.
2. Do one of the following:
   - Select the **Volume remount information** field and click ...
   - Double-click the **Volume remount information** field.

   The property editor appears.
3. Enter the following details:
   - **Volume path**: The complete network path identifying a volume that may have to be remounted by Switch.
   - **User name**: The user name to be used for remounting the volume (required field).

     Note: Do not leave the user name empty! When closing the dialog, volumes without a user name are automatically removed if **Show volume paths used by active flows** is disabled (see step 4 of this procedure).
   - **Password**: The password to be used for remounting the volume.

4. Select or clear the **Show volume paths used by active flows** checkbox as required:
   - If selected (default value), all volume paths currently in used by active flows will be added to the list of volumes to be remounted. If the volume path contains a user name, it is added automatically as well, but this is NOT the case for the password. You must add the password manually.
   - If cleared, all volume paths with an empty user name will be removed from the list.

     Note that the state of this checkbox (enabled/disabled) is remembered between uses of the property editor and across Switch sessions.
5. Click **OK**.

4.1.16. Switch preferences: Active Directory settings

Active Directory Settings are only relevant if you want to use your existing Active Directory user accounts to define access rights for the Switch Web Portal and/or Remote Designer. For more information, refer to *Setting up Switch users* on page 62.

Double-clicking **Active Directory information**, displays a dialog with the following fields:

Property	Description
Server address	Address of the Active Directory server. Example: SERVER001.enfocus.com
Server port	Port number of the Active Directory server. Example: 389 Remark: The default port for an LDAP connection is 389, and for LDAPS it is 636. When you configure an LDAP connection to use port 389/636, you search for objects from the local domain controller only (replicated between domain controllers in the same domain). Alternatively, when you use the environment with multiple domains in the forest, it is often required to use the Global Catalog in order to return objects from all domains in the forest. The default port for this is 3268 for LDAP and 3269 for LDAPS.
Secure connection	If selected, Switch will set up a secure TLS/SSL connection to the Active Directory server. Remark: • If server port 636 is used, the SSL negotiation will start immediately after the connection has been established. • If a different port is used, Switch connects in plain text to the AD server, then explicitly starts the SSL negotiation through the StartLS command.
LDAP version	The version of the LDAP protocol used on your Active Directory server. Example: 2 or 3 (default)
Base DN	Distinguished name to be used as the search base.

Property	Description
	Example: Usually, users and user groups are located under the domain name. If users are stored in the folder enfocus.com, the base DN is: `DC=enfocus;DC=com`. **Note:** If you don't know the base DN, you can leave it empty. Once you have executed an AD directory query, it will be filled in automatically.
Use pre-Windows 2000 logins	This option defines how user names are generated when Active Directory users are added in the Users pane: • When selected, the name of an Active Directory user added in the Users pane will have the format "domain\user" (also known as pre-Windows 2000 domain name), e.g. Netbios\sAMAccountName. Make sure to also use this format for the user to be used to log on to the Active Directory server (next field). • When cleared, the name of an Active Directory user added in the Users pane will have the format "user@domain" (also known as the User Principal Name), e.g. user@example.com. Make sure to also use this format for the user to be used to log on to the Active Directory server (next field). **Note:** Changing this option has no impact on the users already present in the Users pane. However, if needed, you can manually adjust the User names in the Users pane.
User	User name to log on to the Active Directory server. If **Use pre-Windows 2000 logins** is selected, the required format is "domain \user", for example: enfocus\user1 If **Use pre-Windows 2000 logins** is cleared, the required format is "user@domain", for example: user1@enfocus.com
Password	Password to log on to the Active Directory server.

Note: To verify the connection to the Active Directory server, click the **Test connection** button.

4.1.17. Switch preferences: Web services

These preferences configure the settings related to the communication between Switch and its client applications.

Property	Description
Port for the Switch Web Service	The port in the range of 1 to 65535 used for: • Communication between the Switch Web Service and a client application • Receiving webhooks on the URL <http or https>://<Switch host name or IP address>:< Port for the Switch WebService >/scripting/<custom path>. Default value: 51088

Property	Description
	Important: • If you intend to use Designer or Switch Web Portal remotely, try to make the port accessible only for trusted networks and/or addresses. • If you don't intend to use Remote Designer or Switch Web Portal remotely, inbound connections on this TCP port should be blocked by your firewall for security reasons. **Note:** • The port for the Switch Web Service is only used for elements and scripts based on Node.js. For the Webhooks flow element (up to version 6) and other legacy scripts, see the *Webhooks (legacy) preferences*. • The size of the incoming webhook request is limited to 1MB. HTTP error 413 will be returned to the webhook caller in case of bigger incoming requests.
Port for the Switch Web Portal	The port used for communication between the SwitchClient WebServer and a client application, in the range of 1 to 65535. Default value: 51089 **Important:** • If you intend to use Switch Web Portal remotely, try to make the port accessible only for trusted networks and/or addresses. • If you don't intend to use Switch Web Portal remotely, inbound connections on this TCP port should be blocked by your firewall for security reasons.
Protocol	The protocol used for the communication between the Switch WebServer and the browser. Choices: • HTTP (default value) • HTTPS (secured, encrypted communication for which you need a certificate) You must set the HTTPS settings in the corresponding Switch preferences category: *Switch preferences: HTTPS services settings* on page 61. **Note:** If your browser does not recognize the used certificate, it may block the Log messages overview. In that case, you must add it as an exception in your browser settings.
Privacy policy page	URL (starting with "http" or "https") of the privacy policy of your company. This URL is used to make the privacy policy of your company available to users of the Switch Web Portal. *Example URL*: http://www.enfocus.com/en/privacy-policy/ If this property is empty, no privacy policy is displayed.

Property	Description
	Note: Changing this property requires a restart of Switch. A privacy policy contains the guidelines a company uses to protect the information provided by its customers. It's a legal requirement to have such a privacy policy if you're collecting data from your customers. As in Switch the language preference of the users is stored (using cookies) when they launch messages in a web browser, we recommend entering the link to your privacy policy. The privacy policy is made available as follows: • On the login page of the Switch Web Portal, there's a 'Privacy policy' button; when a user clicks this button, the web page concerned is displayed. • Once signed in to the Switch Web Portal, the Info menu in the bottom left corner gives access to the Privacy policy.

4.1.18. Switch preferences: Reporting

These preferences relate to the Dashboard Service that enables the creation of dashboards and job boards on the Switch Web Portal.

Property	Description

Dashboard Service location	Indicates where the Dashboard Service was installed.
	• **Local** (default): The Dashboard Service was installed on the same system as the Switch Server.
	Note: For security reasons, make sure that the 55091 TCP (MongoDB) and 55092 TCP ports are not available for inbound connections from network in your firewall settings.
	• **Remote**: The Dashboard Service was installed on a different system (for example to avoid overload of the server), so the connection between Switch and the Dashboard Service is remote. If this option is chosen, the following additional properties appear:
	  • **Address**: IP address of the system on which the Dashboard Service was installed.
	  • **Port**: Port used for the communication between the Switch Server and the Dashboard Service.
	  Default value: 55092
	  Important: For security reasons, make sure that the remote server that is running the Dashboard Service, only accepts inbound connections on the 55091 TCP port (MongoDB) and the TCP port (specified in the settings) from the system that is running Switch Server.

Property	Description
Keep historical data for (days)	Indicates how long historical data (= data about jobs that left a flow) should be kept. During this period of time, the historical data can be used in history graphs in dashboards on the Switch Web Portal. The default value is 120 days. This preference is only available if the Reporting Module is licensed.

Note: To verify the connection to the Dashboard Service, click the **Test connection** button.

4.1.19. Switch preferences: Webhooks (legacy)

These preferences relate to the webhooks, a mechanism that allows external applications to request information from Switch.

Note: The preferences in this category apply to the **Webhooks flow element** in Switch Designer (up to version 6) and to **legacy scripts** that use webhooks. For use in Node.js scripting, refer to the *Web Services* category.

Property	Description
Enable HTTP listener	If set to **Yes**, Switch accepts requests from external applications/third-party services via HTTP. This triggers a new property: • **Port for HTTP listener**: Port used for the communication between the Switch HTTP listener and the third-party service. The default value is *51080*. **Important:** If you know the IP addresses, from which webhooks will be sent, in advance, try to limit access to this TCP port by only allowing inbound connections from those specific addresses for additional security.
Enable HTTPS listener	If set to **Yes**, Switch accepts requests from external applications/third-party services via HTTPS (secured, encrypted communication for which you need a certificate). You must set the HTTPS settings in the corresponding Switch preferences category: *Switch preferences: HTTPS services settings* on page 61. **Important:** If you know the IP addresses, from which webhooks will be sent, in advance, try to limit access to this TCP port by only allowing inbound connections from those specific addresses for additional security.
Requests delivery timeout (in minutes)	Indicates how long (in minutes) a request that is not received remains valid. After this period of time, the request is removed.

4.1.20. Switch preferences: Remote processing

These preferences relate to the tools for remote processing.

Property	Description
HTTP port	Port used for communication with external applications/third-party services via HTTP. The default value is *51120*. **Important:** If you know your remote processor IP addresses in advance, for additional security, try to limit access to this TCP port by only allowing inbound connections from those specific addresses.
Enable HTTPS	If set to **Yes**, Switch accepts requests from external applications/third-party services via HTTPS (secured, encrypted communication for which you need a certificate). You must set the HTTPS settings in the corresponding Switch preferences category: *Switch preferences: HTTPS services settings* on page 61. **Important:** If you know your remote processor IP addresses in advance, for additional security, try to limit access to this TCP port by only allowing inbound connections from those specific addresses.

4.1.21. Switch preferences: HTTPS services settings

These preferences hold the settings for external communication via HTTPS (secured, encrypted communication). These settings are used whenever HTTPS is enabled, for example for remote processing (see *Switch preferences: Remote processing* on page 61) or for webhooks *Switch preferences: Webhooks (legacy)* on page 60.

Property	Description
Certificate	Path to the certificate file.
Private key	Path to the private key file.
Password for private key	Corresponding password.

Note: If you intend to use self-signed certificates for HTTPS, see *HTTPS with self-signed certificates* on page 436 for more info on the client setup.

4.2. Configuring Switch users

When do you need to set up users?

Switch user configuration is only relevant if you want to allow users to:

- Submit or check jobs using **Submit points and Checkpoints** (which requires a SwitchClient license).
- View log messages through the **Switch Web Portal**.
- Rush jobs through the **Switch Web Portal**.
- View and/or create job boards and dashboards on the **Switch Web Portal**.
- Launch Switch Server using **Remote Designer**.

Procedure

1. *Set up the users and/or groups* that should get access.
2. *Assign access to particular Submit and Checkpoints* (as required).

4.2.1. Setting up Switch users

How does it work?

If a user connects to the Switch Server through the Switch Web Portal or through Remote Designer, he must enter a user name and a password. The user name identifies the user to the server and grants him access based on his permissions. For example, if a Remote Designer user has read-only access, he will be able to view all flows and settings, but he will not be able to change anything.

Users or groups?

If several users should have the same permissions (for example because they have the same role), you may consider to group them and define their (access) rights at group (or "role") level. This will save you time if something changes. For example, if a new employee with a particular role enters the company, you can simply add the new user to the appropriate group.

Example:

- Group 1: Administrators having access to all Submit points and Checkpoints. Only this group has full access to Remote Designer.
- Group 2: Operators having access to all Submit points and Checkpoints, but with limited access to Remote Designer.
- Group 3: Customers having access to particular Submit points and Checkpoints (so they can only see their own jobs), but with no access to Remote Designer.

With this setup, you have to configure the permissions and access rights only three times, instead of e.g. x times (with x being the number of users).

Groups are also required if you want to allow users to share their job boards and dashboards on the Switch Web Portal. Sharing of boards is only possible among group members.

Note: In case of conflicting permissions, the highest permission level is taken into account. For example, if a user has no access to Remote Designer, but the group(s) he belongs to does have access, he will have access as well.

If you have configured a group, you can define a **group manager** for that group. Group managers can view jobs of their group members, whereas regular group members can only see their own jobs (unless otherwise configured).

How to configure users?

There are different ways to set up users:

- You can create *new users* and *groups* in Switch.
- You can *import users and groups* that you exported from a previous Switch version or from a Switch copy installed on another computer.
- You can *import existing Active Directory users and user groups from your Active Directory domain*.

4.2.1.1. Configuring a user

Note: You can set up new users and groups for use in Switch only, or you can re-use your Active Directory users and user groups. This topic explains how to set up users for use in Switch only.

To configure a user

1. In the toolbar at the top of the application, click the **Users** button .
2. Under **Users & Groups**, select the **Users** category Users.
3. Click the **Add user** button at the bottom of the pane.
   A new user (**New User <number>**) is added to the Users category.
4. Enter the required details:
   - User name
   - Full name
   - Password
   - Email address. The email address is used to send messages to users (if configured as such in a flow).
5. If the user belongs to a group, proceed as follows:
   a. Click the plus icon ⊕ at the bottom of the **Member of** field.
   b. Select the group(s) the user belongs to.
      To select several user groups in one go, hold down the **Ctrl** key while selecting them.
   c. Click **OK**.

   To remove groups from the list as required (for example if you made a mistake, or if the user does no longer belong to the group), select the group(s) concerned and click the minus icon ⊖.

6. Assign the appropriate permissions for the **Switch Web Portal**:
   - *In case of an active SwitchClient license*, to allow the user to submit and check jobs through the Switch Web Portal, select the **Submit and check jobs** checkbox and determine which jobs the user is allowed to handle:
     - **All jobs** (also the ones submitted by other users)
     - **Own jobs** (only the ones submitted by the user) or **Own jobs and group members' jobs** (this option is only available for group managers)

     Note that this only applies to jobs in Checkpoints the user has access to.
   - To allow the user to view error messages through the Web Portal, select the **View messages** checkbox.
   - To allow the user to process certain jobs before other jobs in the queue, select the **Rush jobs** checkbox. This can be useful for urgent jobs. For more information, refer to *Rushing jobs* on page 281.
   - To configure the permissions for **boards** on the Web Portal, select the appropriate option:
     - To allow the user to view and create dashboards, select **Full access**.
     - To allow the user to only view shared boards, but not create them themselves, select **Read-only**.
     - To hide all boards from the user, select **No access**.
7. Configure the appropriate permissions for **Remote Designer** (as required):
   - To grant the user the same permissions as if he were working locally, select **Full access**.
   - To allow the user to only view data, but not change them, select **Read-only**.
   - To not allow the user to launch Switch using Remote Designer, select **No access**.

If the user has the right to submit and check jobs (step 6), next thing to do is: assign access to particular Submit and Checkpoints.

4.2.1.2. Configuring a user group

Note:

- You can set up new users and groups for use in Switch only, or you can re-use your Active Directory users and user groups. This topic explains how to set up groups for use in Switch only.
- The Administrators group is available by default and cannot be removed. Members of this group have full access to the Switch Web Portal (including the Admin view) and to Remote Designer. Do not forget to add users to this group (see step 6 of this procedure). Note that administrators can unlock jobs of all users on the Switch Server.

To configure Switch user groups

1. In the toolbar at the top of the application, click the **Users** button.
2. Under **Users & Groups**, select the Groups category.

3. Click the **Add user group** button at the bottom of the pane.
   A new user group (**New Group <number>)** is added to the Groups category.

4. Enter the group name.

5. Select the group manager(s) (as required):
   a. Click at the bottom of the Group manager field.
   b. Select the user(s) that need(s) group manager rights.
      To select several user groups in one go, hold down the **Ctrl** key while selecting them.
   c. Click **OK**.

   Tip: Alternatively, you can select a member in the Group members field and drag it to the Group manager field.

   - Group managers have more rights than the other group members. They can for example unlock the jobs of their group members (in addition to their own jobs) on the Web Portal.
   - To remove users from the Group manager list as required, select the user(s) concerned and click .

6. To select the group members that belong to the group
   a. Click at the bottom of the Group members field.
   b. Select the user(s) belonging to the group.
      To select several users in one go, hold down the **Ctrl** key while selecting them.
   c. Click **OK**.

   To remove users from the list (for example, if you made a mistake), select the user(s) concerned and click .

7. Assign the appropriate permissions for the **Switch Web Portal**:
   - *In case of an active SwitchClient license*, to allow the users of the group to submit and check jobs through the Switch Web Portal, select the **Submit and check jobs** checkbox and determine which jobs the group members are allowed to handle:
     - **All jobs** (the user's jobs and the jobs of other users, not limited to the other group members' jobs)
     - **Own jobs** (the users of this group can only see their own jobs, the group manager can see all the jobs of the group he belongs to)

     Note that this only applies to jobs in Checkpoints the user has access to.
   - To allow the members of this group to view error messages through the Web Portal, select the **View messages** checkbox.
   - To allow the members of this group to process certain jobs before other jobs in the queue, select the **Rush jobs** checkbox. This can be useful for urgent jobs. For more information, refer to *Rushing jobs* on page 281.
   - To configure the group permissions with regard to **boards** on the Web Portal, select the appropriate option:
     - To allow the users of the group to view and create dashboards, select **Full access**.

- To allow the users of the group to only view shared boards, but not create them themselves, select **Read-only**.
- To hide all boards from the user of the group, select **No access**.

8. Determine whether or not the members of this user group are allowed to launch Switch using Remote Designer:
   - To grant the users the same permissions as if they were working locally, select **Full access**.
   - To allow the users to only view data, but not to change them, select **Read only**.
   - To not allow the user to launch Switch remotely, select **No access**.

If the group members have the right to submit and check jobs (step 7), next thing to do is: assign access to particular Submit and Checkpoints.

4.2.1.3. Importing users and user groups from Active Directory

An Active Directory domain controller manages and authenticates all users in a company network. If you import Active Directory users and user groups in Switch, the user names and passwords used in Switch will be checked against your Active Directory server and not against the local Switch user database. As a consequence, users can use the name and password they use to log in on their work computers.

Note: You must have configured your Active Directory settings (such as server address, user name and password) in the User Preferences pane. For more information, refer to *Switch preferences: Active Directory settings* on page 56.

To import users and user groups from LDAP directory

1. In the toolbar at the top of the application, click the **Users** button. .
2. In the Users pane, click the **Select AD user or group** button at the bottom of the pane.
3. In the dialog that pops up, enter (part of) the AD (user) name or email address.

   Note: The search function is case-insensitive.

4. Click **Search**.
5. Select the user or user group you want to use in Switch.

   Tip: You can sort the search results alphabetically, by clicking the column headers.

6. Click **OK**.
   - If you selected an Active Directory group, the group name and the group members are displayed in the Groups category in the Switch Users pane. Subgroups (if any) are not preserved; all users are presented in one flat list.

- If you selected an Active Directory user, the user name, full name and email address are displayed in the Users category in the Switch Users pane. Note that these details are read-only.

7. If you selected an Active Directory user, you can optionally add the user to an existing group:
   a. Click ⊕ at the bottom of the Member of field.
   b. Select the group(s) the user belongs to.
      To select several user groups in one go, hold down the **Ctrl** key while selecting them.
   c. Click **OK**.

   To remove user groups from the list as required, select the group(s) concerned and click ⊖.

8. If you selected an Active Directory user group, you can select a group manager (as required):
   a. Click ⊕ at the bottom of the Group manager field.
   b. Select the user(s) that need(s) group manager rights.
      To select several user groups in one go, hold down the **Ctrl** key while selecting them.
   c. Click **OK**.

   Tip: Alternatively, you can select a member in the Group members field and drag it to the Group manager field.

   - Group managers have more permissions than the regular group members. Refer to step 9 of this procedure.
   - To remove users from the Group manager list as required, select the user(s) concerned and click ⊖.

9. Assign the appropriate permissions for the **Switch Web Portal**:
   - *In case of an active SwitchClient license*, to allow the users (or the members of the user group) to submit and check jobs through the Switch Web Portal, select the **Submit and check jobs** checkbox and determine which jobs the users are allowed to handle:
     - **All jobs**
     - **Own jobs** (users can see their own jobs; if they are a group manager, they can also see the jobs of the other group members)

     Note that this only applies to jobs in Checkpoints the group or the user has access to.
   - To allow the users (or members of this user group) to view error messages through the Web Portal, select the **View messages** checkbox.
   - To allow the users (or members of this user group) to process certain jobs before other jobs in the queue, select the **Rush jobs** checkbox. This can be useful for urgent jobs.
   - To configure the permissions for **boards** on the Web Portal, select the appropriate option:
     - To allow the users (or members of this group) to view and create dashboards, select **Full access**.
     - To allow the user (or members of this group) to only view shared boards, but not create them themselves, select **Read-only**.
     - To hide all boards from the users (or members of this group), select **No access**.

10. Determine whether or not the users (or members of a user group) are allowed to launch Switch using Remote Designer:
    - To grant the user the same permissions as if he were working locally, select **Full access**.
    - To allow the user to only view data, but not to change them, select **Read only**.
    - To not allow the user to launch Switch using Remote Designer, select **No access**.

4.2.1.4. Importing users and user groups

If you have installed different copies of Switch, it can be useful to export the user information from one copy and import it into the other. This topic describes how to import user information.

To import users and user groups

1. In the toolbar at the top of the application, click the **Import** button.

2. In the **Import users and groups** dialog, select the user information file exported from Switch.

   This can be a text file or an XML file.
3. Click **Open**.

   In case of conflicts (for example if a user already exists in Switch), a warning is displayed. You are asked which user (or user group) you want to keep (i.e. the imported user or the one that already exists in Switch).

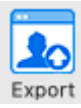
   The imported users and user groups are displayed in the **Users and Groups** panel in Switch.

> **Note:** When you're importing Switch 18 /18 update 1 users or user groups, all users that had the right to create boards will have full access to boards in later Switch versions. Users that did not have the right to create boards, will have no access. You can change this setting manually if required.

4.2.1.5. Exporting users and user groups

If you have installed different copies of Switch, it can be useful to export the user information from one copy and import it into the other. This topic describes how to export user information.

To export users and user groups

1. In the toolbar at the top of the application, click the **Export** button. 

2. In the **Export users and groups** dialog, type a name for the exported file.
3. Select the preferred file type:
    - To save the exported file as an XML file, select: **Switch users and groups (*.xml)**.
    - To save the exported file as a text file, select **Switch users and groups (*.txt)**.

4. Click **Save**.

4.2.2. Assigning access rights

If you have designed flows with Submit points and Checkpoints, you can indicate who has the right to use them. This is done in the right part of the Users pane.

What users can do in Submit and Checkpoints depends on:

- The permissions assigned to the group they belong to (if applicable)
- Their permissions on user level (View messages/Submit and check jobs).
- Their role in the group (group manager or regular group member). For example, group members can see, edit, route and unlock other group members' jobs, whereas regular group members can only do this for their own jobs (unless otherwise configured).

4.2.2.1. Assigning access to Submit points and Checkpoints

For each Submit point and Checkpoint used in your Switch flows, you can define which users or user groups have the right to access it.

To assign access to Submit points and Checkpoints

1. In the toolbar at the top of the application, click the **Users** button.
In the right part of the Users pane, under **Submit points**, all flow groups and flows with a Submit point configured in Switch are shown. Under **Checkpoints**, flow groups and flows with a Checkpoint are shown.

2. To assign access to one or more Submit points, under **Submit points**, select:
   - **All**, to give access to all Submit points in all flows on the Server.
   - A flow group ( ), to give access to all underlying Submit points (i.e. all Submit points configured for all flows in the selected group).
   - A flow ( ), to give access to all Submit points configured for that flow.
   - A Submit point ( ), to give access to this particular Submit point.

   Note: The users or groups that have access to the selected level are listed on the right; users for whom the access has been set on a higher level (e.g. on group level iso flow level) are also shown but grayed out. Note that you must select the correct level to remove a user or user group.

3. Click .

   Note: Alternatively, if (earlier selected) users or groups are listed in the right part of the panel, you can simply select them and drag and drop them (one by one) to the appropriate Submit point.

4. Select the appropriate user or group.
5. Click **OK**.
   The name of the selected user or group is shown.
6. Proceed in the same to way to give access to Checkpoints .

4.3. Running Switch Watchdog as a service

Note: This section is only relevant if your operating system is Microsoft Windows.

4.3.1. Switch Server and Switch Watchdog

Switch offers its functionality through a number of separate applications. See *Switch application components* on page 8.

The Switch Server runs in the background (without user interface) to execute flows, monitored and managed by the Switch Watchdog. In normal circumstances it is automatically started and terminated as needed by the Switch Designer.

4.3.2. Setting up Switch Watchdog as a Windows service

On Microsoft Windows, the Switch Watchdog can be operated as a Windows service. This allows Switch to continue processing after you have logged off from the computer. In addition, you can specify that Switch should be restarted automatically after a system failure. Running the Switch Watchdog as a Windows Service will also restart Switch when it quit unexpectedly.

Note: Are you using third-party apps in Switch? In that case it is **not** recommended to set up Switch Watchdog as a Windows service. Most third-party and desktop applications do not support this. Refer to *Switch Service not compatible with (apps for) desktop applications* on page 72.

To set up Switch Watchdog as a Windows service, proceed as follows:

1. In Switch, navigate to **Edit** > **Preferences** > **User Interface** and configure the following preferences:
   - **Start Switch Server automatically at login** = No
   - **When exiting the flow designer** = Ensure processing is started.

   This avoids that Switch is started when a user logs in to Windows. For more information, refer to *Switch preferences: User interface* on page 34.
2. In the Windows operating system, navigate to **Start** > **Control Panel** > **Administrative Tools** > **Services**.
   If necessary, switch to "Classic View".

3. In the list of services, locate **Enfocus Switch Watchdog**.
4. Right-click this service and choose **Properties**.
5. On the **General** tab, choose the startup type you prefer:
   - **Automatic** will make sure the service is started when booting your computer.

     (Note that **configuring this setting** does not start the service; Switch Watchdog will start as soon as you reboot your computer.)
   - **Manual** means you will have to start the service explicitly from this dialog box.
6. On the **Log On** tab, enter the information for the user account that should be used to run the service.

   This allows Switch to get access to information saved in a specific user's preferences (such as Photoshop actions) and to use Switch data stored in the application data root (which is linked to a specific user and looks like this: C:\Users**<user>**\AppData\Roaming\Enfocus\Switch Server). If you want to keep using the same application data, after switching to Windows service mode, make sure to use the same user.

   Also, if Switch should get access to the network (e.g. to save files), make sure the chosen user has the appropriate access rights.
7. Back on the **General** tab, click the **Start** button to launch the Switch Watchdog as a service.

Note: When shutting down or rebooting the operating system, the operating system will wait for maximum 30 minutes before terminating the Switch Watchdog service and all its child processes. Therefore, to make sure that the Switch Watchdog service is able to shut down gracefully, we advise stopping all flows before shutting down or rebooting the operating system.

4.3.3. Operating Switch as a Windows service

After you install the Switch Watchdog as a service in the installer, the Server need not to be installed as a service anymore.

At startup, the Designer checks if the watchdog is running. If the Watchdog is not running, the Designer starts the Watchdog as a background application. The Watchdog starts the Server almost immediately and the Designer connects to the Server.

Be careful though:

- When you quit the Switch Designer, you will be asked whether you want the server to keep running. If you choose **No**, the server will terminate.
- The Switch Designer next sends a message to the Switch Watchdog to quit.

4.3.4. Switch service and mapped drives

Microsoft Windows allows assigning a drive letter to a network computer or folder, creating a **mapped drive**. A mapped drive letter (such as Z) can be used in a file or folder path just like a local drive letter (such as C). But there is a catch: the drive mappings are established when a user logs in to the system - and a service is not logged in (even if it is associated with a user account).

Thus while Switch Server is running without any user logged in, it cannot access mapped drives. You must ensure that all folders and file paths in the flow definitions are local drive paths or UNC paths (of the form \\server\volume\directory\file) rather than mapped drive paths. This holds for all paths including user-managed folders and references to files in app properties.

4.3.5. Switch Service not compatible with (apps for) desktop applications

Apps that communicate with a desktop application won't work when running Switch as Windows service. This is due to a Windows limitation. Desktop applications cannot be started by a Windows Service, hence their apps cannot be used either.

Apps concerned

- Adobe Photoshop
- Adobe Illustrator
- Adobe InDesign
- Adobe Acrobat Professional/Distiller
- Microsoft Office apps (Microsoft Word, Microsoft Excel, Microsoft Powerpoint)

Some background information

Since the introduction of Windows Vista, Microsoft no longer allows applications that run as a Service to interact with the desktop. This means for example that these applications cannot show any UI to the user. As desktop applications cannot function with this limitation, their apps do not work either.

Note: This problem does not affect Switch itself, because the Switch *Watchdog* (which has no UI) - and not the Switch Designer - is set up as a Windows Service.

Remark

If you want to use the apps for desktop applications, you *must* run Switch as a regular process and not as a Windows service. However, in that case, you may want Switch to *start processing automatically* when a user logs in. To do so, ensure that the preference **Start Switch Server automatically at login** is set to **Yes** (See *Switch preferences: User interface* on page 34). Remember that a user has to log in in order to start Switch, which is not necessary when running Switch as a Windows service.

4.4. Setting up custom icons for job boards

Job boards can be created on the Switch Portal; these virtual boards enable users to view Switch jobs remotely. The jobs can be filtered by flow and/or job stage.

The jobs on the job boards are represented by an icon that refers to the file type of the job. For the most common file types Enfocus provides the standard icon. However, if you're working with different file types for which there is no icon yet, or if you prefer other icons, you can easily replace (some of) the standard icons with your own images.

The icons must be supplied as PNG files. The file name must refer to the file extension, for example psd.png (icon for Photoshop files), txt.png (icon to be used for text files), ... Best size is 128x128 (but the icons are scaled automatically).

To set up custom file type icons

1. On the system that runs the Switch Server, go to:
   - On Windows: AppData\Roaming\Enfocus\SwitchSite
   - On Mac: \Users\<user>\library\Application Support\Enfocus\SwitchSite\
2. Create a subfolder named 'icons'.
3. Copy the images to this folder.
4. Restart the Switch Server.

5. Working with Switch

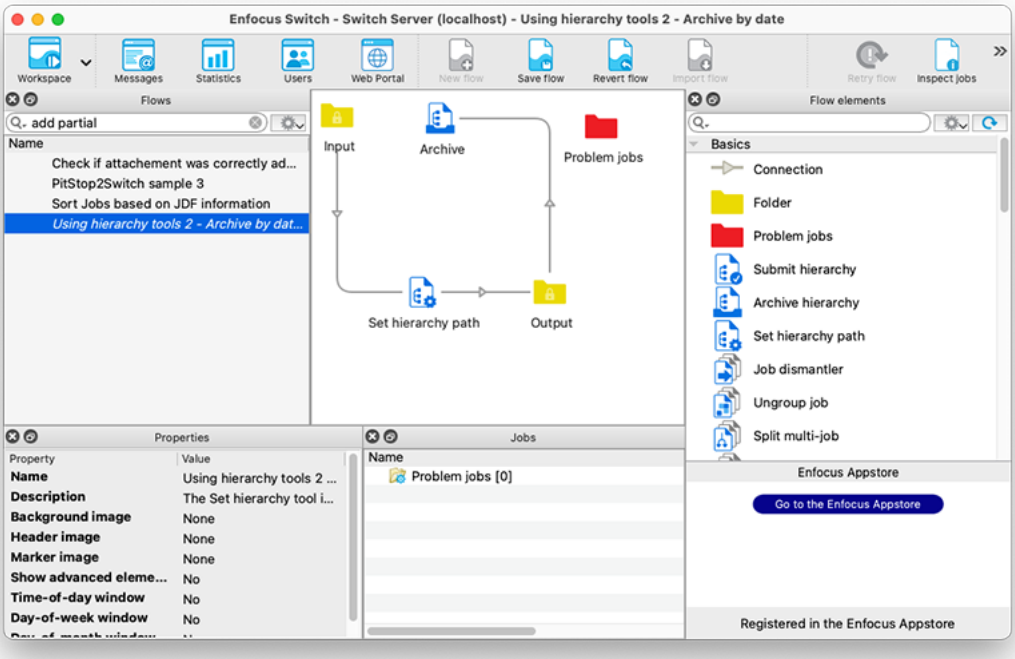
This section gives a detailed overview of the graphical interface of the application and explains how to use the different Switch modules.

5.1. Switch Graphical User Interface

This section gives a detailed overview of all elements of the Graphical User Interface.

5.1.1. Workspace overview

When the Switch Designer is launched, it displays the main window called the workspace, shown here in its default configuration (design view):



Toolbar

The toolbar is the strip at the top of the workspace offering a number of tool buttons.

See *Toolbar* on page 77 for more details.

Panes and views

The workspace contains a number of **panes** which can be manipulated as distinct entities (show, hide, resize, move, ...). Examples include the Flows pane, the Flow elements pane, and the Properties pane.

The central area that displays a flow design is called the **canvas**; it is a special pane because it has no title bar and it can't be moved from its central position.

One or more panes (optionally including the canvas) combine to make up a workspace configuration called a **view**. The currently displayed view is selected by pressing one of the buttons in the leftmost section of the toolbar.

Configuring the workspace

The workspace offers a number of panes that are displayed in a number of pre-configured views. Each of the views can be configured at will to display an arbitrary combination of panes. The contents of a pane persists across views (i.e. the different views display the same instance of the pane rather than different copies).

Panes can be shown or hidden by choosing the corresponding item in the **View** > **Show panes** menu. Panes can be resized by dragging the separators between them, they can be rearranged next to one another or overlaid as tabs by dragging their title bar, and they can be undocked as a floating pane. All configuration settings are persistent across sessions.

The currently displayed view can be returned to its pre-configured settings by selecting **View** > **Show panes** > **Reset view**.

Views

The Workspace offers the following views. The intended function is only a recommendation, since the user can re-configure the views at will.

Tool button	View name	Intended function
	Design	Design a flow
	Test	Test-run a flow
	Run	Run a flow in production
	Messages	View and export log messages

Tool button	View name	Intended function
	Statistics	View statistics
	Users	Manage users/groups and their access rights
	Web Portal	Manage Switch Server remotely (see *Using the Switch Web Portal* on page 260)

Panes

The workspace offers the following panes, which can be combined at will in the different views.

Pane	Description
Dashboard	Displays status information on problem jobs or processes, as reported by the Switch Server
Flow elements	Lists the icons representing flow elements that can be dragged onto the canvas
Jobs	Serves to view and explore the contents of flow element backing folders (i.e. mostly jobs) Can also be used to view the contents of an arbitrary folder in the file system, but this is not a primary function
Flows	Lists all flows
Progress	Displays progress information for tasks currently being executed by the Switch Server
Properties	Displays the properties of the currently selected flow or flow element
Statistics	Displays statistics about job execution by the Switch Server
Statistics 2, 3	Extra statistics panes that may be configured to display a different set of statistics.
Job Information	Displays the number of jobs waiting to be processed by each flow element.

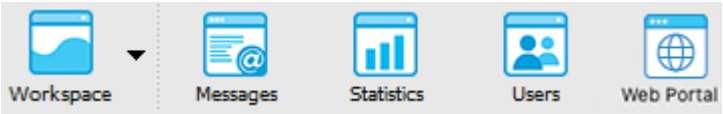
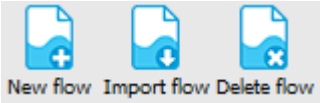
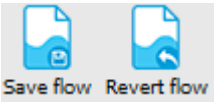
Pane	Description
Health Indicator	Monitors the internal communication processes within Switch.
Users pane	Allows managing user names, passwords and access rights

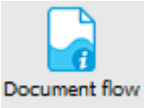
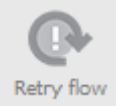
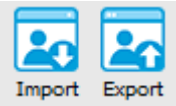
5.1.1.1. Toolbar

The toolbar is the strip located at the top of the workspace window; it contains a number of tool buttons to accomplish common tasks.

Tool sets

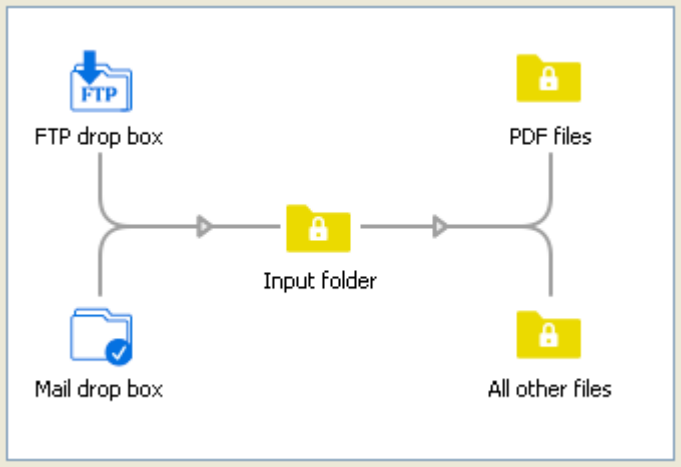
The tool buttons are grouped in tool sets, which are shown or hidden depending on which panes are currently shown or hidden. The following table provides an overview of the tool sets and their function.

Tool set	Function
	• Always shown • Select a view (Workspace, Messages, Statistics, Users, Web Portal). See **Configuring the workspace** in *Workspace overview* on page 74
	• Shown with the Flows pane • New Flow, Import Flow, Delete Flow See *Importing and exporting flows* on page 224
	• Shown with the Canvas and Flows pane • Save Flow, Revert Flow See *Saving and reverting flows* on page 220
	• Shown with the Canvas and Flows pane • Activate Flow, Stop Flow See *Activating and deactivating flows* on page 222
	• Shown with the Canvas and Flows pane

Tool set	Function
	• Generate HTML documentation See *Generating flow documentation* on page 227.
	• Shown with the Canvas and Dashboard pane • Retry Flow, e.g. in case of a problem job or problem process. See *Viewing flow problems in the Dashboard pane* on page 241 and *Manual retry* on page 248
	• Shown with the *Users pane* on page 90 • Allows export and import of user information. See also *Setting up Switch users* on page 62, *Importing users and user groups* on page 68 and *Exporting users and user groups* on page 68.
	• Allows to inspect metadata. See *Working with sample jobs* on page 349

5.1.1.2. Canvas

The canvas is the central workspace area that allows viewing and editing flows. Here's an example of a simple flow displayed in the canvas:



To display a flow in the canvas, select it in the Flows pane.

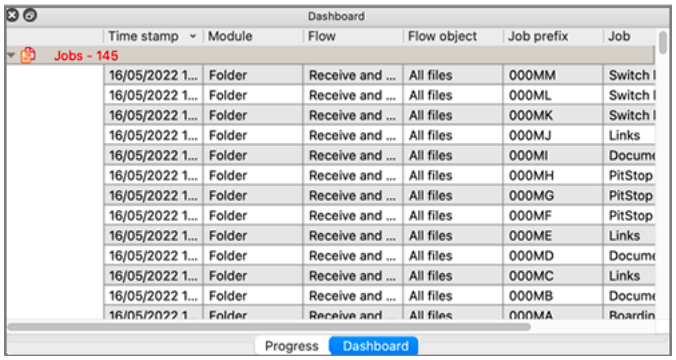
To make changes to a flow, ensure that it is inactive and unlocked.

You can also:

- drag new flow elements from the elements pane onto the canvas,
- create connections between flow elements,
- configure flow elements using the properties pane, and
- drag flow elements around to adjust the layout of the design.

5.1.1.3. Dashboard pane

The Dashboard pane gives an overview of problems found during flow execution. The information is updated dynamically: a problem item appears as soon as it is detected and disappears as soon as the problem is solved or handled.



For more information, refer to *Viewing flow problems in the Dashboard pane* on page 241.

5.1.1.4. Flow elements pane

The Flow elements pane lists the icons representing flow elements (such as folders, connections, tools and apps) that can be dragged onto the canvas and become part of a flow design.

Filtering

You can use the Search field on top to filter the flow elements. See *Filtering lists* on page 93

Favorites

The Favorites section can contain shortcuts to elements in other sections. It looks and functions like other section headers, but its content is managed by the user.

You can

- Select **Add to Favorites** from the context menu of a flow element to add a shortcut to the Favorites section.

  Note: Add to Favorites menu is disabled for flow elements, which have already been added to the Favorites section.

- Drag a flow element into the Favorites section to add a shortcut to the Favorites section.
- Select **Move up** or **Move down** from the context menu of a shortcut in the Favorites section, to change the order.
- Drag and drop shortcuts in the favorites section to change the order.
- Select **Remove from Favorites** from the context menu of a shortcut in the Favorites section, to remove it from the Favorites section.

Note: You can use keyboard shortcuts to add your favorite flow elements to the canvas. Just click ctrl+<number 1-9> (Windows) or cmd+<number 1-9> (Mac). The <number> refers to the position of the flow element in the Favorites category (first element = 1, second = 2, etc.).

Sections

The Flow elements pane groups the flow elements in sections. Click on a section header to open or close the sections, showing or hiding the flow elements in the section.

The flow elements in all categories except for the 'Apps' category are part of the standard installation, depending on your licenses. For example, the flow elements in the Basics category are included in the Core Engine, whereas the flow elements in the Metadata category require a license of the Medata Module. See *Flow elements matrix*.

The flow elements in the 'Apps' category must be installed explicitly through the Enfocus Appstore. Some are free, some are paying. See also *Working with apps in Switch* on page 252.

Section	Description
Basics	Basic flow elements that form the fabric of a flow design, including folder and connection
Tools	Tools such as compress and rename, mostly for file handling
Scripting	Tool for using scripts (script folders and script packages).
Communication	Tools for communication including email and FTP
Metadata	Tols for working with metadata, including XML
Database	Tools for using ODBC data sources
Apps	Small applications that can be used in Switch and that are made avavailable through the Enfocus Appstore. This category becomes

Section	Description
	available as soon as you have installed at least one app. See also *Working with apps in Switch* on page 252.

Flow elements

The list of flow elements displayed in the Flow elements pane depends on the Switch modules you have licensed. See the *Flow elements matrix* on page 162 for an overview.

The flow elements that are included in the standard installation (see higher) are called **default apps**. They are installed automatically with a new release. They cannot be removed. However, if a new version is available, you'll be able to switch to this new version. See *Installing a new version of an app* on page 258.

If you want to know more about a flow element, you can open the documentation from within Switch, using the flow element's context menu. Choose **Check the app details**. This will bring you to an app page on the Enfocus Appstore where you can find detailed information. Want to switch to a different version? Click the **Manage** button in the top right corner of the screen and choose a new version in your account section ("My Enfocus"). You can easily find the default apps, thanks to a new filter, 'Default App'.

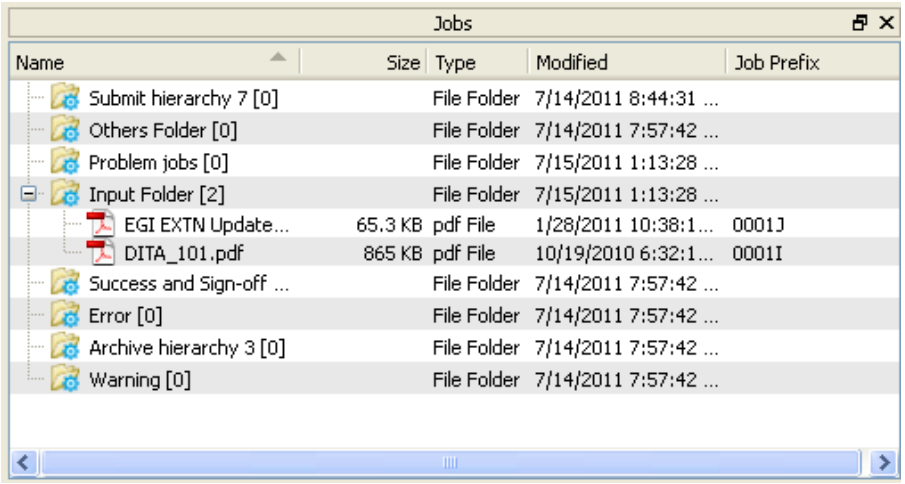
Note: A small number of flow elements are not converted to default apps. For those flow elements (Connection, Folder, Problem job, Refresh info, Submit point and Checkpoint), you can find the documentation in the Switch Reference Guide.

Detailed information

Refer to: *Flow elements: overview* on page 95.

5.1.1.5. Jobs pane

The Jobs pane serves to view and explore the contents of flow element backing folders (that is, mostly jobs).



Use the Jobs pane to:

- View the contents of the backing folder for one of more flow elements by selecting the flow elements in the canvas.
- Drop files and folders in a flow using copy and paste or drag and drop.
- Delete files and folders (permanently) by pressing the delete key or by choosing the **Delete** context menu item.

Row types

Each row in the Jobs pane represents a file or folder as described in the following table. Folder rows offer a triangle button to show/hide the rows representing the contents of the folder.

Icon	Row represents	Information displayed
	The backing folder of a flow element	Flow element name and backing folder path
	A job folder	Folder info; Job info
	A job file	File info; Job info
	A regular folder	Folder info
	A regular file	File info

Jobs pane columns

The rows in the Jobs pane have multiple columns as listed in the following table. Individual columns can be shown or hidden through the "Show columns" context menu item. By default, only a subset of the columns is shown.

The visible columns can be resized and reordered by dragging. Clicking on a column header selects that column as the key for sorting the rows in the Jobs pane, and toggles between ascending and descending order. Rows that have the same parent (and thus are on the same hierarchical level in the tree) are sorted according to this specification. Root rows are always sorted on the name column (ascending or descending depending on the last setting).

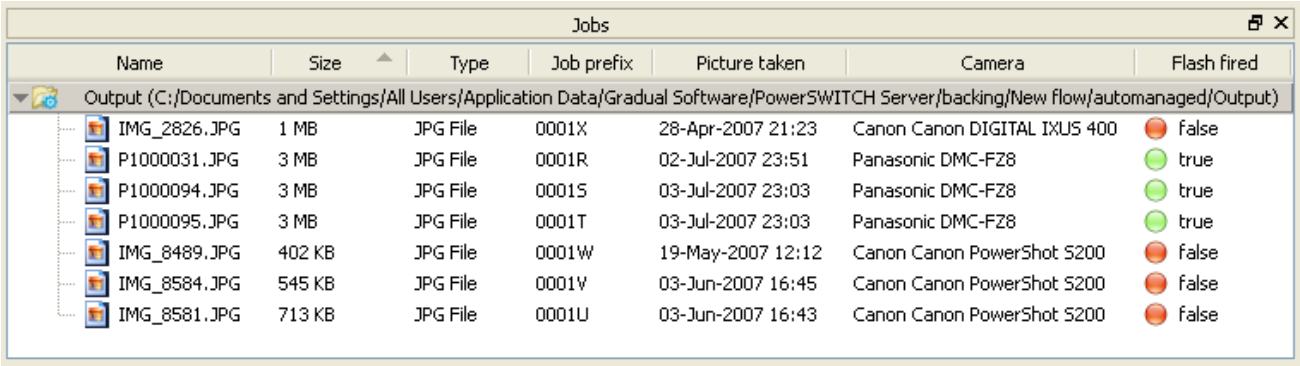
Column	Description
Name	Name of the file or folder represented by the row For a job file or folder the unique name prefix is removed
Size	The file size in bytes for job files and regular files; blank for folders

Column	Description
Type	The file type as retrieved from the operating system
Modified	The date/time the folder or file was last modified
Job Prefix	The unique name prefix for job files and job folders; blank otherwise This field is shown in red color if there is no corresponding valid internal job ticket (i.e. the job ticket doesn't exist or its file path doesn't point to this job)
The following columns are not shown by default	
Waiting since	The date/time the job arrived in this backing folder (more precisely, when it was detected by the server)
State	The name of the state currently attached to the job, or blank if there is none. A state can be attached to a job through the "Attach job state" property of the folder flow element; for more information, see *the Folder element* and *Viewing statistics* on page 243.
Entered state	The date/time the job entered the state currently attached to it, or blank if there is none. A state can be attached to a job through the "Attach job state" property of the folder flow element; for more information, see *the Folder element* and *Viewing statistics* on page 243.
Submit point	The name of the Submit point through which the job was submitted, or blank if it wasn't submitted through a Submit point
Submitted	The date/time the job was submitted through a Submit point, or blank if it wasn't submitted through a Submit point
User name	The name of the user associated with the job, or blank if there is none (a user is automatically associated with the job when it is submitted through a Submit point)
Custom 1 ... Custom 5	A user-configurable value calculated through variables or a script expression Both the column header and the column value can be configured through the context menu items "Set column header" and "Set column value (first make the column visible with the "Show columns" context menu item) Initially the values for these columns are blank

Example of custom columns

In the following example, two custom columns were configured to display the date when the picture was taken and the camera model (see defining text with variables).

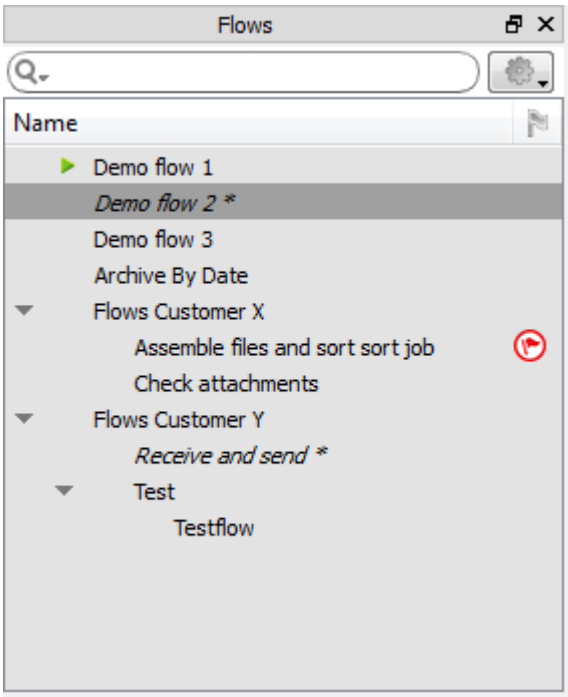
A third custom column was configured to display whether the flash fired when taking the picture (see defining a condition with variables).



5.1.1.6. Flows pane

The Flows pane lists all flows known to Switch at the present time. It allows you to organize these flows in a hierarchy of groups and subgroups, and provides a context menu for managing flows in various ways.

Note: If a flow is not saved yet, it is displayed in italics, followed by an asterisk.



Filtering

You can use the search field on top to filter the flows. See *Filtering lists* on page 93.

Actions

If you click the Actions icon ( ), a list appears with all the items that are available in the Flow menu on the menu bar.

Flows and groups

Each row in the flows pane represents a flow or a group. A group can contain flows and other groups, up to any nesting level. When you select a group, all the flows in the group (and in any subgroups) are automatically selected as well. You can open/close a group by clicking the arrow at the left. You can reorganize the order and nesting structure in the flows pane by dragging the rows.

When you select a flow in the flows pane, it is displayed in the canvas and you can see its properties in the properties pane.

When you select two or more flows in the flows pane, a scaled-down representation of all the selected flows is shown in the canvas. You can perform many operations (such as activate/deactive) on multiple flows at the same time; however you can't make changes to the flow design while two or more flows are selected.

For more information, refer to the chapter *Organizing flows* on page 211.

State

An icon is displayed at the left of each row to indicate its flow state, as described in the following table. The flow state for a group row is equal to the "highest" flow state for any of the flows in the group (the table lists the flow states from high to low). For more information, refer to the chapter *Activating and deactivating flows* on page 222.

Icon	Description
	The flow can't be activated because it contains a design error.
	The flow is being activated.
	The flow is active, that is, it is being executed by Switch.
	The flow is active, that is, it is being executed by Switch, but one or more of the connections are put on hold.
	The flow is being deactivated.
	The flow is inactive and it is locked for editing.
	The flow is scheduled and will become active during the time specified in the Flow properties (See *Flow properties* on page 216).
	The flow is scheduled, but one or more of the connections are put on hold.

Name and description

You can rename a row by clicking on the name field and entering the new name. You can also change the value of the "Name" property in the properties pane. You can add a longer (possibly multi-line) description of the flow or group in the "Description" property.

Marker

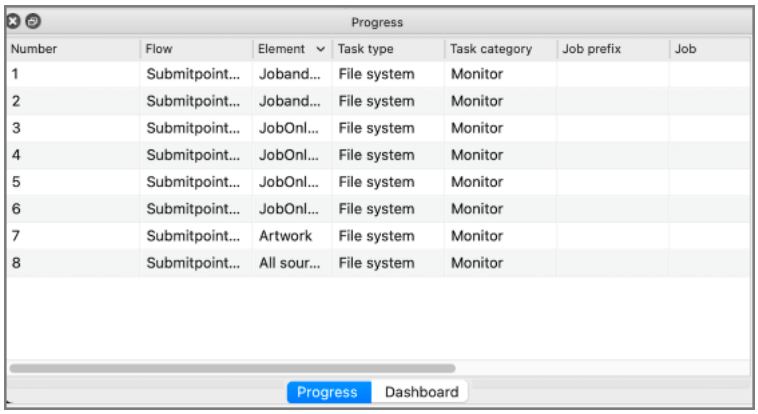
The rightmost column in the flows pane can display a marker icon selected from a predefined list of icons (including colored flags, priorities, and level of completeness indicators). You can set these markers at your discretion to help organize your flows (for example, indicate work in progress). The markers have no meaning to Switch.

If you do not want to use markers, you can hide the marker column with the "Marker column" context menu item.

For more information, refer to the chapter *Setting flow markers* on page 214.

5.1.1.7. Progress pane

The Progress pane displays a list of currently executing processes (for all active flows) with their progress information.



Number	Flow	Element	Task type	Task category	Job prefix	Job
1	Submitpoint...	Joband...	File system	Monitor		
2	Submitpoint...	Joband...	File system	Monitor		
3	Submitpoint...	JobOnl...	File system	Monitor		
4	Submitpoint...	JobOnl...	File system	Monitor		
5	Submitpoint...	JobOnl...	File system	Monitor		
6	Submitpoint...	JobOnl...	File system	Monitor		
7	Submitpoint...	Artwork	File system	Monitor		
8	Submitpoint...	All sour...	File system	Monitor		

Examples of processes include internal processes (such as downloading a file from an FTP site), external processes controlled by Switch (such as distilling a PostScript file) and remote processes (triggered by the Remote process element). Processes are dynamically added to and removed from the list as they occur.

The columns can be reordered as usual in Switch. Following columns are displayed:

- **Flow**: flow concerned
- **Element**: name of the flow element in the flow
- **Task type and task category**:
  - Task types include file handling tasks (such as copying and moving jobs), file processing tasks executed by apps, network transfer tasks, ...
  - Task categories include "disk" (disk operations, mainly related to copying and moving jobs), "light" (quick tasks executed by scripts used in the Script element), "processor", ...

  Note: Task type and task category are taken into account to calculate the maximum number of concurrent slots. Refer to *Execution slots* on page 249.
- **Job prefix and job**: unique prefix and name of the job
- **Status**: current status
- **Progress**: current progress
- **Process ID**: process ID, may be useful for troubleshooting. For example, when executing a Node.js script, you can see the process ID of the Node.js executor in this column. This can be

useful to kill the process when the executor is hanging, or to find out which script is using a lot of CPU or memory.

For more information, see *Viewing processes in the Progress pane* on page 240.

5.1.1.8. Properties pane

The Properties pane shows the properties of a flow or a flow element, depending on what's selected on the canvas:

- If a *single flow element* is selected on the canvas, the Properties pane shows the properties of that flow element.

  To learn how you can edit the values in the Properties pane, refer to *Changing flow element properties* on page 175.

- If *multiple flow elements* are selected, the Properties pane shows all mutual properties, i.e. the properties that can be set for every selected flow element. This allows you to change the (same) property for multiple flow elements at once.

  Note: The Name and Description of a flow element must be changed one by one.

- If *no flow elements* are selected, the Properties pane shows the *flow* properties.

  For more information, refer to *Changing flow properties* on page 215.

Properties

Property	Value
Element type	Submit hierarchy
Name	Submit hierarchy
Description	
Path	/Users/anncoupe/DATA/Testfiles1
Leave originals in place	No
Minimum file size (KB)	None
Scan every (seconds)	Default
Time-of-day window	No
Day-of-week window	No
Day-of-month window	No
Subfolder levels	1
Process these folders	All Folders
Adjusted by (rule 1)	Excluding folders not named
Folder name	Regular expression defined
On levels	
Restriction	None
Nesting	Exclude nested subfolders as well
Adjusted by (rule 2)	None
Adjusted by (rule 3)	None
Adjusted by (rule 4)	None
Adjusted by (rule 5)	None
Attach hierarchy info	Yes
Include hierarchy name	No
Include subfolder levels	1
Save top subfolders	Yes
Attach email info	
Allow subfolder cleanup	No

5.1.1.9. Statistics pane

The Statistics pane allows you to display the average time jobs reside in a particular folder or state while being moved along a flow.

You can open this pane, by clicking

in the Switch toolbar, or by selecting **View** > **Statistics** from the menu at the top of the application.

Important: Do not forget to refresh the statistics (by selecting **View** > **Refresh Statistics**), to make sure the most recent information is displayed.

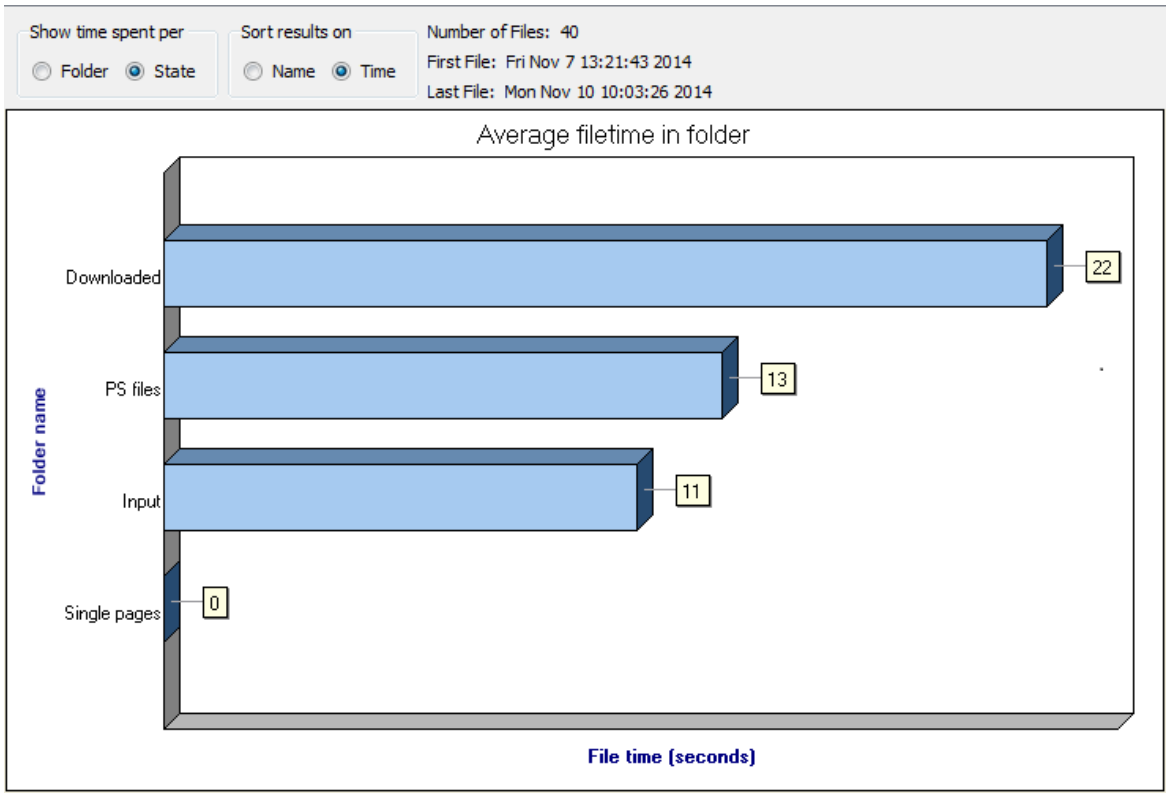
The chart gives an overview of the folders or states (on the y-axis) and the average time in seconds (on the x-axis) jobs spent in each of them.

You can determine what is shown by changing the options in the **Show time spent per** and **Sort results on** sections:

- **Show time spent per Folder/State** determines what's shown in the chart below; either the average time spent in a particular (statistics-enabled) **Folder** or the time spent in a particular **State**.

- **Sort results on** determines how the information in the chart is sorted: based on the **Name** of the folder/state (alphabetically), or the **Time** (decreasing).

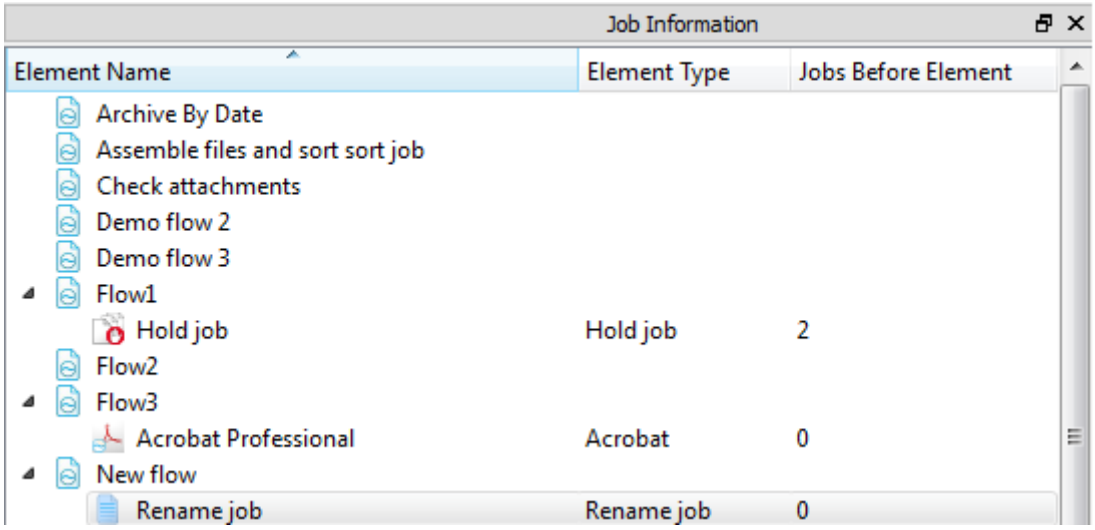
In the top right corner of the pane, you can see the number of files that have been processed, and the date and time the first and last file were processed.



For more information, see *Viewing statistics* on page 243.

5.1.1.10. Job Information pane

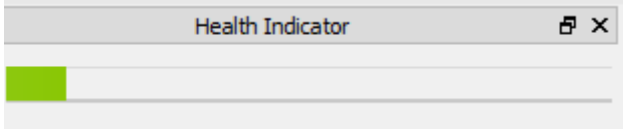
The **Job Information** pane displays current job distribution in the flows, that is, the number of jobs waiting to be processed by each flow element. Here elements are grouped by flows.



This pane requires presence of responsive Server process as it is updated constantly when visible.

5.1.1.11. Health indicator pane

The **Health indicator** monitors the internal communication processes within Switch. Under normal operation, the Health Indicator will show a green status bar.



If Switch begins to experience problems communicating with internal processes due to delayed or excessive internal communication requests, the indicator bar will change to orange or red in extreme cases. However, the Health Indicator does not change due to number of jobs or the heavy processing as this does not typically threaten the stability of Switch.

In most cases when an internal process becomes unavailable or communication is lost, the Switch Watchdog will automatically restart the failed service. If the Health Indicator frequently shows orange or red, it is recommended that you review the **Statistics** pane for details on which Switch services are experiencing problems and may require corrective action. See *Statistics pane* on page 88.

5.1.1.12. Users pane

The Users pane allows you to manage the **access rights of users accessing the Switch Server from another computer**, i.e.:

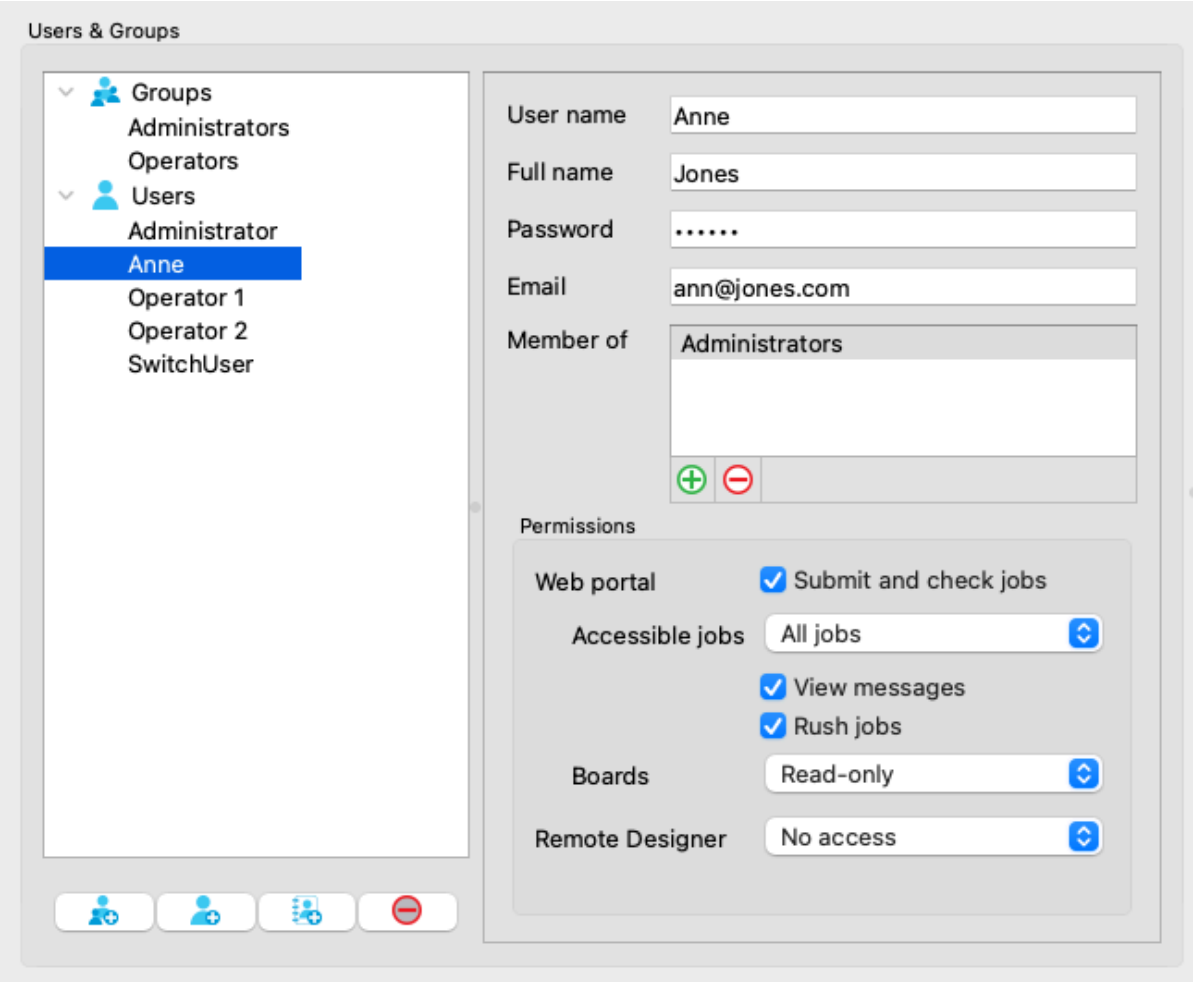
- Through the Switch Web Portal via *Submit points* and *Checkpoints* (requires a SwitchClient license) or to view log messages.

- From another computer than the one on which the Switch Server is installed, via Remote Designer.

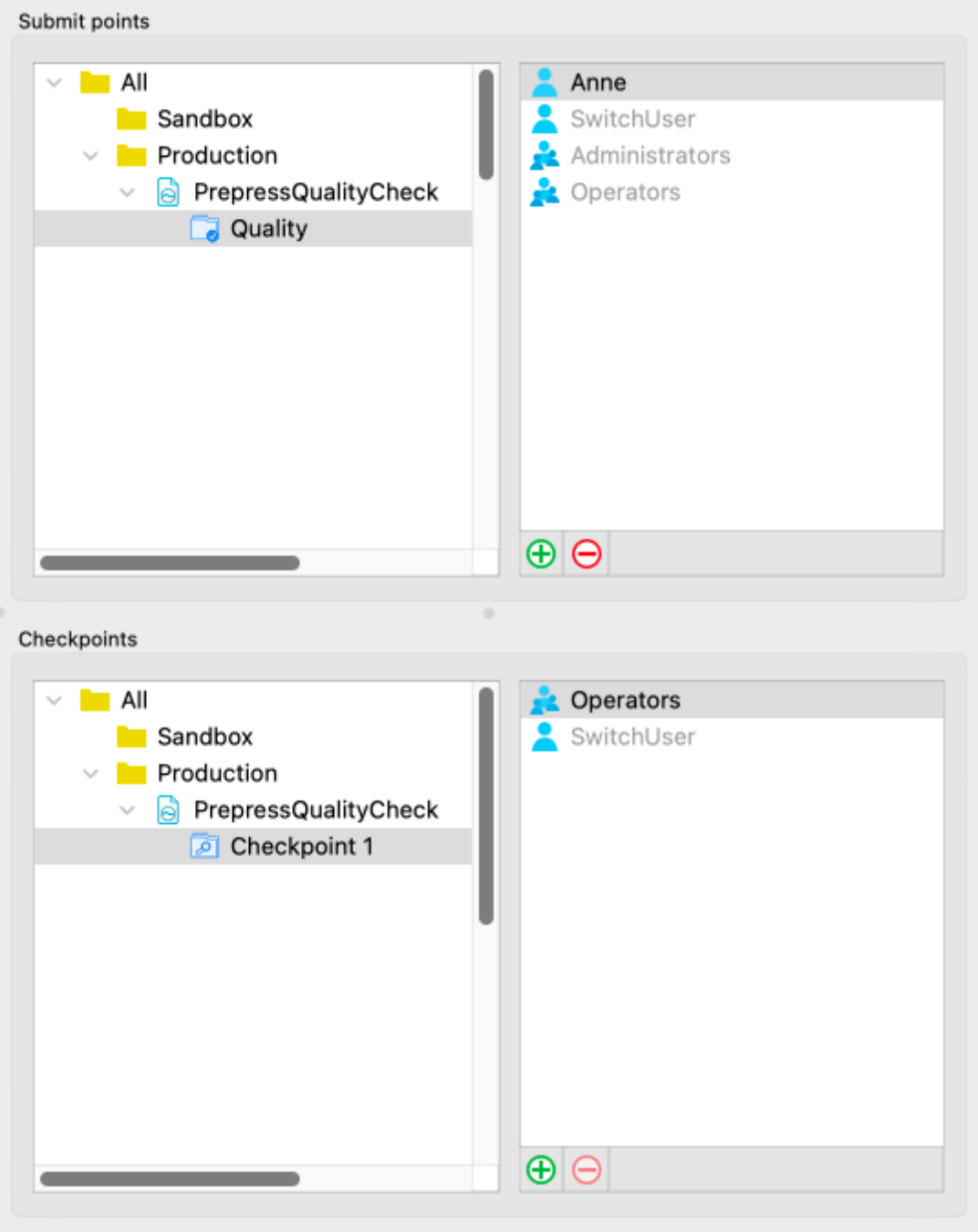
You can open this pane, by clicking the Users button in the toolbar, or by selecting **View** > **Users** from the menu at the top of the application.

The Users pane consists of two parts:

- In the left part of the pane, you can **configure users and user groups**, and assign them permissions for the Switch Web Portal and/or for Remote Designer.



- In the right part of the pane, you can grant users and user groups **access to particular Submit points and Checkpoints**. This part is only visible, if you have activated the SwitchClient and/or the Web Services module.



The buttons in the toolbar allow you to import and export user information.

For more information, see *Configuring Switch users* on page 62 and *Assigning access to Submit points and Checkpoints* on page 69.

5.1.1.13. Filtering lists

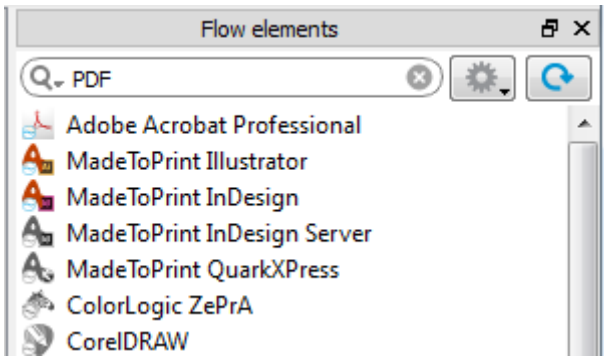
Filtering restricts the set of items shown in the list by comparing search terms (entered in the **search field**) with one or more search targets associated with the items.

Filtering is available for Flow elements and Flows.

In the **Flow elements** pane, items are not only filtered, but also searched for in the Enfocus Appstore. If the search term matches an app, you will see the app appear in the bottom part of the Flow elements pane, under "Enfocus Appstore results" and, if it is installed already on your system, you will also see it in the Apps category. See also *Working with apps in Switch* on page 252.

Using the search field

The search field is located above the list of items being managed.



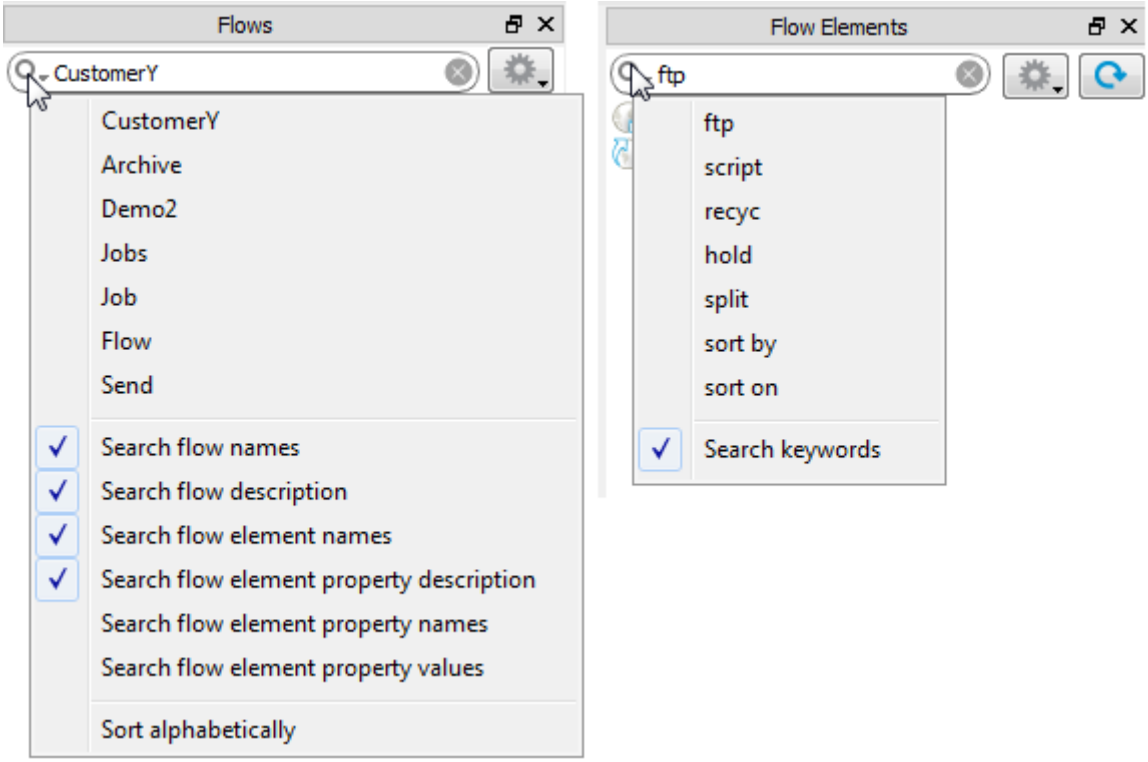
- If the search field is empty, all items are shown in the list.
- If the search field is not empty, a clear button appears at the right side of the field, to clear the search field and show all elements.

Refresh button (Flow elements pane only)

If an app you recently purchased is not in the list, you may have to click the **Refresh** button . This will install the app concerned on your local computer.

Using the search menu

You can open the search menu by clicking the **Search** button on the left side of the search field.



The search menu contains:

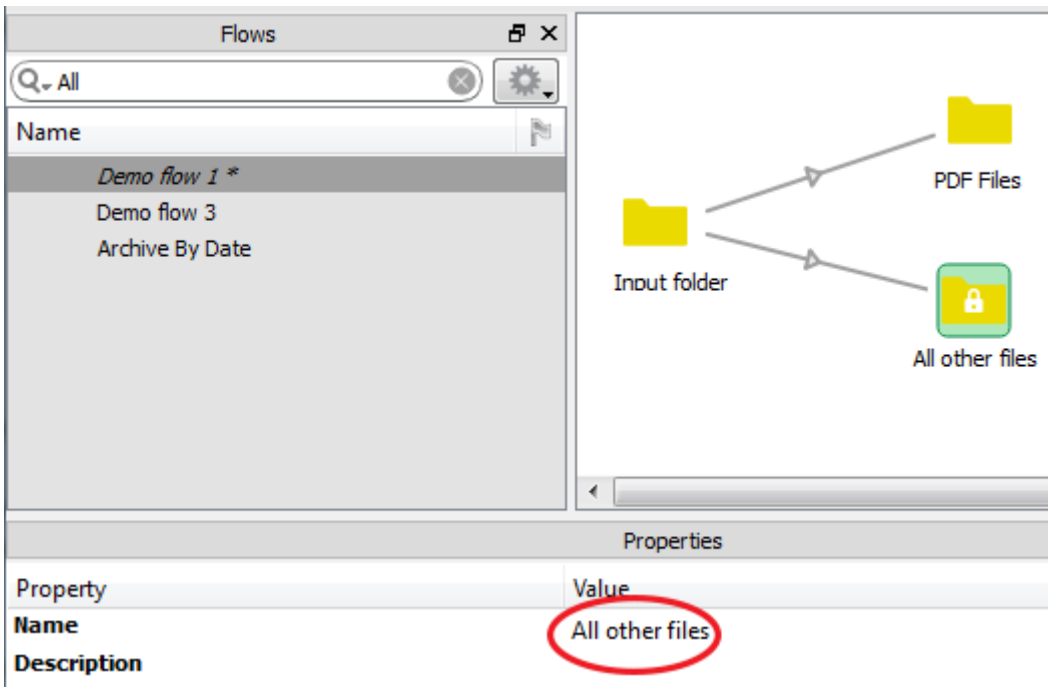
- The last 7 strings entered in the field. Selecting one will reapply this filter.
- A number of search options.

  This controls the search targets included in the search. Each menu item has a checkbox which can be turned on or off by choosing the menu item.

  For *Elements*, the name of the elements is always included in the search. You can also search for keywords, which are associated with the elements. For example searching for "PDF" will include Adobe Acrobat Distiller, although "PDF" is not a part of the Element name. For an overview of all elements and their keywords, see the *Flow elements: overview* on page 95.

  For *Flows*, you can search in the flow names, the flow descriptions, the elements used in the flows, or even the properties or values in the flow's elements. This allows for example to search for Flows containing the "Adobe Acrobat Distiller" element. If found, the flow element or connection is highlighted in green (see example below).
- Sort options, allowing to sort the search result alphabetically, or in the order they were found.

Example of a search result found in the name of a flow element

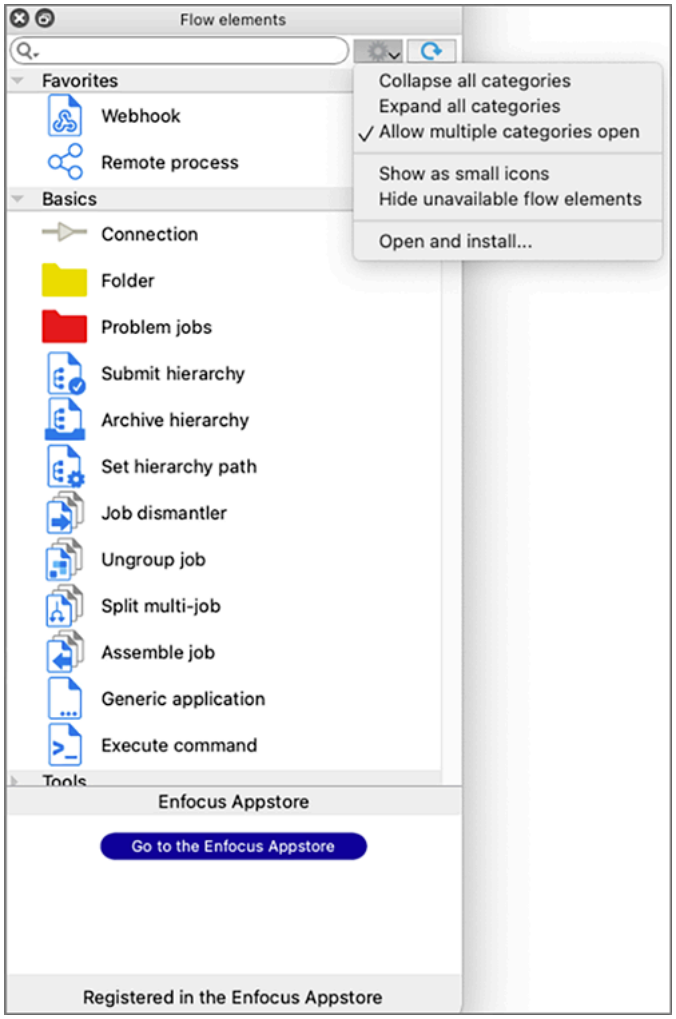


5.1.2. Flow elements: overview

This section gives a detailed overview of all flow elements available in the Flow elements pane. They are sorted by category (Basics, Tools, Scripting...) just like in the application.

Note that you can change the way the flow elements are displayed (show/hide unavailable flow elements, open or collapse categories etc.), by clicking the button next to the search field.

If you think that flow elements are missing, check your licenses (some flow elements require a license of an additional module!).



5.1.2.1. Basics

Connection

Connection is a special flow element that serves to interconnect other flow elements. The network of connections in a flow determines how jobs can travel between the flow elements.

To connect two flow elements that are already present on the canvas, do one of the following:

- Drag the connection icon from the Elements pane and drop it onto the first flow element; then click on the second flow element.
- Double-click the first flow element to start a connection and drop it on the second flow element to connect it with the first flow element.
- Select "Start connection" in the context menu of the first flow element and drop the extension on the second flow element.

Keywords

If you enter one of the following keywords in the Search field at the top of the Flow elements pane, the **Connection** element will be shown in the list:

- move
- filter
- traffic light

Flow element types

In terms of connectivity, there are four types of flow elements (other than connection itself):

Flow element type	Description
Folder	Represents a folder on disk that can hold jobs before, after or in between processing steps; folder has a central role in Switch (see below).
Processor	Processes jobs and thus accepts incoming and outgoing connections.
Producer	Injects jobs into a flow from an outside source (such as an email inbox); a producer does not accept incoming connections.
Consumer	Consumes jobs from a flow and possibly transports them to an outside target (such as an FTP site); a consumer does not allow outgoing connections.

The central role of the Folder element

At least one of the two flow elements being connected must be a folder. In other words, a flow element other than a folder can be connected only to a folder.

A simple rule of thumb is "there must always be a folder in between".

Connection types

There are several types of connections, each with a slightly different set of properties. The type of a connection is determined by the flow element from which the connection originates. All connections originating at a particular flow element have the same type. Some flow elements also restrict the number of outgoing connections.

Connection type	Description
Move	Simply moves jobs along (under the control of Switch); a flow element with outgoing move connections often produces only a single output along one of the outgoing connections (for example, file balancer), or it may allow just one outgoing connection
Filter	Offers properties for file filtering in addition to the move properties; a flow element with multiple outgoing filter connections (for example, folder) usually sends identical copies of its output along these connections (assuming a connection's filter allow the output to pass)

Connection type	Description
Traffic light	Offers data and log subtypes and allows to set success-, warning- and error-filters; this connection type is used by flow elements that produce a report for human consumption and/or validate jobs against some specified rules (for example, preflight); multiple connections of the same subtype carry identical copies of the output
No-options	Jobs are moved under the control of a third-party application; this connection type is used only in conjunction with generic application; it offers only the most basic set of properties

Properties

The following table lists the properties for all connection types (i.e. no single connection offers all of these properties). Some flow elements "inject" extra properties in their outgoing connections. These properties are described with the flow element that injects them.

Property	Description
Name	The name of the connection displayed in the canvas; most connections have a blank name (the default) but the user can add a name if so desired; some flow elements use the name of their connections for special purposes (these rare cases are described for each flow element where applicable)
Description	A description of the connection displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the connection.
Corner angle	Determines the layout of a connection as it is drawn on the canvas Consider the rectangle formed by drawing horizontal and vertical line segments through the center of the two flow elements being connected; the breakpoint in the connection line can be positioned anywhere on the diagonal of this rectangle The corner angle is an integer number in the range [-90, 90] inclusive; the value is a measure for how much the corner formed at the breakpoint differs from a straight line; thus a zero value means a straight line (the default) and a value of ±90 means a rectangular corner (the breakpoint is positioned at one of its extremes).
Color	The color of the connection displayed in the canvas. The default is Gray, but you can select another color from the list (Yellow, Green, Cyan, Blue, or Magenta). Alternatively, you can change the color via the context menu, by selecting the **Choose color** option. Note that connections can also have "conditional" colors: • If a value is wrong in the properties, the connection can be displayed in red. • If the connection is put on hold, it's displayed as an orange dashed line. See *Putting a connection on hold* on page 229.

Property	Description
	• If a property of the connection matches a keyword entered in the search field of the Flows pane, it's displayed in green. See *Using the search menu* on page 93. **Note:** The "conditional" colors take priority over the "custom" colors set in this property. For example, even if you have chosen Green for your connection, its color will change to orange when the connection is set on hold. When the connection is released, the chosen color (green) will be restored.
Hold jobs	While set to yes, jobs are not allowed to move through the connection; this is mostly used to temporarily hold jobs (perhaps because there is a problem with a process downstream) The value of this property can be modified while the flow is active (through a canvas context menu item); see putting connections on hold.
Include these jobs	Jobs that match the specified filter are moved through this connection, unless they are explicitly excluded (see next property); refer to *Specifying file filters* on page 194 for more details. **Note:** If you're using a **script expression**, remember that the script expression should return a boolean value (**true or false**), instead of a string. For example, you could create a script expression to include jobs smaller than 1 MB. If the checked job < 1 MB (= matches), the result of the script is "true" and the job is included.
Exclude these jobs	Jobs that match the specified filter are never moved through this connection; refer to *Specifying file filters* on page 194 for more details. **Note:** If you're using a **script expression**, remember that the script expression should return a boolean value (**true or false**), instead of a string. For example, you could create a script expression to exclude jobs smaller than 1 MB. If the checked job < 1 MB (= matches), the result of the script is "true" and the job is excluded.
Include these folders	Subfolders that match the specified filter are included for this connection; injected by producers that retrieve jobs from an outside folder hierarchy, such as FTP receive; refer to *Specifying file filters* on page 194 for more details. **Note:** If you're using a **script expression**, remember that the script expression should return a boolean value (**true or false**), instead of a string. For example, you could create a script expression to include folders smaller than 1 MB. If the checked folder < 1 MB (= matches), the result of the script is "true" and the folder is included.
Exclude these folders	Subfolders that match the specified filter are ignored for this connection; injected by producers that retrieve jobs from an outside folder hierarchy, such as FTP receive; refer to *Specifying file filters* on page 194 for more details.

Property	Description
	Note: If you're using a **script expression**, remember that the script expression should return a boolean value (**true or false**), instead of a string. For example, you could create a script expression to exclude folders smaller than 1 MB. If the checked job < 1 MB (= matches), the result of the script is "true" and the folder is excluded.
Carry this type of jobs	Determines the type of files carried by this connection: • Data: data file (regular output) • Log: log file (reports) • Data with log: data file with the corresponding log file associated to it as a metadata dataset; this is equivalent to picking up the log file with one of the existing pickup tools; see *Picking up metadata* on page 388. The data model that is used is determined by the element of the outgoing traffic light connection.
Dataset name	If the previous property is set to "Data with log", this property defines the name of the metadata dataset containing the log file attached to the data file; see *Picking up metadata* on page 388
Success out	If set to yes, a file will move along the connection if the originating process did not log any warnings or errors
Warning out	If set to yes, a file will move along the connection if the originating process logged at least one warning and no errors
Error out	If set to yes, a file will move along the connection if the originating process logged at least one error

Folder

Folder is a central flow element that serves as an intermediary for moving jobs between other flow elements. Each folder flow element instance represents a backing folder on disk that can hold jobs before, after or in between processing steps. The contents of the backing folder can also be accessed by external processes or by users. For example, a folder may be used to submit jobs into a flow or to retrieve the results of a flow.

Keywords

If you enter one of the following keywords in the Search field at the top of the Flow elements pane, the **Folder** element will be shown in the list:

- backing
- input
- output
- hot

- watched

Processing jobs

Any subfolders placed into a folder are treated as a job folder; that is, the subfolder and its contents are moved along as a single entity.

If a folder has no outgoing connections (that is, it is a "dead-end" folder), a job placed in the folder will stay there until it is removed by some external process that is not under the control of Switch.

If a folder has at least one outgoing connection, a job placed in the folder is removed after it was processed by all outgoing connections. If none of the filters on the outgoing connection(s) match, the job is moved to the problem jobs folder. Refer to *Handling problem jobs* on page 245 and error handling preferences for more details.

User-managed versus auto-managed folders

The backing folder (on disk) for a folder on the canvas can be auto-managed (default) or user-managed. The difference is explained in the following table:

	Auto-managed	**User-managed**
Location on disk	Special area managed by Switch, i.e. "the application data root" (see *Switch preferences: Application data* on page 47)	Location selected by the user (through the Path property)
Editable by the user?	No, users should not manipulate auto-managed folders! **Note:** The **Open in Explorer/Finder** option in the context menu is only available if you hold down Shift while right-clicking the folder on the canvas. This is an advanced preference that only should be used for debugging purposes!	Yes, through the **Open in Explorer/Finder** option in the context menu.
Scanned?	No need to scan, as the contents is known and managed by Switch.	Yes, at regular intervals as defined in the Preferences (See *Switch preferences: Processing* on page 41)
Lock icon?	Yes 	No
Remarks	External processes (not under control of Switch) and users should not refer to auto-managed folders since they can change the name and/or location under the control of Switch!	It is not allowed to point user folders to auto-managed folders (e.g. containing the result of another flow). As auto-managed folders are not scanned, this will not work.

For more information on how to create an auto-managed or user-managed folder (or to switch from one type to the other), refer to *Using Folder elements in Switch* on page 105.

Properties

Note that certain properties are present only for folders that have at least one outgoing connection, and certain other properties are present only for folders that have no outgoing connections ("dead-end" folders)

Property	Description
Element type	The flow element type: Folder. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the folder displayed in the canvas. A newly created folder receives a default name ("Folder 1", "Folder 2", ...), which you should replace with a meaningful name. **Note:** If you set up a user-managed backing folder while a "Folder <number>" name is still in place, the flow element automatically adopts the name of the backing folder. For example, if you drag "D:\data\input" onto the canvas, the folder will be named "input".
Description	A description of the folder displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the folder.
Path	The path of the folder's backing folder on disk, or **auto-managed**. *The following options in italics relate to the frequency of which the folders are scanned for new files. As auto-managed folders are not scanned, these options are only available for user-managed folders.*
Leave originals in place	If set to **Yes**, incoming jobs are left untouched in the folder. Switch never writes to the folder, so read-only access rights suffice. For more details, refer to *Leaving originals in place* on page 183. If set to **No** (default), incoming jobs are moved out of the folder; Switch needs full access rights to rename, create and remove files and folders. *Ignore updates (only available if **Leave originals in place** is set to **Yes**)* If set to **Yes**, a job will only be processed once, regardless of any changes to the file size or modification date. This can be used for workflows where the input job is replaced by the processing result, to avoid triggering endless loops. If set to **No**, the job will be reprocessed when its file size or modification date is different. This allows processing jobs which have the same file name as previously submitted jobs.
Minimum file size (KB)	Used to set the minimum file size limit (in KB) before Switch picks up the files or folders. To set no limits, leave it empty.
Scan every (seconds)	The frequency with which this folder is scanned for newly arrived jobs. If set to **Default** or zero, the global user preference is used instead; see *Switch preferences: Processing* on page 41.

Property	Description
Time-of-day window	If set to **Yes**, the folder detects (and moves) newly arrived jobs only during a certain time of the day (specified in the subordinate properties). *Allow from (hh:mm)* and *Allow to (hh:mm)* The time-of-day window during which to detect jobs. The values are structured as "hh:mm" (hours, minutes) indicating a time of day on a 24 hour clock; an empty value means midnight; two identical values mean the folder always detects jobs.
Day-of-week window	If set to **Yes**, the folder detects (and moves) newly arrived jobs only during certain days of the week (specified in the subordinate properties). *Allow from* and *Allow to* The days of the week (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday) during which to detect jobs. Two identical values mean the folder only detects jobs on that specific day.
Day-of-month window	If set to **Yes**, the folder detects (and moves) newly arrived jobs only during a certain day of the month (specified in the subordinate properties). *Day* The day in the month during which to detect jobs, as a number in the range [1 . .31]; the default value of one means the first or the last day of the month (depending on the following property). *Relative to* Determines whether the day of the month is relative to "Start of the month" or "End of the month".
Color	The color of the folder displayed in the canvas. The default is Yellow, but you can select another color from the list (Orange, Green, Cyan, Blue, Magenta). Alternatively, you can change the color via the context menu, by selecting the **Choose color** option. Refer to *Adjusting the colors of folders and connections* on page 179.
Attach hierarchy info	If set to **Yes**, the folder's name is added to each job's hierarchy location path as the job passes through the folder; see *Using hierarchy info* on page 184. *Add name at the top* If set to **Yes**, the folder name is added at the top of the hierarchy location path; otherwise it is added at the bottom.
Attach email addresses	The specified email addresses are added to each job's email info as the job passes through the folder; see *Using email info in Switch* on page 186.
Attach email body text	The specified email body text is added to each job's email info as the job passes through the folder; see *Using email info in Switch* on page 186.
Attach job state	If the specified string is non-empty, the job state of each job is set to the string as soon as the job arrives in the folder; the statistics view can display

Property	Description
	the average time spent for each job state. For more information, see *Viewing statistics* on page 243.
Flow stage	**Note:** This property has been moved to the Refresh job info flow element. It's no longer available as a property of the Folder flow element, except in existing flows (set up in Switch 2021 Fall or earlier) where its value is not empty, for backward compatibility reasons. *About flow stages:* Flow stages allow you to check where jobs are in a flow. The flow stage of a job can be viewed on the job boards on the Switch Portal. Refer to *Working with flow stages* on page 110.
Set job priority	• If set to **None** (default), nothing happens. • If set to any other value (including zero), the job priority of each job is set to this new value as soon as the job arrives in the folder. **Note:** The specified value is converted to a number and rounded to the nearest integer; text strings that do not represent a number are converted to zero. To specify a negative value, use the **Single-line text with variables** property editor or provide a script expression.
Safe move	This option is only available for output folders and relevant for transferring job files between folders on different volumes (drives/partitions). If set to **Yes** (default value), Switch will first copy the job to a temporary file before deleting the job from the original location. This is useful to avoid that files get lost in case of network problems. If set to **No**, Switch immediately moves the job files to the output folder. This may be necessary in case of network permission issues.
Strip unique name	If set to **Yes**, the unique name prefix added to the filename by Switch is removed before placing the job in the folder. the default is to strip the prefixes from jobs deposited in a dead-end folder - leaving the prefixes in place avoids overwriting a previously deposited job with the same name. *Duplicates* *Determines what happens when **Strip unique name** is set to **Yes** and a job arrives with the same name as a job already residing in the folder:* • ***Overwrite**: replace the existing job with the new one – this is the default behavior.* • ***Keep unique name**: preserve the new job's unique name prefix, leaving the existing job untouched (without unique name prefix).* • ***Add version number**: add an incrementing version number at the end of the filename body for the new job ("2", "3", ... "9", "10", "11"), leaving the existing job untouched. For example, "job.pdf" will become "job1.pdf"," job2.pdf", ...*

Property	Description
	*Optionally, you can add a **separator** between the filename body and the version number, for example an underscore. In that case, e.g. "job.pdf" will become "job_1.pdf"," job_2.pdf", ... By default, the **Separator** property is empty.* *You can also determine the **width** of the version number, i.e. the number of digits used for the version number. For example, if Width is set to "5", the version number will consist out of 5 digits (e.g. job_00001.pdf), meaning that leading zeros will be added as required.* • **Fail**: move the new job to the problem jobs folder, leaving the existing job untouched.
Ignore these subfolders	All subfolders that match the specified folder filter are ignored for the purpose of counting the number of jobs residing in this folder. This property appears only when the folder's outgoing connection leads to a generic application; if that application stores information in subfolders inside its input folder, this property allows Switch to ignore these folders and their contents.

Set job private data (property not present in dead end folders)	Allows you to attach private data to the jobs arriving in the folder.
	
	Format: *key=value* (one key per line)
	
	Example:
	
	`Reference=[Job.NameProper]`
	`Customer=[Email.From]`
	
	Note: The first instance of the equals sign ('=') separates the key from its value. As a consequence,'=' is not allowed in the key, but it can be used in the value of the key if required.

Show in statistics	Set to **Yes**, if the average time that jobs reside in this folder should be calculated and displayed in the Statistics pane. For more information, see *Viewing statistics* on page 243.

Using Folder elements in Switch

To create a Folder element in Switch

1. Do one of the following:
   - To create an **auto-managed** folder, drag the Folder icon from the Elements pane onto the canvas.

     If you check the Path in the Folder properties, you will see that the value "auto-managed" is filled in automatically.
   - To create a **user-managed** folder, drag a folder from your system onto the canvas.

     If you check the Path in the Folder properties, you will see that the path to the folder is filled in automatically.

Note: Submit hierarchy folders are always user-managed, as the hierarchy of the folders must be determined by the user.

2. To convert a folder from auto-managed to user-managed as required, do one of the following:
   1. Choose a folder path for the Folder's Path property
   2. Drag a folder from the Folders pane onto the folder in the canvas.
   3. Drag a folder from any location onto the Folder element on the canvas.
3. To convert a folder from user-managed to auto-managed, choose **auto-managed** for the Folder's Path property.

Problem jobs

Problem jobs is a special flow element that represents the Switch problem jobs folder. When a Switch process fails to handle a particular job, the "problem job" is moved to the problem jobs folder.

Refer to *Handling problem jobs* on page 245 for more information.

Keywords

Keywords can be used with the search function above the Elements pane.

The keywords for the **Problem jobs** element are:

- error
- failure

Connection

The problem jobs tool can be placed in a flow on its own, without any connections. In that case it serves simply as an easy way to access the problem jobs from the designer user interface (for example, when you select the problem jobs tool, the Files pane shows its contents). See *Handling problem jobs* on page 245 for more information.

If the problem jobs tool has an outgoing connection, it acts as a producer picking up any problem jobs that arrive and injecting them into the flow (again). This allows providing automated error handling. You can add a filter to the outgoing connection to select the jobs you want to handle, leaving the others in the problem jobs folder. In any case be careful to avoid endless loops of jobs that fail over and over again.

The problem jobs tool supports only one outgoing connection. To overcome this limitation, connect it to a regular folder from which you can originate as many connections as you like.

Properties

Property	Description
Element type	The flow element type: Problem jobs. This property is useful to identify renamed flow elements. It cannot be changed.

Property	Description
Name	The name of the flow element displayed in the canvas
Description	A description of the problem jobs folder displayed in the canvas, for example indicating if the flow contains all problem jobs of all flows or only the current flow's problem jobs (see next property). The description is also shown in the tooltip that appears when moving your cursor over the connection.
Handle problem jobs for	Determines the "scope" of this problem jobs tool: • This flow only: acts on problem jobs generated just by the flow containing this flow element • All flows: acts on all problem jobs generated in this copy of Switch
Send alerts to	*This property is only available if **Handle problem jobs for** is set to **This flow only**.* Determines who will receive alert messages if a job arrives in a Problem jobs folder. **Note:** Alerts are only sent if enabled in the *Problem alerts preference*, i.e. if the *Problem job arrives* preference is set to Yes! Otherwise, no alerts are sent! Options are: • *None*: No emails are sent for this specific flow. • *Default*: Alerts are sent to the email addresses entered in the *Send problem alerts to* preference. • *One or more email addresses*, separated by a colon (if entered via *Inline Value*) or a newline (if entered via the *multi-line text* editor): alerts will be sent to all entered email addresses.
Retry count	*This property is only available if **Send alerts to** is **NOT** set to **Default**.* If sending an alert fails, this property determines how many times Switch will retry sending it.
Retry delay (in minutes)	*This property is only available if **Send alerts to** is **NOT** set to **Default**.* If sending an alert fails, this property determines after how much time Switch will try again.

Multiple problem jobs tools

A flow can have at most one problem jobs element; including more than one will keep the flow from activating.

In addition, at any one time, the active flows in Switch can have at most one problem jobs element with a scope set to "All flows".

Submit hierarchy

Submit hierarchy is a default Switch app that enables you to submit job files and job folders that are stored in a folder structure with different levels. The original location of each of the files is remembered.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Archive hierarchy

Archive hierarchy is a default Switch app that creates a nested hierarchy with one or more levels of subfolders. It is used to archive jobs into a structured hierarchy at the end of a flow.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Set hierarchy path

Set hierarchy path is a default Switch app that replaces or augments the hierarchy path in the internal job ticket by constructing a fresh path from the segments specified as its properties. There are five segment properties and thus a maximum of five path segments can be specified (an empty value means "unused").

Since the segment properties support variables (and script expressions), this tool is a great help when building custom archive hierarchies, for example organizing jobs in a folder hierarchy based on today's year, month, and day.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Job dismantler

Job dismantler is a default Switch app that disassembles a job folder (which may have one or more levels of subfolders) into separate files.

This tool is often used to dismantle job folders that really do not represent a single job. This happens for example when a user submits a folder into the flow that contains a set of otherwise unrelated files that need to be processed individually rather than as a single entity.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Ungroup job

Ungroup job is a default Switch app that, in combination with assemble job, provides a way to keep track of files that belong together while they are being processed separately.

Ungroup job injects all files from a job folder into the flow as separate jobs. After these files have been processed through the flow (and possibly were renamed), assemble job can reassemble them into a new job folder with a structure similar to the original one, with provisions for injecting additional files and for dealing with incomplete jobs or orphaned files.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Split multi-job

Related Adobe InDesign or QuarkXPress jobs are often stored in a single job folder with multiple "main" files at the top level and shared resources (such as images and fonts) in subfolders. The Switch apps for these applications however expect a single main file in each job folder, so these "multi-job folders" cannot be processed without change.

The Split multi-job app splits a multi-job folder in separate job folders, one for each main file. Each resulting job folder contains a single main file, and a full copy of all resources (in fact, everything from the original job folder except for the other main files).

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Assemble job

Assemble job is a default Switch app that offers various schemes for assembling a job folder from individual job files.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Generic application

Generic application is a default Switch app that functions as a stand-in for a third-party hot folder application.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Execute command

Execute command is a default Switch app that executes a system command or a console application with the specified command-line arguments and output mechanisms.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.1.2.2. Tools

Refresh job info

Refresh job info is a processor that allows you to control the generation of thumbnails and job info shown in the Check jobs view, on the job boards and in the job info dialog on the Switch Web Portal.

Before Switch 2021 Fall, the job info and the thumbnails shown in the Check jobs view were generated each time a new job was created from a job that came in through a Submit point or Checkpoint, which in some cases could lead to a big performance hit. Thanks to the Refresh job info element flow designers and Switch administrators can now force Switch to only generate the thumbnails and job info (including custom job info) where they need it.

In Switch 2022 Spring, extra functionality was added: you can now set, change and remove flow stages and create and/or remove custom fields through this flow element.

Note: Custom job info fields are not inherited for child jobs and are cleared in folders that set the stage.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Working with flow stages

What are flow stages?

"Flow stage" is an optional property of certain flow elements* that indicates a logical stage in a flow.

For example, if in the first part of the flow files are preflighted, in the second part they are prepared for large format print and in the last part they are moved to the appropriate folder on the server, you may split up your flow in three stages: Preflight, Prepare for print, and Distribute (regardless of the number of folders in your flow).

* *Currently Refresh job info, Submit points and Checkpoints have this property.*

For which flow elements a flow stage should or can be defined?

A job gets associated with a flow stage as soon as it arrives in the flow element. This means that flow elements that mark the beginning of a stage should have a flow stage defined.

If a job arrives in a flow element that does not have a flow stage, the flow stage linked to the job simply does not change.

If a job is moved to the Problem jobs folder, it gets the default "Problem jobs" stage assigned. This stage is kept until the job is retried and is injected in the flow again; from that moment onwards the job gets the previous job stage assigned (= the stage it should have if not moved to the Problem jobs folder).

Note: Stages do not have to be unique, not on flow-level, not on Switch-level.

Where can you see the flow stage of a job?

The flow stage associated with a job is shown on the Switch Web Portal, on the job boards (in the properties of the job). See *Job fields* on page 322 (flow stage = Stage).

What are flow stages typically used for ?

The flow stage of a job provides information about the status of the job; it indicates in what logical stage of the flow a job currently is. It can be interesting for an operator to know which jobs are in a particular stage, for example which jobs are problem jobs (= have the 'problem jobs' status), which jobs are finished, etc.

For a quick overview of the jobs and the flow stage they are in, you can create virtual job boards on the Switch Web Portal. Such a job board could for example only display jobs with a particular flow stage.

For more information, refer to *Finding Switch jobs through the Switch Web Portal* on page 272

Sort by preflight state

Sort by preflight state is a default Switch app that sorts incoming Enfocus Certified PDF files across its outgoing connections depending on their preflight state: Error, Success, Warning or Sign-off.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Archive

Archive is a default Switch app that places the incoming file or a job folder into a compressed ZIP archive (ZIP64-compliant). All files in a job folder are placed in a single archive. The archive is named as the incoming file or job folder with a ".zip" extension.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Unarchive

Unarchive is a default Switch app that extracts files from an archive in ZIP or RAR format (ZIP64-compliant).

Any files that are not recognized as an archive are passed through the Problem jobs folder.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Split PDF

Split PDF is a default Switch app that produces a job folder containing a separate PDF file for each page or range of pages in the incoming PDF file. The app does not require Adobe Acrobat or any other external application to be installed.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Merge PDF

Merge PDF is a default Switch app that produces a single PDF file containing all of the pages provided by the PDF files in the incoming **job folder**. The app does not require Adobe Acrobat or any other external application to be installed.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Hold job

Hold job is a default Switch app that offers various time-based schemes for holding and releasing jobs and for distributing jobs across multiple outgoing connections.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Inject job

Inject job is a default Switch app that injects a job into the flow when triggered by an incoming job or by various time-based events. The injected job can be selected dynamically from a repository of jobs, it can be a fixed job, or it can be the incoming job itself.

The properties for each outgoing connection specify what needs to happen for that connection (independently of other connections). For example, to inject a job from a repository based on the metadata of some incoming job while keeping the original job around, setup one connection to receive the incoming job, and a second connection to receive the job from the repository.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Rename job

Rename job is a processor that provides various mechanisms for renaming the incoming job and/or the files inside a job folder.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

File type

File type is a default Switch app that sets a filename extension for a file and if applicable its Mac file type and creator type to a specified type.

Job folders are moved along without change.

See also *About Mac file types* on page 39 and *Switch preferences: Mac file types* on page 39.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Sort job

Sort job is a default Switch app that offers various schemes for sorting incoming jobs across its outgoing connections depending on metadata associated with the jobs.

For each job the tool determines the value of the specified metadata field and compares this value with the names of the outgoing connections. If a match is found, the job is moved along that

connection. Otherwise the job is moved along the outgoing data error connection, or if there is no such connection, it is moved to the problem jobs folder.

Note: This flow element has become redundant and should only be used for maintenance reasons. Sorting jobs can be done (much faster and easier) by *defining a condition with variables* on a Connection.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Log job info

Log job info is a default Switch app that issues a (warning, debug or info) message to the Switch execution log containing the value of the specified metadata field. It is intended mainly for use while testing a flow.

For example, you could issue a warning message whenever a file arrives in a particular flow element, or an info message that displays the size, the priority, the submission date, ... of each job moving along the flow, ...

For further analysis of your messages, you could use a Switch app like *Switch Logger* or *DataLogger*.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Sort files in job

Sort files in job is a default Switch app that provides a mechanism for "sorting" the files inside a job *folder*, in other words to perform the following two steps:

1. Determine the desired sorting order of the files based on their current filename.
2. Rename the files so that they alphabetically collate in the desired sorting order.

This is useful to prepare the job for tools that process files in alphabetical order, for example merging pages into a single document.

Sort files in job ignores any nested subfolders and their contents (that is, it works only on the files immediately inside the job folder). Individual job files are passed along unchanged.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

XSLT transform

XSLT transform is a default Switch app that performs an XSLT 1.0 transformation on the incoming XML file and produces the resulting XML, HTML or text file.

Refer to the XSLT 1.0 specification and to widely available literature about XSLT for more information.

See also *External metadata* on page 388.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Recycle bin

Recycle bin is a default Switch app that deletes incoming jobs either immediately or depending on the jobs size, age etc...

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.1.2.3. Scripting

Script element

Script is a default Switch flow element that executes a script program specified by the user to process, produce or consume jobs.

A script flow element can be a processor, producer or consumer depending on the specifications in the attached script declaration. In addition, the script declaration may inject extra properties into the script element and into its outgoing connections. These extra properties serve as arguments to the script program.

For more information on scripting in Switch, refer to the *Scripting documentation on the Enfocus website*.

Keywords

Keywords can be used with the search function above the Flow elements pane.

The keywords for the **Script element** are:

- package
- program
- custom
- plug-in
- plugin
- visual basic
- javascript

Script folders and script packages

A script can be represented by a script folder or a script package.

- A **script folder** is a folder containing a number of encrypted files that describe the different parts of a Switch script written in Node.js. For more information, refer to the *Switch Scripting Guide* on the Enfocus website.
- A **script package** is an archive file (with filename extension "sscript") that contains all information about a script. It includes a script declaration, a script program, and possibly an icon to be displayed in the Switch flow designer instead of the standard script element icon. A script package can be exchanged between users as a single entity.

To assign a new script folder or script package to a script element, right-click on the script element in the canvas and select the "Choose script" menu item, or edit the "Script path" property in the properties editor.

To edit the script folder selected in a script element, right-click on the script element in the canvas and select the "Edit script code" menu item. The script package will be opened in the default application (e.g. VSCode) for viewing or editing.

To edit the script package selected in a script element, right-click on the script element in the canvas and select the "Edit in Scripter" menu item. The script package will be opened in SwitchScripter for viewing or editing.

It's also possible to **create a new script folder** from within Switch Designer. To do so, right-click on the script element in the canvas and select the "New script folder" menu item. In the dialog that appears, you have to enter the script path and the script ID and indicate whether or not you want to use TypeScript. The main.js or the main.ts file is opened in the default application (that is, the application associated with the file extension; if none, a dialog will open allowing you to select the preferred application).

Connections

The type and maximum number of outgoing connections for a script element are determined by the script declaration attached to the script element. Furthermore, the script declaration may cause the script element to inject extra properties into its outgoing connections.

Properties

Property	Description
Element type	The flow element type: Script element. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the flow element displayed in the canvas
Description	A description of the flow element displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the flow element
Enable debug mode	*This property is only available if the script package includes a Node.js.script. For more information, refer to the Scripting Guide available on our website.* If set to Yes, it is possible to debug the included Node.js script using Chrome or Visual Studio Code editor. **Note:** The script execution mode is set to 'Serialized' automatically, once the debug mode is enabled. This prevents the flow element instance that uses the script

Property	Description
	from executing entry points concurrently. The debugging can be enabled for only one Node.js script at a time. The flow designer must ensure that different Script elements do not execute the entry points concurrently.
Port	*This property is only available if Enable debug mode is set to Yes.* Defines the port number a debugger can use to connect to a Node.js process. The default port is 9229.
Debug entry points	*This property is only available if Enable debug mode is set to Yes.* Defines the list of script entry points to debug. By default, all three possible entry points (*jobArrived*, *timerFired* and *httpRequestTriggeredAsync*) can be selected (regardless of whether or not they are used in the script).
Script path	The Switch script to be attached to this script element
<Injected>	The script declaration may define extra properties to be injected into the script element as arguments for the script program
Log debug messages	This option is only available if **Show advanced element properties** is enabled in the properties of the flow! This option allows you to log debug messages for a particular Node.js script, without having to restart Switch to enable debug messages for all flow elements (through the *Switch Logging preferences*). **Note:** This option doesn't switch on debug logging for legacy script expressions used to define property values. Options are: • Default: Debug messages for this particular script element are only logged if **Log debug messages** is enabled in the Switch preferences. • Yes: Debug messages for this particular script element are logged.

5.1.2.4. Communication

HTTP request

HTTP request is a default Switch app that for each incoming job executes an HTTP or HTTPS request. Thus the incoming job is a request trigger and it can be used to define the request specification: URL, authentication data, request parameters, file to upload, etc. The protocol type (HTTP or HTTPS) is automatically detected from the URL: if the URL starts with “https://”, HTTPS is used, otherwise HTTP is used.

The server responds to the request by sending something back: an HTML source, JSON or XML data, or a file that is downloaded. The tool provides properties to manipulate this server response. The server response is always saved as a file and the tool can inject this file into the flow as a new job, attach it as metadata dataset to the incoming job or assemble it into a job folder together with the incoming job.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Webhook

Webhook is a default Switch app that subscribes to specific incoming HTTP requests and injects the received request content as a new job in the flow. The job file name is 'payload' and the file extension is automatically generated from the 'Content-Type' header.

You can add this tool to your flow to accept notifications via HTTP/HTTPS protocol.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

FTP receive

FTP receive is a default Switch app that downloads jobs from an FTP site and injects them into the flow. The syntax is similar to the syntax of a Submit hierarchy.

If your system environment requires FTP connections to pass through a proxy server, you need to set up the FTP proxy preferences to provide Switch with the configuration details of the proxy server. See *Switch preferences: FTP proxy* on page 38.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

FTP send

FTP send is a default Switch app that uploads any incoming jobs to an FTP site.

If your system environment requires FTP connections to pass through a proxy server, you need to set up the FTP proxy preferences to provide Switch with the configuration details of the proxy server. See *Switch preferences: FTP proxy* on page 38.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Mail receive

Mail receive is a default Switch app that retrieves email messages from a POP3 and IMAP email server (so that users can access email accounts like Gmail, Hotmail etc) and injects any file attachments into the flow. Please note that Switch only accepts MIME encoded attachments.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Mail send

Mail send is a default Switch app (although conceptually it is a consumer) that sends an e-mail message to an SMTP e-mail relay server for each incoming job.

Some properties for this tool (such as the SMTP server details) must be set up in the global user preferences, since these values are the same for all outgoing email. For more information, refer to *Switch preferences: Mail send* on page 36.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Submit point

Submit point is a default Switch app that serves to submit jobs into a flow through the Switch Web Portal by a user with the appropriate access rights. See also *Designing flows for use with the Switch Web Portal* on page 306.

The backing folder for a Submit point is always auto-managed.

Note: You can only use the Submit point flow element, if you have licensed the SwitchClient and/or the Switch Web Services module.

Keywords

If you enter one of the following keywords in the Search field at the top of the Flow elements pane, the **Submit point** element will be shown in the list:

- Internet
- web
- network
- communication
- transfer
- input

- client
- user
- upload
- metadata
- workstation

Properties

Property	Description
Element type	The flow element type: Submit point. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the flow element displayed in the canvas. By default it is displayed as "Submit point".
Description	A description of the flow element displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the flow element. **Note:** The description entered here is not displayed on the Web Portal (or client application): if you want a description to be shown on the Web Portal (or client application), use the 'Display description' field below.
Display name	The name to be displayed on the Switch Web Portal (or a different client application). If set to **Default**, the name entered in the Name field is displayed.
Display description	The description to be displayed on the Switch Web Portal (or a different client application). If this field is empty, the description will be: "No description available". You can enter the description in (plain) multi-line text or in HTML format, so that it will be rendered as HTML on the Switch Web Portal. If defined as HTML, you can add images, links,.... For guidelines and an example, refer to *Display description defined as HTML* (below this table).
Thumbnail	The image to be used as thumbnail for this Submit point on the Switch Web Portal (in the top left corner of the dialog). Allowed image types are PNG, BMP and JPEG.
Flow stage	The stage assigned to the Submit point. This allows you to check where jobs are in a flow. The flow stage of a job can be viewed on the job boards on the Switch Portal. Refer to *Working with flow stages* on page 110.
Attach hierarchy info	If set to **Yes**, part of a job's submit information (as configured with the next two properties) is added to its hierarchy location path as it is injected in the flow; see *Using hierarchy info* on page 184 for more details.

Property	Description
Include Submit point name	If set to **Yes**, the name of this flow element is included at the top of the remembered location path.
Include user name	If set to **Yes**, the name of the user submitting the job is included in the remembered location path.
Attach user email address	If set to **Yes**, the submitting user's e-mail address is added to each job's email info as the job is injected in the flow; see *Using email info in Switch* on page 186.
Attach extra email info	E-mail addresses and body text specified with the editor for this property are added to each job's email info as the job is injected in the flow; the information added can vary depending on the user submitting the job; see *Using email info in Switch* on page 186.
Submit	Choices are: • **Job and metadata**: The Submit point accepts both job files and metadata associated with the job. This option triggers a number of subordinate properties (see further). • **Job only**: The Submit point only accepts job files. Metadata cannot be supplied. • **Metadata only**: The Submit point only accepts metadata. Note that in this case, a dummy job (*.dummy) moves through the Switch flow. This option triggers a number of subordinate properties (see further). • **Trigger**: The Submit point triggers an action. The Submit point acts like a button: when a user clicks it, a dummy job (*.dummy) moves through the Switch flow and (depending on the flow) this job can start a process, call a database, ...
	The following properties are only available if metadata submission is enabled:
Metadata fields	Definitions for the metadata fields to be entered; see *Defining metadata fields* on page 396 for more information.
Dataset name	A name for the set of metadata entered here; see *Picking up metadata* on page 388 for more information.
Invalidate metadata cache on user login	Determines whether or not the dynamic metadata cache will be cleared when a user logs in. This property only applies to the user cache; the common cache will not be cleared. For more information, refer to the paragraph on 'Invalidating the metadata cache' below this table.
Invalidate metadata cache condition	Determines the condition on which the metadata cache will be cleared, for example after a certain time. For more information,

Property	Description
	refer to the paragraph on 'Invalidating the metadata cache' below this table.
Accept these jobs	*This property is only available if "Submit" is set to "Job and metadata" or "Job only".* Determines which jobs are accepted. Options: • Files and folders • Files only • Folders only In case of the two first options, an extra option appears, which allows you to determine which file types are allowed: • *File types*: Enter a list of allowed file types, one per line, for example *pdf* to allow PDF files. If you leave this field empty, all file types are allowed.
Requires Switch Helper	*This property is only available if "Submit" is set to "Job and metadata" or "Job only".* If set to **Yes**, extra metadata, such as job origin* and file creation date** will be attached to the submitted jobs. This requires Switch Helper, so the users of the Portal or the client application must have installed Switch Helper. Without Switch Helper, they will not be able to submit jobs. Note that Submit points with this option enabled will not accept jobs via 'drag-and-drop'; users will have to upload them by clicking the Upload file or Upload folder button. Switch Helper is *available on the Enfocus website*. * Without Switch Helper, Switch doesn't know the location of the submitted job, hence the value of job origin will be the Submit point's backing folder. If Switch Helper is enabled, the value of job origin will be the folder on the user's computer. ** Without Switch Helper, the creation date is (incorrectly) replaced with the modification date. For more information about job origin and the file creation date, refer to *Job group* on page 371.

Picking up client fields as metadata

If a Submit point is configured to accept metadata (*Submit* set to *Job and metadata* or *Metadata only*), the Submit point:

- Creates a metadata dataset containing the contents of the metadata fields entered by the user.
- Associates this dataset with the job ticket for the submitted job under the dataset name specified in the "Dataset name" property.

Refer to *Client fields schema* on page 401 for details on the format of the generated metadata.

Invalidating the metadata cache

In case of dynamic values, Switch can store the metadata in the user cache ("cache per user") or in the common cache ("cache for all users"), so the values do not have to be recalculated each time metadata is requested. For more information, refer to the "Cache dynamic values" property in the topic on *Defining metadata fields* on page 396.

Note that by default, the cache is not cleared unless you explicitly enable "Invalidate metadata cache on user login" or define a condition for "Invalidate metadata condition".

Display description defined as HTML

Guidelines

If defined as HTML, you can add images, links and other elements.

You can also use CSS styles, but make sure to only apply styles to unique IDs or classes for a specific Submit point. See the table below.

WRONG	RIGHT

`body{`
`…`
`}`
`div{`
`…`
`}`
`span{`
`…`
`}`
`h1{`
`…`
`}`
`…`
	`#sp1{`
	`…`
	`}`
	`#sp1 > div{`
	`…`
	`}`
	`.sp1{`
	`…`
	`}`
	`body .sp3 h1{`
	`…`
	`}`
	`…`

Currently the following tags are **not supported**:

- <script>
- <iframe>
- <audio>
- <video>

<html> and <body> tags can be used but are **not recommended**.

Example

HTML code entered in the Display description property

```
<style>
#container_sp2 {
background: #03e0da;
color: #D228d4;
}
#container_wrapper {
padding:10px;
}
</style>
<div id="container_sp2">
 <div id='container_wrapper'>
  <p>Requirements:</p>
         <nav>
           <ul>
              <li>PDF or TIFF format</li>
              <li>Resolution 600 dpi</li>
              <li>3mm bleed</li>
```

```
                <li>CMYK or greyscale</li>
                </ul>
            More info on <a href="https://www.enfocus.com" target="_blank"
 title="Enfocus"/>our website</a>
<br><br>
<img alt="Enfocus" height="20px" src="https://www.enfocus.com/manuals/_elearning/
Enfocus-logo-black-horizontal_149x27.png" width="auto" />
             </nav>
 </div>
```

How it looks on the Web Portal

Checkpoint

Checkpoint is a default Switch flow element that holds jobs for human intervention. A user with the appropriate access rights can review jobs in a Checkpoint through the Switch Web Portal and redirect them along any of the Checkpoint's outgoing connections.

The name shown to the user for each outgoing connection is the name of the connection, or if it is empty, the name of the target folder.

The backing folder for a Checkpoint is always auto-managed.

See also *Designing flows for use with the Switch Web Portal* on page 306.

Note: You can only use the Checkpoint flow element, if you have licensed the SwitchClient and/or the Switch Web Services module.

Keywords

If you enter one of the following keywords in the Search field at the top of the Flow elements pane, the **Checkpoint** element will be shown in the list:

- Internet
- web
- network
- communication
- transfer
- interact
- client
- user
- route
- approve
- metadata

Connections

Checkpoint allows any number of outgoing move connections.

Properties

Property	Description
Element type	The flow element type: Checkpoint. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the flow element displayed in the canvas. Default value is "Checkpoint".
Description	A description of the flow element displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the flow element.
Flow stage	The stage assigned to the Checkpoint. This allows you to check where jobs are in a flow. The flow stage of a job can be viewed on the job boards on the Switch Portal. Refer to *Working with flow stages* on page 110.
Allow multiple outputs	If set to **Yes**, the user can send copies of a job along more than one outgoing connection; otherwise the job is sent along exactly one of the outgoing connections.
Enable report viewing	If set to **Yes**, the user gets extra buttons to view or save a report obtained by retrieving the metadata dataset named in the property described below.

Property	Description
	This feature is most often used with datasets picked up through a traffic light connection by setting "Carry this type of files" to "Data with log".
Report dataset name	The metadata dataset name for the report to be viewed by the client.
Allow replacing or editing job	If set to **Yes**, an extra button is available allowing the user to edit and/or replace jobs with a new version (presumably edited on the client user's computer) before moving it out of the Checkpoint; the original job is lost, but its metadata is preserved.
Enter and display metadata	If set to **Yes**, you can specify or display optional or required metadata fields a user needs to review, update or fill in before allowing the job to go through this Checkpoint.
Metadata fields	Specify the metadata fields a user needs to review, update or fill in. Click this ... button to invoke the **Define metadata fields** dialog box where you can specify the metadata fields. For a full description, refer to *Defining metadata fields* on page 396.
Dataset name	The name of the dataset in which the specified metadata fields will be stored is entered here; see *Picking up metadata* on page 388 for more information.
Invalidate metadata cache on user login	Determines whether or not the dynamic metadata cache will be cleared when a user logs in. This property only applies to the user cache; the common cache will not be cleared.*
Attach user email address	If set to **Yes**, the handling user's e-mail address is added to each job's e-mail info as the job is moved along the flow. In addition, the Checkpoint updates the "user name" attribute in the internal job ticket as follows: • If this property is set to **Yes**, the "user name" attribute is always set to the name of the Checkpoint client user moving the job along, regardless of its previous value. • If this property is set to **No**, the "user name" attribute is set to the new name only if it was empty to begin with.
Update user info	Specifies if the user's info (name, full name and email address) associated with the job should be updated to contain the info of the user who handles the job. Options: • If empty • Yes • No

Property	Description
Fail jobs after timeout	If set to **Yes**, jobs are failed after residing in the Checkpoint for a certain period of time (specified in the subordinate properties). Failed jobs are moved to the outgoing connection specified in the subordinate properties or to the problem jobs folder.
Unit	Selects the unit for the subsequent property: Minutes, Hours, Days
Timeout delay	The timeout delay in the units indicated by the previous property. *0* means that the jobs are failed immediately.
Fail connection	The name of the connection to which failed jobs must be moved. If this property value is empty or if the specified name doesn't match any of the outgoing connection names, failed jobs are moved to the problem jobs folder.

Picking up client fields as metadata

The Checkpoint tool picks up metadata fields entered by the user when moving along a job. Specifically, when a user moves along a job residing in a Checkpoint and the list of editable field definitions in the Checkpoint's "Metadata fields" property is not empty, the Checkpoint creates a metadata dataset and associates it with the job's job ticket under the specified dataset name.

Note that a Checkpoint always creates a completely new dataset, i.e. it does not update or modify an existing dataset (even if the job was previously moved through the same or another Checkpoint). If the job already has a dataset association with the same name, the reference to the old dataset is removed and replaced by the new one.

Refer to *Client fields schema* on page 401 for details on the format of the generated metadata.

* In case of dynamic values, Switch can store the metadata in the user cache ("cache per user") or in the common cache ("cache for all users"), so the values have not to be recalculated each time metadata is requested. For more information, refer to the "Cache dynamic values" property in the topic on *Defining metadata fields* on page 396.

Note that by default, the cache is not cleared, unless you explicitly enable "Invalidate metadata cache on user login".

Checkpoint via mail

Checkpoint via mail is a default Switch app that allows implementing a simple Checkpoint via e-mail, performing the following main functions:

- For each arriving job, send out an e-mail message that includes the unique name prefix of the job and a list of possible "Checkpoint actions" (the names of the outgoing connections, or, if no name is specified, the name of the target folders) – in addition to instructions on how to operate the Checkpoint by return e-mail.
- Monitor e-mail messages coming back from users and parse those messages for the original information about the job and for the Checkpoint action selected by the sender.

- When a matching response comes in, move the corresponding job along the specified outgoing connection or (if no name is specified for the connection) to the specified target folder.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Pack job

Pack job is a default Switch app that packs a job and its associated metadata for transmission. The result is always a single ZIP file that contains a globally unique identifier to identify it across multiple Switch instances.

Pack job also stamps the internal job ticket of its output with the unique identifier so that confirmations can be matched with the packed data without opening the ZIP file.

See *Acknowledged job hand-off* on page 193 for an example of how to use this tool.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Unpack job

Unpack job is a default Switch app that unpacks a job that was packed for transmission with Pack job.

Outgoing data success connections receive the unpacked job, with restored metadata (if it was included in the packed archive). Outgoing log success connections receive a checksum-protected XML file that can serve as a formal confirmation of successful receipt of the job, recognized by the Monitor confirmation element.

Incoming jobs that do not have the appropriate format (or that were corrupted during transmission) are sent to the data error connection or if there is no such connection, these jobs are moved to the problem jobs folder.

See *Acknowledged job hand-off* on page 193 for an example of how to use this tool.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Monitor confirmation

Monitor confirmation is a default Switch app that monitors incoming receipt confirmations (generated by Unpack job) and matches them against a copy of the packed data (generated by Pack job) waiting in its input folder. When no confirmation is received after a certain amount of time, the tool can be setup to retry the communication (that is, send another copy of the packed data).

See *Acknowledged job hand-off* on page 193 for an example of how to use this tool.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Remote process

Remote process is a default Switch app that allows you to take Switch jobs out of the flow, process them remotely (using the service of your choice) and put them back in the flow after processing.

The API to communicate with Switch is available on the Enfocus website.

Note: The Remote process element is only available if you have licensed the *Scripting module*.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.1.2.5. Apps

This category is only available if you have downloaded and installed at least one app from the Enfocus Appstore. For more information about working with apps, refer to the dedicated chapter: *Working with apps in Switch* on page 252.

For more information about a particular app, search for the app in Apps category of the **Flow elements** pane, and from the context menu, select **App details**. This will bring you to a page on the Enfocus Appstore. The documentation can be found in the bottom right corner, under **Resources**.

5.1.2.6. Configurators

Enfocus PitStop Server

The PitStop Server configurator is an application that drives PitStop Server. It is a processor that preflights and/or corrects a PDF file according to specifications. The resulting PDF file flows along the "data" output connections, the Preflight Report flows along the "log" output connections. The PitStop Server configurator can process only individual PDF files and not job folders.

Tip: Check out *the eLearning course* on this topic!

Licensing

The PitStop Server configurator is only available in the Flow elements pane (Configurators category) if you have installed and licensed PitStop Server. It is not an app that can be downloaded from the Enfocus Appstore.

Note: Ideally, you have installed PitStop Server before you installed Switch. That way, Switch can automatically find the application, which is necessary for the configurator to run. If PitStop Server is installed afterwards while Switch is running, make sure to restart Switch.

Compatibility

PitStop Server

Keywords

PDF PDF/X preflight certified correct fix modify optimize convert color colour GWG profile transparency flattening action list

Application discovery details

This configurator tries to locate the PitStopServerCLI executable in the PitStop Server installation folder. It is also possible to set the path to the PitStop Server CLI manually through the configurator's popup menu in the Flow elements pane.

Connections

This configurator uses traffic light connections. PDF files that generate one or more preflight errors will be sent to the error connection; files that generate warnings but no errors will go to the warning connection, and files that have neither errors nor warnings will go to the success connection. Any number of outgoing connections is supported, but at least one Data connection is required.

Properties detailed information

Note: You can also find this information in Switch. Just go to the configurator in the Flow elements pane, right-click the configurator to open the context menu and choose '**Documentation...**'.

Properties	Description
Flattening	If set to 'Yes' PitStop Server will flatten all transparencies. Color management in this configurator must be enabled for images and other objects. Subordinate properties: • *Raster/vector balance:* A value from 0 to 100. This controls the degree of rasterization of complex areas in the document. If set to 100, no areas in the document will get rasterized for performance reasons (although some areas may still be rasterized for other reasons). • *Vector resolution*: Rasterizes all objects, including images, vector artwork, text, and gradients, to the specified resolution. Allowed values are between 1 and 9600. • *Gradient resolution*: Specifies the resolution for gradients and Illustrator mesh objects after rasterization because of flattening. Allowed values are between 1 and 1200.

Properties	Description

	• *Convert all text to outlines*: If set to 'Yes', all text is converted to outlines and all type glyph information is discarded.
	
	• *Convert all strokes to outlines*: If set to 'Yes', all strokes are converted to filled paths.
	
	• *Clip complex regions*: If set to 'Yes', the boundaries between vector artwork and rasterized artwork will fall along object paths. This option reduces stitching artifacts as a result of a part of an object being rasterized while another part of the object remains in vector form.
	
	• *Preserve overprint*: If set to 'Yes', preserves overprint where possible. If this option is disabled all overprint in the document will be simulated by blending the colors of overprinted objects.
	
	• *Blending color space*: Specifies the page level transparency blending color space.
	  • If 'Current' is selected, the blending color space is left untouched.
	  • If 'ICC profile' is selected, you must select a color profile from the library stored inside PitStop Server or browse to a standard ICC profile file.
	
	• *Remove ICC profiles*: If set to 'Yes', ICC profiles are removeed after flattening.
	
	• *Recompress images*: If set to 'Yes', the post flattening image recompression is enabled. Otherwise the compression that is the result of the flattening will be kept. Extra options are:
	  • **Color bitmap images**: Specifies the type of compression to be used on color bitmap images after flattening.
	
	  • **Gray scale bitmap images**: Specifies the type of compression to be used on gray scale bitmap images after flattening.
	
	  • **One bit images**: Specifies the type of compression to be used on one bit images after flattening.
	
	  • **ASCII filter**: Specifies the ASCII filter to be applied.
	
	• *Resolve transparency*: This property is no longer supported and should be set to 'Yes'.

Preflight Profile	The Enfocus Preflight Profile to be used to preflight and possibly correct the file. The Preflight Profile can be omitted in case one or more Action Lists are specified.
Manage Preflight Profiles	Manage the Preflight Profile database for the PitStop Server configurator.
Action List(s)	A sequence of Action Lists to be executed on the file.

Properties	Description
	Note: This property can be empty in case a Preflight Profile is specified.
Manage Action Lists	Manage the Action List database for the PitStop Server configurator.
Variable Set	Select a variable Set for Smart Preflight. A Variable Set is required only if dynamic Preflight Profile is used. For more info, refer to the chapter on *Smart Preflight*.
Certified PDF	Determines Certified PDF-related behavior while processing the file as one of these choices: • *Unchanged*: The certify status of the document will not be changed • *Save as uncertified*: The result file will not be certified. If the incoming document was certified all certify information will be deleted. • *Start certified*: The result will be saved as a certified PDF document If you've chosen 'Unchanged' or 'Start certified', following subordinate properties become available: • **Allow rollback**: If set to 'Yes', the output file preserves the Certified PDF history information allowing rollback to previous Certified PDF sessions. • **Keep original profile**: If Certified PDF is set to 'Unchanged' or 'Start Certified', and Keep Original Profile is set to 'Yes', the original profile will be kept, even if the incoming file is already Certified with a profile other than the defined Preflight Profile. • **Set personal info**: If set to 'Yes', a number of extra properties appear for defining the personal information listed on the Preflight Report and used for the Certified PDF session created by processing the file. More info on Certified PDF can be found in the *PitStop Pro Reference Guide* on our website.
Enable Color management	Determines whether PitStop Server uses color management to process the file. If set to 'Yes', the configurator shows a series of extra properties to specify color profiles and rendering intent: • *Color management for images*: Specifies the color management mode for image objects. If set to Yes, a number of extra properties are displayed, such as *Gray/RGB/CMYK and Lab source*, where you must specify the Gray/RGN/CMYK and Lab target color profile respectively. • *Color management for other objects*: Specifies the color management mode for objects other than images; choices are: • **Same as images**: Color management for all objects is specified by 'Color management for images' property and its subordinates.

Properties	Description
	• **Different**: Color management for other objects than images is turned on and defined by the subordinate properties, such as *Gray/RGB/CMYK and Lab source*, where you must specify the Gray/RGN/CMYK and Lab target color profile respectively. • **No:** Color management for other objects is turned off. • *BPC*: Set BPC to 'Yes' to enable black point compensation in the color management engine.
Use system fonts	Specifies if the fonts in the system folder are available for handling fonts during processing.
Extra font folder	Path to a folder that contains extra fonts for use while processing files (in addition to the system fonts).
Skip font license checks	Set this to 'Yes' if you comply with the font license restrictions imposed by any font used in the input files. Some fonts may be licensed for View and Print only. By setting 'I comply with the font license restrictions' to 'Yes', you agree that you have checked the licensing conditions of the print vendor of these fonts and that you are allowed to manipulate these fonts according to the configuration of this flow element. Enfocus disclaims any liability for any use of the fonts which is not in accordance with the licensing agreement between yourself and the print vendor. Choose 'No' if you do not agree.
Optimization	The optimization performed: • **For web**: Optimized for web download • **File size only**: Optimized for file size only • **None**: Not optimized
Report type	The format of the Preflight Report: • *None*: No Report will be generated. • *PDF*: Regular PDF Preflight Report format (generated by PitStop Server). • *PDF minimum*: Minimum PDF Preflight Report format PDF minimum (generated by PitStop Server). • *PDF continuous*: Continuous PDF Preflight Report format (generated by PitStop Server). • *PDF annotated*: Annotated PDF Preflight Report format (generated by PitStop Server). • *PDF annotated low res*: Low resolution annotated PDF Preflight Report format (generated by PitStop Server).

Properties	Description

	• *PDF annotated scaled*: Scaled annotated PDF Preflight Report format (maximum A4; generated by PitStop Server).
	• *Custom PDF Report template*: A highly customizable PDF Report.
	• *XML*: XML Preflight Report format PitStop Server (generated by PitStop Server).
	• *JSON*: JSON Preflight Report format.
	Depending on the chosen option, a number of extra properties are displayed:
	• **Report template**: Select a Report template (.prefs file) to be used for the PDF Report. A Report template can be used to greatly customize the appearance of PDF Reports.
	• **Hyperlinks include unique name prefix**: A PDF Report contains hyperlinks to the file being processed; this property determines whether the filename in those hyperlinks includes the Switch unique name prefix or not. In both cases the hyperlinks are relative to the file's position, so the preflight Report and the file being processed must remain in the same folder for the hyperlinks to work.
	• **Additional XML Report dataset name**: The name of an additional dataset where an XML Report will be stored. Subordinate properties are:
	  • Type: Choose the XML Report type. The version of the XML defines the schema used for the XML Report. v3 is the current version and is strongly recommended. v2 Reports are still supported but may be removed in the future.
	  • Maximum number of items: It is possible to truncate the number of Reported items per category. Reducing this number imposes a limit on the xml Report file size but might results in an incomplete Report. Default is 100.
	  • Maximum number of objects: It is possible to truncate the number of Reported objects per item. Reducing this number imposes a limit on the xml Report file size but might results in an incomplete Report. Default is 100.
	  • Report language: The language of the Preflight Report.
	  • Measurement units: The measurement units used in the Report; choices are: Points, Picas, Inches, Feet, Millimeters, Centimeters, Meters.
	  • XSLT Transformation (if Report type = XML): Use this property to define an additional XSLT transformation for the XML Report. This property only works for version 3 XML Reports. Choices are:
	  • Preflight results: A summary of the errors, warnings and fixes of the preflight.
	  • Page boxes: Information about the page boxes of each page.
	  • Page color type: Information about each page's color type: black and white, color, or empty.
	  • Layers: The layer structure of the document.

Properties	Description
	• Fonts: Information about the fonts in the document. • Images: Information about the images in the document. • Ink usage: A list of used inks in the document and per page, including their total areas. • Output intents: Document output intent information. • Text summary: a CSV with preflight result information. • XML summary: an XML with preflight result information.
Add troubleshooting datasets	Determines whether or not troubleshooting datasets are created. This has an impact on the speed of Switch. • Yes (default): Troubleshooting datasets are created at /Users/<User>/Library/Application Support/Enfocus/Switch Server/datasets. • No: No troubleshooting datasets are generated. This will result in some processing speed improvement as this reduces memory usage **Note:** This option was added in PitStop Server 2023 update 1.

Enfocus PitStop Server PDF2Image

The PitStop Server PDF2Image configurator is an application that drives the PDF2Image functionality of Enfocus PitStop Server. It renders the pages of a PDF to images, either as a whole or split into separations. The PitStop Server PDF2Image configurator can process only individual PDF files and not job folders.

Tip: Check out *the eLearning course* on this topic!

Licensing

The PitStop Server PDF2Image configurator is only available in the Flow elements pane (Configurators category) if you have installed and licensed PitStop Server. It is not an app that can be downloaded from the Enfocus Appstore.

Note: Ideally, you have installed PitStop Server before you installed Switch. That way, Switch can automatically find the application, which is necessary for the configurator to run. If PitStop Server is installed afterwards while Switch is running, make sure to restart Switch.

Compatibility

PitStop Server

Keywords

PDF export render image png jpg jpeg

Application discovery details

This configurator tries to locate the PitStopServerCLI executable in the PitStop Server installation folder. It is also possible to set the path to the PitStop Server CLI manually through the configurator's popup menu in the Flow elements pane.

Connections

The configurator uses a "Move" connection. The PDF that is used as input is exported as an image, and this image is sent to the connection.

Properties detailed information

Note: You can also find this information in Switch. Just go to the configurator in the Flow elements pane, right-click the configurator to open the context menu and choose '**Documentation...**'.

Properties	Description
Image type	The output image type. Options are: • PNG • JPEG Subordinate properties if PNG is chosen: • *Interlaced*: If set to Yes, Adam 7 interlaced PNG is created. • *Output color space*: Output color space to be used: DeviceGray or DeviceRGB. Ther subordinate property **Background color** is used to specify the background color during rendering. If none is specified, the rendered image may contain transparency. In case of DeviceGray, the background color should be a gray value between 0 and 100. In case of DeviceRGB, the background color is a RGB based color, defined by a red, green and blue value between 0 en 255. • *Embed ICC profile*: Embed the ICC profile used as target for images in the image. This requires that color management is used, and that the full page is rendered. Subordinate properties if JPEG is chosen: • *Quality*: The quality of the JPEG compression. • *Progressive*: Generate a progressive JPEG. • *Output color space*: This element specifies the output color space to be used. Choices are DeviceGray, DeviceRGB and DeviceCMYK. Background colors have to be defined as well; in case Gray, Cyan, Magenta, Yellow and Black, values between 0 and 100 are valid. Red, Green and Blue expect values between 0 and 255. • *Embed ICC profile*: Embed the ICC profile used as target for images in the image. This requires that color management is used, and that the full page is rendered.

Properties	Description
Append page number	Appends the page number from which the image was generated to the file name. If set to yes, you should also specify the **Page number width**. Note that page numbers are padded with zeroes until given width if necessary.
Include empty pages	If set to 'Yes', images without (selected) contents will be generated as well.
Image export option	Options are: • *Composite*: The page will be exported as one image. • *Separations*: An image will be generated for each separation present on the page. In that case, you must also set the **Append separation name** option. If enabled, the separation name is appended to the output file name. Note that some characters in the separation name may be replaced in order to create a valid file name.
Prerender Action List	The Action List to be executed before the page is rendered.
Restricting Action List	The Action List to restrict the contents of pages. If no Action List is defined, all visible contents is considered selected. If a page does not contain any selection, it is not exported to an image.
Variable Set	Select a variable Set for Smart Preflight. A Variable Set is required only if dynamic Action Lists are used.
Render area	This element specifies which area to be rendered, based on the page box.
Image dimensions	Choices are: • *Resolution*: The page will be rendered at the given resolution. • *Fixed with and/or height*: The page is rendered at the given width and/or height. At least one of Height or Width must be defined. If both are defined, the aspect ratio is not maintained.
Anti-aliasing	If set to 'Yes', the rendering engine will use anti-aliasing.
Enable Color management	Determines whether PitStop Server uses color management to process the file. If set to 'Yes', the configurator shows a series of extra properties to specify color profiles and rendering intent: • *Color management for images*: Specifies the color management mode for image objects. If set to Yes, a number of extra properties are displayed, such as *Gray/RGB/CMYK and Lab source*, where you must specify the Gray/RGN/CMYK and Lab target color profile respectively. • *Color management for other objects*: Specifies the color management mode for objects other than images; choices are: • **Same as images**: Color management for all objects is specified by 'Color management for images' property and its subordinates.

Properties	Description
	• **Different**: Color management for other objects than images is turned on and defined by the subordinate properties, such as *Gray/RGB/CMYK and Lab source*, where you must specify the Gray/RGN/CMYK and Lab target color profile respectively. • **No:** Color management for other objects is turned off. • *BPC*: Set BPC to 'Yes' to enable black point compensation in the color management engine.
Use system fonts	Specifies if the fonts in the system folder are available for handling fonts during processing.
Extra font folder	Path to a folder that contains extra fonts for use while processing files (in addition to the system fonts).

Smart Preflight

The following topics are only relevant if you're using the Enfocus PitStop Server configurators, as only these configurators support Smart Preflight. It's explained further in this document what Smart Preflight is and how it can be used in the Enfocus products in general and in Switch in particular.

About Smart Preflight

Smart Preflight is a functionality that allows you to handle many different job types and specifications by using only one Preflight Profile. This is possible, thanks to the use of *variables*.

For example, if one of your preflight settings checks the page size, it is sufficient to define one Profile using a variable with the most commonly used page size (e.g. A4) as the default. If a document type with a different page size comes in (e.g. a leaflet or a newspaper), you can select the required page size from a pre-defined list or type the appropriate value (depending on how the variable is defined) in the dialog that pops up when running the preflight check.

There are three types of variables:

- **Constant variables** are variables that get their value from user input (in PitStop Pro, as in the example above) or from a Job Ticket or a database (in PitStop Server and Connect):
  - In **PitStop Pro**, a dialog pops up just before running the preflight check. You can manually enter the required values.
  - In **PitStop Server**, you must send an XML/JDF Job Ticket along with the PDF. The information in this Job Ticket (e.g. the page size) is used to determine the value of the variables.
  - In the **PitStop Server Configurator** (for use with Switch), the information can be taken either from a Job Ticket or from a database.
  - In **Connect**, you can create Job Tickets that collect job information for each document processed by a Connector. The metadata in these Job Tickets will be used to determine the value of the variables.

- **Calculation-based variables** are variables of which the value is calculated by multiplying, dividing, subtracting, adding up, ... certain values (fixed values or variables).

  For example, in large format printing, the required resolution depends on the viewing distance; the bigger the distance, the lower the required resolution. The optimal resolution can be calculated with a calculation variable.

  Another example is point size: if a large poster will be viewed on a small display, the point size should be smaller; the optimal point size can be calculated by dividing the regular value (a fixed value) by the scaling factor (stored in a variable).

- **Rule-based variables** are variables of which the value is based on other variables (possible in all Enfocus products)

  For example, suppose you want to check the ink coverage using a Preflight Profile. The optimal ink coverage depends on several different factors, just like the paper type and the printing method. Without variables, you must define different Profiles for each combination of paper and printing method, each with fixed total ink coverage values (e.g. Profile 1 for Uncoated + Sheetfed Litho and Profile 2 for coated + Sheetfed Litho, ...). However, using variables, you can define one Profile and enter the required information for the job (paper type and printing method) to calculate the optimal ink coverage at run-time.

The different types of variables can be combined (e.g. rule-based variables calculated based on a drop-down of constant variables), making it possible to configure multiple checks and fixes based on a single user input (PitStop Pro) or on only one value in a Job Ticket or database.

	Constants User input	Constants Job Tickets	Constants Databases	Rule-based	Calculation-based
PitStop Pro	✔			✔	✔
PitStop Server		✔		✔	✔
PitStop Server with Enfocus Switch*		✔	✔	✔	✔
Enfocus Connect/ Connectors		✔	✔	✔	✔

** The PitStop Server Configurator also supports the Switch variables. Refer to* *Smart Preflight Variables: types on page 143.*

Note: Variables can be used in Action Lists as well, in a similar way as in Preflight.

Getting started with Smart Preflight

Variables and Variable Sets

Before you can start working with Smart Preflight, you need to define the variables you want to use and save them within a Variable Set (a file format which can be exported and imported).

When defining your Preflight Profile, you can then select the variables you need from this Variable Set. Note that you can create different Variable Sets (e.g. if you would like to define different Variable Sets for different document types or different Enfocus products) and that a Variable Set can contain as many variables as required. However, you can apply only one Variable Set at a time (e.g. one per hot folder in PitStop Server, one active Variable Set in PitStop Pro) and it should match the Variable Set used in the Preflight Profile concerned.

Note: PitStop Pro and PitStop Server can share the same Smart Preflight Variable Sets, much like they can share Preflight Profiles or Action Lists. However, some variable types (see further) are useful in PitStop Pro only and others work only in PitStop Server. Unsupported variables will use a default value or will generate a failure.

How to decide which preflight settings could be configured as variables?

Good candidates are preflight settings that can change from job to job, for example:

- Trim page size
- Total ink coverage
- Number of colors defined

Preflight settings that are often the same can better be configured as fixed values. Some examples:

- Embedded fonts
- Security settings
- Document contains pre-separated pages

Getting started

The following topics explain step by step how to configure a Variable Set and how to use the variables in your Preflight Profiles.

Setting up Smart Preflight

Smart Preflight setup: overview

This topic describes the steps required to set up and use Smart Preflight.

1. *Configure a Variable Set:*
   a. *Create a Variable Set.*
   b. *Define the Variables to be used.*
2. *Apply the variables to the appropriate checks in your Preflight Profile.*
3. *Run the Preflight Profile with the variables enabled.*

Configuring a Variable Set

Creating or editing a Variable Set

You need a Variable Set (which contains the variables you need) in order to use variables in a Preflight Profile or Action List. You can create a new one or re-use an existing one (i.e. add any new variables as required).

Important:

- Although you can create more than one Variable Set, we recommend that you keep all your variables in one Set. Only if you are working with both PitStop Pro and PitStop Server, you might consider using different sets. However, if you use variables of different Variable Sets within a single Preflight Profile, only the "active" (applied) Variable Set variables will contain values. Variables used from inactive Variable Sets will be blank!

- Do you want to use a Variable Set with the PitStop Configurator in Switch? To get access to the Switch Variables (see *Smart Preflight Variables: types* on page 143), you should edit the Variable Set in Switch (not in PitStop Server).

To create or edit a Variable Set

1. In the Properties pane of the PitStop Server Configurator
   a. Locate the Variable Set property.
   b. Click .
   c. Click **Select Variable Set**.

   The Select variable set: Variable Set Panel appears, displaying all the installed Variable Sets as well as any local Variable Sets that have been defined.

2. Do one of the following:
   - To edit an existing Variable Set, double-click the Set concerned.
   - To create a new Variable Set, from the actions menu ( ), select **New** > **New**.

   The Enfocus Variable Set Editor appears.

3. Enter the appropriate details (a meaningful name and a description) and lock the Variable Set if required.

   See *Locking a Variable Set (optional)* on page 141

4. Define the Variables you need.

   See *Defining Smart Preflight variables* on page 142

5. To change the order of the variables in the set, do one of the following:
   - Drag and drop the variables to the position of your choice.
   - Select a variable and use the up and down arrows to move it to another position.

6. Click **Save**.
   The new Variable Set is saved to your Local Switch folder.

   Note: This Local folder is shared with any other Enfocus applications that you may have installed.

Locking a Variable Set (optional)

You can lock a Variable Set with a password, to prevent other users from editing the Variable Set and viewing details when they open it in the Enfocus Variable Set Editor.

To lock a Variable Set

1. Open the Variable Set.

   See *Creating or editing a Variable Set* on page 140

2. In the Enfocus Variable Set Editor, click **SETUP** > **General**.

3. From the Permissions list, select **Locked**.

4. Enter a password and repeat it.

Note that you can change the password at any point of time if required, by clicking the **Change Password** button.

5. Click **OK**.
6. Click **Save**.

The Variable Set is locked. Users wanting to edit or view the details of the Variable Set must click the Lock icon and enter the correct password.

Defining Smart Preflight variables

The Smart Preflight variables for use in Preflight Profiles must be defined before you can use them. This topic explains how you can create and define new variables.

To define Smart Preflight variables

1. Open the dialog with the Variable Set that will contain the new variable.

   See step 1 of *Creating or editing a Variable Set* on page 140.

2. In the left part of the Enfocus Variable Set Editor, under Variables, click ⊞.
3. Enter the required details for the new variable:

Field	Meaning
Name	Choose a meaningful name, for example, the check the variable is intended for. This name will be visible in the Preflight Profile editor or in the Action List editor, when applying a variable to a check or fix (see *Applying variables to a check in a Preflight Profile* on page 152). For this reason, it is advisable to keep this name as short as possible.
User Readable Name	Use this field if the variable name is too technical or too short to be clear enough.
Type (*First list*)	Choose the appropriate type. Refer to *Smart Preflight Variables: types* on page 143.
Type (*Second list*)	The type of the values produced by this variable. For example, if a variable for a trim page size is to be created, then it must have a "Length" variable type. If a variable is needed to select or deselect a check box (such as to turn on a correction), then a Boolean variable type needs to be defined. Some examples for each option: • Number - Page count, Number of separations, etc • Length (i.e. a number of measurement fields) - Page trim size, bleed amount, etc • Text - Any text, for example Document author, Font name, Spot color name, Substrate type, etc. • Boolean - Selection for any checkboxes

Field	Meaning
	Note: Make sure that this value type matches the preflight check setting it is intended for. When applying variables to a preflight check setting, *only the variables that match that type of entry will be displayed*.
Type (*Third list*)	In case of a Job Ticket in combination with value type "Length", a third list is available, allowing you to choose the appropriate unit, for example "Points", "Inches", ... **Note:** The unit displayed in the Default Value field (lower) depends on the application Preferences.
Description	Optionally, provide a brief description.

4. Proceed with the fields in the lower part of the dialog.

   This part of the procedure depends on the chosen variable type:

   - *Constant variable definition* on page 144.
   - *Calculation-based variable definition* on page 146.
   - *Rule based variable definition* on page 147.
   - *Variable definition: Text with variables* on page 150.
   - *Variable definition: Script expression* on page 151.

   Note: For example variables, have a look at the Smart Preflight Variable Set - PitStop Pro - v1.4. (available under **Standard** > **Smart Preflight**).

5. Click **Save**.

Smart Preflight Variables: types

When defining a variable, you must choose a type. The table below gives an overview of the available variable types per application and explains their meaning.

Type	Meaning	Application
Constant	In PitStop Pro, when a Constant variable is applied to a preflight check, a default value will be displayed to the operator, allowing him to override it before running that preflight check. Constants can be a text string, a number, a length (i.e. a measurement) or a boolean (yes/no or on/off) value. Constant variables are available in PitStop Server to stay compatible with PitStop Pro. Only their default value is used when processing. No choice to override their value is given at the time of processing, since PitStop Server is intended to process files completely "hands-off".	PitStop Pro/Server PitStop Server Configurator in Switch Enfocus Connect

Type	Meaning	Application
Rule Based	A Rule Based variable allows you to take values from other variables and use them to create a new value, based on different conditions. For example, variables representing paper type and printing method could both be used to define the value for the necessary Total Ink Coverage.	PitStop Pro/Server PitStop Server Configurator in Switch
Calculation Based	A Calculation Based variable allows you to make calculations. You can divide, multiply, subtract, add up, ... fixed and variable values as required.	PitStop Pro/Server PitStop Server Configurator in Switch Enfocus Connect
Job Ticket	Job Ticket variable values are extracted from an XML/JDF file submitted to PitStop Server or a Connector in conjunction with the PDF job file. These variables can either change a single setting or be linked to Rule Based variables for more complex processing. **Note:** The Job Ticket variables of PitStop Server cannot be used in Switch. However, you can change the Job Ticket variables to either Text with Variables or Script Expression and modify them to correspond to the behavior of Switch.	PitStop Server Enfocus Connect
Text with variables	Variable values are defined using the Switch variables. Note that this type is only available if you open the Variable Set via the PitStop Server Configurator in Switch.	PitStop Server Configurator in Switch
Script expressions	Variable values are defined using JavaScript. Note that this type is only available if you open the Variable Set via the PitStop Server Configurator in Switch. **Note:** Node.js Script expressions are not supported yet.	PitStop Server Configurator in Switch

Constant variable definition

Options

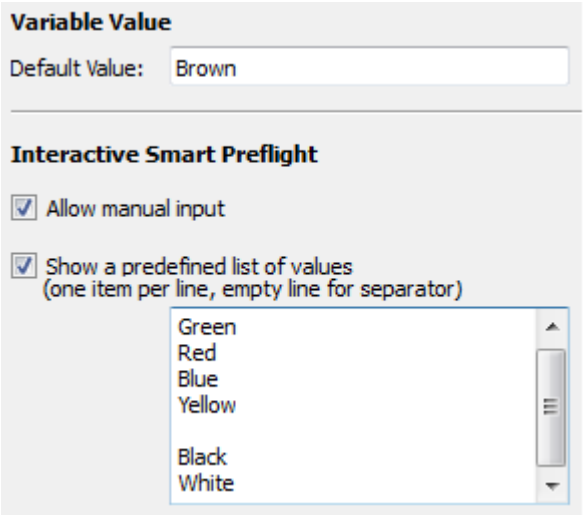
The following table gives an overview of the constant-specific options.

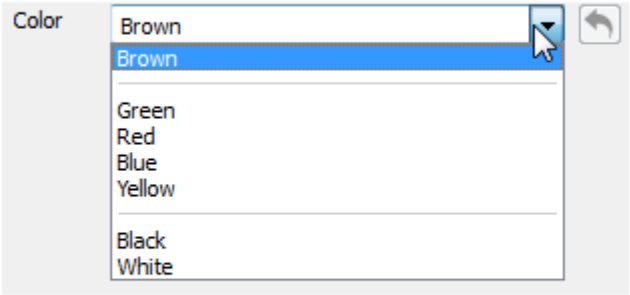
Option	Description
Default Value	Fixed value, which will be used when Switch runs a Preflight Profile that needs this variable. **Note:** Constant variables used in PitStop Server cannot be manipulated by the user. Hence, PitStop Server will only use the default value.

Option	Description
Allow manual input	Enables users to type values when they run the Preflight Profile.
Show a predefined list of values	Enables users to select a predefined value from a list of values. If the value type is Number or Length, you will have the possibility to mask the value and provide an alternate name for the user. **Tip:** You can change the order of the items in the list by just selecting a value and dragging it up or down and dropping it in the desired position.

Example

Below you can see an example of a constant variable definition (left) and the resulting list the users will see when running the Preflight Profile (right).





.

Combining options

Allow manual input and **Show a predefined list** can be combined. The following table explains what this means.

Selected options	Meaning
Both enabled	Users can either select a value from the predefined list but or manually enter a value.
Both disabled	Users will see the default value in a read-only text box. They cannot change it.
Only **Allow manual input** enabled	Users can manually enter a value. There is no list to choose from.
Only **Show a predefined list** enabled	Users can select a value from the predefined list. They cannot enter a value themselves.

Calculation-based variable definition

Calculation-based variables allow you to calculate a value by multiplying, dividing, subtracting, adding up, ... certain values (both fixed and variable values).

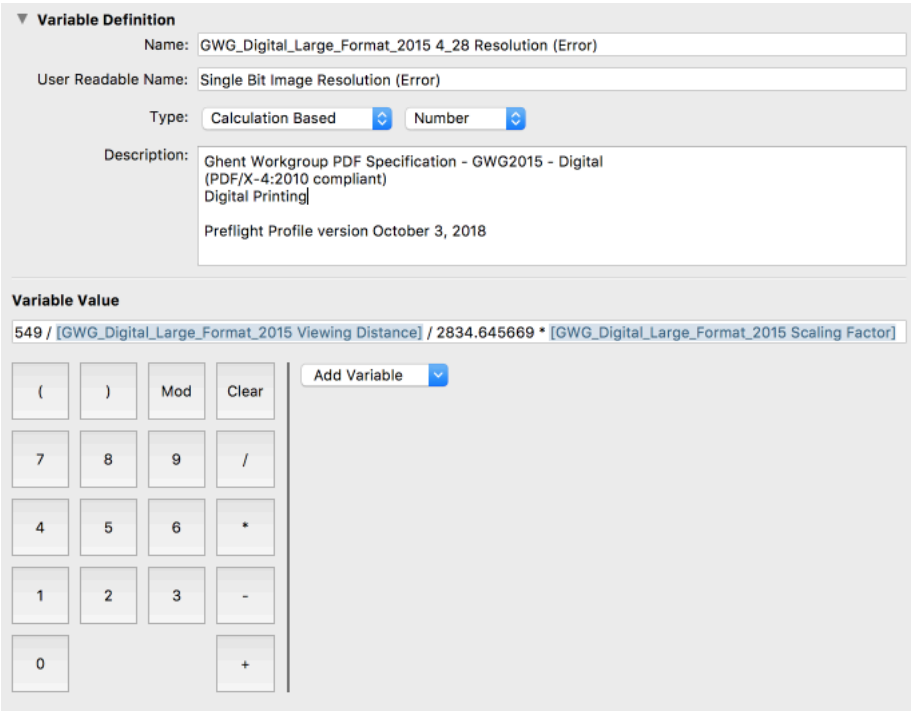
You can build your calculation (in the **Variable Value** entry field) as follows:

- You can type it directly into the **Variable Value** field.
- To insert the digits and operators, you can also use the calculator beneath the entry field. Note that 'Clear' clears the whole entry field.
- To insert variables:
  1. Click the **Add variable** button or enter a square bracket ([) in the entry field. This will open a drop-down list with all variables defined in the current Variable Set.
  2. Click the variable you want to insert.

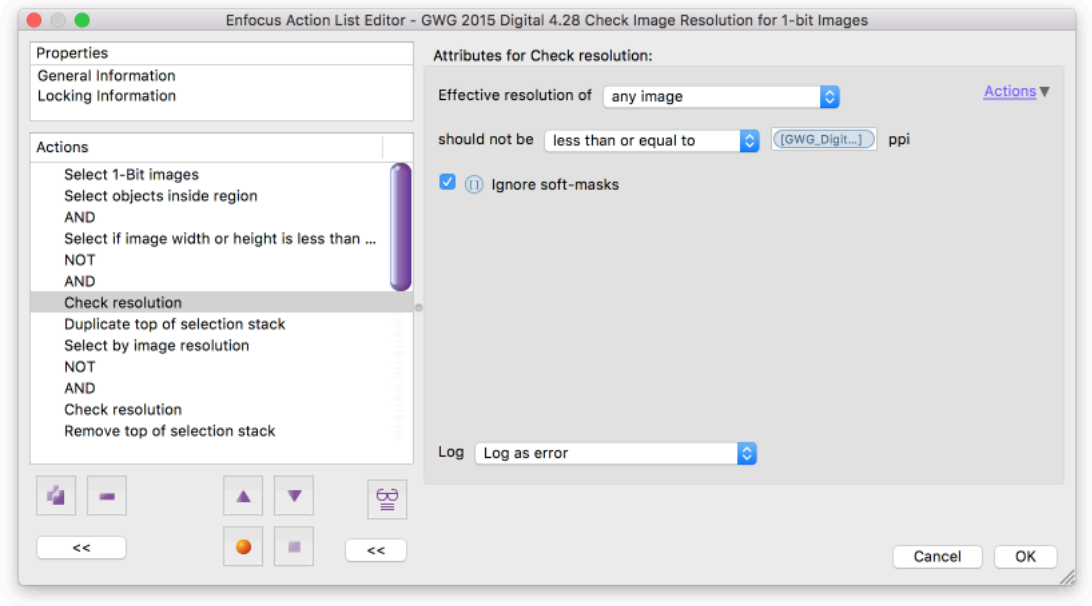
Example

This is an example of a calculation variable that is used to check the resolution of images in large formatting. This is the value that triggers an error.

The first screenshot shows the variable definition. The value is calculated by dividing and multiplying fixed values and variable values (the viewing distance and the scaling factor), which both have an impact on the allowed image resolution. Note that the variable definitions for viewing distance and scaling factor must be defined as variables in the same Variable Set.

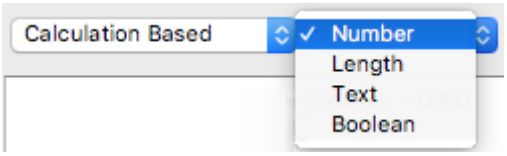


The second screenshot shows how the variable is used in an Action List to check the image resolution of grayscale and color images.



More examples can be found in Variable Set 1.4 (under **Preferences** > **Variable Sets**). These variables were configured for use with the GWG Profiles for Packaging (2015 Specifications).

Remark



The most common value type of calculation variables will be Number. However, if your Preflight check or Action expects a different type, this is also possible. For example, in case of a "Boolean" variable, the result of the calculation will be converted to false (if it's 0) or true (if not 0). In case of "Length", the result of the calculation will be converted to a value in the unit chosen in the Preferences (so x points will be converted to the corresponding value in cm, mm, feet, etc).

Rule based variable definition

About rule based variables

The concept of a rule based variable is to build a variable that will change based on the state of another setting. For example:

Rule based variable "Image Resolution" is defined as follows:

```
IF "Job type" is "Offset" THEN set "Image Resolution" to 300 ppi
ELSE
IF "Job type" is "Digital", THEN set "Image Resolution" to 150 ppi
```

Rule based variables get their values based on one or more rules. Each rule has two parts: a condition to trigger the rule (IF) and the value to be used when that condition is triggered (THEN).

The condition contains one or more comparisons of a variable with a value. In the above example, the variable "Job type" is compared with the value "Digital". These comparisons can be combined with "AND" and "OR" to create complex conditions.

If a rule is not triggered, the next rule is tried. There must be an ELSE rule at the very end, that is triggered if none of the conditions are met.

Because a rule based variable always needs to be compared with one or more other variables, you will always need to create **at least one other variable** to make a rule based variable work. In the above example, you need to know the value of the "Job type" variable in order to determine the value of "Image Resolution". In PitStop Server, the variable to compare with will usually be a Job Ticket variable. In PitStop Pro, this will usually be a constant variable which offers the user a list of predefined constant values to choose from.

How to proceed

Proceed as follows:

Note: Before starting the configuration in the software, we recommend writing down the rule for yourself (using IF/ELSE statements). This will make clear which variables you need.

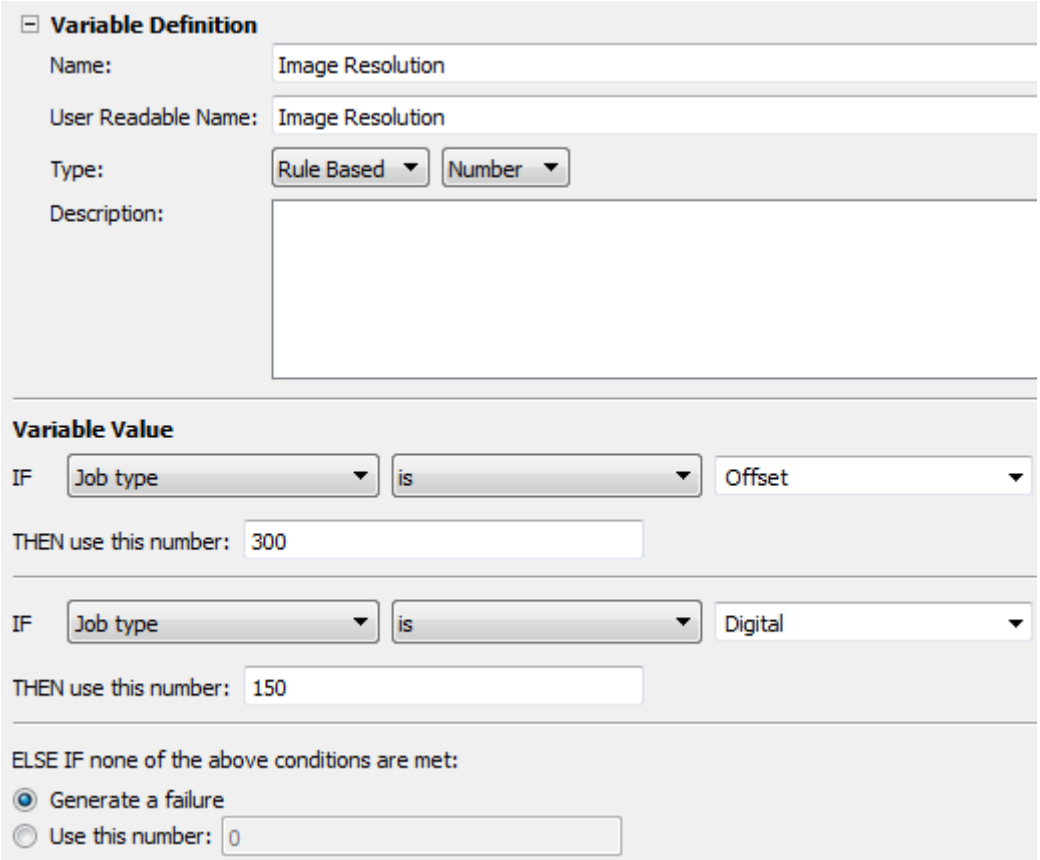
1. Define the variable(s) you need.
2. Define the rule based variable itself:
   - Choose **Rule Based** as Type and determine the value type, for example "Number".
   - Build the rules:
     - The first list (preceded by "IF") allows you to select any earlier defined variable.
     - Choose "is", "is not", "begins with", ... as required and enter or select the appropriate value. Options depend on the variable chosen in the previous step.
     - Click the appropriate operator (AND/OR). (The chosen operator is added to the rule.)

       AND/OR statements will add a condition to the selected rule, making the rule dependent on two or more conditions.
     - Enter/Select the resulting value (the type depends on the chosen value type).
     - If required, click **ELSE** to add an alternative rule to the overall variable (=IF) and proceed in the same way.
     - Determine what should happen in case none of the conditions are met. You can either generate a failure (so the preflight check will generate a preflight error) or enter a default value.
3. Save the Variable Set.

Example 1

Below you can see the definition of the "Image Resolution" rule based variable (value type = Number). It makes use of an earlier defined variable: "Job type", which is a constant (text) variable with "Offset" and "Digital" as possible values.

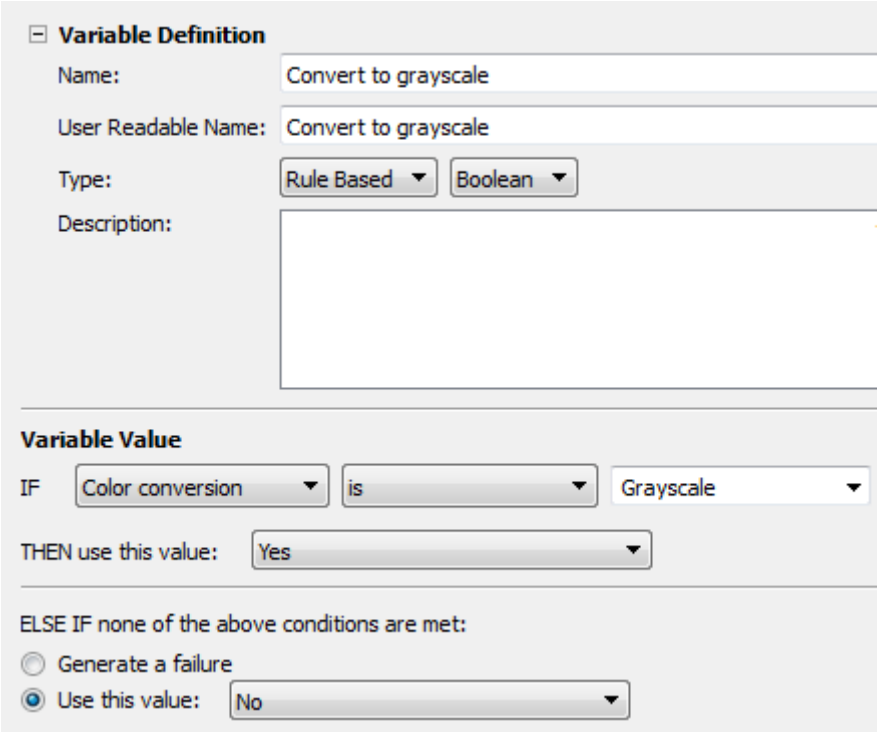
Depending on the value of "Job type", the Image Resolution will be different (300 or 150). If the Job type is different from the ones for which a rule has been configured, a preflight error will be generated.



Example 2

Below you can see the definition of the "Convert to grayscale" rule based variable (value type = Boolean). It makes use of an earlier defined variable: "Color conversion", which is a constant (text) variable with "Grayscale" as one of the possible values.

If the value of the "Color conversion" variable is "Grayscale", the value of "Convert to grayscale" will be "Yes". If this is not the case (e.g. Color conversion is "CMYK"), the value of "Convert to grayscale" will be "No" (=default value).



Variable definition: Text with variables

About Text with variables

This type of variable provides access to run-time information about the Switch flow environment and about the job, including embedded metadata fields and external metadata fields, without the need for scripting.

Note that you need an active license for the Switch Databases Module, if you want to use database information, and active license for the Switch Metadata Module, to use metadata fields.

Length/Unit

When you select "Length" as the value type for this variable, an additional dropdown menu called **Unit** appears, allowing you to choose the appropriate measuring unit.

Note: Make sure to use the same unit in the Variable Value text box below. Otherwise, the chosen value from the **Unit** list will be ignored. For example, if you choose "Centimeters" in the **Unit** dropdown and enter "20 mm" in the **Variable Value** text box, then Smart Preflight will consider millimeter as the unit and centimeter will be ignored.

How to proceed

To define a variable using the text with variables option, proceed as follows:

1. To determine the Variable Value, click the ... button.
2. In the Define text with variables dialog, select the appropriate Variable Group (first column), Variable (2nd column) and attributes (3rd column).
3. Click **Insert variable**.

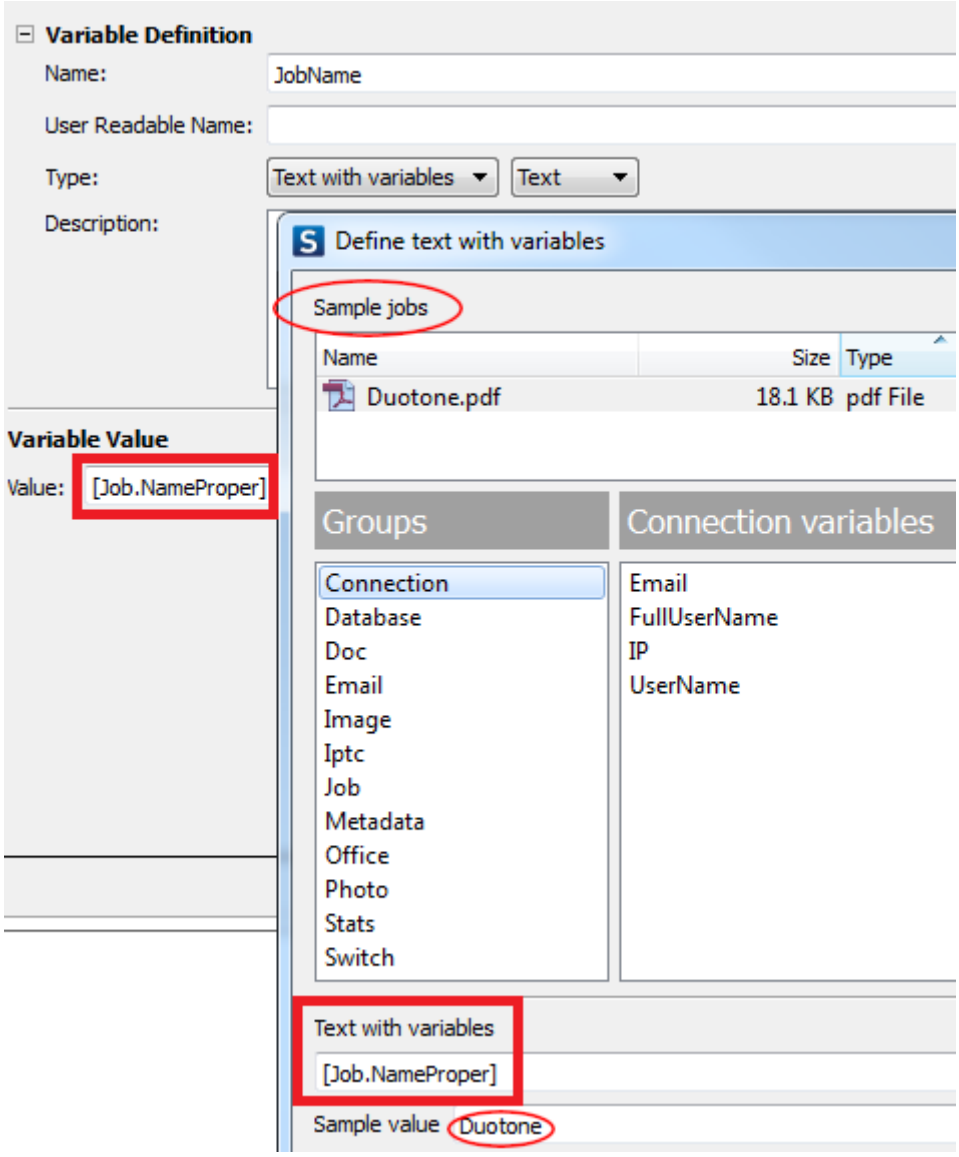
Tip: Use a sample job to see the actual value of the inserted variable.

For more details, refer to *Defining text with variables* on page 343

Example 1

Below you can see the definition of the "JobName" variable (Text). The value returned from the sample Job is "Duotone".

This is a basic example. For more complex cases, refer to the chapter *Metadata* on page 342



Variable definition: Script expression

About script expressions

A script expression is a JavaScript program that gets evaluated in the context of a job (file or jobfolder) to determine the value of a particular property of a flow element or connection. This allows the property value to depend on the job or its associated metadata.

Note that you need an active license for the Scripting Module in order to configure and use this type of variable.

Length/Unit

When you select "Length" as the value type for this variable, an additional dropdown menu called **Unit** appears, allowing you to choose the appropriate measuring unit.

Note: Make sure to use the same unit in the Variable Value text box below. Otherwise, the chosen value from the **Unit** list will be ignored. For example, if you choose "Centimeters" in the **Unit** dropdown and enter "20 mm" in the **Variable Value** text box, then Smart Preflight will consider millimeter as the unit and centimeter will be ignored.

How to proceed

To define a variable using a script expression, do one of the following:

- Type the JavaScript source code in the Variable Value box and click **Save** to save the code to a file.
- Click **Open** and select an existing script (*.js). The content of the selected script will be shown in the Variable Value box. If you make any changes, makes sure to save them to a file (**Save**/**Save as**).

Applying a Variable Set

Once you have defined your Variable Set, you must "apply" or activate the Variable Set you want to use. This is extremely important if you have defined more than one Variable Set; if the variables used in your Preflight Profile are taken from a different Set than the one that is activated, the variable values in the Profile will remain blank.

To apply a Variable Set

1. In the properties of the PitStop Server Configurator, click >.
2. Select the Variable Set that contains the variables used in a Preflight Profile.

Applying variables to a check in a Preflight Profile

Variables allow you to process different jobs and job types with one Preflight Profile; instead of using multiple Profiles with different, fixed values, you enter a variable which is defined when running the Preflight Profile.

Note that you need to have defined a Variable Set with Smart Preflight variables before you can use variables in a Preflight Profile.

To use variables in a Preflight Profile

1. Click **(Plugins)** > **PitStop Pro** > **Preflight Profiles** and double-click the Preflight Profile concerned.
2. In your Preflight Profile, open the CHECK ON: category for which you want to use a variable.
3. Do one of the following:

- If a variable should be used for enabling or disabling **all checks on the tab**, click the **Actions** link in the top right corner of the tab and select **Enable Variable Names**. A button appears next to the checkbox of Enable checks without restriction/Enable checks of <restriction>.
- If a variable should be used for one particular check, in the attributes of the check concerned, click the **Enable Variable Names button**. A button appears next to each property where it is relevant.

4. Click next to the property for which you want to use a variable.

   Note that this button is only shown when the check can have a variable applied.

5. In the Select a Variable dialog, make sure **Use a Variable from the selected Variable Set** is selected and select a Variable Set as required.

6. Double-click the variable you want to use for the property concerned.

   Only the variables that match the type required for the property concerned are shown. For example, if you want to define the page width, you need a variable of the type Length.

   The name of the variable is shown in the Preflight Profile.

Running a Smart Preflight check

If you want to preflight PDF files in Switch using the **PitStop Server Configurator**, you must build a flow with the PitStop Server Configurator and set all properties correctly. As PitStop Server is an automated system, there is no manual intervention, so the values cannot be entered by the user. Instead, the values are taken from a Job Ticket - at least if the variable type is "Job Ticket". If this is not the case (i.e. if the variable type is "rule based" or "constant"), the default values are used. See also *Smart Preflight Variables: types* on page 143.

Note that all PDF files moved to the PitStop Server Configurator will be preflighted. No additional setup is required.

To learn more about the PitStop Server Configurator, search for the configurator in the Flow Elements pane and select **Documentation** from the context menu.

Using Smart Preflight variables in Action Lists

Smart Preflight variables can also be used in Action Lists.

Using variables instead of fixed values in Action Lists

You can also use Smart Preflight variables to define attributes of your Actions contained in your Action Lists. The advantages are the same as for Preflight Profiles, i.e. you don't need different Action Lists but you can dynamically modify the values just before running the Action or by taking them from a Job Ticket or database.

This topic explains how you can configure an Action to use variables instead of fixed values.

To define your Actions using variables instead of fixed values

1. Click **(Plugins)** > **PitStop Pro** > **Action Lists** and double-click the Action List concerned.

2. Select the Actions you want to define using a Smart Preflight variable.

3. Click the **Actions** link (in the top right corner of the attributes for the Action concerned).

4. Select **Enable Variable Names**.

   This option is only available if it is relevant for the Action concerned.

   The icon appears where it is possible to use a variable.

5. Click .

6. Select the variable you want to use.

   You will only see the variables that can be used in the field concerned. Note that you can choose a different Variable Set if necessary.

7. Click **OK**.

Running an Action List with Smart Preflight variables enabled

If you want to run an Action List with variables enabled on your PDFs using the **PitStop Server Configurator** or the **PitStop Server PDF2Image Configurator**, you must build a flow with this Configurator and set all properties correctly. As PitStop Server is an automated system, there is no manual intervention, so the values cannot be entered by the user. Instead, the values are taken from a Job Ticket - at least if the variable type is "Job Ticket". If this is not the case (i.e. if the variable type is "rule based" or "constant"), the default values are used. See also *Smart Preflight Variables: types* on page 143.

Note that all PDF files moved to the PitStop Server (PDF2Image) Configurator will be processed with the selected Action List. No additional setup is required.

To learn more about the PitStop Server and PitStop Server PDF2Image Configurator, search for the configurator in the Flow elements pane and select **Documentation** from the context menu.

Troubleshooting for Smart Preflight

Following topics explain how to fix some issues you may run across while working with Smart Preflight.

Variable not available to apply a preflight check

Issue

Although the variable is present in the Variable Set, you are not able to select it for a particular preflight check.

Cause/Context

When configuring a preflight check, you must first select the Variable Set concerned. Only variables that belong to this set can be applied.

Variables are (among others) defined using a particular type (Constant, Rule Based, Job Ticket) and value/measurement type (Number, Length, String, Boolean). This value type must match the preflight check settings it is intended for, otherwise it is not displayed when you try to select it.

Fix

Make sure the correct Variable Set is selected. If the variable you want to use is present in a different Variable Set, you may decide to switch Variable Sets or add the variable to the currently selected Variable Set.

Next, review the variable and ensure it's defined as the right "value type" (Number, Length, String or Boolean) to match the preflight check.

Variable Set not supported

Issue

While importing a Variable Set, you get one of the following errors:

- This Variable Set has settings not supported by this version of software. These may be changed or removed when editing the Variable Set.
- The selected Variable Set has been created with a more recent application and cannot be used.

Cause/Context

Variable Sets created with earlier versions of the software are always compatible with new versions. You can import them and use any new features of the software as required. No error messages will be shown.

Variable Sets created with newer versions of the software than the one you're using can be used as long as no new settings were used (as they are not supported by the software). If there is a version mismatch, one of the above mentioned error messages appears.

Fix

If you can import the Variable Set, remove or change the variables containing settings that are not supported.

If you cannot import the new Variable Set, you can either upgrade the software (recommended) or re-create the Variable Set using the older version of the software.

Note that, while saving Variable Sets, Enfocus PitStop Pro will automatically choose the lowest possible Variable Set version number to ensure maximum portability.

Red exclamation mark in front of a variable

Issue

When opening your Variable Set in the Variable Set Editor, you notice that one or more variables in the Variable Set have a red exclamation mark in front of them. Possible warnings:

- The variable uses the unkown variable type ... and cannot be edited.
- Variables from ... are not supported because ... Module is not licensed.

Cause/Context

Not all variable types are compatible with all Enfocus products. For example, "Text with Variables" can only be used with Switch. If a variable is "unknown" to an Enfocus product, it cannot be used or edited, but it won't harm either.

In Switch, some variable types are linked to a particular Switch module. For example, the "text with variables" variable using database fields is only supported if you have an active license for the Switch Database module.

The problem can also be linked to a rule-based variable; if the variable is based on another variable that has been removed or is invalid, the rule-based variable becomes invalid as well and gets a red exclamation mark in front of it.

Fix

If you want to use "unknown" variables, you must change the variable type to a type supported by the product you're using.

If you don't want to use it, just leave it in there; it won't do any harm. You can use (or edit) it again when working with other Enfocus products.

If you want to use variables that require a license that you don't have, please contact Enfocus to buy a license.

In case of invalid rule-based variables, review the rule(s) and correct or re-define the dependent variable(s) as required.

5.1.2.7. Metadata

The flow elements in the Metadata category of the Flow elements pane are only available if you have licensed the *Metadata Module*.

JSON pickup

JSON pickup is a default Switch app that allows associating a JSON string with a job as metadata. It supports the following pickup mechanisms:

- Metadata alongside asset
- Metadata in job folder asset
- Metadata refers to asset
- Metadata is asset

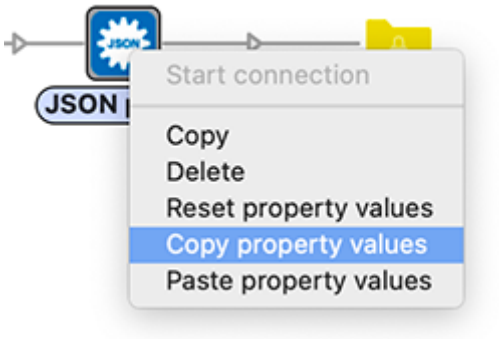
For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Remark

This is a default app (included in the Metadata module) as of Switch 2022 Spring. Its functionality is identical to the paying JSON pickup app that is available on the Enfocus Appstore.

The app has become part of the Metadata module, because support for the JSON metadata model was added in Switch 2022 Spring. So it's no longer necessary to convert JSON strings to XML (as was done by the paying JSON pickup app).

If you want to switch to this default app, you can cancel your subscription for the paying app and replace the old app with the new app in all your workflows. You can copy-paste the properties via the context menu of the app (see screenshot below). The new app has a different icon, so it's easy to see which version (the paying or the default app) you have!



XML pickup

XML pickup is a default Switch app that allows associating an arbitrary XML file with a job as metadata. It supports the following pickup mechanisms:

- Metadata alongside asset
- Metadata in job folder asset
- Metadata refers to asset
- Metadata is asset

For more info see *Pickup modes* on page 391.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

JDF pickup

JDF pickup is a default Switch app that allows associating an JDF file (that is, a JDF job ticket) with a job as metadata. It supports the following pickup mechanisms:

- Metadata alongside asset
- Metadata in job folder asset
- Metadata refers to asset
- Metadata is asset

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

XMP pickup

XMP pickup is a default Switch app that allows associating an XMP packet with a job as metadata. It supports the following pickup mechanisms:

- Metadata embedded in asset (the default location for an XMP packet)
- Metadata alongside asset
- Metadata in job folder asset
- Metadata is asset

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

XMP inject

The XMP inject default Switch app can be used for two main purposes:

- Inject an external dataset into the job

  The data to be injected is linked to the incoming job as an external dataset and corresponds to the XMP schema which is listed in the Switch jobticket.

  For example, the dataset could have been created by the export metadata mechanism which extracts information from a PDF.

  A scenario where we can use this feature is when merging information from multiple PDFs into a single PDF.
- Insert or update data to an existing XMP dataset

  All kinds of Switch variables can be injected as data. For example, we can use this feature in a GWG Ad Ticket to update the missing values.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Opaque pickup

Opaque pickup is a default Switch app that allows associating an arbitrary file with a job as metadata. It supports the following pickup mechanisms:

- Metadata alongside asset
- Metadata in job folder asset

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

Export metadata

Export metadata is a default Switch app that allows saving a metadata dataset associated with the incoming job to a standalone file. The tool merely copies the dataset's backing file to the output location without any transformations. The *XSLT transform* on page 114 tool can be used to transform the exported metadata if needed.

The outgoing log connections carry the exported metadata; the outgoing data connections carry the incoming job without change. If the incoming job has no dataset with the specified name, no log output is generated.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.1.2.8. Database

Database connect

This default Switch app helps in configuring certain settings in the databases (like selecting Datasource, adding SQL statement etc) without the use of scripting. It is only available if you have licensed the *Database module*.

Drag and drop the **Database Connect** to the workspace.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.1.2.9. Legacy

Compress (legacy)

Compress is a default Switch app that places the incoming file or a job folder into a compressed ZIP archive. All files in a job folder are placed in a single archive. The archive is named as the incoming file or job folder with a ".zip" extension.

Note: This tool is outdated and should only be used for maintenance reasons. Please use the new *Archive* on page 111 tool, which provides proper support for Unicode based on zip file format specification.

Keywords

Keywords can be used with the search function above the Flow elements pane.

The keywords for the **Compress** element are:

- ZIP
- archive

Connections

Compress allows only a single outgoing connection.

Properties

Property	Description
Element type	The flow element type: Compress. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the flow element displayed in the canvas
Description	A description of the flow element displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the flow element
Compress	If set to yes, the files in the ZIP archive are compressed (the default behavior) If set to no, the files are stored in the ZIP archive without compression, dramatically reducing processing time; this can be meaningful when speed is more important than size, or when the files will not compress well anyway (example: JPEG images) – but you still want a single archive containing all files
Use password	If set to yes, all created archives are password-protected
Password	The password used for protecting archives

Note: Switch uses zlib which does not support the AES encryption, therefore Switch cannot read passwords which use the AES encryption. Hence, the Uncompress tool cannot read passwords which have been encrypted using the AES encryption. As a workaround, users can try using a third-party archiver as a command line application from Switch.

Uncompress (legacy)

Uncompress is a processor that extracts files from an archive in one of the following formats:

- ZIP
- RAR
- MIME

Any files that are not recognized as an archive are passed through the Uncompress tool without change.

Note: This tool is outdated and should only be used for maintenance reasons. Please use the new *Unarchive* on page 112 tool, which provides proper support for Unicode based on the zip file format specification.

Keywords

Keywords can be used with the search function above the elements pane.

The keywords for the **Uncompress** element are:

- ZIP
- RAR
- MIME
- archive
- compress
- decompress
- unzip

Filenames and folder structure

The following table describes the resulting file or folder structure and the corresponding naming conventions.

Multiple files from the same archive are always placed in a job folder. If the intention is to inject these files into the flow as separate jobs, a job dismantler should be placed directly after the uncompress flow element.

Archive contents	Uncompress result
Single file	The file (named as specified in the archive).
Multiple files or folders with a common root folder	A job folder (named as the nearest common root folder) containing all files and folders (named as specified in the archive).
Multiple files or folders without a common root folder	A job folder (named as the archive after stripping the extension) containing all files and folders (named as specified in the archive).

Connections

Uncompress allows only a single outgoing connection

Properties

Property	Description
Element type	The flow element type: Uncompress. This property is useful to identify renamed flow elements. It cannot be changed.
Name	The name of the flow element displayed in the canvas.
Description	A description of the flow element displayed in the canvas. This description is also shown in the tooltip that appears when moving your cursor over the flow element.
Passwords	A list of passwords for opening password-protected archives; each of the passwords in the list will be tried in turn.

Property	Description

	The script expression can be used to determine a password dynamically, for example based on the sender of the packed data.
	
	Note: The result of the script expression evaluation must be a string containing one password or a list of passwords separated by a newline character ('\n').
	
	Example:
	
	`var thePasswords = new Array();`
	`thePasswords.push( "password" );`
	`thePasswords.push( "password2" );`
	`thePasswords.join( '\n' );`

Remove redundant folders	If set to **Yes**, for archives where the files or job folders are contained in deeply nested subfolder structures, removes all but the deepest subfolder level while uncompressing **Example:** A PDF file that is compressed as "Folder 1\Folder 2\Folder 3\Test.pdf" is uncompressed as "\Folder3\Test.pdf", if this option is enabled.

Note: The Uncompress tool cannot read passwords which have been encrypted using the AES encryption. Switch uses zlib which does not support the AES encryption. As a workaround, users can try using a third-party archiver as a command line application from Switch.

5.1.2.10. Flow elements matrix

The following table provides an overview of the flow elements offered by each module.

Flow element	Switch Core engine	Config module	Meta data module	Data base module	Scripting module	Switch Client module
Basics						
Connection	✔					
Folder	✔					
Problem jobs	✔					
Submit hierarchy	✔					

Flow element	Switch Core engine	Config module	Meta data module	Data base module	Scripting module	Switch Client module
Archive hierarchy	✓					
Set hierarchy path	✓					
Job dismantler	✓					
Ungroup job	✓					
Split multi-job	✓					
Assemble job	✓					
Generic application		✓				
Execute command	✓					
Tools						
Refresh job info	✓					
Sort by preflight state	✓					
Archive	✓					
Unarchive	✓					
Split PDF	✓					

Flow element	Switch Core engine	Config module	Meta data module	Data base module	Scripting module	Switch Client module
Merge PDF	✓					
Hold job	✓					
Inject job	✓					
Rename job	✓					
File type	✓					
Sort job	✓					
Log job info	✓					
Sort files in job	✓					
XSLT transform	✓					
Recycle bin	✓					
Scripting						
Script element					✓	
Communication						
HTTP request	✓					
Remote process					✓	

Flow element	Switch Core engine	Config module	Meta data module	Data base module	Scripting module	Switch Client module
Webhook	✓					
FTP receive	✓					
FTP send	✓					
Mail receive	✓					
Mail send	✓					
Submit point						✓
Checkpoint						✓
Checkpoint via mail						✓
Pack job	✓					
Unpack job	✓					
Monitor confirmation	✓					
Apps						
Various apps purchased through the Enfocus Appstore	✓					

Flow element	Switch Core engine	Config module	Meta data module	Data base module	Scripting module	Switch Client module
See also *Working with apps in Switch* on page 252.						
Metadata						
JSON pickup			✓			
XML pickup			✓			
JDF pickup			✓			
XMP pickup			✓			
XMP inject			✓			
Opaque pickup			✓			
Export metadata			✓			
Database						
Database connect				✓		
Legacy						
Compress	✓					
Uncompress	✓					

5.2. Working with flows

Working with Switch means creating, designing and running flows for the processes you want to automate.

5.2.1. About working with flows in Switch

Working with flows consists of the following steps:

1. First you have to **create a new flow**. You can start from scratch (blank flow) or from a sample flow.
2. Next, you have to **design your flow**, by dragging the required flow elements to the canvas. You must configure the properties of the different flow elements and connectors.
3. Finally, you must **activate** the flow, and test it, using test files, until you are happy with the result.

For a step by step explanation, refer to the Switch Quick Start Guide on the *Enfocus website*.

For a detailed description of everything you can do with Switch flows, refer to the topics below.

5.2.2. Creating a new blank flow

Use this procedure, if you want to create a blank flow with an empty canvas. You'll have to add all flow elements yourself.

To create a blank flow

1. Do one of the following:
   - In the toolbar at the top of the screen, click

   - From the menu, select **Flow** > **New Flow...**.
   - In the Flows pane, right-click and select **New Flow**.

   A new flow is created. By default it is called "New flow" (followed by a number if it's not your first "New flow").

2. Enter a meaningful new name for your flow.

   Your cursor will automatically focus on the flow name in the Flows pane, so you can immediately type a new name. If you click outside the name field, the name will be displayed in italics and it will have an asterisk next to it, to indicate that the flow hasn't been saved yet.

You can now add flow elements as required.

5.2.3. Creating a new flow based on a sample flow

Use this procedure, if you want to start from one of the Switch sample flows. These flows come with the default Switch installation and are available through the Flows menu.

To create a flow starting from a sample flow

1. From the menu, select **Flow** > **Import sample flows...**.
2. Select the flow(s) you want to start from.
   - To select all flows in one go, click **Select all**.
   - To clear the checkboxes of all already selected flows, click **Clear selection**.
   - To select one or more flows, select the corresponding checkbox(es).

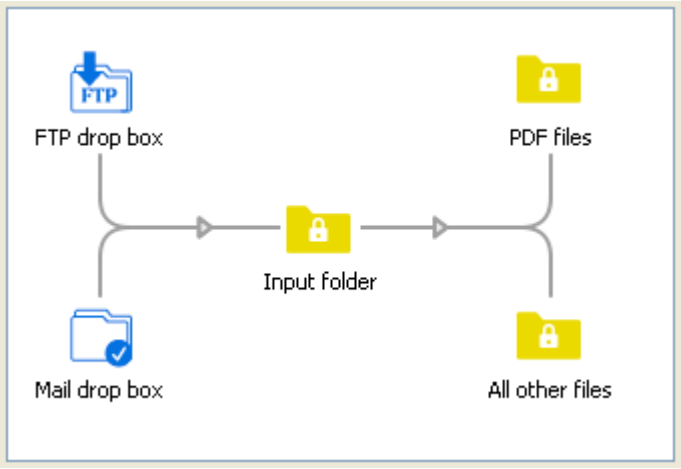
   Note:
   - For a description of the available flows, click a flow name. The description appears in the lower part of the dialog.
   - You can select more than one flow, for example to have a look at the differences or to see if they are similar to what you need. All the flows you select will become available in the Flows pane.
3. To import the selected flow(s), click **OK**.
   The Flows pane shows the imported sample flow(s). You can modify and expand the flow(s) as required. See *Designing flows* on page 168.

5.2.4. Designing flows

5.2.4.1. Working with the canvas

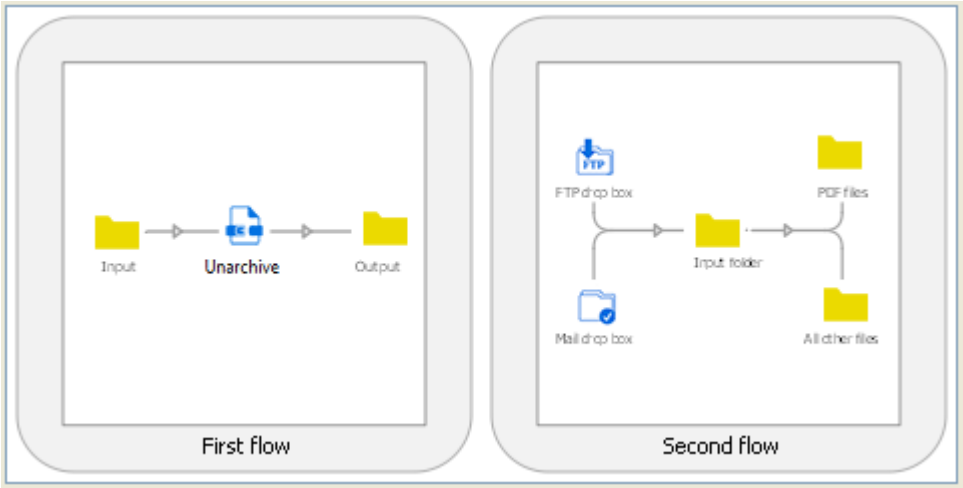
The canvas is the central workspace area that allows viewing and editing flows. The canvas always displays the flows selected in the Flows pane.

Single flow at full size



When a single flow is selected, the canvas displays it at full size and scroll bars appear if the flow design is larger than the visible area. In this mode the flow is editable (assuming that it is inactive and unlocked); see *Editing a flow* on page 170.

Multiple flows as tiles



When two or more flows are selected, the canvas displays a tile for each flow. A tile is a scaled-down version of the flow design similar to a thumbnail. Tiles can't be edited. However you can select a particular tile and edit its flow properties in the Properties pane.

In tile mode the canvas never shows horizontal scroll bars. Instead the size of the tiles is adjusted so that a predefined number of tiles fit on a row. The maximum number of tiles shown can be set as well.

- To adjust the number of tiles in a row, choose the "Tiles in a row" menu item in the canvas context menu and select one of the choices 1 through 9 in its submenu (this context menu item is present only while the canvas displays tiles).
- To return one of the displayed flows to full size:
  - Double-click the tile in the canvas; or

  - Select the tile in the canvas and choose the "Show at full size" menu item in the canvas context menu; or
  - Select the flow in the Flows pane (without selecting any other flows).
- To change the maximum tiles shown, select the "Maximum tiles" menu item in the context menu and select the desired value. If more flows are selected than this maximum number, the canvas will show a message instead of the tiles.

Single flow scaled to fit

- To display a large flow design (that doesn't fit the current Canvas pane) as a tile that fits the visible area of the canvas:
  - Select the flow and choose the "Scale to fit" menu item in the canvas context menu (this context menu item is present only if the canvas shows a scroll bar).
- To return the scaled-down flow to full size, perform one of these steps:
  - Double click the tile in the canvas; or
  - Select the tile in the canvas and choose the "Show at full size" menu item in the canvas context menu.
- You can also zoom in and zoom out the canvas area to enlarge or minimize the selected flow:
  - On Windows OS, press the **Ctrl** button and scroll with your mouse.
  - On Mac OS, press the **Command** button and scroll with your mouse.

Editing a flow

Before making changes to a flow:

- Ensure that the flow is inactive and unlocked; an active or locked flow is displayed with a darkened background and cannot be edited.

  Note: Are you viewing the flow with a Remote Designer? In that case, a darkened background may indicate that you don't have the right to edit the flow (read-only access). Refer to the section about user configuration for Remote Designer, for example: *Configuring a user* on page 63 (last step).

- Select the flow in the Flows pane without selecting any other flows; when multiple flows are selected the canvas shows tiles which cannot be edited.

5.2.4.2. Working with flow elements

A flow design (as displayed in the canvas) consists of a number of interconnected flow elements. Switch offers a range of flow elements, including:

- Connection: a special flow element used to connect other flow elements; connections determine how jobs can travel along a flow.
- Folder: a central flow element used to (temporarily) store or modify jobs in between processes.
- Various flow elements types to produce, process and consume jobs.

Adding new flow elements

To add a new flow element to the canvas

Do one of the following:

- Drag the icon for the desired flow element type from the **Flow elements** pane onto the canvas in the desired location.
- Right-click a blank area of the canvas and select **Add** > **<category>** > **<desired flow element>**.

For flow elements that are used often, you can use the following shortcuts:

- To *add a Folder flow element*, you only need to *double-click* in the canvas where you want the Folder to be added.
- To *add a favorite flow element*, you can use the following keyboard shortcuts: *ctrl +<number>* (Windows) or *cmd+<number>* (Mac). The number (1-9) refers to the position of the flow element in the Favorites category (first in the list = 1, second = 2, etc). The flow element is placed in the middle of the canvas.

Connecting flow elements

To connect two flow elements that are already present on the canvas

Do one of the following:

- Drag the Connection icon from the Flow elements pane and drop it onto the first flow element; then click the second flow element.
- Double-click the first flow element; then click the second flow element.
- Right-click the first flow element and select **Start connection**; then click the second flow element.

A connection line connects the two flow elements.

Inserting a folder between two non-folder flow elements

In Switch, you cannot make a connection between two non-folder flow elements, without having a folder in between.

For this reason and to save time, when dragging a connection between two non-folder flow elements, Switch automatically adds a folder in between and creates a double connection (from the first flow element to the folder, and from the folder to the second flow element).

You can see that a folder is added upon creating the connection as the drag line includes the outline of a folder between source and destination, and the cursor changes to "allowed".

This insertion of a folder does not take place if,

- There is not enough room in between the two flow elements to insert a folder.
- Inserting a folder does not result in valid connections.

Inserting a flow element on an existing connection

You can insert a flow element on an existing connection by dragging and dropping the new flow element on the connection between two other elements.

The flow element that you insert can be dragged from the Flow elements pane, or you can drag and drop an existing flow element from the canvas, if it does not have any connections yet.

The connection from the original "source" flow element will go to the newly inserted flow element and a new connection from the newly inserted element to the "original" target element will be established.

If necessary, a folder will be added in between, just as when connecting two flow elements. See *Inserting a folder between two non-folder flow elements* on page 171.

You can see that the flow element will be added on the existing connection as the outline of the element is shown between source and destination.

This insertion on a connection will not take place if:

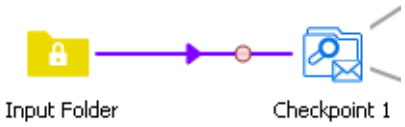
- There is not enough room in between the two flow elements to insert the flow element (and a folder if necessary).
- Inserting the element doesn't result in a valid connection.

Manually changing connections

You can manually change connections by clicking and dragging the start or end of a connection from one flow element onto another one.

To manually change connections

1. Select the connection you want to change.
2. Hover the cursor over the source or target end of the connection you want to change. A grab handle (red circle) appears, similar to the grab handle for the corner point, as shown below:



3. Click and drag the connection on another flow element, for which the new configuration is allowed:
   - For the target of the connection, this is similar to creating a new connection.
   - For the source, the new source flow element must accept outgoing connection of the same type and with the same injected properties.

   Note: To *copy* the connection instead of moving it, press the **Ctrl** key (for Windows) or **Alt** key (for Mac OS).

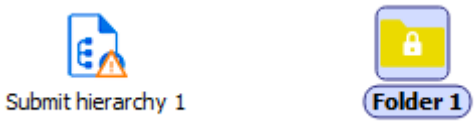
Warnings when adding new flow elements

After adding a new flow element to the canvas, the flow element may display an alert icon ( ) indicating a problem with the flow design.

This usually refers to missing connections, since many flow elements require at least one incoming and/or outgoing connection. For more information, hover your cursor over the icon to display a tooltip.

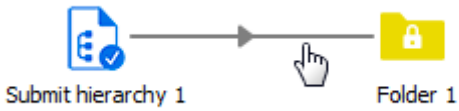
Example:

After adding a "Submit hierarchy" and a "Folder" the flow design looks as follows:



The tooltip for the Submit hierarchy 1 element states: The flow element requires at least one outgoing connection.

After adding a Connection element, the warning will be gone.



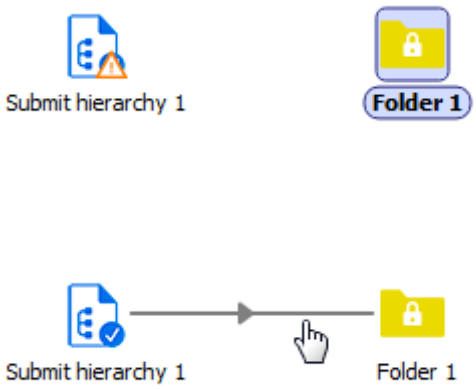
Selecting flow elements

Note: You can select multiple flow elements as required. However, a connection and other flow elements cannot be combined in one selection.

To select flow elements

1. To select one flow element at a time, click the flow element in the canvas.
   In the canvas, you can see which element is selected:
   - Selected flow elements are surrounded by a gray rectangle.
   - Selected connections have a darker color.
2. To select multiple flow elements at the same time, do one of the following:
   - Drag a selection rectangle around the flow elements in the canvas.
   - Click a first flow element, and then expand the selection by clicking other flow elements, while holding down the **Ctrl** key (on Windows) or **Command** key (on Mac OS).

Example of a selected flow element and a selected connection.



Moving flow elements

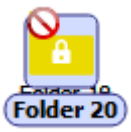
To move flow elements on the canvas

1. Select one or more flow element as required.

   See *Selecting flow elements* on page 173.

2. Use the arrow keys or drag and drop the selected flow element to the preferred place on the canvas.

   Note: If you're about to place two elements on top of each other, a warning icon appears. Move the element a little bit, to avoid that one of the two gets hidden.



Configuring flow elements

Each flow element (including the Connection flow element) offers one or more properties that help determine the flow element's behavior. You should set an appropriate value for each property (or use the default value) to fully configure a flow.

For a detailed description of the properties offered by each flow element, refer to *Flow elements: overview* on page 95.

Editing the name of a flow element

All flow elements (including the Connection flow element) offer at least two properties: the element type and the name of the flow element as displayed in the canvas. When you add a new

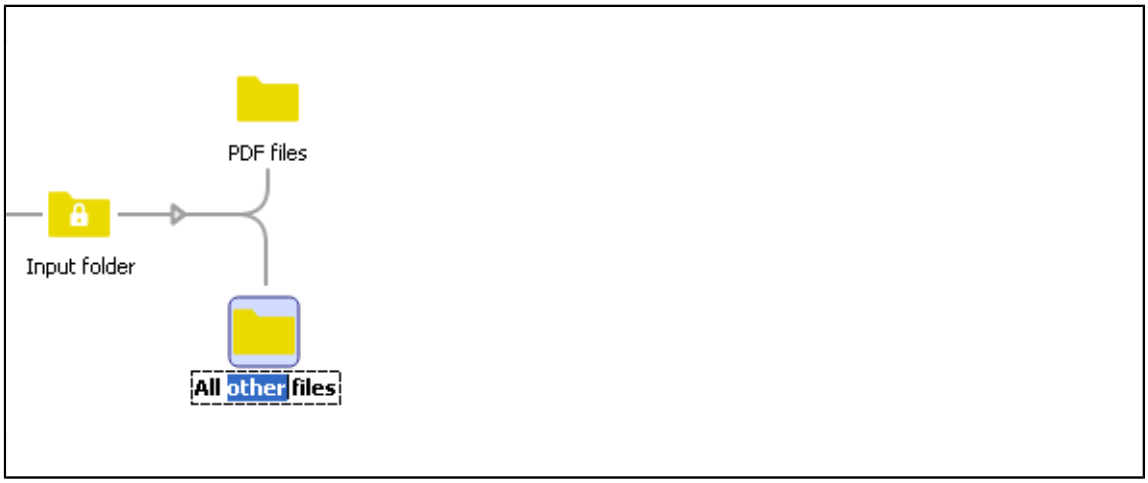
flow element, Switch provides it with a default name inspired by the flow element type. By default, a connection does not contain a name.

You can edit the Name property in the Properties pane, just like other properties (See *Changing flow element properties* on page 175), or you can edit the name directly on the canvas, as explained below.

Tip: For a better overview, we recommend using meaningful names!

To edit the name of a flow element directly on the canvas

1. On the canvas, select the flow element.
   Ensure only one flow element is selected.
2. Click the *name* of the flow element (on the canvas).
3. Enter the new name or adjust the existing name.



Changing flow element properties

Switch provides you with default values for the flow elements, but you can change the defaults as required.

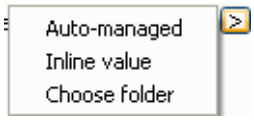
Note: You can only change the properties if the flow is not active and not locked.

To change the properties of flow elements

1. Select the flow element of which you want to change the properties.

   Note: If you select multiple (similar) flow elements at the same time, you can change the common properties.

   The properties of the selected flow element(s) are displayed in the Properties pane.
2. Click the property you want to change.
   Depending on the selected property, a text box, a button, or a drop-down menu appears.
3. Make the required changes:

If ... appears	Do the following:
A text box	Type the text in the displayed text field.
A drop-down menu	Select the appropriate option.
	1. In the the property editor dialog that pops up, update the field(s) as required. 2. Click **OK**.
	1. From the pop-up list, select one of the options.  Depending on the selected option, an inline editor or a dialog appears. 2. Configure the desired values.

For an overview of the properties and their meaning, see *Flow elements: overview* on page 95.

Your changes are applied immediately.

Resetting flow element properties

You can reset the property values to the factory defaults, as when creating a new flow element on the canvas.

To reset property values

1. Select the flow element.
2. Right-click the flow element, and select **Reset property values**.

Copying flow element properties

For all flow elements, including connections, you can copy and paste the property values.

Note: Property values can only be pasted to flow element(s) of the same (or a similar) type.

To copy flow element properties

1. Right-click the flow element, from which you want to copy the property values.
2. From the contextual menu, choose **Copy property values**.
3. Select the flow element(s) you want to paste the property values on.
4. Right-click the flow element(s), and select **Paste property values**.

Warnings when editing flow element properties

If property values are invalid or missing, you are informed in two ways:

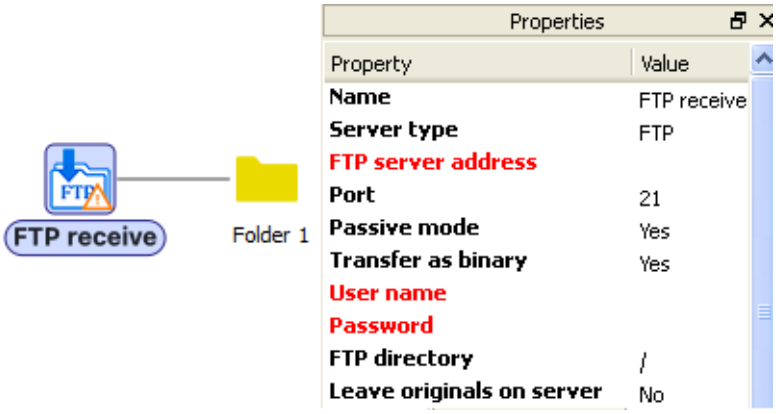
- The flow element is displayed with an alert icon (⚠).

  For more information, hover your cursor over the icon to display a tooltip.

- The invalid property is displayed in red in the Properties pane.

Example:

After adding and connecting an FTP receive flow element, the canvas and the Properties pane look as follows:



The tooltip for the FTP receive element states: Required fields are not valid: FTP server address, User name, Password.

After entering the missing information, the warning will be gone and the properties will be displayed in black again.

Adjusting the layout of the flow design

To adjust the layout of the flows design, select one or more flow elements (other than connection) and drag the selection around, or use the arrow keys to "nudge" the selection to the indicated direction in small steps. Connections automatically adjust to the new layout.

Aligning flow elements horizontally

To align flow elements horizontally

1. Select the flow elements to be aligned.
2. Do one of the following:
   - *On Windows OS:*

     Select **Edit** > **Align Horizontally**, or press **Ctrl** + **Shift** + **H**.
   - *On Mac OS:*

Select **Enfocus Switch** > **Align Horizontally**, or press **Command** + **Shift** + **H**.

Aligning flow elements vertically

To align flow elements vertically

1. Select the flow elements to be aligned.
2. Do one of the following:
   - *On Windows OS:*

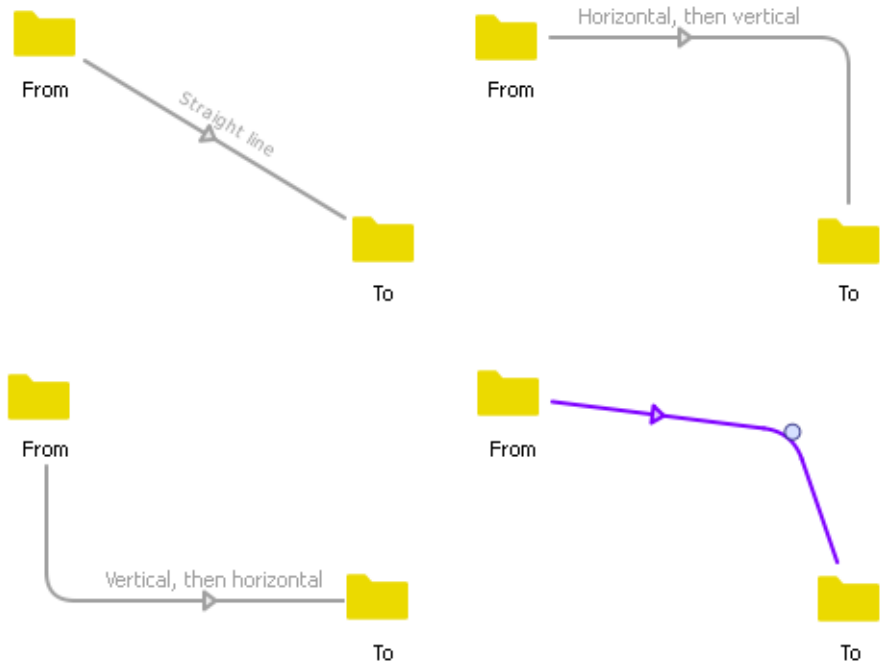
     Select **Edit** > **Align Vertically**, or press **Ctrl** + **Shift** + **V**.
   - *On Mac OS:*

     Select **Enfocus Switch** > **Align Vertically**, or press **Command** + **Shift** + **V**.

Adjusting the layout of a connection

By default, connections are drawn as straight lines between two flow elements. You can however adjust these lines to make a well-arranged design.

1. To draw the connection along the sides of a rectangle (with a rounded corner)
   a. Select the connection.
   b. Do one of the following:
      - Right-click the connection and select **Vertical, then horizontal** or **Horizontal, then vertical**.
      - In the Properties pane, set the connection's **Corner angle** to -90 or +90.
2. To draw the connection along a route somewhere in between these extremes
   a. Select the connection.
   b. Do one of the following:
      - Move your cursor over the connections's corner until a drag handle (blue circle) appears, and drag the handle to the desired direction.
      - In the Properties pane, set the connection's **Corner angle** to a value between -90 or +90.



Adjusting the colors of folders and connections

To make it easy to distinguish between different folder or connection types, for example between network and input folders, you can change the default color for folders (yellow) and connections (gray).

To adjust the colors of folders and connections

1. Select one or more connections or folders.

   Note: You cannot combine connections and folders in one selection.

2. Right-click to open the context menu.
3. Click **Choose color** and select the appropriate color from the list of predefined colors.

   You can choose one of the following colors:

   - Gray (default), Yellow, Green, Cyan, Blue, Magenta for *connections*.
   - Yellow (default), Orange, Green, Cyan, Blue, Magenta for *folders*.
   - Or click "Custom" and select the color of your choice using the color picker.

   Alternatively, you can set the color via the Properties pane.

Keep in mind that "conditional" colors (e.g. orange for connections on hold) will take priority over custom colors.

For example, even if you have chosen green for a particular connection, its color will change to orange when the connection is set on hold. When the connection is released, the chosen color (green) will be restored.

Copying and deleting flow elements

You can copy and paste flow elements within the same flow or to another flow. The copy includes all selected flow elements plus any connections between them. Connections to flow elements outside of the selection are not included. It is not possible to copy a connection on its own.

When pasting flow elements into a flow, Switch renames the new flow elements if needed to avoid name clashes between backing folders.

- To copy one or more flow elements to the pasteboard, select the flow elements and
  - Choose the **Edit** > **Copy** menu item, or
  - Choose the **Copy** menu item in the canvas context menu.
- To paste previously copied flow elements from the pasteboard into a flow, select the target flow and
  - Choose the **Edit** > **Paste** menu item, or
  - Choose the **Paste** menu item in the canvas context menu.
- To delete one or more flow elements from a flow, select the flow elements and
  - Choose the **Edit** > **Delete** menu item, or
  - Choose the **Delete** menu item in the canvas context menu, or
  - Press the **Delete** key.

Undoing flow editing operations

Switch remembers flow editing operations (including changes to flow element properties) since it was last started, and allows undoing these operations in reverse order.

There is a separate undo stack for each flow.

- To undo the most recent edit operation for a flow, select the flow and perform this step:
  - Choose the **Edit** > **Undo** menu item.
- To redo the most recently undone edit operation for a flow, select the flow and perform this step:
  - Choose the **Edit** > **Redo** menu item.

5.2.4.3. Advanced topics for designing flows

Working with folders

Working with individual files in Switch is quite straightforward. When files are grouped into folders (and sometimes in nested folder structures), you need to take the following information into consideration.

Switch distinguishes between two important concepts related to (and implemented by) folders:

- Subfolder hierarchies provide structure to file submissions and to final processing results by placing files in appropriately named subfolders (for example, a subfolder for each customer).

- Job folders represent file sets that move along the flow as a single entity, for example a page layout with its accompanying images and fonts, or the individual pages in a book.

Since both concepts are implemented with regular file system folders, Switch needs a way to know what it is looking at when it sees a folder. This is accomplished as follows:

- Subfolders in a regular folder are always treated as a job folder; i.e. the subfolder and its contents are moved along as a single entity.

- Certain flow elements (such as Submit Hierarchy and Archive Hierarchy) have special provisions to support a mixture of subfolder hierarchies and job folders; these provisions are configured through the flow element's properties.

Thus the complexity of dealing with both concepts at the same time is limited to those special flow elements.

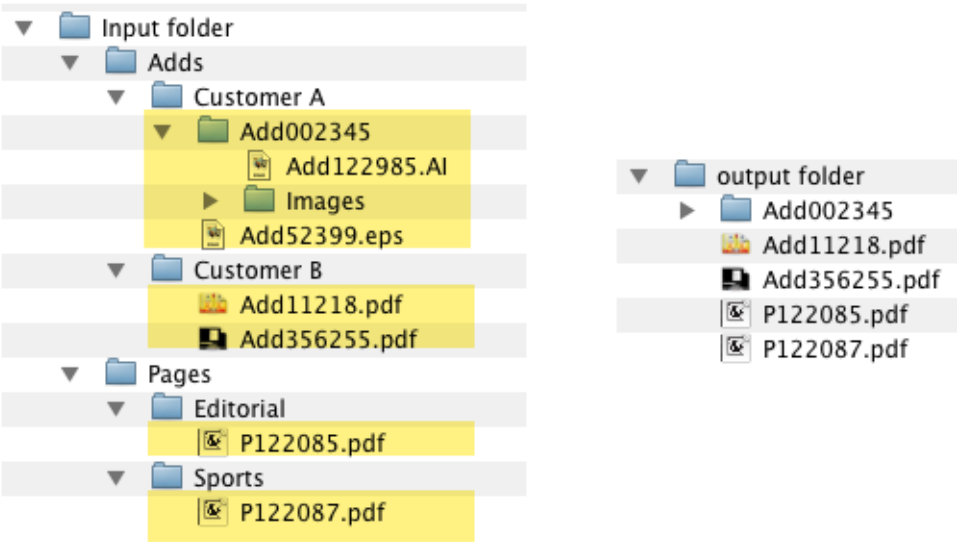
Working with subfolders

Submit hierarchy

The "Submit hierarchy" tool (and its sibling FTP receive) can be used to fetch files that are delivered in a hierarchy of subfolders. The tool looks for files in the nested subfolder structure up to a certain level (specified in a property), and injects those files into the flow along its output connection(s). The injected files are placed in the output folder(s) at the highest level, in effect flattening the subfolder hierarchy. However, if so requested, the original location in the hierarchy is stored with the file (in its internal job ticket) so that it can be retrieved later to recreate the hierarchy. See *Using hierarchy info* on page 184 for more details.

If a subfolder occurs in the hierarchy on a deeper nesting level than what is specified in the "Subfolder levels" property, it is treated as a job folder (i.e. it is moved along as a single entity). Thus, in effect, the "Subfolder levels" property determines which subfolders in the hierarchy should be treated as "hierarchy folders" and which should be treated as job folders.

In the example below you can see the input folder and the corresponding output folder, using Subfolder levels set at **2**.



If you do not want to support job folders, set the "subfolder levels" property to a very high value (for example, 999). This will cause all files to be processed separately, regardless of their nesting level in the hierarchy.

Using the Submit Hierarchy function eliminates the need to set up individual input folders on a user by user basis. In the example above, by just adding another sub folder for "Customer C", any job files or folders put in that folder would be seen and processed by Switch without any additional changes to that workflow.

Archive hierarchy

When archiving files (or job folders), you might want to recreate the subfolder hierarchy that was used to deliver them, or you may want to create a different subfolder hierarchy based on which route files took in a flow. Even though the files have been retrieved from different locations and have been moved along the flow through various processing steps, the internal job ticket for each file can remember the information needed to place the file in its appropriate location in the hierarchy.

The archive hierarchy tool extracts this information and creates the corresponding hierarchy (you can still limit the number of subfolder levels to be recreated regardless of the information stored in the internal job ticket). See *Using hierarchy info* on page 184 for more details.

Working with job folders

Any folder (and its contents) that should be processed as one entity is considered to be a job folder. A job folder usually contains files and/or subfolders (which can contain other files and folders, recursively). Examples include a page layout with its accompanying images and fonts, and the individual pages in a book.

To inject a job folder in a flow, you need an active flow. Otherwise it will take the folder path of this folder as its new input folder and will treat all files as single jobs. The job folder will be moved along the flow and processed as a single entity.

It is also possible to submit job folders through a "Submit hierarchy". In that case you need to make sure that the "Subfolder levels" property is set correctly, as explained in working with subfolders above. For example, if you have a subfolder for each of your customers and these subfolders contain the jobs, the "Subfolder levels" property should be set to 1. If you would set this property to 2, the job folder would be treated as yet another subfolder level and the files in the job will be processed as separate files.

Job dismantler

In some situations you need to dismantle a job folder and continue with the job's files as separate entities. Often this is because the files arrived inside a folder, but in reality they are not part of a single logical entity. Sometimes you just want to deal with (some of) the components of a job.

For example:

- Customers submit a "job folder" that contains a number of related PDF files, but you really want to preflight each of them separately.
- You use the uncompress tool to unzip a zip archive, resulting in a job folder that contains all of the files from the ZIP archive.
- You want to review each of the images inside a page layout job (outside of the job's context).

In these situations you can use the job dismantler to retrieve the individual files from the job folder.

When you dismantle a job, you need to set the "Subfolder levels" property correctly. This property behaves in the same way as what is explained above for Submit hierarchies i.e. it determines how many levels Switch will search for individual files from the job.

Job assembler

Vice versa, sometimes you need to gather a number of files and keep them together through the rest of the flow.

For example:

- You need to group individual PDF files that will have to be merged into a single document.
- You want to send out an email for every 10 files that arrived in some input folder.
- You would like to insert a file (for example, a preflight report) into an existing job folder.

The job assembler supports various ways of determining which files go together in a job:

- Merge by file name: the file names must contain a numbering scheme (e.g. "page X of Y")
- Complete job every N files: a job is created when N files are collected.
- Complete job every N minutes: a job is created every N minutes.

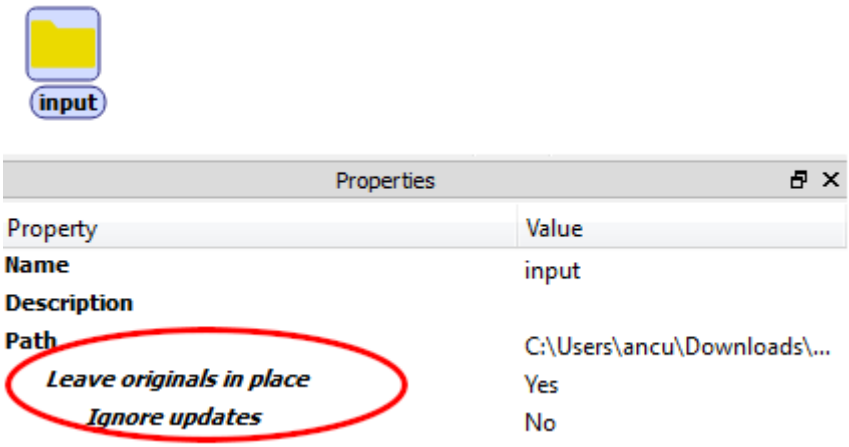
By default all newly created job folders are named "Job" followed by a running count.

To create a job with (nested) subfolders, you can use the same mechanisms as described above for archive hierarchies. See *Using hierarchy info* on page 184 for more details.

Leaving originals in place

By default, Switch moves incoming jobs out of the input folder when injecting them into a flow. Therefore, Switch needs full access rights to rename, create and remove files and folders in the input folder.

However, a number of key flow elements (Folder (*user-managed input*), Submit hierarchy, FTP receive and Mail receive) also support a read-only mode, activated by setting the **Leave originals in place** property for the flow element to **Yes**. In that case, Switch does not write anything to the input folder, so read-only access rights suffice.



Ignore updates

Leave originals in place has "Ignore updates" as subordinate option.

If **Ignore Updates** is set to **Yes**, Switch processes a job only once, ignoring any changes to the job's file size or modification date after it was initially processed. This can be used in workflows where Switch replaces the input job by a processing result, without triggering an endless loop.

If set to **No**, Switch will reprocess a job when its file size or modification date changes. This can be useful when submitting a job with the same name of a previously submitted job. In this case, Switch will use the list of already processed jobs (see below).

How it works

For each flow element operating in read-only mode, Switch maintains a list of all files/ folders in the input folder that were already processed (i.e. actually injected in the flow or skipped due to filters).

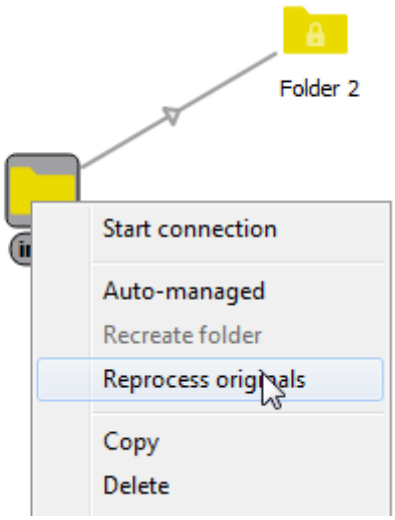
Switch automatically updates the list at regular intervals as follows:

- Items that are updated or replaced in the input folder are reprocessed if "Ignore Updates" is set to "No"; changes are detected by looking at the byte count and at the most recent of creation date and modification date.
- Items that disappear from the input folder are removed from the list (to keep its size down).

Reprocessing originals

The user can manually clear the list of jobs already processed as follows:

- Choose the **Reprocess originals** context menu for the relevant flow element. This causes all remaining original items to be reprocessed when the flow is next activated.
- Certain flow design changes (e.g. set **Leave originals in place** to **No**; change backing folder) automatically clear the list when the flow is next activated.



Using hierarchy info

A key feature of Switch is its ability to

- Remember a job's origin and routing information, and
- Use this information when placing the job in a folder hierarchy (Example: for archiving).

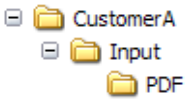
This information is called **hierarchy info**. It is stored in the job's internal job ticket under the form of a hierarchy location path, as described below.

See also *Working with folders* on page 180.

Hierarchy location path

The hierarchy location path (stored in a job's internal job ticket) consists of zero or more segments, and each segment represents the name of a (sub)folder in a nested folder structure. The first segment represents the top-level folder.

For example, the hierarchy location path consisting of the segments "CustomerA", "Input" and "PDF", in that order, represents the following folder structure:



Remembering hierarchy info

Most producers allow remembering hierarchy info depending on a job's origin, and provide properties to configure what's remembered. For example, a "Submit hierarchy" element allows remembering its own name and/or the relative path to the subfolder where the job was submitted.

A folder allows adding the folder name to the location path (at the top or at the bottom). This can be used to create additional hierarchy levels. For example, separating input and output jobs for each customer.

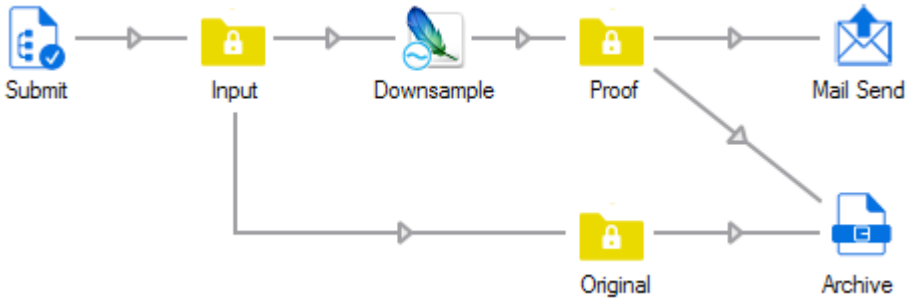
Using hierarchy info

Some elements, and most notably the archive hierarchy, use the hierarchy information remembered for each job to place the job in an appropriate nested folder structure.

Switch automatically creates any folders needed for the (nested) hierarchy.

Example

For example, consider this flow:

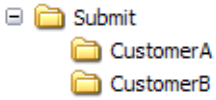


And the following configuration details:

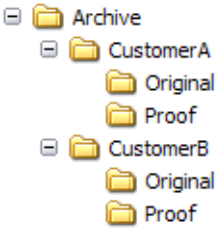
- Submit is configured to remember one level of subfolders, and those subfolders are named for different customers.
- Downsample is configured to produce a JPEG thumbnail of the incoming image file.

- Proof and Original are configured to add their own folder name at the bottom of the hierarchy location path.
- Archive is configured to accept two subfolder levels.

Then the following Submit hierarchy:



Will result in this Archive hierarchy:



Specifically, submitting a file named "File.tif" in folder Submit/CustomerA will result in two archived files (in addition to the proof being mailed out):

- The original "File.tif" will be placed in Archive/CustomerA/Original.
- The downsampled copy "File.jpg" will be placed in Archive/CustomerA/Proof.

And naturally submitting a file in folder Submit/CustomerB will result in two archived files under the Archive/CustomerB/... structure.

Using email info in Switch

A key feature of Switch is the ability to attach email information to the jobs that are being processed and use this info to send notifications or receipts.

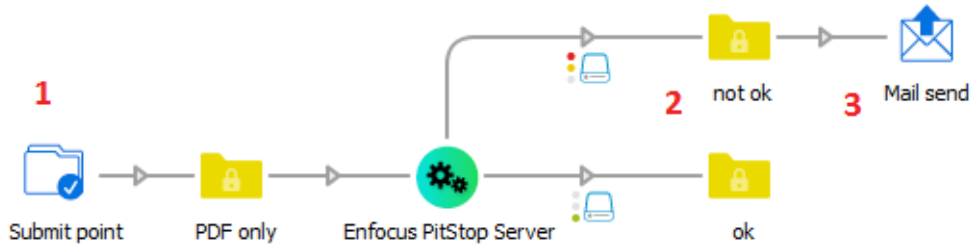
For example:

- If jobs are submitted through e-mail, Switch can use the sender's email address to send him/her a receipt.
- Additional email info (email addresses or body text) may be attached to a job, e.g. to also inform customer sales representatives or operators of new jobs that were injected in the flow.
- If jobs are submitted in a folder hierarchy, notifications can be sent based on the folder the job is in. This is useful if the folders have the name of the customers or refer to the type of job being submitted.

"Email info" in Switch refers to both (a list of) email addresses and body text. This information is *stored in the job's internal job ticket*, so it can move along the Switch flows as metadata and be retrieved through variables ([Job.EmailBody] and [Job.EmailAddress]).

Note that Switch combines new email information with any email information already present. Email addresses are added to the list, and body text is appended to what's there (inserting a line break if needed). Existing email info is never removed.

The following topics explain how you can attach email info to a job in Switch and how this info can be used to send the appropriate email message to the appropriate recipient. This is also illustrated in the following example flow:



1. Email info is attached when the job comes in. In this example, jobs are submitted via a Submit point and for example the email address of the user submitting the job is attached.
2. Extra email info is attached when the job is moving along the flow. In this example, the preflight status is added as email info.
3. The attached email info is used when (part of the) processing is finished to notify operators, customers or sales representatives. The Mail send tool is needed to send the notifications.

Attaching email info to a job - flow elements

Associating email information with jobs submitted to Switch is possible through the configuration of the relevant **flow element properties**. Not all flow elements support email information; only the ones that have properties related to email info. These properties must be configured appropriately as described further in this document.

Note: Remember that the (email) info attached to the job can be used by other flow elements that support variables.

The following table gives an overview of the flow elements that allow you to attach email info to the job's internal job ticket.

Flow element	Properties
Mail receive (submitted jobs)	• **Attach email info**: if enabled, the sender's email address (*not the body text!*) is copied to the job's metadata. • **Attach extra email info**: allows you to add extra email addresses or body text to the job's metadata. You can define different email info depending on who's the sender (email address or email account name), or what's in the message subject line. For example, you could attach mail X to jobs from customer X and mail Y to jobs from customer Y. How to do this is explained in *Attaching email info - the email info map* on page 189.
FTP receive (submitted jobs)	**Attach email info**: allows you to associate email addresses and body text based on the name of the folder on the FTP server that holds the job. This is useful if the folder name reflects the type of job, or if it refers to the customer.

Flow element	Properties
Submit hierarchy (submitted jobs)	**Attach email info**: allows you to associate email addresses and body text based on the name of the folder the job resides in. This is useful if the folder name reflects the type of job, or if it refers to the customer.
Folder (submitted jobs + jobs moving along the flow)	• **Attach email addresses**: allows you to add one or more email addresses. • **Attach email body text**: allows you to add an email message. Note that here it is not possible to differentiate between jobs; all jobs will get associated with the same list of addresses and with the same body text. Some use cases: • Accumulate an audit trail of status messages in the email body text as a job moves along a flow, and email the audit trail to a supervisor at the end of the flow. • Associate a different email address with a job depending on its status in the flow (e.g. passed preflight test or not). • Sort jobs based on filename (or any other criteria) and then associate a different email address with a job depending in how it was sorted.
Job Dismantler (jobs moving along the flow)	**Attach email info**: allows you to associate email addresses and body text based on the folder name the job belongs to. This is useful if the folder name reflects the type of job, or if it refers to the customer.

Flow elements that become available if you have licensed the SwitchClient Module also allow attaching email info, as shown in the table below. For more info, refer to the *SwitchClient Module* on page 423.

Flow element	Properties
Submit point	• **Attach user email address**: allows you to add the email address of the user that submits the job to Switch. • **Attach extra email info**: allows you to add extra email information. The information added can vary depending on the user submitting the job.
Checkpoint	**Attach user email address**: allows you to add the email address of the user that handles the job.

Attaching email info - the email info map

How it works

In order to differentiate between the different jobs and the email addresses/messages that have to be associated with them, you must build a mapping table (called email info map).

Each entry in that map consists out of three elements:

- **A key**, used to identify the job and to determine which message/address(es) must be attached.
  - In case of FTP receive, Submit hierarchy, Folder and Job dismantler, this is a folder name.
  - In case of a Submit point, this is the name of the Switch user that submits the job.
  - In case of Mail receive, this is the sender's email address or email account or a key word that must be present in the mail subject line (depending on what you select in the **Base map key on** property (subordinate property of **Attach extra email info**).

  By default, the mapping table contains an entry for the special key *<all>*. This entry allows you to specify **email info that should be added to all jobs**, regardless of their key. If this key is left empty, however, it will be ignored.

- **One or more email addresses** that will be attached to the job. Make sure to use semicolons (not surrounded by spaces) to separate the email addresses.

- An **email message** consisting of one or more paragraphs. You can use Switch variables in your body text, for example to refer to the name of the job.

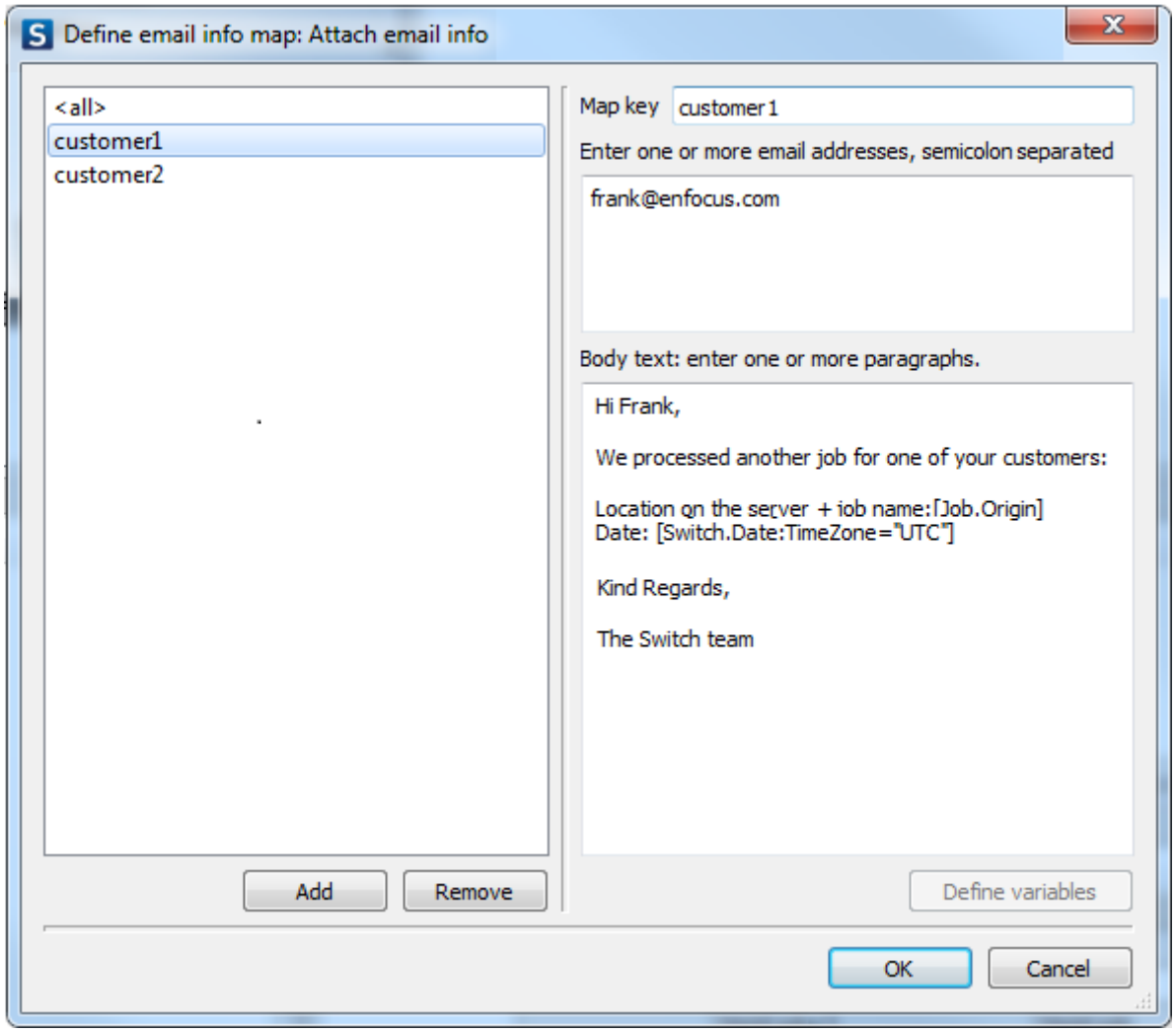
The email info map can contain as many entries as you need. Note that the order of the entries in the map is not important.

Example 1: Attaching email info through FTP receive

Let's say that you've set up an FTP site where your customers submit jobs.There is a separate subfolder for each of your customers (with the appropriate access rights) and you want to make sure that the responsible account manager is informed.

To achieve this:

1. Configure an FTP receive flow element. Make sure to check all the relevant subfolders (see "Subfolder levels" property).
2. Click **Attach email info** and create an email info map, mapping the name of the customer's subfolder (the "key") to the responsible account manager's email address, as shown below. Note that you could enter the customer's email address as well, as required.
3. Further in the flow, configure a Mail send flow element (see *Using attached email info* on page 191).



Note:

- FTP receive always uses subfolder names as the key, whereas as Mail receive allows selecting the basis for the key ("base map key on").
- It is possible to have multiple key matches for the same job. For example, if a job is submitted in a nested subfolder some levels deep, FTP receive uses each of the subfolder names in the nested subfolder path as a key in the mapping table. The email information for all matches is combined and associated with the job. This is also the case for the <all> key.

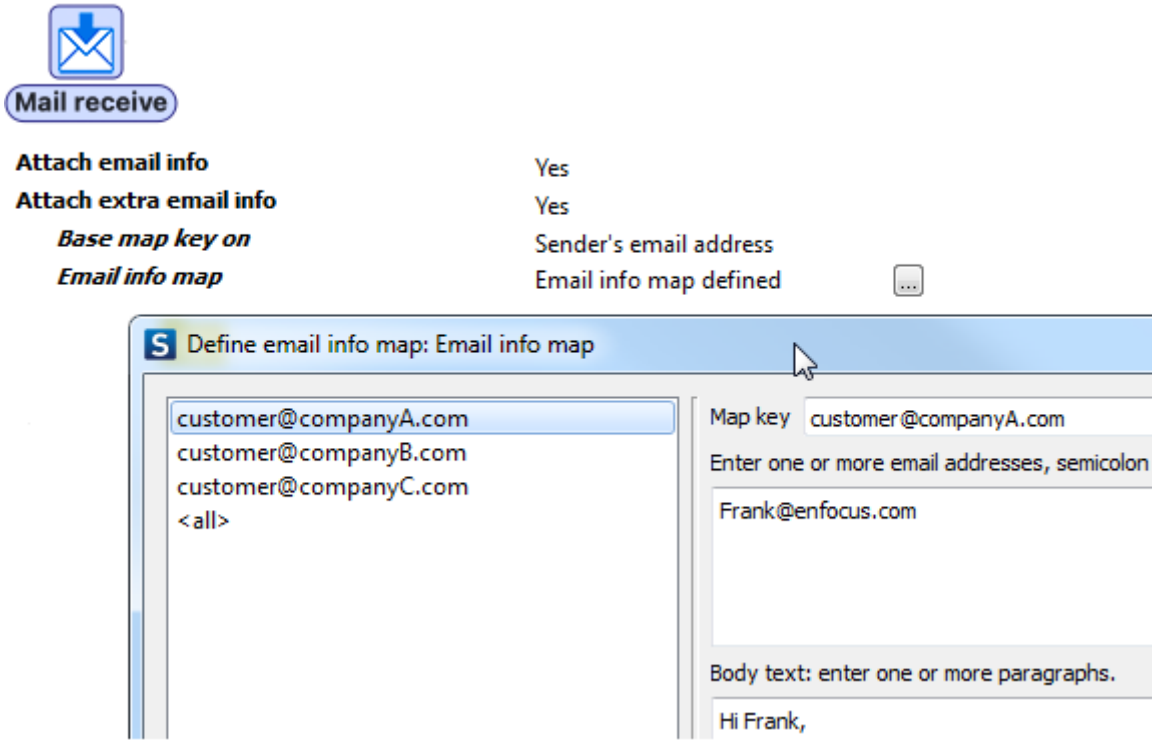
Example 2: Attaching email info through Mail receive

Suppose the jobs in your flows are submitted through mail. You want to attach the sender's email address (for future reference) as well as the account manager's email address.

In order to achieve this:

1. Configure a Mail receive flow element.
2. Set **Attach email info** to **Yes**, to make sure the sender's email address is stored.
3. Set **Attach extra email info** to **Yes** and configure the subordinate properties:

- Base map key on **Sender's email address**.
- Create an email info map, making sure the keys are your customer's email addresses. Note that the email address in the map key can be either the complete email address or only the part in front of/following the @ sign.



Note: In the above example, jobs from customers that are NOT in the list will match the <all> key. Jobs from customers that are listed, will be associated with the corresponding email address info AND with the info behind the <all> key.

Using attached email info

There are two ways to use email info attached to jobs in Switch:

- You can use the **variables related to email**, such as [Job.EmailAddress] and [Job.Emailbody], at any stage in the flow.
- You can use the attached info email in the **Mail send** flow element, using the following properties:
  - **Include attached addresses**
  - **Include attached body text**

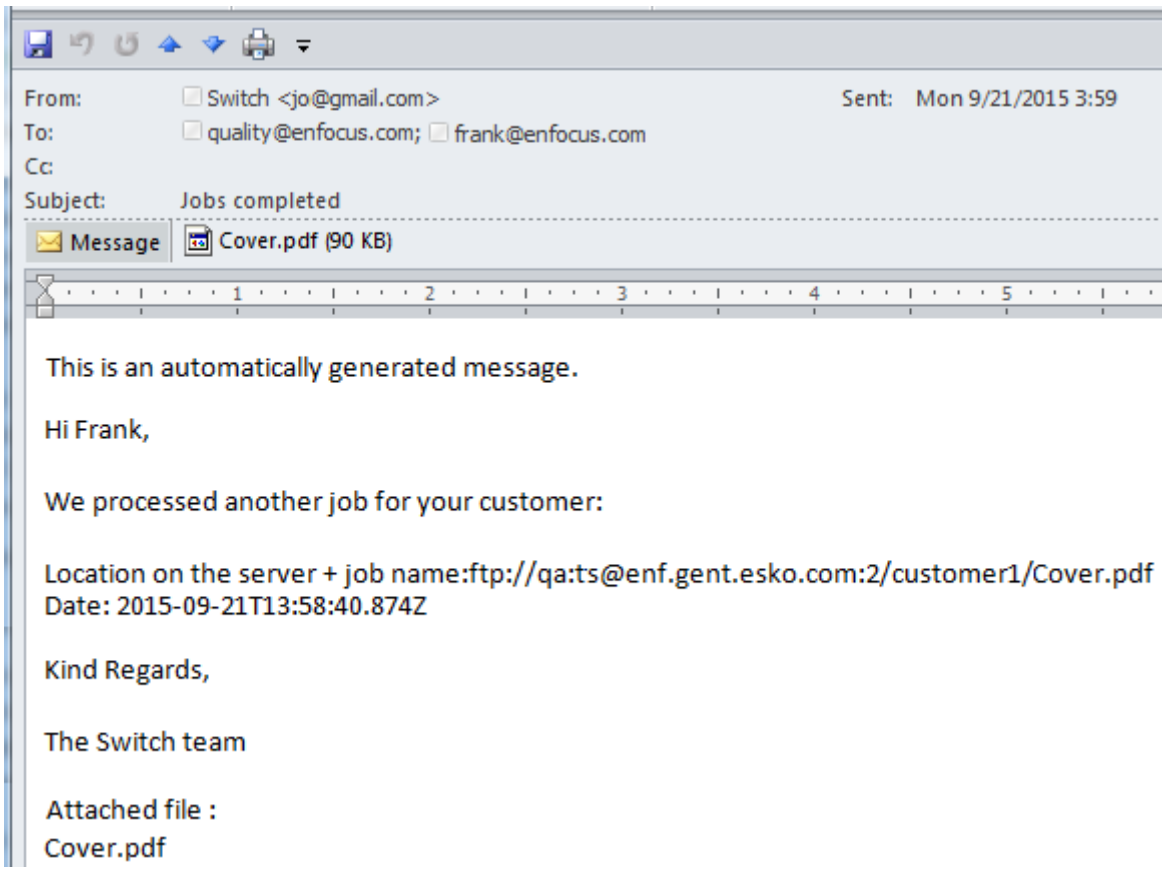
Example

Properties:

Properties	
Property	Value
Name	Mail send
Description	Send notification to account manager and customer
Subject	Jobs completed
To addresses	quality@enfocus.com
Include attached addresses	Yes
CC addresses	
BCC addresses	
Reply address	Default
Message format	Plain text
Body template	Built-in
Body text	This is an automatically generated message.
Include attached body text	Yes
Attach files	Yes
Strip unique name	Yes

Below is an example of a mail sent via a Mail send flow element with the properties shown higher:

- The email address in the **From** field is the address specified in the Switch *Mail send preferences* (User name property).
- The **To** field contains the email address(es) entered in the To addresses property (of Mail send) and the addresses attached to the job concerned.
- The **Subject** is the one specified in Mail send - Subject.
- The job file is attached.
- The body text contains the phrase "This is an automatically generated message" followed by the email message that was attached to the job earlier in the Switch flow.



Note that this message contains two variables that were selected when configuring the email message: [Job.Origin] and [Switch.Date:TimeZone="UTC"].

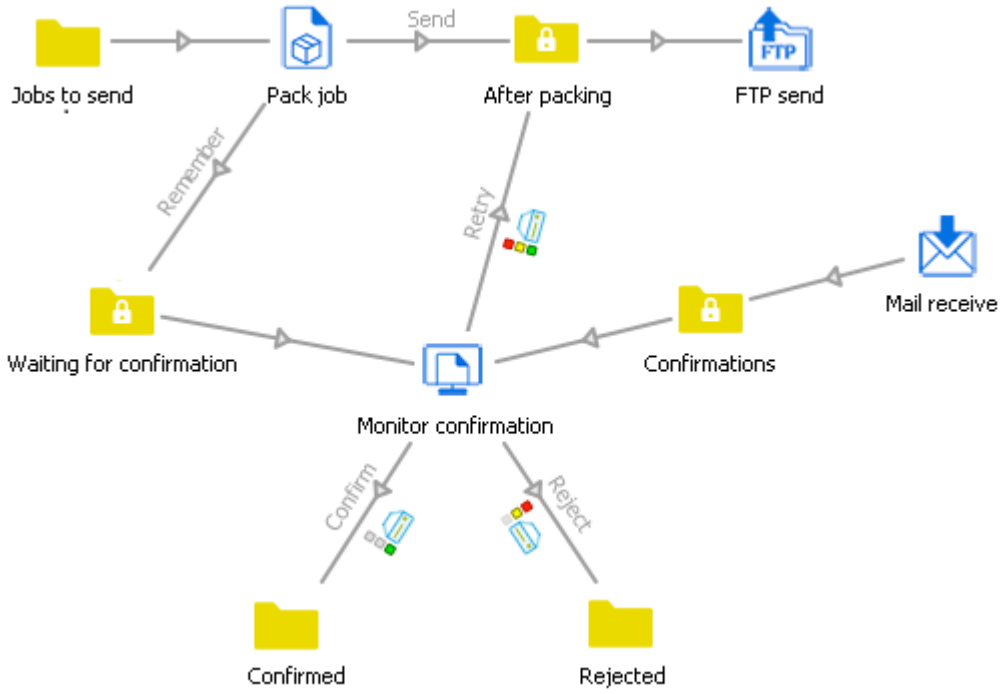
Note: Users of the Switch Web Portal can use the attached email info in a similar way with *Checkpoint via mail* on page 127 to send reply messages for jobs arriving in the Checkpoint.

Acknowledged job hand-off

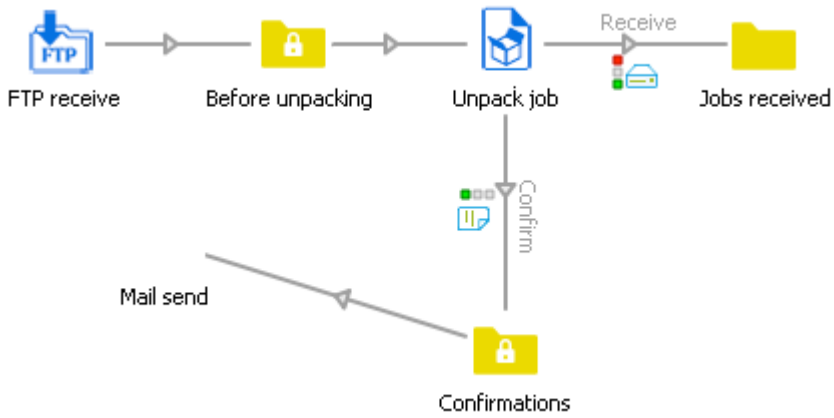
The Pack job, Unpack job, and Monitor confirmation tools can be used to implement acknowledged hand-off of jobs between instances of Switch running on separate computers, regardless of the communication channel used to transfer the data. The involved instances of Switch may reside on the same local network, or they may be in remote locations connected through the Internet (or any other communications channel).

Furthermore, Pack job and Unpack job can carry over any Switch metadata associated with the job, including internal job ticket information (such as email and hierarchy information), external metadata and (of course) embedded metadata. This feature can be used with or without acknowledged hand-off.

Example flow on sender's side



Example flow on receiver's side



Specifying file filters

Several Switch tools offer file or folder filter properties, including for example:

- the "Include/exclude these jobs" properties on connections leaving a folder.
- the "Include/exclude these folders" properties on connections leaving an FTP receive instance.

Each of these properties can be set to a particular file or folder filter that "matches" a certain category of jobs based on the filter's characteristics.

File filters

A file filter is applied to a job (file or job folder) being submitted to or moving along a flow. The following table lists the various supported filter types.

Filter type	Description
All jobs	Matches all files and job folders; is used as the default for "Include" properties
No jobs	Matches no files or job folders; is used as the default for "Exclude" properties
All other jobs	Matches all files and job folders not moved by any other connection (see All other files for more details)
Define file types	A predefined list of cross-platform file types. A file matches the filter if its Mac file and creator types and/or its filename extension match any of the specified types A job folder matches the filter if any of the files at the topmost level inside the folder match any of the specified types (or if the list of types contains the special "Folder" type)
Define file patterns	A list of filename pattern strings entered in a dialog; a pattern includes one or more of the following wildcard characters (in addition to regular characters that must match exactly): • * (asterisk): matches zero or more arbitrary consecutive characters • ? (question mark): matches exactly one arbitrary character A file matches the filter if its filename matches any of the patterns in the list. A job folder matches the filter if its folder name matches any of the patterns in the list.
Define regular expression	A regular expression (i.e. a more complex pattern; see *Regular Expressions* on page 201 for more details) A file matches the filter if its filename completely matches the regular expression. A job folder matches the filter if its folder name completely matches the regular expression.
Define condition with variables	A condition expressed through variables; see *Defining a condition with variables* on page 346
Define script expression	A script expression that returns a **Boolean result (true or false)**

All other files

A common problem while creating connections from a flow element is how to capture those files or job folders not matched by any other connection. The "All other jobs" filter addresses this problem; all files or job folders that do not match one of the connections with another filter (example: file type, file pattern, regular expression) are matched by this filter.

For example: imagine a flow element with one connection that matches all PDF files and a second connection that matches all PostScript files. Adding a third connection where the "Include these jobs" property is set to "All other jobs" causes all files that are not PDF or PostScript to be matched (i.e. moved through this third connection).

A flow element can have more than one outgoing connection that uses the "All other jobs" filter. In that case all of these connections match the same set of files and job folders: those not matched by other connections using e.g. file type, file pattern or regular expression filters.

Folder filters

A folder filter is applied to a subfolder of the folder hierarchy from which files are being retrieved.

Filter type	Description
All folders	Matches all folders; is used as the default for "Include" properties
No folders	Matches no folders; is used as the default for "Exclude" properties
All other folders	Matches all folders not matched by any other connection; the semantics are similar to the "All other jobs" file filter (see All other jobs for more details)
Folder patterns	A list of folder name pattern strings entered in a dialog; a pattern includes one or more of the following wildcard characters (in addition to regular characters that must match exactly): • * (asterisk): matches zero or more arbitrary consecutive characters • ? (question mark): matches exactly one arbitrary character A folder matches the filter if its folder name matches any of the patterns in the list
Regular expression	A regular expression (i.e. a more complex pattern; see the separate topic for more details) A folder matches the filter if its folder name completely matches the regular expression
Script expression	A script expression that returns a Boolean result (true or false)

Process these folders

The objective is to offer more flexibility for defining the subset of the folder hierarchy to be processed. This is accomplished by offering a variable list of powerful rules.

Properties

The tool offers the following new properties:

Property name	Description	Editors	Default
Process these folders	Defines the 'initial' set of folders that should be processed by the submit hierarchy tool; this set can be adjusted by defining one or more rules in subsequent properties Possible values are: • All folders • No folders	Dropdown list	All folders
Adjusted by (rule 1)	Defines a rule for adjusting the set of folders that should be processed by including or excluding folders Possible values are: • Including folders named • Including folders not named • Excluding folders named • Excluding folders not named	Dropdown list	None
.. Folder name	A pattern for the folder name to be included or excluded	Folder patterns Regular expression Script expression	Empty
.. On levels	The level or range of levels to which this rule applies, in the same format as the old "Subfolder range" property	Single-line text	Empty
.. Restriction	Defines an optional restriction on the parent or ancestors for the folder in this rule Possile values are: • None • With immediate parent named • With no immediate parent named	Dropdown list	None

Property name	Description	Editors	Default
	• With any ancestor named • With no ancestor named		
.... Parent name or .... Ancestor name	A pattern for the folder name of the parent or ancestor	Folder patterns Regular expression Script expression	Empty
.. Nesting	Defines whether this rule operates on subfolders of the target folder, which are deeper in the hierarchy than the defined level range. The matching rule is also applied on these subfolders. Possible values for "including" rule are: • Include nested subfolders as well • Don't include nested subfolders Possible values for "excluding" rule are: • Exclude nested subfolders as well • Dont exclude nested subfolders	Dropdown list	"Don't include..." or "Exclude..."
Adjusted by (rule 2) .... Adjusted by (rule 5)	Same as rule 1 with an identical set of dependent properties		

Applying rules

The rules are applied in the same order as they are specified. It is perfectly possible for a rule to exclude folders that were included by a previous rule, or vice versa.

For example, consider a hierarchy with two levels (in addition to the root folder) and where each level has three folders called A, B, C. Now, consider the following rules:

- Start with no folders
- Include folders named C on level 2 (with or without nesting)
- Exclude folders named C on level 1 (with nesting)

These rules will process all jobs in folders A/C and A/B, but not in folder C/C (because it was excluded in the second rule), and not in any of the other folders (because they were never included to begin with).

Reversing the order of the rules would change the result (files in folder C/C will be processed as well), because excluding something from an empty set has no effect.

Upgrading

When upgrading from a previous version of Switch, the new properties are initialized as follows:

- The new "Process these folders" property is set to "All folders"
- If the old "Process only these folders" property is not set to "All folders", a rule is created as indicated in the following table
- If the old "Skip these folders" property is not set to "No folders", a rule is created as indicated in the following table

If both old properties are present, the rules are listed in the order presented above (although the order is not important).

Property name	Value for "Process only these folders"	Value for "Skip these folders"
Adjusted by	"Excluding folders not named"	"Excluding folders named"
.. Folder name	The value of the "Process only these folders" property	The value of the "Skip these folders" property
.. On levels	The value of the corresponding dependent property	The value of the corresponding dependent property
.. Restriction	"None"	"None"
.. Nesting	"Exclude nested subfolders as well"	"Exclude nested subfolders as well"

These values should produce the same behavior as in the previous Switch version.

Unique name prefixes

Internal job tickets

A key feature of Switch is its ability to remember information about a job (file or job folder) while it is being processed through a flow. This information is stored in an internal job ticket managed by Switch.

The internal job ticket for each job contains housekeeping information (such as where the job was last located) in addition to information about the job's origin and routing.

For example, a job's hierarchy info and email info (attached by specific tools) are stored in its internal job ticket.

Switch needs a way to associate a particular internal job ticket with its corresponding job, and vice versa. To maximize flexibility and transparency for the user, Switch uses the filename as the basis for this mechanism rather than hiding jobs in some database. However Switch may be handed two or more jobs with the same name (in different input folders, or even in the same input folder after the first job was moved along).

Thus Switch employs a "trick" to keep similarly named jobs apart: unique name prefixes.

Unique name prefixes

A job is associated with its internal job ticket by prefixing the file or folder name with a unique identifier that consists of five letters or digits preceded and followed by an underscore.

For example: "myjob.txt" may become "_0G63D_myjob.txt".

Note that the files inside a job folder are not renamed; only the job folder name receives the unique name prefix. When a job folder is disassembled into separate files, each of the files of course receives its own unique name prefix.

For the technically-minded: each of the five characters in the unique name prefix can be a digit (0-9) or an uppercase letter (A-Z). This allows 36^5 or about 60 million combinations. A different unique name prefix can be generated every second for about 23 months.

Switch generates a new unique name prefix (and a corresponding internal job ticket) when:

- It detects a job in a folder or in a submit hierarchy.
- It makes a copy of a job.
- A producer (such as email receive) injects a new job in the flow.
- A processor produces a secondary output job that is injected in the flow.

The primary output of a processor (i.e. the incoming job with any changes applied by the processor) retains the same unique name prefix as the incoming job.

When a job loses its unique name prefix (for example because the "strip unique name" property is set for an archive or a final folder), it also loses the association with its internal job ticket.

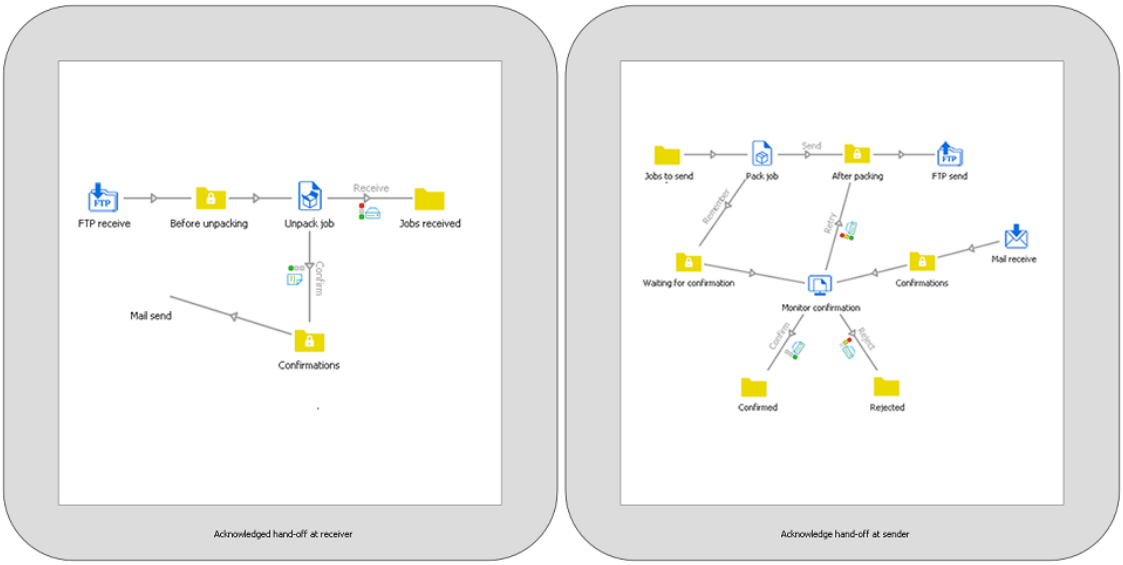
Handing over jobs between flows

Switch can pass along a job from one flow to another without loosing the job's association with its internal job ticket (assuming both flows are being executed by the same instance of Switch; hand-over between different instances of Switch does not preserve the internal job ticket information at this time).

This feature enables splitting up a complex flow in smaller segments without losing any information.

To hand over jobs from flow A to flow B:

- In flow A, create a user-managed folder with no outgoing connections and make sure its "strip unique name" property is set to No.
- In flow B, create a user-managed folder with the same backing folder (the folder in flow B may or may not have incoming connections).



Remark:

The following configuration is currently not supported:

- In flow A, the "strip unique name" property of the user-managed folder set to No.
- In flow B, the "leave originals in place" property of the user-managed folder with the same backing folder set to Yes.

Note: Switch cleans up job tickets in end folders at a regular interval as set in the *Application Data* preference. Make sure that the job ticket is handed over to the second flow in a timely manner.

Regular Expressions

Note: The contents of this topic is adapted from documentation provided by Trolltech.

Introduction

Regular expressions, or "regexps", provide a way to find patterns within text. This is useful in many contexts, for example a regexp can be used to check whether a piece of text meets some criteria. In Switch a regular expression can be used to sort files based on some naming scheme: only files with a name that matches the regular expression are allowed to pass through a certain connection.

While this is almost surely of no concern for the use of regexps in Switch, it is good to know that not all regexp implementations are created equal. Most implementations provide identical results for basic expressions, but the results for more advanced expressions and matches may differ in subtle ways.

The Switch regexp language is modeled on Perl's regexp language, A good reference on regexps is **Mastering Regular Expressions: Powerful Techniques for Perl and Other Tools** by Jeffrey E. Friedl, ISBN 1565922573. Several web sites offer tools for working with regexps or provide libraries with examples for matching all sorts of patterns. One simple tool to start playing with regexps can be found at *https://www.regexpal.com/* or *https://regex101.com/*.

Brief tutorial

Regexps are built up from expressions, quantifiers, and assertions. The simplest form of expression is simply a character, example, **x** or **5**. An expression can also be a set of characters. For example, [**ABCD**] will match an **A** or a **B** or a **C** or a **D**. As a shorthand we could write this as [**A-D**]. If we want to match any of the capital letters in the English alphabet we can write [**A-Z**]. A quantifier tells the regexp engine how many occurrences of the expression we want, e.g. **x{1,1}** means match an x which occurs at least once and at most once. We will look at assertions and more complex expressions later.

We will start by writing a regexp to match integers in the range 0 to 99. We will require at least one digit so we will start with **[0-9]{1,1}** which means match a digit exactly once. This regexp alone will match integers in the range 0 to 9. To match one or two digits we can increase the maximum number of occurrences so the regexp becomes **[0-9]{1,2}** meaning match a digit at least once and at most twice. However, this regexp as it stands will not match correctly. This regexp will match one or two digits within a string. To ensure that we match against the whole string we must use the anchor assertions. We need ^ (caret) which when it is the first character in the regexp means that the regexp must match from the beginning of the string. And we also need **$** (dollar) which when it is the last character in the regexp means that the regexp must match until the end of the string. So now our regexp is **^[0-9]{1,2}$**. Note that assertions, such as ^ and $, do not match any characters.

If you have seen regexps elsewhere, they may have looked different from the ones above.

This is because some sets of characters and some quantifiers are so common that they have special symbols to represent them. **[0-9]** can be replaced with the symbol **\d**.

The quantifier to match exactly one occurrence, **{1,1}**, can be replaced with the expression itself. This means that **x{1,1}** is exactly the same as **x** alone. So our 0 to 99 matcher could be written **^\d{1,2}$**. Another way of writing it would be **^\d\d{0,1}$**, i.e. from the start of the string match a digit followed by zero or one digits. In practice most people would write it **^\d\d?$**. The **?** is a shorthand for the quantifier **{0,1}**, i.e. a minimum of no occurrences and a maximum of one occurrence. This is used to make an expression optional. The regexp **^\d\d?$** means "from the beginning of the string match one digit followed by zero or one digits and then the end of the string".

Our second example is matching the words 'mail', 'letter' or 'correspondence' but without matching 'email', 'mailman', 'mailer', 'letterbox' etc. We will start by just matching 'mail'. In full the regexp is **m{1,1}a{1,1}i{1,1}l{1,1}**, but since each expression itself is automatically quantified by {1,1} we can simply write this as **mail**; an **m** followed by an **a** followed by an **i** followed by an **l**. The symbol | (bar) is used for alternation, so our regexp now becomes **mail|letter|correspondence** which means match 'mail' or 'letter' or 'correspondence'. Whilst this regexp will find the words we want it will also find words we do not want such as 'email'.

We will start by putting our regexp in parentheses, **(mail|letter|correspondence)**.

Parentheses have two effects, firstly they group expressions together and secondly they identify parts of the regexp that we wish to capture for reuse later on. Our regexp still matches any of the three words but now they are grouped together as a unit. This is useful for building up more complex regexps. It is also useful because it allows us to examine which of the words actually matched.

We need to use another assertion, this time **\b** "word boundary": **\b(mail|letter|correspondence)\b**.

This regexp means "match a word boundary followed by the expression in parentheses followed by another word boundary". The **\b** assertion matches at a position in the regexp not a character in the regexp. A word boundary is any non-word character such as a space, a newline or the beginning or end of the string.

Characters and abbreviations for sets of characters

Element	Meaning
c	Any character represents itself unless it has a special regexp meaning. Thus c matches the character c.
\c	A character that follows a backslash matches the character itself except where mentioned below. For example if you wished to match a literal caret at the beginning of a stringyou would write \^.
\a	This matches the ASCII bell character (BEL, 0x07).
\f	This matches the ASCII form feed character (FF, 0x0C).
\n	This matches the ASCII line feed character (LF, 0x0A, Unix newline).
\r	This matches the ASCII carriage return character (CR, 0x0D).
\t	This matches the ASCII horizontal tab character (HT, 0x09).
\v	This matches the ASCII vertical tab character (VT, 0x0B).
\xhhhh	This matches the Unicode character corresponding to the hexadecimal number hhhh (between 0x0000 and 0xFFFF).
\0ooo	(i.e. zero ooo) This matches the ASCII/Latin1 character corresponding to the octal number ooo (between 0 and 0377).
.	(i.e. period) This matches any character (including newline).
\d	This matches a digit.
\D	This matches a non-digit.
\s	This matches a whitespace.
\S	This matches a non-whitespace.
\w	This matches a word character (letter or number or underscore).
\W	This matches a non-word character.
\n	This matches the n-th backreference, e.g. \1, \2, etc.

Sets of characters

Square brackets are used to match any character in the set of characters contained within the square brackets. All the character set abbreviations described above can be used within square brackets. Apart from the character set abbreviations and the following two exceptions no characters have special meanings in square brackets.

Character	Meaning
^	The caret negates the character set if it occurs as the first character, that is immediately after the opening square bracket. For example, [abc] matches 'a' or 'b' or 'c', but [^abc] matches anything except 'a' or 'b' or 'c'.
-	The dash is used to indicate a range of characters, for example, [W-Z] matches 'W' or 'X' or 'Y' or 'Z'.

Using the predefined character set abbreviations is more portable than using character ranges across platforms and languages. For example, [0-9] matches a digit in Western alphabets but \d matches a digit in any alphabet.

Note that in most regexp literature sets of characters are called "character classes".

Quantifiers

By default an expression is automatically quantified by **{1,1}**, i.e. it should occur exactly once. In the following list **E** stands for any expression. An expression is a character or an abbreviation for a set of characters or a set of characters in square brackets or any parenthesized expression.

Quantifier	Meaning
E?	Matches zero or one occurrence of E. This quantifier means "the previous expression is optional" since it will match whether or not the expression occurs in the string. It is the same as **E{0,1}**. For example **dents?** will match 'dent' and 'dents'.
E+	Matches one or more occurrences of E. This is the same as **E{1,}**. For example, **0+** will match '0', '00', '000', etc.
E*	Matches zero or more occurrences of E. This is the same as **E{0,}**. The * quantifier is often used by mistake. Since it matches zero or more occurrences it will match no occurrences at all. For example if we want to match strings that end in whitespace and use the regexp **\s*$** we would get a match on every string. This is because we have said find zero or more whitespace followed by the end of string, so even strings that don't end in whitespace will match. The regexp we want in this case is **\s+$** to match strings that have at least one whitespace at the end.
E{n}	Matches exactly n occurrences of E. This is the same as repeating the expression n times. For example, **x{5}** is the same as **xxxxx**. It is also the same as **E{n,n}**, e.g. **x{5,5}**.
E{n,}	Matches at least n occurrences of E.
E{,m}	Matches at most m occurrences of E. This is the same as **E{0,m}**.
E{n,m}	Matches at least n occurrences of E and at most m occurrences of E.

If we wish to apply a quantifier to more than just the preceding character we can use parentheses to group characters together in an expression. For example, **tag+** matches a 't' followed by an 'a' followed by at least one 'g', whereas **(tag)+** matches at least one occurrence of 'tag'.

Note that quantifiers are "greedy". They will match as much text as they can. For example, 0+ will match as many zeros as it can from the first zero it finds, e.g. '2.0005'.

Capturing text

Parentheses allow us to group elements together so that we can quantify and capture them. For example if we have the expression **mail|letter|correspondence** that matches a string we know that one of the words matched but not which one. Using parentheses allows us to "capture" whatever is matched within their bounds, so if we used **(mail|letter|correspondence)** and matched this regexp against the string "I sent you some email" we would capture 'mail'.

We can use captured text within the regexp itself. To refer to the captured text we use backreferences which are indexed from 1. For example we could search for duplicate words in a string using **\b(\w+)\W+\1\b** which means match a word boundary followed by one or more word characters followed by one or more non-word characters followed by the same text as the first parenthesized expression followed by a word boundary.

If we want to use parentheses purely for grouping and not for capturing we can use the non-capturing syntax, e.g. **(?:green|blue)**. Non-capturing parentheses begin '(?:' and end ')'. In this example we match either 'green' or 'blue' but we do not capture the match so we only know whether or not we matched but not which color we actually found. Using non-capturing parentheses is more efficient than using capturing parentheses since the regexp engine has to do less book-keeping.

Both capturing and non-capturing parentheses may be nested.

Anchors

Anchors match the beginning or end of the string but they do not match any characters.

Regular expressions entered in the Switch user interface always match the complete string. In other words the regexp is automatically anchored at the beginning and at the end of the string, and you shouldn't specify explicit anchors. (Regular expressions specified in a Switch JavaScript program should include explicit anchors as needed).

Anchor	Meaning
^	The caret signifies the beginning of the string. If you wish to match a literal ^ you must escape it by writing \^. For example, **^#include** will only match strings which begin with the characters '#include'. (When the caret is the first character of a character set it has a special meaning, see Sets of Characters.)
$	The dollar signifies the end of the string. For example **\d\s*$** will match strings which end with a digit optionally followed by whitespace. If you wish to match a literal $ you must escape it by writing \$.

Assertions

Assertions make some statement about the text at the point where they occur in the regexp but they do not match any characters. In the following list E stands for any expression.

Assertion	Meaning
\b	A word boundary. For example, the regexp **\bOK\b** means match immediately after a word boundary (example: start of string or whitespace) the letter 'O' then the letter 'K' immediately before another word boundary (example: end of string or whitespace). But note that the assertion does not actually match any whitespace so if we write (**\bOK\b**) and we have a match it will only contain 'OK' even if the string is "It's OK now".
\B	A non-word boundary. This assertion is true wherever **\b** is false. For example, if we searched for **\Bon\B** in "Left on" the match would fail (space and end of string are not non-word boundaries), but it would match in "tonne".
(?=E)	Positive lookahead. This assertion is true if the expression matches at this point in the regexp. For example, **const(?=\s+char)** matches 'const' whenever it is followed by 'char', as in 'static const char *'. (Compare with **const\s+char**, which matches 'static const char *'.)
(?!E)	Negative lookahead. This assertion is true if the expression does not match at this point in the regexp. For example, **const(?!\s+char)** matches 'const' except when it is followed by 'char'.

Note: Positive and negative lookbehind are currently not supported.

Case insensitive matching

You can make the complete regexp case insensitive by surrounding it by the /.../i constuct. More precisely, if the regexp starts with a forward slash and ends with a forward slash followed by the letter i, then matching for the complete regexp is case insensitive.

For example:

Regexp	Matches these strings
ABC	ABC
abc	abc
/ABC/i	ABC, abc, Abc
/ABC/	/ABC/

JavaScript for applications

Introduction

The Adobe Creative Suite applications (Acrobat, Photoshop, Illustrator and InDesign) can be extensively scripted through JavaScript (a scripting language interpreted and executed by the application). All four applications offer a similar overall interface for working with JavaScript,

although each application offers a different set of JavaScript functions to actually control the application's functionality

The JavaScript programming interface for each application is documented in the application's software development toolkit which can be found on the Adobe web site. The Adobe Creative Suite bundle includes the "ExtendScript Toolkit" application which is extremely useful for developing and debugging JavaScript scripts for Adobe Creative Suite applications.

The Switch apps for the four applications mentioned above allow posting a JavaScript script to the application for execution. Combined with Switch's built-in capabilities this provides powerful control of the Adobe Creative Suite applications.

Note: In the remainder of this topic "application" means one of the four Adobe Creative Suite applications mentioned above, and "app" means the Switch app that controls the application under consideration.

Stages

An app defines the action to be executed by its corresponding application in the form of three consecutive stages:

- Open the file and make it the currently active document.
- Perform a command on the currently active document.
- Save the currently active document and close it.

The desired action for each stage is defined independently, and can be selected from:

- One of the built-in actions listed by name.
- A user-provided script (which is specified by browsing to a JavaScript text file).

Depending on the selected action a number of subordinate properties are shown to further configure the action. In other words, each choice has its own set of properties.

The properties for the "Use script" choice are described below; those for built-in choices are described for each app separately.

Properties for specifying a user script

The following set of properties is shown for an action stage if the "Use script" option is selected for the stage.

Property	Description
Script file	The text file that contains the JavaScript script to be executed by the application for this stage
Argument 1	The first argument to be passed to the script (or empty)
Argument 2	The second argument to be passed to the script (or empty)
Argument 3	The third argument to be passed to the script (or empty)
Argument 4	The fourth argument to be passed to the script (or empty)
Argument 5	The fifth argument to be passed to the script (or empty)

There are always five arguments because there is no mechanism to determine how many arguments are actually needed by the script.

Writing a user script

To write a user script, simply provide the JavaScript statements that should be executed in the main body of the script file. If your script encounters an error, it should set the $error variable to the appropriate error message; otherwise it should leave the $error variable alone. See below for a typical coding pattern.

The following special global variables are defined before your script executes, and thus their value can be used in your script; in some cases (noted in the variable's description) your script should also set or update the contents of the variable.

Variable	Description
$arg1	The first argument passed to the script (or the empty string if there is none)
$arg2	The second argument passed to the script (or the empty string if there is none)
$arg3	The third argument passed to the script (or the empty string if there is none)
$arg4	The fourth argument passed to the script (or the empty string if there is none)
$arg5	The fifth argument passed to the script (or the empty string if there is none)
$infile	The absolute path of the input file, including name and extension; this is used mostly in a script attached to an "open" action
$doc	The currently active document, that is, the document that was opened by the "open" action; $doc is null for a script attached to an "open" action (or when the "open" action failed) **Note:** • Use $doc instead of "this" to refer to the currently active document. • If you're using a custom 'open' script for the **InDesign or InDesign Server App** to open or to create more than one document, the script must explicitly set the value for $doc. This is necessary to make sure the app processes the right document. For other Adobe applications, the $doc variable is automatically set to contain the active document.
$outfolder	The absolute path of the folder in which to place the output; this is used mostly in a script attached to a "save" action
$filename	The filename (without extension) of the input (and output) file

Variable	Description
$extension	The filename extension of the input file, or if it does not have one, the filename extension corresponding to the Mac file types of the input file
$outfiles	The incoming value of this variable is irrelevant If your script is attached to a "save" action, it should set the contents of this array variable to the absolute paths of the output files generated by the script
$jobfolder	The incoming value of this variable is irrelevant If your script is attached to a "save" action, it should set the contents of this variable as follows: • The empty string: each output file is moved along the outgoing connection as a separate job • The desired name of the job folder: all output files are placed inside a single job folder with the specified name
$error	If an error occurred during the execution of an earlier stage, or while preparing for the execution of this stage, this variable contains an appropriate error message: otherwise its value is null (NOT the empty string; an empty string signifies that an error indeed occurred but no meaningful error message was generated -- this is considered bad practice but it may happen) If your script encounters an error, it should set the $error variable to the appropriate error message (that is, a non-empty string); otherwise it should leave the $error variable alone. **Note:** If $error is set, the script will fail the job and move it to the 'Error' level data output connections. If there is no error connection, the job will be moved to the Problem jobs folder. Note however that it's possible to explicitly determine where the job should go to (either to the Error connection or to the Problems jobs folder) by setting the *$status* variable. For more information, refer to the explanation below.
$status	$status allows you to control the output behavior of the error jobs, by specifying where the error out job must be moved to. You can also specify to stop the script from further processing in case of a critical failure. **Note:** The value of $status is ignored if $error is 'null'. $status is a string and must have one of the following values: • **error** (default value): Failed jobs will be moved to the Error connection; if no Error connection is found, the jobs are moved to the Problems folder.

Variable	Description
	• **failJob**: Failed jobs are sent to the Problems folder. • **failProcess**: In case of problems, all processing is stopped.

Error handling

Here's a typical coding pattern to correctly handle errors in a user script attached to the command action:

```
if ($error == null)
{
    try
    {
        // statements to be executed by this script
        // $doc.ApplicationDependentFunction();
    }
    catch( e )
    {
        $error = e.description || e.message;
        $status = failJob;
        // This will move the failed job to Problem Jobs folder. If not set, the
          default is the "Error" level data connection.
        $doc.closeDoc( Application Specific Parameters );
        // close any other resources used in the try block
    }
}
```

The InDesign and Illustrator app produce an XML log file. This is an example:

```
<AdobeConfiguratorLog>
 <FlowElementName>ConfiguratorFlowElementName</FlowElementName>
   <Job>
     <Name>NoFontPackage</Name>
     <Status>Error</Status>
     <StatusMessage>Error Message String</StatusMessage>
     <MissingFonts>
        <Font>Somora</Font>
        <Font>XBAND Rough</Font>
      </MissingFonts>
   <Job>
</AdobeConfiguratorLog>
```

Note: The log is an XML file named after the incoming job name.

Here's a typical coding pattern to correctly handle errors for Adobe Acrobat application:

```
// Acrobat is used to make a summary of the annotations resulting in a file that shows
 you the page
// content and the annotations per page.
// No arguments are required.

if($error == null)
{

 try
 {
  var title = $doc.documentFileName + " summary"
  $outfile = $outfolder + '/' + $filename + "_summary.pdf";
  $doc.ANsummarize($doc, title, ANSB_Page, null, $outfile, null, false, true, false,
 false, false, false);
  $outfiles.push($outfile);
 }
 catch(theError)
```

```
  {
   $error = theError;
   $doc.closeDoc( {bNoSave : true} );
  }
 }

 $error
```

More info needed?

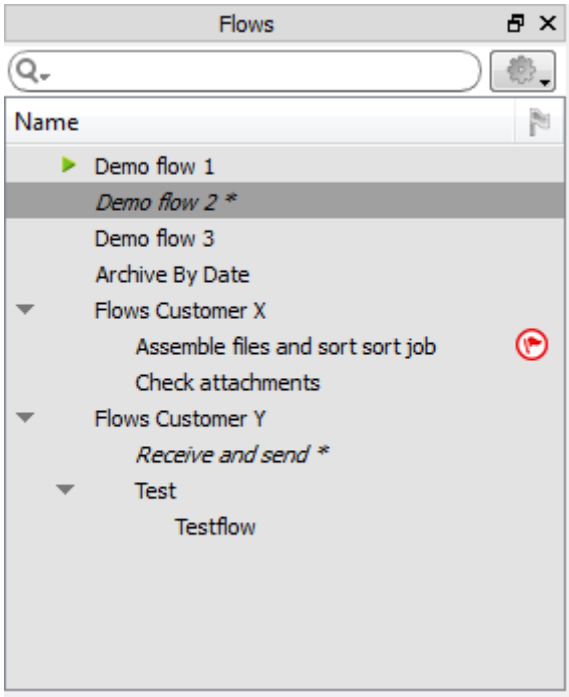
For more information about scripting, refer to *the documentation on the Enfocus website*.

5.2.5. Managing flows

5.2.5.1. Organizing flows

The Flows pane

The Flows pane lists all flows currently known to Switch. It allows organizing these flows in a hierarchy of groups and subgroups, and provides a context menu for managing flows in various ways.



Groups and subgroups

Groups and subgroups are marked with small icons, indicating whether or not the group is collapsed (so you don't see the flows) and/or the flows are activated.

Icon	Meaning
	This group is collapsed.
	This group is expanded.
	• If preceding a group: at least one of the flows of this group is activated. • If preceding a flow: this flow is activated.

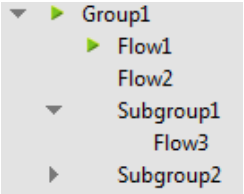
Example:

In the example below, one group with 2 subgroups has been defined.

Group1 and Subgroup1 are expanded; you can see the flows belonging to those groups.

Subgroup2 is collapsed.

Only Flow1 is activated.



Selecting flows

You can select any number of flows in the Flows pane at the same time.

Note: When you select *a group*, all flows and groups in that group are automatically selected as well, regardless of whether the group is displayed open or closed.

To select one or more flows:

1. To select one flow, in the Flows pane, click it.
   The selected flow is shown in the canvas.

2. To select more than one flow at a time, in the Flows pane, click the preferred flows while holding down the **Ctrl** or the **Shift** key.

   The selected flows do not have to be consecutive.

   All selected flows are shown as tiles in the canvas. Tiles cannot be edited. However, you can select a particular tile and edit its flow properties in the Properties pane. For more information, refer to *Multiple flows as tiles* on page 169.

Adding a group in the Flows pane

You can use groups to organize your flows into a tree-like structure, much like files in a folder tree. A group can contain flows and other groups, up to any nesting level.

To add a new group in the Flows pane:

1. In the Flows pane

- To add a new group, select the flow after which the new group should be inserted.
- To add a new subgroup, select the group in which the new group should be inserted.

2. Right-click and select **New group**.

3. In the Properties of the newly inserted group, click the **Name** field and type an appropriate name for the group.

The new group is empty. You can move existing flows to the group (see *Organizing flows* on page 211) or create new flows for that group.

Reorganizing flows in the Flows pane

You can reorganize the order and nesting structure in the Flows pane by dragging the flows around.

Note: You can move flows as well as groups; when moving groups, all flows belonging to that group are moved to the new location.

To move flows to a different location in the Flows pane

1. Select the flow(s) you want to move.

   To select multiple flows, hold down the **Ctrl** key while selecting the flows.

2. Drag the selected flows to the target location. You can:

   - Drop them in between two flows to move them between those flows, or
   - Drop them on top of a group to place them inside that group. This works, even if the group is collapsed.

Ordering flows in the Flows pane

The Flows pane supports three row ordering modes, i.e. three ways to sort the flows:

- **Manual ordering**: The flows are ordered by manually dragging them into the appropriate position.

- **Sorted by name**: At each level in the tree, flows are sorted on the name column (case insensitive, and regardless of whether they are groups or flows).

- **Sorted by marker**: At each level in the tree, flows are sorted on the marker column (see *Setting flow markers* on page 214), and then on the name column (so that the order is predictable when rows have the same marker).

To change the sort order in the Flows pane

1. Do one of the following

   - To order the flows manually, drag them into the appropriate position.
   - To sort by name, click the column header of the Name column.
   - To sort by marker, click the column header of the Marker column (small flag icon).

   Note: If the Marker column is not visible, right-click the column header of the Name column and select **Marker column**.

2. To toggle between ascending and descending order, click the column header (of the column you're sorting by).

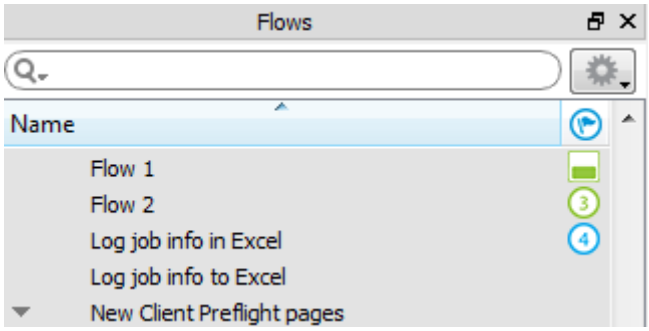
Setting flow markers

The rightmost column in the Flows pane can display a marker icon selected from a pre-defined list of icons (including colored flags, priorities, and level of completeness indicators).

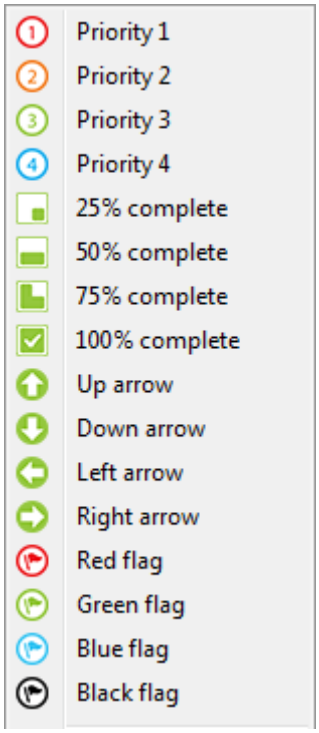
The markers have no meaning to Switch. They can be useful to sort flows, for example by priority or by level of completion.

Flow markers are preserved when exporting and importing flows.

Example Flows pane with markers



Available icons



Custom image

You can also upload your own custom image and use it as a flow marker.

Groups

Groups only have a marker if all flows belonging to that group have the same marker. For example, if all flows in a group are marked as Priority 1, the group will be marked as Priority 1 as well.

In all other cases (if none of the flows have a marker, or they have different markers), no marker is displayed at group level.

Setting a marker for a flow

To set the marker for one or more flows

1. Select the flows you want to mark (with one particular marker).
2. Right-click and select **Mark flow**.
3. Select the appropriate marker or upload a custom image.
   The selected marker icon is displayed next to the flow, in the Marker column. In the properties of the flow, the Marker image property holds the name of the marker (e.g. Priority 4) or the name (and path) of the custom image (e.g. /Users/<userX>/my_image.png).

   Note: If the Marker column is not visible, right-click the column header of the Name column and select **Marker column**.

Clearing a marker for a flow

To clear the marker for one or more flows

1. Select the flow(s) for which you want to clear the marker.
2. Right-click to open the context menu.
3. Select **Mark flow**.
4. Select **No marker**.
   The marker is removed from the Flows pane. In the flow properties, the Marker image property is set to None.

5.2.5.2. Changing flow properties

After you have created a flow, you can still make a number of changes. You can for example:

- Rename the flow.
- Add a background and/or a header image.
- Tune the performance of Switch, by overruling a number of default settings for concurrent job processing (Refer to **Show advanced element properties** in *Flow properties* on page 216).

To change the flow properties

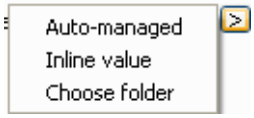
1. In the Flows pane, select the flow of which you want to change the properties.

   Note: Make sure that none of the flow elements in the canvas are selected. Otherwise, you might see the properties of the element, rather than the properties of the flow.

The properties of the selected flow are displayed in the Properties pane.

2. Click the property you want to change.
   Depending on the selected property, a text box, a button, or a drop-down menu appears.

3. Make the required changes:

If ... appears	Do the following:
A text box	Type the text in the displayed text field.
A drop-down menu	Select the appropriate option.
...	1. In the the property editor dialog that pops up, update the field(s) as required. 2. Click **OK**.
>	1. From the pop-up list, select one of the options.  Depending on the selected option, an inline editor or a dialog appears. 2. Configure the desired values.

For an overview of the properties and their meaning, see *Flow properties* on page 216.

Your changes are applied immediately.

Flow properties

The following properties are displayed in the Properties pane, when you select a particular flow.

Property	Description
Name	The name of the flow as it is shown in the Flows pane.
Description	A description of, or comments about the flow; the text in this field may have multiple lines. The creation date and time are filled in automatically (but can be removed as required).
Background image	A PNG or JPG image to be shown in the background of the flow design. • The background image is placed at its effective resolution. • If the image is too small to fill the canvas, it is repeated (as tiles). • When the flow is not editable (because it is locked or active), the background image is darkened.

Property	Description
	The background image is a kind of wallpaper on which the flow design is drawn. Light colors or sober patterns work best.
Header image	A PNG or JPG image to be shown in the upper-left corner of the flow design, on top of the background image. • The header image is placed at its effective resolution. • The header image is not repeated to fill the canvas. • When the flow is not editable, the header image is not darkened. The header image is intended to mark a flow with a company or brand logo. Small images work best (avoiding overlap with the actual flow design).
Marker image	If a flow marker is set: the name of the marker (e.g. Priority 4) or the name (+path) of the uploaded custom image (e.g. /Users/<userX>/my_image.png). If no flow marker is set: the value is **None**.

Show advanced element properties	If set to Yes, certain flow elements get extra properties:
	• Node.js scripts and apps get the following extra property:
	  • **Log debug messages**:
	  • If set to *Default*, debug messages will only be shown if Log debug messages is enabled in the Switch preferences (*Switch Preferences: Logging*). See also *Script element*.
	  • If set to *Yes*, debug messages for this particular flow element will be shown in the Messages overview, regardless of the value of Log debug messages in the Switch preferences.
	• Flow elements that can process jobs concurrently get two extra properties that overrrule the performance settings in the Switch Preferences (*Switch preferences: Processing* on page 41):
	  • **Number of slots** : Number of slots available for concurrent processes.
	  • **Idle after job (secs)** : Idle time-out after each job.
	  For an overview of flow elements that support concurrent processing, refer to *Concurrent processing tasks*.
	• Node.js elements get the following extra property:
	  • **Abort after (minutes)**: Number of minutes a Node.js script can run after which it is aborted.
	  • If set to *Default*, the value of the global *Abort processes after (minutes)* preference will be used.
	  • If set to *0*, the script will never be aborted.

Property	Description
	Important: The value of *Abort after (minutes)* is ignored when *Enable debug mode* is enabled for the same flow element! **Note:** In older versions of Switch (Switch 2020 and earlier), this property was named "Allow advanced performance tuning". It only affected the performance of the concurrent processing tasks.
Time-of-day window	If set to **Yes**, the flow will be active during a particular time of the day, as specified in the following properties (only available if *Time-of-day window* is enabled): • *Allow from (hh:mm):* Start time, for example: 09:00 • *Allow to (hh:mm):* End time, for example: 11:00
Day-of-week window	If set to **Yes**, the flow will be active during a couple of days of the week, as specified in the following properties (only available if *Day-of-week window* is enabled): • *Allow from*: Day of the week the flow will be activated, for example: Tuesday • *Allow to*: Day of the week the flow will deactivated, for example: Friday
Day-of-month window	If set to **Yes**, the flow will be active during a particular day of the month, as specified in the following properties (only available if *Day-of-month window* is enabled): • *Day*: Day of the month during which to keep the flow active. Use a number between 1 and 31. For example, "1" (default) means the first or the last day of the month (depending on the value in *Relative to*). • *Relative to*: Choose between: Start/end of the month.

Note: If you have enabled the Time-of-day, Day-of-week or Day-of-month window, when activating the flow manually, it will be preceded by a small icon . This indicates that the flow is scheduled and will be active during the time specified in the Flow properties.

5.2.5.3. Adding and removing flows

The Flows pane lists all flows known to Switch at the present time.

Adding flows

-

See *Creating a new blank flow* on page 167 or *Creating a new flow based on a sample flow* on page 168
-

See *Importing a flow or a flow group* on page 225

Duplicating flows

To make a copy of one or more existing flows

1. Select the flow(s) in the Flows pane.
2. Do one of the following: menu item, or
   - Select **Flow** > **Duplicate Flow(s)**.
   - Right-click and select **Duplicate Flow(s)**.
   - Drag the selected flow(s) to a different location in the Flows pane.

     You must hold down the appropriate modifier key to select and move multiple flows.

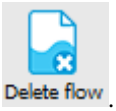
The suffix "[Copy]" is added to the names of the duplicated flows.

Note: You can duplicate a flow even while it is active; the new copy will be inactive.

Deleting flows

To delete one or more flows

1. In the Flows pane, select the flow(s) you want to delete.

   Make sure the flows are inactive, as it is not possible to delete an active flow.
2. Do one of the following:
   - In the toolbar, click the **Delete Flow** button 

.
   - From the menu, select **Flow** > **Delete Flow**.
   - In the Flows pane, click and select **Delete Flow**.
   - Press the **Delete** key.
3. Confirm your choice.

Remember that deleting a flow is permanent and cannot be undone.

5.2.5.4. Saving and reverting flows

As long as a flow hasn't been saved, in the Flows pane, its name is displayed in italics and followed by an asterisk. The unsaved changes are stored in the local cache on disk on the Designer side.

Note: You can have several flows with unsaved changes in your design. It is also possible to switch between flows without saving. However, if you want to exit the application, or if you want to activate a flow, you will be asked to save your changes.

Saving flows

Before you can activate one or more flows, you must first save them. In the Flows pane, unsaved flows are displayed in italics, followed by an asterisk.

Note: If you forget to save your flow, a warning pops up. Note that clicking **Save**, will save **all** flows with unsaved changes. If you do not want to save all unsaved flows, click **Cancel** and manually save the flows as required.

To save flows

1. In the Flows pane, select the flow(s) you want to save.
2. Do one of the following:
   - In the toolbar at the top of the screen, click

.
   - In the Flows pane, right-click and select **Save Flow(s)**.
   - From the menu, select **Flow** > **Save Flow(s)**.

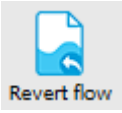
   In the Flows pane, the flow names are no longer displayed in italics and the asterisk has disappeared. You can now activate the flow(s) as required.

Reverting flows

As long as a flow hasn't been saved, you can go back to the previously saved version. You can do this for one flow at a time, or for several flows at the same time.

To revert flows

1. In the Flows pane, select the unsaved flow(s) you want to revert.

   Flows with unsaved changes are displayed in italics and followed by an asterisk.
2. Do one of the following:
   - In the toolbar at the top of the screen, click 

.

- In the Flows pane, right-click and select **Revert Flow(s)**.
- From the menu, select **Flow** > **Revert Flow(s)**.

A warning appears.

3. Click **Yes** to confirm.
   In the Flows pane, the flow names are no longer displayed in italics and the asterisk has disappeared. You can now activate the flow(s) as required.

5.2.5.5. Locking and unlocking flows

A flow in the Flows pane can be locked for editing.

When a flow is locked, the Flows pane shows the state icon when the flow is inactive and no changes can be made to the flow design or to the flow's properties. The flow can still be activated as usual. The icon is not visible when you activate the flow but the flow remains locked.

The locking status is preserved when the flow is exported and re-imported.

Locking flows without password

When a flow is locked without a password, it can be unlocked without providing a password (i.e. no password is requested). This is useful to guard against accidental editing without protection against interference by another user.

To lock one or more flows without password

1. In the Flows pane, select the flows you want to lock.
2. Do one of the following:
   - From the menu, select **Flow** > **Lock**.
   - In the Flows pane, right-click the selected flow(s) and choose **Lock**.
   - In the Flows pane, click and select **Lock**.

   Switch displays a dialog requesting a lock password.
3. Leave the password blank.
4. Click **OK**.

Locking flows with a password

When a flow is locked with a password, the password must be provided to unlock it. The password is stored in the flow definition in an encrypted form.

Note: There is no way to recover the password when forgotten!

To lock one or more flows with a password

1. In the Flows pane, select the flow(s) you want to lock.
2. Do one of the following:

- From the menu, select **Flow** > **Lock**.
- In the Flows pane, right-click the selected flow(s) and choose **Lock**.
- In the Flows pane, click and select **Lock**.

Switch displays a dialog requesting a lock password.

3. Enter the same password twice.
4. Click **OK**.

Note: Certain Enfocus employees have access to a mechanism that bypasses the password protection (because Switch defines the password encryption). While Enfocus does not intend to open password-protected flows, and does not intend to publish the bypass mechanism, the company does not legally guarantee that this will never happen. It is important for flow designers to understand the limitations of the protection.

Unlocking flows

To unlock one or more flows

1. In the Flows pane, select the flow(s) you want to unlock.
2. Do one of the following:
   - From the menu, select **Flow** > **Unlock**.
   - In the Flows pane, right-click the selected flow(s) and choose **Unlock**.
   - In the Flows pane, click and select **Unlock**.

   If the flow is password protected, Switch displays a dialog requesting the password. Otherwise, the flow is unlocked immediately.
3. Enter the password.
4. Click **OK**.

5.2.5.6. Activating and deactivating flows

A flow can be in different states:

- An **inactive** flow is in "design mode": you can change the flow and the flow element properties. An inactive flow cannot process jobs.
- An **active** flow is currently being executed by the Switch Server, that is, it is processing jobs.

  An active flow cannot be edited. This state is indicated by the icon next to the flow name in the Flows pane, and by the darkened background in the canvas.

For an overview, refer to *Flows pane* on page 84 (Table "State").

Activating flows

If you want a flow to start processing jobs, you must activate it. Note that you can activate several flows in one go.

To activate flows

1. In the Flows pane, select the (inactive) flow(s) you want to start.
2. Do one of the following:
   - In the toolbar at the top of the screen, click Activate flow.
   - In the Flows pane, click and select **Activate Flow(s)**.
   - In the Flows pane, right-click and select **Activate Flow(s)**.
   - In the Flows pane, double-click the selected flow (only possible in case of a single flow).
   - From the menu, select **Flow** > **Activate Flow(s)**.

   If you haven't saved your flow yet and you haven't enabled automatic flow saving in the *user interface preferences*, a warning pops up. Note that clicking **Save**, will save all flows with unsaved changes. If you do not want to save all unsaved flows, click **Cancel** and manually save the flows as required.

   The background of the flow is darkened. In the Flows pane, you can see an icon next to the name of the flow. The flow is now active and waits for input jobs to appear.

   Note: If the flow has been scheduled, an icon appears. The flow will become active at the time specified in the Flow properties (See *Flow properties* on page 216).

Deactivating flows

If you want a flow to stop processing jobs, you must deactivate it. Note that you can deactivate several flows in one go.

To deactivate flows

1. In the Flows pane, select the (active) flow(s) you want to stop.

   To select multiple flows, hold down the **Ctrl** or **Shift** key while selecting.
2. Do one of the following:
   - In the toolbar at the top of the screen, click Stop flow.
   - In the Flows pane, click and select **Stop Flow(s)**.
   - In the Flows pane, right-click and select **Stop Flow(s)**.
   - From the application menu, select **Flow** > **Stop Flow(s)**.

The processing is terminated. You can now edit the flow as required.

5.2.5.7. Importing and exporting flows

If you want to make a backup of your flows, or if you want to share them with someone else, you can export the flows concerned. Likewise if you have an exported flow, you can import that flow into your copy of Switch and have the flow appear in the Flows pane.

You can do this for single flows, but you can also import and export flow *groups* as a whole (to maintain the hierarchy and the order of the flows).

Exported flows are saved as files with the "sflow" filename extension; exported flow groups have the "sflow**s**" filename extension.

Note: Flows cannot be exported to or imported from folders that are shared such as the **Desktop** folder and the **Downloads** folder. This is also the case for folders that are redirected from shared folders.

References to external files

If a flow which contains a link to an external file (for example an XSLT stylesheet) is exported, both the *location* of this file and the *file itself* are stored inside the flow file.

When the flow is imported again, Switch will search for this file in the same location. However, if the external file is not available (e.g. because the flow is imported on another system, which doesn't have this file), Switch will use the file that is stored in the flow and link the value of the property to that file.

Tip: To make sure flows are kept in sync on different computers, we recommend copying all external files to all systems. This way, you don't have to worry about files stored in the internal Switch structure.

For more details, refer to *Compatibility considerations* on page 226.

Exporting a flow or a flow group

To export one or more flow or flow groups

1. In the Flows pane, select the flow(s) or flow group(s) concerned.
2. Do one of the following:
   - From the menu, select **Flow** > **Export Flow(s)...**
   - Right-click the selected flow(s) and choose **Export Flow(s)...**
   - Click and select **Export Flow(s)...**
3. Choose a location and a name (in case of a single flow) or a destination folder (in case of flow groups or if you selected more than one flow).
   The selected flows and flow groups are exported and saved in the chosen location. If you have exported several flows, the flows are saved in the destination folder, one file per flow, and they are named after the flow. For example, a flow called DemoFlow will result in a file called *DemoFlow.sflow*.

Flow groups are saved with file extension "sflow**s**", for example *CustomerXflows.sflows*.

Exporting all flows in the Flows pane (for a backup)

Use this function if you want to create a quick backup of your flows, being sure that all flows are exported.

To export all flows in the Flows pane

1. Do one of the following:
   - From the menu, select **Flow** > **Export all...**.
   - In the Flows pane, click and select **Export all...**.
2. Select a destination folder.
   The flows are exported and saved in the chosen location. The grouping structure of the flows in the Flows pane is not exported. There is no way to do this.

Importing a flow or a flow group

To import one or more flows from an external ".sflow" file (in case of single flows) or ".sflow**s**" file (in case of flow groups)

1. Determine where you want your flow(s) or flow group(s) to be placed in the Flows pane.

   The flow(s) /flow group(s) will be placed at the same level as the flow that is have currently selected. If no flows are selected, they will be placed at the root level (highest level).
2. Do one of the following:
   - From the menu, click **Flow** > **Import Flow...**.
   - In the Flows pane, right-click somewhere and choose **Import Flow...**.
   - In the Flows pane, click and select **Import Flow...**.
3. Select the external file(s) you want to import.

   You can select multiple files at the same time by holding down the **Ctrl** or **Shift** key.
4. Click **Open**.

   If problems occur, a message will appear, for example to warn you about unsupported flow elements (See *Importing a flow with unsupported flow elements* on page 226).

   If everything goes well, the flow(s) or flow group(s) will appear in the Flows pane. The hierarchy and the order of the flows in the the flow groups are preserved.

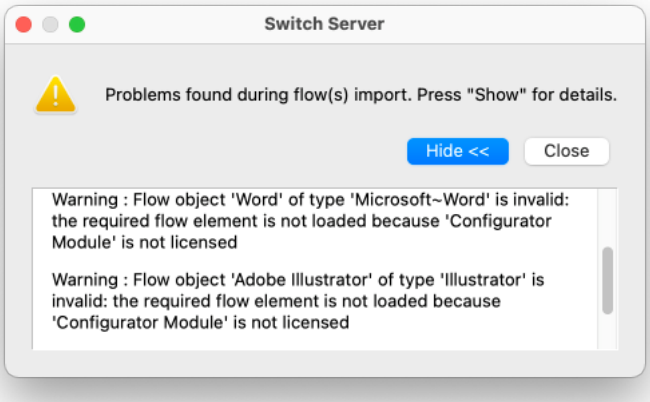
Alternative ways to import files:

Alternatively you can locate the external ".sflow(**s**)" file using the Windows Explorer (on Microsoft Windows) or Finder (on Mac) and:

- Double-click the file; this will launch Switch if it is not yet running and import the flow or flow group.
- Drag and drop the file onto the Flows pane in Switch; this will import the flow or flow group.

Importing a flow with unsupported flow elements

When you import a flow in which some of the flow elements are not supported by the current configuration of Switch (for example, the flow element may belong to a module which you have not licensed), the following message will be displayed:



When you click **Close** in the above dialog box, the flow is imported along with the unsupported flow elements, but the unsupported flow elements will display a small triangle with an exclamation mark. When you hover your mouse over this triangle, a pop-up also displays the message about the unsupported flow element.

Compatibility considerations

When exporting a flow, Switch stores a maximum amount of information in the exported flow file:

- The list of flow elements and connections as they are shown in the canvas, including the geometry.
- The values of all properties, including references to backing folders and configuration files
- A copy of any referenced configuration files.

Sometimes a property value refers by name to configuration data stored internally by a third-party application. In those cases it is not possible to include the configuration data itself (the reference by name is still included).

When importing a flow, Switch ensures that all encountered flow elements and properties are supported by this version of Switch. If not, any issues are reported to the user and the unsupported items are omitted from the imported flow. Switch also copies configuration files from the flow file being imported into a special location under its application data root, and changes the corresponding references to point to these new copies.

Further validation of property values is performed when the flow is activated (for example, ensuring that all backing folders have a valid path).

Auto-managed backing folders are automatically created where necessary. For user-managed backing folders the original paths are preserved without change. In most cases this means that you must create and assign new backing folders (i.e. unless the backing folders already exist because you are importing a flow that was previously created on your own system).

5.2.5.8. Generating flow documentation

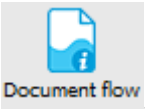
For a good overview of a flow and its flow elements, it may be handy to generate an HTML page that contains all this information. You can afterwards save this HTML as PDF (using the print function of your browser) as required.

To generate flow documentation

1. In the Flows pane, select the flow(s) for which you want to generate the documentation.

   Note that it is also possible to generate documentation for all flows in one go. To do so, no need to select anything, just select **Flow** > **Document all**.

2. Do one of the following:

   - In the toolbar at the top of the screen, click 

.
   - In the Flows pane, right-click and select **Document Flow(s)**.
   - From the menu, select **Flow** > **Document Flow(s)**.

The flow documentation is generated and shown immediately in your default browser. It provides you with details of the flow itself (e.g. name and description, if a background image is used, ...), a graphical representation of the flow (as shown on the canvas), and an overview of all properties of all flow elements. Note that you can click the elements in the flow image, to see the corresponding properties. The arrow allows you to return to the top of the HTML page.

5.2.6. Monitoring flows

5.2.6.1. Viewing an active flow

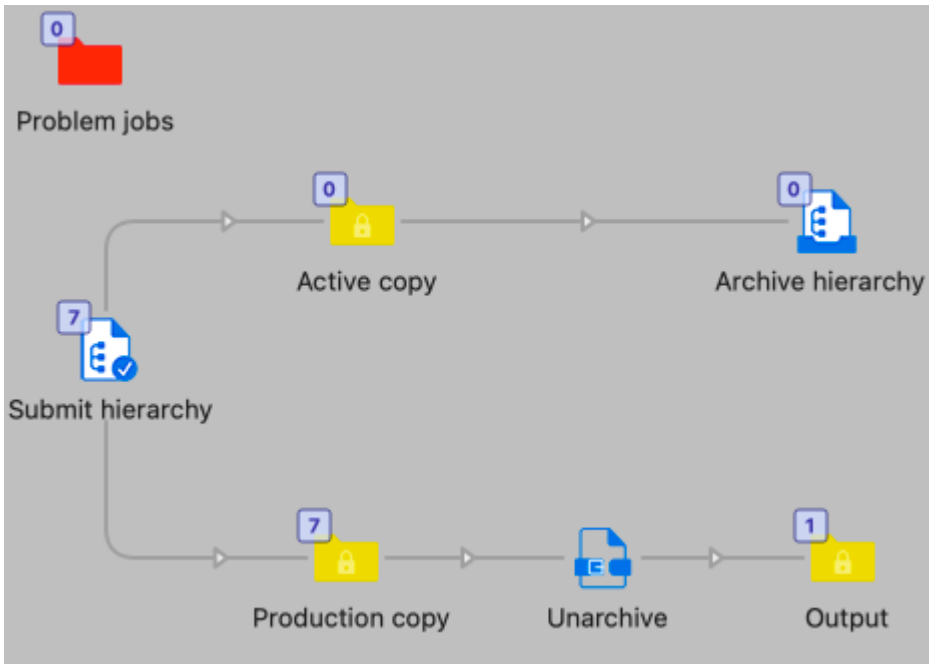
Active flows are flows which have jobs that are currently being processed by the Switch Server. The active state is indicated by the icon next to the flow name in the Flows pane, and by the darkened background in the canvas. See *Activating and deactivating flows* on page 222 and *Flows pane* on page 84.

While executing a flow the canvas provides visual feedback about the number of jobs residing in each backing folder, and about problem jobs and problem processes, as described in this topic below.

More extensive feedback about flow execution is provided elsewhere; for more information see:

- *Viewing log messages* on page 234
- *Viewing processes in the Progress pane* on page 240
- *Viewing flow problems in the Dashboard pane* on page 241

Number of jobs



When a flow is active, the canvas attaches a small rectangle to each flow element that has a backing folder, as shown above. The number in the rectangle reflects the number of jobs residing in the flow element's backing folder.

For performance reasons Switch stops counting at 100 jobs. When a backing folder contains 100 or more jobs, the rectangle displays the symbol for infinity.

Scanning user-managed folders and checking Mail / FTP

Switch automatically scans the contents of user-managed folders and checks Mail and FTP in an active flow at regular intervals. The interval between scans is governed by global user preferences; see *Switch preferences: Processing* on page 41.

When testing a flow it is sometimes impractical to wait for the next interval scan. Therefore, when a flow is active, you can use an option in the context menu to immediately scan the folders concerned:

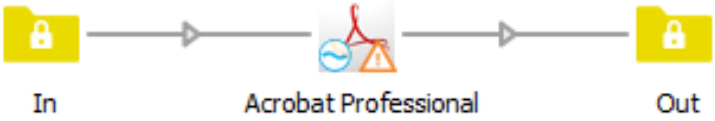
- The **Scan now** context menu for Folder and Submit hierarchy elements causes Switch to immediately scan the corresponding folder.
- The **Check now** context menu for Mail Receive and FTP receive causes Switch to immediately check for jobs arrived by mail or FTP .
- The **Scan folders now** context menu for the canvas causes Switch to immediately scan all backing folders in the currently displayed flow.
- The **Check FTP now** context menu for the canvas causes Switch to immediately check for arrived jobs with all FTP receive flow elements in this flow.
- The **Check Mail now** context menu for the canvas causes Switch to immediately check for arrived jobs with all Mail receive flow elements in this flow.

Problem jobs

When the Problem jobs flow element contains at least one problem job, it displays a red error mark as shown above. This feedback is provided for both active and inactive flows.

See also *Handling problem jobs* on page 245.

Problem processes



When a flow is active, flow elements that correspond to a problem process display a red error mark (as shown above for FTP send). This feedback is provided only for active flows since, by definition, an inactive flow can't have problem processes.

See also *Handling problem processes* on page 246.

5.2.6.2. Putting connections on hold

Most connections offer a **Hold** property. If this property is enabled, jobs are not allowed to move through the connection. This is mostly used to temporarily hold jobs (for example because there is a problem with a process downstream).

The canvas displays connections on hold as an orange dashed line.

Although editing in the Properties pane is disabled while a flow is active (see *Activating and deactivating flows* on page 222), the status of the Hold jobs property can be modified at any time through the context menu of the connection.

Note: Note that, when the flow is running while you're putting a connection on hold, the jobs that are already present in the folder just before the 'on hold' connection will still move through the connection. The reason is that those jobs, although visually still present in the folder, are already being moved by Switch in the background.

Putting a connection on hold

Sometimes it's useful to temporarily hold jobs, i.e. stop them from moving through the connection, for example because there is a problem with a process downstream.

To put a connection on hold

1. Select the connection in the canvas.
2. Do one of the following
   - Right-click the connection and select **Hold**.

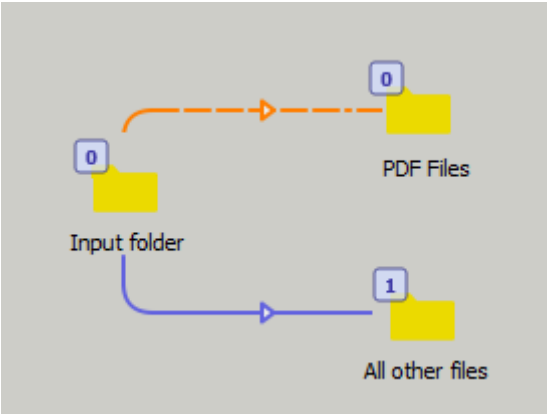
     Note: This works, even if the flow is active. Note that jobs already present in the input folder (the folder just before the connection) when enabling this setting will still move through the connection.
   - In the Properties pane, set the value of the **Hold jobs** property to **Yes**.

     Note: This does not work if the flow is active.

   In some cases, a (partial) hold is not possible, for example because jobs are moved under an external application's control. In other cases, if setting *one* connection on hold, all other connections originating from the same tool are automatically set on hold as well.

   For more information, refer to *Examples of connections on hold* on page 231.

Once put on hold, the connection is displayed in the canvas as an orange dashed line.



When the flow is active, the icon in the Flows pane that refers to the flow state will change from to to indicate that one or more of the connections are put on hold. Refer to *Flows pane* on page 84.

Releasing a connection

If a connection is set on hold, no jobs can move through the connection, until the connection is released. The connection is displayed in the canvas as an orange dashed line.

To release a connection

1. Select a connection in the canvas.
2. Do one of the following
   - Right-click the connection and select **Release**.

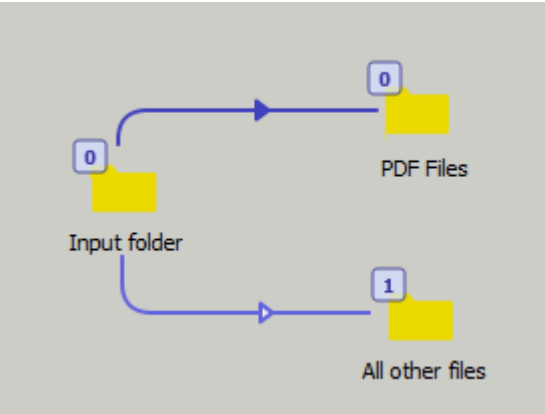
     Note: This always works, even if the flow is active.

- In the Properties pane, set the value of the **Hold jobs** property to **No**.

Note: This does not work if the flow is active.

In some cases, if releasing *one* connection on hold, all other connections originating from the same tool are automatically released as well. For more information, refer to *Examples of connections on hold* on page 231.

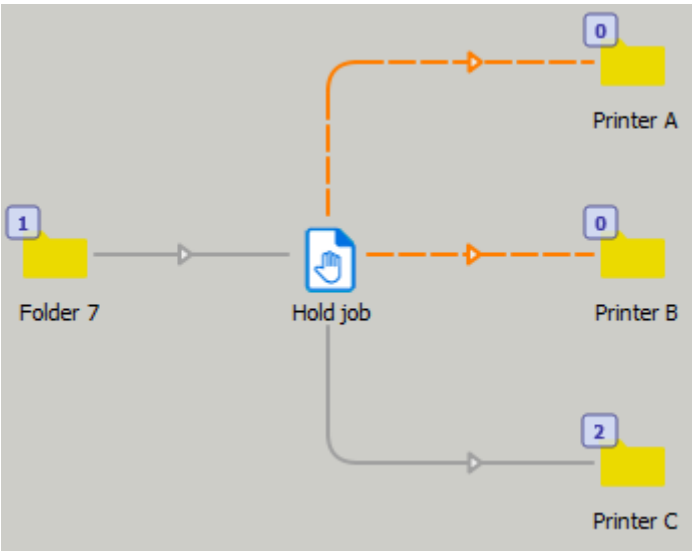
The connection is displayed in the canvas as a continuous line. The color depends on the color set in the Color property of the connection (blue in the image below). The default color is gray.



Note: It is also possible to release all connections in one go, using the **Release all** option in the context menu of the canvas.

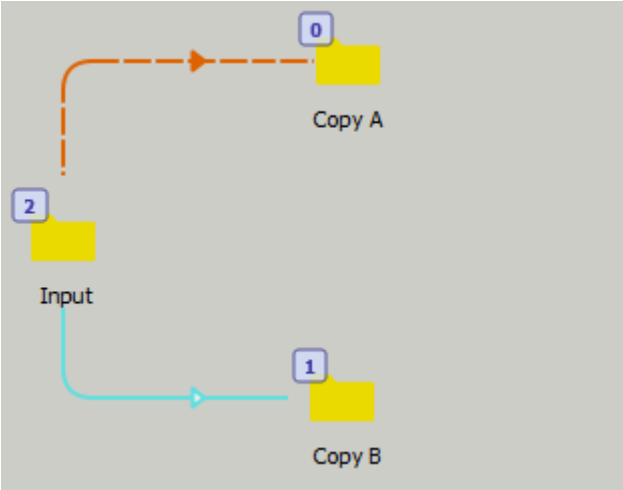
Examples of connections on hold

Hold job example



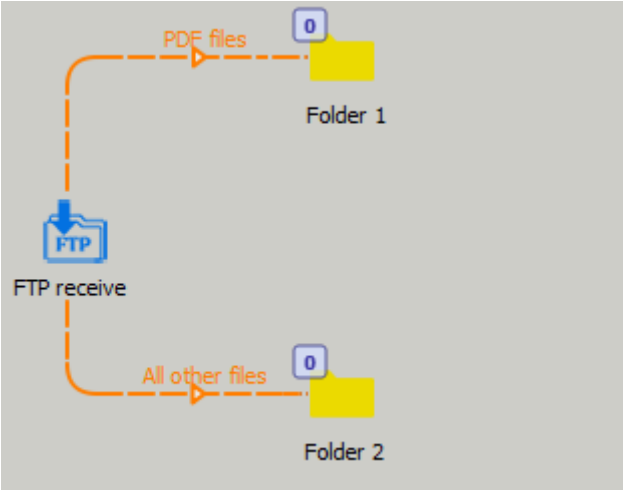
In this example, the **Hold job** flow element is used to distribute jobs evenly across three printers. The connections for printers A and B have been put on hold because the printers are temporarily off line. This causes the Hold job to send all jobs to printer C.

Folders example



In this example, the connections are set up to duplicate the incoming job (one copy in each output folder). When the first connection is put on hold, the copies for that connection are held in the input folder until the connection is released. The copies for the other connection proceed without interruption.

FTP receive example

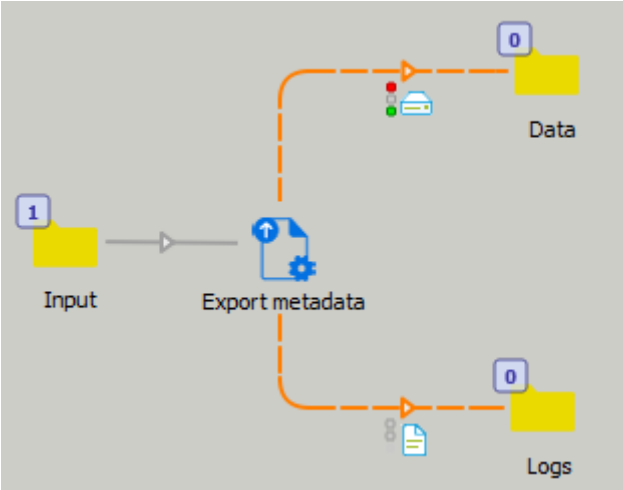


In this example, file filters have been set up for the connections leading from the FTP receive tool. PDF files are sent to Folder 1 and all other jobs are sent to Folder 2.

When the **PDF files** connection is put on hold, **the other connection is automatically put on hold as well**, effectively disabling the FTP receive tool. The connections are linked in this respect because implementing a "partial hold" on the remote connection would be tricky.

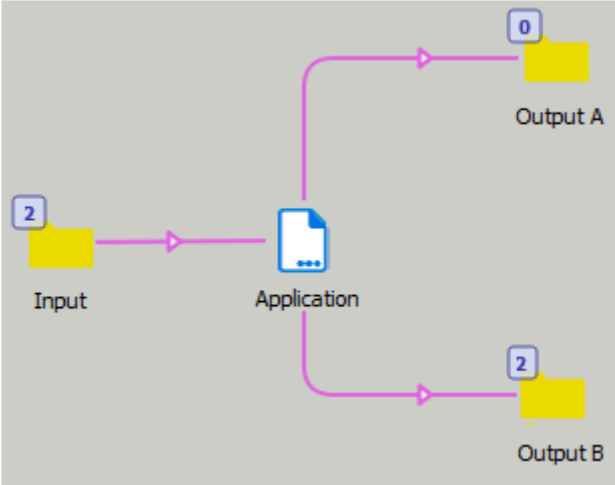
Once the connections are on hold, maintenance can happen on the FTP server without affecting the rest of the flow.

Traffic light example



Traffic light connections carry data or log information for the same job, so it does not make sense to put a single connection on hold independently. **When one of the connections is put on hold, all other connections are automatically put on hold as well**, effectively disabling the originating tool.

Generic application example



In this example, the **Generic application** tool is used to integrate an external hot folder application in the flow. **The connections can't be put on hold** because the jobs are moved under the external application's control.

5.2.6.3. Viewing log messages

This topic describes how you can open the log messages overview from within Switch. Alternatively, the message overview can be opened through the Switch Web Portal (see: *Viewing log messages through the Switch Web Portal* on page 265).

To view the log messages

In Switch, do one of the following:

- Click **View** > **Messages**.
- Press **F6**.
- Click the **Messages** button in the Switch toolbar.

Depending on the configuration in the *User interface category of the Switch preferences*, the messages view will open either inside Switch Designer or outside Switch, in a browser window. In both cases, the message overview contains the same information.

You can now show more messages or filter out the messages you're not interested in, or export the messages to a csv file. Refer to *Filtering log messages* on page 237 and *Exporting log messages* on page 240.

The Messages overview

This topic describes the Messages overview.

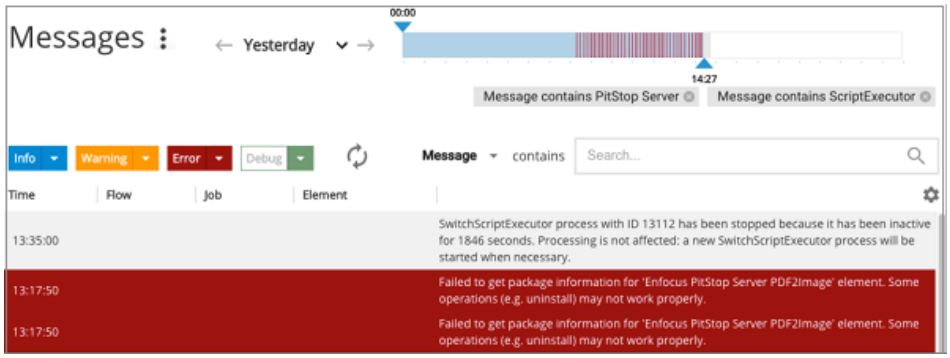
You can open this overview

- Through the Switch Web Portal.
- From within Switch, by clicking the **Messages** button in the toolbar of the Switch Designer. Alternatively, you can press **F6** or select **View** > **Messages**.

Note: If opened from within Switch, it's possible to have the messages shown inside the Switch Designer (For more info, refer to *User interface category of the Switch preferences* ("Render HTML in Designer")).

Buttons and menus

The table below explains the meaning of the main buttons, labels, icons and menus in the Messages overview.



Button/menu	Description
← Yesterday ⌄ →	Indicates the date(s) on which the shown messages were issued, and allows you to select a different date or date range. • ←: Show messages of the previous day • →: Show messages of the next day • ⌄ : Show messages of a particular date or date range. You can also choose "Full history", i.e. all messages since the last message cleanup (as defined in the Switch preferences (Application data category)).
	Indicates the time frame in which the shown messages were issued. You can move the blue arrows to enlarge or reduce the time frame. The red vertical lines represent error messages. This way you can immediately see when error messages were issued.
Message contains PitStop Server Message contains ScriptExecutor	The applied filters are listed right above the Search field. When two different filters are applied, all log messages that match one of the strings are shown (in this example: messages that have "PitStop Server" OR "ScriptExecutor" in the description).
Message ⌄ contains Search...	This part of the overview allows you to configure filters, to select messages that contain certain strings (in the message itself, in the name of the flow, the name of the job, ...) Refer to *Filtering log messages* on page 237.
⚙	Opens a menu with the following options: • **Flow, Job, Module, Element, Prefix**: Refers to the columns in the overview. Click to hide or show columns as required. • **Reset view**: Allows you to reset the columns to their default size and position: only Flow, Job and Element are shown by default.

Button/menu	Description
	• **Export**: Allows you to export the *filtered* log messages to a .csv file. You can either open the file or save it locally. • **Clear all**: Allows you to remove all log messages from the log database. Note that there is no undo for this action!
Info Warning Error Debug	Message types, indicating the severity level of the message. If colored, the messages of that type are displayed in the overview, in a background with the corresponding color. In the example, info, warning and error messages are shown, whereas debug messages are hidden (default). You can click a message type to switch from hidden to shown and vice versa, or you can click the arrow to the right, to only show the messages of that particular type. **Note:** Info messages are displayed in a white and gray background. Note that the Debug button also shows or hides assert messages. See also the table below (Message types).
	By default, the page refreshes automatically, so you always have an up-to-date overview. You can turn off this option by clicking the auto refresh button , which will turn into a blue arrow .

Columns

The following table describes the columns in the Messages overview.

Remember that you can hide columns as required via the icon just below the search field. It's also possible to resize the columns.

Column	Description
Time	Time when the message was triggered.
Flow	The name of the flow that triggered the message.
Job	The name of the job for which this message was issued.
Module	The Switch module (such as Control) or type of flow element (such as folder, Mail receive, ...) that triggered the message.
Element	The name of the flow element that triggered the message.
Prefix	The unique name prefix of the job referred to in the message, or blank if there is no unique name prefix.
Message	The message itself.

Message types

The following table describes the different types of messages that can appear in the Type column of the Messages overview.

Type	Description
Info	An informational message that has no other purpose than to inform the user of a certain occurrence. *Info messages are always shown in the Messages overview (unless a filter is applied).* The Messages overview displays all types of info messages (related to Switch Server and to Switch Designer).
Warning	A warning message that informs the user of a recoverable problem or non-fatal error. *Warnings are always shown (in orange) in the Messages overview (unless a filter is applied).*
Error	An error message that informs the user of a fatal error. *Errors are always shown (in red) in the Messages overview (unless a filter is applied).*
Debug	An informational message solely intended for debugging purposes (often generated by apps). *Debug messages are not shown by default. If the **Log debug messages** preference is enabled*, you can display them using the Debug message type filter. Refer to Switch Preferences: Logging.
Assert	A message solely intended for debugging purposes that is issued only when a coding error is discovered. *Assert messages are not shown by default. If the **Log debug messages** preference is enabled*, you can display them using the Debug message type filter. Refer to Refer to Switch Preferences: Logging.

Note: Scripters have access to all messages, to be able to debug their scripts.

Filtering log messages

By default, all info, warning, and error messages issued on the current date are shown in the Messages overview. You can however change this and only display the messages you're interested in.

To filter the log messages

1. Pick the **date(s)** of which you want to see the messages.

By default, today's messages are shown.

To ...	Do the following ...
Show messages of the previous day	Click ←
Show messages of the next day	Click →
Show messages of a particular date or date range	Click ⌄
Show messages of a particular date or date range	Click ⌄ and select the appropriate option from the menu: • Today • Yesterday • Choose date(s): Opens a calendar. Click the date you want to select. In case of a date range, click the first and the last date. • Full history: Displays all messages since the last messages cleanup (as defined in the Switch preferences (Application data category)).

2. Pick the appropriate **time frame**:
   - To indicate the start time, click the blue indicator to the left of the slider and drag it to the time of your choice.
   - To indicate the end time, click the blue indicator at the right of the slider and drag it to the time of your choice.

   By default, the messages of the current date are shown. The blue part indicates the currently shown time. The red vertical lines indicate when time error messages were issued.

   Note: If the end time is not the current time, the auto refresh is disabled and the auto refresh button will turn into a blue arrow. If you click this blue arrow, auto refresh is turned on again and the end time is reset to the current time.

3. Pick the **type of messages** you want to see in the overview:
   - Click the name of the message type to show or hide it in the overview. If the name is shown in a colored background, the messages are shown in the same background color, if the name is shown in white, the messages are hidden. Note that info messages are shown in a white and gray background.
   - Click the small arrow next to the message type to open a menu with two options:
     - Hide messages of this type
     - Only show messages of this type

   By default, all types except for debug messages are shown.

4. Set a **filter** as required:
   a. Select the column in which you want to search for a particular string. If the column doesn't matter, choose **Any**.

b. In the search field, enter one or more strings to only view the messages that contain those strings. The case of the entered strings is not taken into account.

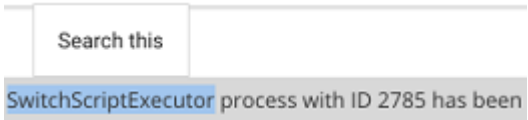
c. Press enter or click the ⊕ button.

The filter is applied immediately. The messages that match the filter are shown, and the filter definition is displayed just above the filter field.

Remarks:

- Alternatively, you can select a string somewhere in the overview and click **Search this** (which appears automatically). The filter is configured and applied automatically.

  Example:

  Resulting filter:

- To view messages that contain several strings in one entry (e.g. configurator AND workflow), type those strings in one filter field.

- To view messages that contain either string x or string y (e.g. configurator OR workflow), type those strings in two different filter fields (see screenshot).

5. To clear a filter, click the cross button in the filter label.

   Alternatively, to clear all filters at once, click the Messages ⋮ button and choose **Reset current filter**.

   The label is removed and the messages overview is updated immediately.

6. To **save your filter**, so you can reuse it later on, proceed as follows:

   Note: This is not possible when you open the Messages overview in Designer (this is a beta feature in the *User interface category of the Switch preferences* (last setting))

   a. Click the ⋮ button.
   b. Click **Save current filter**.
   c. In the dialog that pops up, enter a meaningful name for the filter.
   d. Click **Save**.

The new filter is added to the sidebar under "Messages". Note that you can delete it anytime (via the button ⋮ next to the name of the selected filter).

Exporting log messages

Log messages can be exported to a CSV file for processing by third-party tools. If you have set filters, these filters are taken into account; only the messages that are shown will be exported to a file.

To export log messages

1. Open the Log messages overview.
2. Click the icon ⚙ below the search field.
3. Click **Export**.
   A log.csv file is created.

Clearing log messages

Log messages are stored in a database on disk and thus remain available after quitting and restarting Switch. The application data preferences determine for how long messages are retained.

To permanently clear all log messages

1. Open the Log messages overview.
2. Click the icon ⚙ below the search field.
3. Click **Clear all**.
   A confirmation dialog appears. If you click **Clear**, all messages will be removed from the log database. **Note that there is no undo for this action!**

5.2.6.4. Viewing processes in the Progress pane

The *Progress pane* displays a list of currently executing processes (for all active flows) with their progress information.

Concurrent processes

Depending on the value of the processing preferences, there may be more or less concurrent processes.

Stopping and starting processing

- To cause the Switch Server to stop processing, choose **File** > **Stop processing**.
- To resume processing, choose **File** > **Start processing**.

When you stop processing, operation of all active flows is halted and flows are de-activated temporarily. When you subsequently start processing, all active flows are simply resumed.

To stop processing is sometimes useful while designing and testing a flow that interacts with a third-party application. Stopping processing suspends Switch's interaction with the external

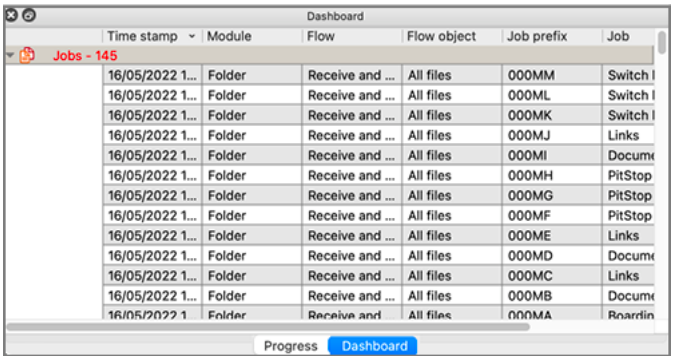
application (and with the file system), so that you can, for example, change a setting in the external application without the need for deactivating the flow.

When in doubt, deactivate and reactivate the flow rather than stopping and restarting processing.

5.2.6.5. Viewing flow problems in the Dashboard pane

The Dashboard pane (displayed by clicking **View** > **Show panes** > **Dashboard**) displays an overview of current flow execution problems at any given time. This is in contrast with the Messages overview, which provides an audit trail of what happened in the past.

Furthermore, the Dashboard allows relevant actions to be taken for certain problem types, such as retrying a problem job.



Wrap text

To display long messages on multiple lines (i.e. "wrapped" rather than chopped off), choose the "Wrap text" menu item in the context menu of the Dashboard pane.

Problem categories

Switch distinguishes in the Dashboard pane between problem jobs (which cannot be processed because of an issue with the job itself) and problem processes (where jobs cannot be processed because of a general issue with the process). Processes are further divided in file transfers and external processes.

Category	Description	Switch action
Problem job	A process failed to handle this job because of an issue that does not affect other jobs; human intervention is required for this specific job but processing can continue for other jobs.	Move the problem job to the Problem jobs folder See *Handling problem jobs* on page 245
File transfer	A Mail, FTP or local network operation cannot transfer any jobs because there is a communication problem;	Make all jobs in front of the process wait "inline" in the flow until the problem is resolved

Category	Description	Switch action
	human intervention may be required, or communication may be restored "by itself".	See *Handling problem processes* on page 246
External process	A built-in tool (such as Compress), a script or a third-party application under the control of an app cannot continue processing jobs due to a problem with the process; human intervention is most likely required.	

Information in the Dashboard pane

The information in the Dashboard pane is updated dynamically. A problem item appears as soon as it is detected and disappears as soon as the problem is solved or handled.

Rows

The Dashboard pane shows a header row for each problem category indicating the number of items in the category. The triangle in front of the header row serves to expand or collapse the category. The items in each category may be grouped per flow; grouping can be turned on and off for all categories at the same time through the **Grouping on** menu item in the Dashboard context menu.

Group nodes, if present, are sorted on flow name. The order in which items are sorted within each group (or within the category if there are no groups) can be configured by clicking the column headers in the table.

Columns

The following table describes the columns in the Dashboard pane. You can resize and reorder the columns by dragging the column headers.

Column	Description
Time stamp	The moment in time when the problem was detected.
Module	The Switch module (such as Control) or type of flow element from which the problem originated.
Flow	The name of the flow in which the problem originated (this column is absent when grouping is turned on).
Flow element	The name of the flow element from which the problem originated.
Job Prefix	The unique name prefix of the job referred to in the message, or is left blank if there is no unique name prefix.
Job	The name of the problem job, or the name of the job for which the process problem was detected, or blank if there is no job context.
Message	A message that describes the problem.

Researching problems

The Dashboard pane offers assistance with researching a problem through the following context menu items:

Context menu item	Description
Show flow element	Causes the canvas to select the flow and the flow element listed in the selected problem item.
Show job	Causes the canvas to select the flow and the flow element in which the job listed in the selected problem item currently resides (i.e. a problem jobs folder for the "jobs" category and a regular folder for the other categories). Causes the files pane to show the backing folder of the previously mentioned flow element, and to select the job under consideration.

Retrying problems

The Dashboard pane offers assistance with retrying a problem through the context menu items described in the following table. For more information on retrying problems, refer to *Handling problem jobs* on page 245 and *Handling problem processes* on page 246.

Context menu item	Description
Retry item	Retries the job or process associated with the selected row.
Retry group	For a group row, retries all items in the associated group. For an item row, retries all items in the group that contains the selected row.
Retry category	For a category row, retries all items in the associated category. For a group or item row, retries all items in the category that contains the selected row.

5.2.6.6. Viewing statistics

About Statistics in Switch

Switch allows you to collect information on how long jobs reside in certain folders or states while being moved along a flow. This can be useful to identify performance bottlenecks.

There are two types of statistical data:

- **Folder statistics** calculate the average time jobs reside in a folder for which statistics have been enabled.
- **State statistics** calculate the average time jobs reside in a particular state. A state can be attached to a job folder via the Folder property "Attach job state", and allows you to combine

information about several folders having the same function, for example "coming in" or "in progress".

Statistics are not limited to a single flow: Switch **combines all statistics-enabled folders from all active flows in a single set of statistics**. If two or more folders (used in different flows) have the same name, the statistics for these folders are combined in one single entry.

Tip: To receive meaningful results, we recommend calculating statistics only for folders leading to heavy processes, i.e. processes forming a potential bottleneck for resources, such as CPU time or communication bandwidth.

Setting up statistics

- To gather **Folder statistics**, you must enable the **Show in statistics** property of the folder concerned.
- To gather **State statistics**, you must fill out the **Attach job state** property of the folder concerned.

You can only gather statistics for a folder that has outgoing connections. Folders at the end of the flow do not have the **Show in statistics** and **Attach job state** property, because Switch has no control over the time the jobs reside in such a folder.

Remark

- In case of **Folder statistics**, the calculated time is the queuing time between the moment the job is detected and the the moment the job is handed over for processing on an outgoing connection.
- In case of **State statistics**, this is the queuing and processing time between two *different* job states. Note that, due to the fact that statistics are only logged when the job state changes, it is necessary to *introduce an extra dummy state* (which will never be logged) at the end of the last flow element of interest or just before the last folder of the flow (as the last folder has no **Attach job state** property, hence the job state cannot change). In the following example, the time spent in the "Set to MyState" includes the queuing time in the first folder and the processing time in the generic application ("Process"). The second folder was introduced to change the job state to a dummy value.

Note: The time during which a job is blocked (e.g. because the relevant flow was not active or Switch was not running) is also included in the statistics.

Displaying statistics

To display the Statistics pane, click

in the Switch toolbar or go to **View** > **Statistics**.

Important: Do not forget to refresh the statistics (by selecting **View** > **Refresh Statistics**), to make sure the most recent information is displayed.

You can display up to three statistics panes (by clicking **View** > **Show panes** > **Statistics 2** or **Statistics 3**) at the same time. This allows you to display a second and third set of statistics (e.g. sorted in a different way).

For more information about this pane, refer to *Statistics pane* on page 88.

Resetting statistics

To remove the collected information, i.e. to set all counters to zero, go to **View** > **Reset Statistics**. Switch will start gathering statistics from scratch.

5.2.7. Handling execution problems

5.2.7.1. Handling problem jobs

While executing a flow, Switch executes processes and moves jobs between processes according to the specifications in the flow definition. However there are situations where a process fails to handle a job properly and it no longer makes sense for the job to move along the flow in its usual fashion. In those cases, Switch moves the job to the Problem jobs folder, a central location for jobs that require human intervention.

Important examples of why a job may be moved to the Problem jobs folder include:

- The job has an invalid file format causing a third-party application to issue a fatal error message.
- The job matches none of the file filters set on the outgoing connections of a particular folder.

Switch offers a number of facilities for handling problem jobs, from detecting their presence to re-injecting them in the flow after the problem has been resolved.

Detecting problem jobs

There are various ways to detect the existence of problem jobs in Switch:

- The *Problem alerts user preferences* allow specifying that a notification email should be sent to the system administrator when a job is moved to the Problems folder.
- The Problem jobs flow element can be placed on the canvas right inside a flow design; its icon displays a red error mark when there are problem jobs present (see *Viewing an active flow* on page 227).
- The Dashboard pane displays an overview of the current problem jobs at any given time. See *Viewing flow problems in the Dashboard pane* on page 241.

Researching problem jobs

Switch assists with locating and researching problem jobs in various ways:

- When you select the Problem jobs flow element in the canvas; the Jobs pane displays a list of the problem jobs (for this flow or for all flows depending on how the Problem jobs flow element is configured).

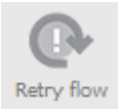
- The context menu for the Dashboard pane provides options to locate the flow element causing the problem in the canvas, and to show the problem job in the Jobs pane. See *Viewing flow problems in the Dashboard pane* on page 241.
- The Messages overview shows all messages issued by Switch and the processes under its control; use the overview's filtering capabilities to pinpoint the messages issued for the problem job or by the process(es) involved in the problem; this may provide some context in case the problem was really caused by an occurrence further upstream. See *Viewing log messages* on page 234.

Retrying problem jobs

When Switch moves a job to the Problem jobs folder, it remembers the original location of the job in its internal job ticket. This makes it possible to move the job back to the location where it left the flow for another attempt at successful processing, without losing any of the job's history (which is also stored in the internal job ticket). The process of moving the job back in the flow is called retrying the job.

It is meaningful to retry a job only after you have fixed the problem (or at least believe you did) by reconfiguring a process, adjusting the flow design, or tweaking the job itself.

Note: Leave the job in the Problem jobs folder and leave its file name intact (including unique name prefix and file name extension); if you change the location or the file name Switch may lose the connection with the job's internal job ticket and it can no longer retry the job.



Switch offers various ways to retry a job:

- When you select the Problem jobs flow element in the canvas (and if it contains problem jobs), the **Retry** button in the tool bar is enabled. Click the **Retry** button to retry all jobs in the selected Problem jobs flow element.
- The context menu for the Problem jobs flow element also offers a **Retry all jobs** option.
- When the Jobs pane displays a list of problem jobs (because the Problem jobs Flow element is selected), its contextual menu offers a **Retry job** option that retries only the selected job(s).
- The context menu for the Dashboard pane provides options to retry one or more of the listed jobs. See *Viewing flow problems in the Dashboard pane* on page 241.

5.2.7.2. Handling problem processes

While executing a flow Switch causes processes to be performed and jobs to be moved between processes according to the specifications in the flow definition. However there are situations where a process is no longer able to continue processing jobs due to some problem with the process itself. In those cases, Switch makes all jobs in front of the process wait "inline" in the flow until the problem is resolved (it makes no sense to move these jobs to the problem jobs folder since there is nothing wrong with the jobs).

Important examples of why a process may fail include:

- There is a network communication problem so jobs can no longer be transferred.
- A property for the process is set to an improper value (Switch attempts to detect invalid properties when a flow is activated but this can never be foolproof in all cases).

Switch offers a number of facilities for handling problem processes, from detecting their presence to re-enabling them once the problem has been resolved.

Detecting problem processes

There are various ways to detect the existence of problem processes in Switch:

- The *Problem alerts user preferences* allow specifying that a notification email should be sent to the system administrator when communication (Email, FTP, local network) is down for more than a specified time, or when an external process fails.
- The flow element corresponding to a problem process is shown in the canvas with a red error mark, providing obvious feedback on its problem state (see *Viewing an active flow* on page 227).
- The Dashboard pane displays an overview of the current problem processes at any given time. See *Viewing flow problems in the Dashboard pane* on page 241.

Researching problem processes

Switch assists with locating and researching problem processes in various ways:

- The context menu for the Dashboard pane provides options to locate the flow element causing the problem in the canvas. See *Viewing flow problems in the Dashboard pane* on page 241.
- The Messages overview shows all messages issued by Switch and the processes under its control; use the overview's filtering capabilities to pinpoint the messages issued for the process(es) involved in the problem; this may provide some context in case the problem is caused by interrelated processes. See *Viewing log messages* on page 234.

Retrying problem processes

The process of re-enabling a process (or at least attempting to do so) is called retrying the process.

It is meaningful to retry a process only after you have fixed the problem (or at least believe you did) by reconfiguring the process, adjusting the flow design, or resolving any relevant issues outside of Switch.

Automatic retry

The *Error handling user preferences* allow automatically retrying a problem process after a specified time interval. Separate values can be specified for different categories of processes.

Automatic retry is especially meaningful for communication processes since a network problem is often resolved by external influences.

Manual retry

Switch offers various ways to manually retry a problem process:

- When you select the flow element in the canvas that corresponds to a problem process, the Retry tool button is enabled. Pressing the Retry tool button retries the process.
- The context menu for the flow element in the canvas that corresponds to a problem process also offers a "Retry" menu item.
- The context menu for the Dashboard pane provides options to retry one or more of the listed processes. See *Viewing flow problems in the Dashboard pane* on page 241.
- When you deactivate and reactivate a flow, all of its problem processes are implicitly retried.
- When you quit and restart Switch, all problem processes are implicitly retried.

5.2.8. Advanced topics for running flows

5.2.8.1. Scheduling jobs

Objectives for scheduling jobs

The Switch job scheduler has the following (sometimes conflicting) objectives, in order of importance:

- Maximize overall throughput, that is, process as many jobs as possible in a given amount of time.
- Allow users to specify individual job priorities: a task for a job with a higher priority should be executed first. This can be used to "rush" a particular job through a flow, or to define a high-priority flow (by assigning a priority to all jobs in the flow).
- Process jobs in order of arrival, that is, jobs should arrive at the end of a flow in the order they were placed in the flow to begin with (FIFO = first-in/first-out).

These objectives are not absolute: enforcing some particular order of execution to the letter would sacrifice throughput and/or overly complicate the implementation.

Internal job ticket

To support these objectives, the internal job ticket for each job stores the following fields:

- Job priority: a signed integer number that determines the priority of the job; a higher number indicates a higher priority; the default priority is zero.
- Arrival stamp: an unsigned integer number that indicates the order in which this job first arrived in a flow, as compared to other jobs.

Execution slots

The scheduler manages a number of slots in which tasks can be executed in parallel. The maximum number of concurrent slots is determined for each category of tasks as described in the following table.

Note: For an overview of the flow elements belonging to each of these categories, refer to *Switch performance tuning* on page 434.

Task category	Task types in this category	Maximum concurrent slots for this category
Disk	*File handling tasks*, such as copying & moving jobs	5
Network	*Network transfer tasks*, including FTP send/receive, Mail send/receive, Checkpoint via mail.	Determined by the value of the "Concurrent network transfer tasks" preference (See *Switch preferences: Processing* on page 41)
Processor	*File processing tasks*, executed by apps and flow elements such as archive, unarchive, 'heavy' scripts,... Note that light scripts belong to a separate category (see paragraph below).	Determined by the value of the "Concurrent processing tasks" preference (See *Switch preferences: Processing* on page 41)
Light script	Light scripts used in the Script element (see paragraph below)	5 + value of the "Concurrent processing tasks" preference (See *Switch preferences: Processing* on page 41)
Timer	Any timerFired entry point invocation	Minimum: 2 Maximum: twice the value of the "Concurrent processing tasks" preference (See *Switch preferences: Processing* on page 41)
Webhook	Any webhookTriggered entry point invocation	Minimum: 2 Maximum: twice the value of the "Concurrent processing tasks" preference (See *Switch preferences: Processing* on page 41)

Task category	Task types in this category	Maximum concurrent slots for this category
Flow stop	Any flowStopTriggered entry point invocation	Minimum: 2 Maximum: twice the value of the "Concurrent processing tasks" preference (See *Switch preferences: Processing* on page 41)
PitStop Server	PitStop Server tasks, executed by the PitStop Server configurators.	Determined by the value of the "Concurrent PitStop Server tasks" preference (See *Switch preferences: Processing* on page 41)

Within each category concurrency is further limited by the serialization needs of each task type. Thus even when a slot is available for a particular category, a task in that category may not match the slot because, for example, another task of the same type is already executing and the task type has the serialized execution mode.

Light and heavy scripts

Scripts include many of the tools built-in to Switch, and all third-party script packages.

Initially a script is heavy. If its entry points consistently complete quickly (in less than 1 second for 5 consecutive times) the script becomes light, until it violates this "trust" by not completing within 1 second once – it then becomes heavy again.

Scheduling tasks

The scheduler removes tasks from the task queue and schedules them for execution in one of the available slots. The scheduler attempts to schedule a task:

- Each time a new task is queued (because a slot may be available that does not match the previously queued tasks).
- Each time an execution slot becomes available because a task has completed (because there may be a queued task that matches this slot).

The scheduler selects a task for execution by narrowing down the set of queued tasks using the following steps:

1. Start with the set of all tasks on the queue that match any available execution slot.
2. Narrow down to tasks for jobs that have the highest job priority in the task set.
3. Narrow down to the task that was placed on the queue first.

The selection process ends as soon as the result set contains a single task (in which case the task is scheduled for execution) or is empty (in which case no action can be taken). The last step selects a single task so the selection process always ends.

5.2.8.2. Job priorities

The internal job ticket for each job contains a field that determines the priority of the job.

Switch stores a job queue **per element type** and the scheduler lets each element type take turns to schedule a next job. Therefore:

- Priority of a job will only have an effect on the order of how jobs are processed compared to other jobs waiting before the same element.
- Priority has no effect on the processing order of that job compared to jobs currently waiting in other elements in the flow i.e. jobs with a lower priority in other elements can still be processed earlier.

Priorities are remembered when the job moves to a next element. Therefore:

- Priority of a job will also have an effect on the order of how that job will be processed compared to other jobs in the next elements, i.e. in each element where the job arrives afterwards, it can skip the queue this way.
- When jobs from different elements using a different magnitude (1, 10, 100, 100K?) to set priorities arrive in the same folder later on, jobs coming from one element will take precedence over jobs coming from the other element. So as script writer it's not possible to know which number to set as priority to ensure that it will also get higher priority in the rest of the flow or what the consequence will be for further processing in the flow when picking a certain number as priority. For this reason predefined job priority values are available to use. For more details, refer to the *Job priority section in the Switch Scripting Guide (Node.js)*.

A job priority is a signed integer number (in the range that can be represented with 32 bits). A higher number indicates a higher priority. The default priority is zero; relative to the default a priority can be higher (positive numbers) or lower (negative numbers).

A job's priority can be set through one of the properties of the folder flow element and through the scripting API.

5.2.8.3. Arrival stamps

The internal job ticket for each job contains a field that records the job's arrival stamp.

Unless job priorities dictate otherwise, Switch processes jobs in order of arrival (if there is a matching execution slot). Switch uses the arrival stamp to determine which job arrived first. See *Scheduling jobs* on page 248.

An arrival stamp is an unsigned integer number (in the range that can be represented with 32 bits). It indicates the order in which a job first arrived in a flow, as compared to other jobs. Switch maintains a persistent and global arrival count that gets incremented each time a new arrival stamp is handed out. Thus a higher number indicates a more recent arrival.

Several jobs may have the same arrival stamp. This happens when multiple jobs are generated from the same original job, or when for some reason no arrival stamp was assigned to a job.

Stamping jobs

Switch assigns a new arrival stamp to a job when it first detects the job in a folder or submit hierarchy, or when a producer (such as FTP receive or Mail receive) first injects the job into a flow. A job's arrival stamp is not affected while the job is moving along a flow. Results generated for a job (such as a preflight report, or a duplicate of the job) retain the original job's arrival stamp.

In certain situations a job's arrival stamp needs to be refreshed (that is, assigned a fresh stamp) so that the job is not unduly processed before other jobs. For example, a Checkpoint refreshes the arrival stamp when moving a job along one of its outgoing connections.

5.3. Working with apps in Switch

Note: This chapter applies to apps that you can buy through the Enfocus Appstore. It does not apply to default apps that are included in the default Switch installation. See also *Flow elements pane* on page 79

5.3.1. About the Switch apps - an introduction

What are Switch apps?

Apps are small applications that can be used as flow elements in Switch. They are available through the Enfocus Appstore.

Where to find apps?

You can search for Switch apps in the *Enfocus Appstore (our webshop)* or from within Switch, through the search function in the Flow elements pane. The apps matching your search results are displayed in the bottom part, together with a link to the Enfocus Appstore, where you can buy them and immediately use them in your flows (even without restarting Switch!). For the detailed procedure, see *Finding apps* on page 255.

Purchasing apps

Apps are sold through the Enfocus Appstore. Some apps are free, some are sold for a fixed price (traditional/perpetual license), but for most apps you have to pay a subscription fee. See *Purchasing an app* on page 256. If your subscription is about to expire, you'll receive an email and a notification in Switch. Make sure to pay the subscription fee in time, so your flows remain valid.

Not sure if a particular app suits your needs? You can download a free trial. See *Trying an app for free* on page 255.

Note: Sometimes the people who buy apps are not the people who use them. Is this the case for you? Make the person who buys the apps a "Switch manager" of the Switch installation on which the app will be used. See *Adding a Switch manager* on page 260.

Using apps on different Switch installations

Apps are linked to a Switch installation. You can however assign an app to a different Switch and use it there without having to buy an additional license. If you want to use your apps on different Switch installations at the same time, you need of course multiple licenses.

For more details, refer to see *Assigning an app to a different Switch installation* on page 259.

New versions

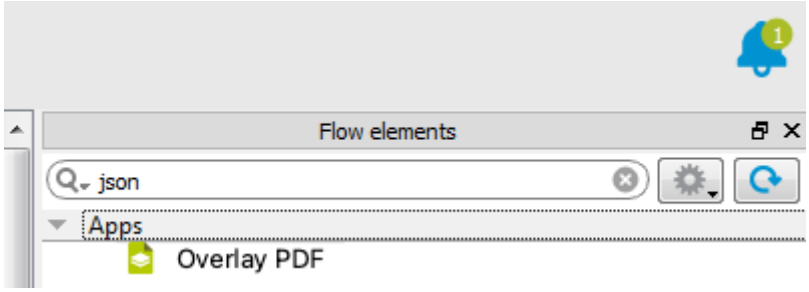
As soon as there are new versions of the apps you have purchased, you'll receive a notification in Switch and you're entitled to use this new version immediately. For the detailed procedure, see *Installing a new version of an app* on page 258.

Note that you're never obliged to switch to a newer version, and that you can go back to a previous version as required.

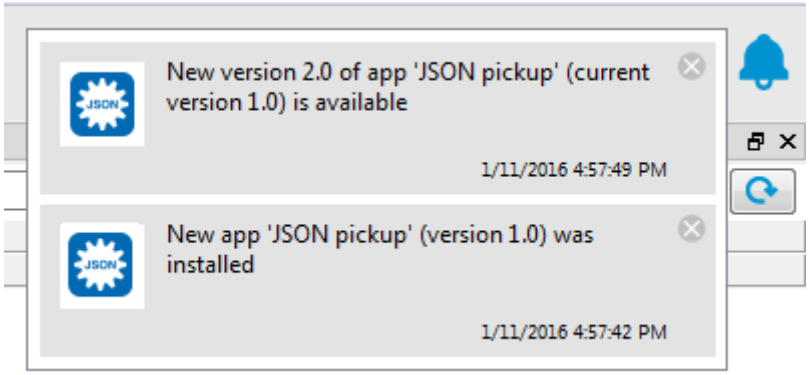
Notifications

As soon as you start working with the Enfocus Appstore, you'll get notifications. They are displayed in the top right corner of the application. They inform you about newly installed apps, new versions, the status of your license (e.g. apps that are about to expire,...)

If a notification is available, you will see a "bell" icon. The number indicates the number of new (unread) notifications that are waiting for you.



You can open the notifications by clicking the icon and closing them again by clicking anywhere in Switch. However, if you don't want to see the message anymore, you should click the cross icon, and the notification will disappear.



5.3.2. About the Enfocus Appstore

The Enfocus Appstore

The Enfocus Appstore is the Enfocus webshop where you can purchase apps for use in Switch, developed by third-party app creators.

The Enfocus Appstore is available via *https://appstore.enfocus.com* or from within Switch, by clicking the **Go to the Enfocus Appstore** button in the Flow elements pane.

There you'll find an overview of all Switch apps currently available. For more information about a particular app, simply click the logo or description. On the detail page, you can find detailed information about the way the app works, the required Switch version or platform, support info, how much it costs,... Starting from this page, you can also install a free trial or buy the app.

My Apps

Information about the apps you have purchased and/or tried can be found on the Enfocus customer portal. Just go to the Enfocus website and sign in with your Enfocus ID. You'll find 'My Apps' in the sidebar, under Switch.

You can filter the apps by clicking the **Show filters** icon. Categories are:

- **Unassigned apps** are apps for which you have a valid license, but that are not assigned to a particular Switch installation yet. Refer to *Assigning an unassigned app* on page 258.
- **Assigned apps** are apps that have been assigned to a Switch installation. You can assign them to a different Switch if needed, see *Assigning an app to a different Switch installation* on page 259.
- **Active apps** are apps that are currently in use on one of your Switch installations.
- **Expired apps** cannot be used anymore because the license has expired. You have to pay the subscription fee in order to be able to use them again. To do so, click the **Buy now** button.
- **Paying apps** are apps you have purchased.

  Note: The invoices for these payments can be found in the Account section, under **Billing**. Just click 'Show filters' and select "AppStore".

- **Free apps** are free apps that you have installed.
- **Trials** are apps that you're trying (in that case you can see how many days of your trial are left) or have tried in the past. ou have to pay the subscription fee in order to be able to use them again. To do so, click the **Buy now** button.

My Switch

'My Switch' is another submenu of Switch. Here you can find information about the Switch installation(s) linked to your Enfocus ID. There are two ways to link a Switch installation to an Enfocus ID:

- When you sign into Switch using an Enfocus ID, that Switch installation is registered automatically in the background. Note that the name mentioned in the list is determined by the name set in *the Switch preferences (Internal Communication)*.
- When another user wants to allow you to buy and assign apps to his/her Switch installation as well, he can add you as a Switch manager for that Switch installation. In that case, that Switch installation will also be linked to your Enfocus ID and you'll see it under **My Switch**.

Here you can also add extra **Switch managers** for your Switch installation: people allowed to buy and assign apps to your Switch installation. You are automatically a Switch manager of your own Switch (registered as such when you sign into your Switch), and you can add as many other people as you want to, by adding their email addresses. Note that Switch managers have also access to the Switch Insight Dashboard. See also *Adding a Switch manager* on page 260 and *The Switch Insight Dashboard* on page 425.

The apps that can be used on your Switch are called "assigned apps". The apps that are installed as part of the default Switch installation are called "default apps" (see *Flow elements pane* on page 79). You can hide both types of apps from the overview if you want.

Note: On this page, you also find a **Forget Switch installation link**. Use this link only if your Switch Server is no longer accessible, e.g. due to hardware issues and you cannot uninstall the apps in Switch. Using this link, all apps will be uninstalled in one go and all flows using apps will stop running. Your apps will become available again under My apps, and you can re-assign them to another Switch installation as required.

5.3.3. Finding apps

This topic describes how you can find an app using the search function in Switch.

Note: Alternatively, you can directly go to the Enfocus Appstore by clicking the blue **Go to the Enfocus Appstore** button (at the bottom of the **Flow elements** pane).

To find an app in Switch

1. In the Flow elements pane, enter (part of) a keyword in the search field at the top of the pane. The matching *apps* are shown at the bottom, in the Enfocus Appstore section.
2. To know what the listed apps can do, hover over the items in the Enfocus Appstore section and check the tooltip.
3. For a detailed explanation, click the app in the list.
   You're redirected to the Enfocus Appstore, where you get detailed information about the app, for example a full description, compatibility and version info, the name of the author, screenshots, the subscription fee, ... On this page, you can start a trial or buy a license. See also *Trying an app for free* on page 255 and *Purchasing an app* on page 256.

   Note: Enfocus does not offer support for apps that were developed by third-parties. In case of problems, please contact the app creator (mentioned on the app detail page in the Enfocus Appstore, under **Support**).

5.3.4. Trying an app for free

If you have found an app that is interesting to you, you can start a free one-month trial.

To start a trial

1. On the detail page of the app in the Enfocus Appstore, click the **Try it for free** button.
2. Sign in with your Enfocus ID and password as required.
3. Assign the app to the Switch installation that you will use to work with the app.

By default, if you have more than one Switch, the app is assigned to all your Switch installations. If you don't want this, clear the checkbox(es) as required.

4. Click **Start free trial**.
   The app is downloaded to the assigned Swith installation(s).

5. Do one of the following:

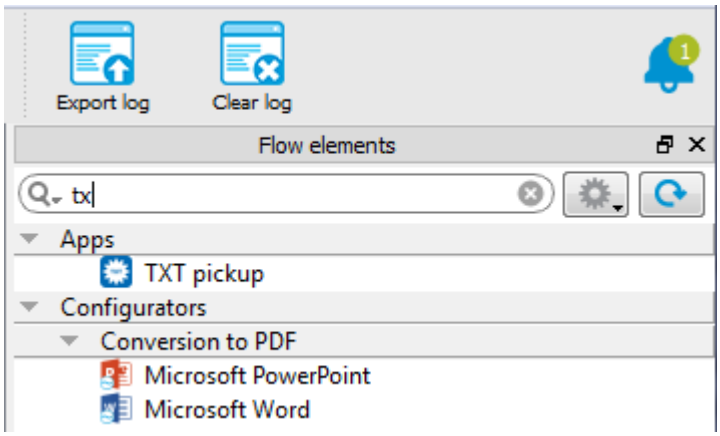
   - If Switch is running, you can start using the app immediately by clicking the **Refresh apps** button in the top right corner of the Flow elements pane. This will install the app in your local Switch.

     Note: If you don't click the **Refresh apps** button, the app will be installed automatically next time you start Switch.

   - If Switch is not running, next time you sign into Switch, the app is installed automatically in the background. You don't have to do anything.

     Note: If you start Switch without being signed in, the app will not be installed.

   You'll find the new app in the **Apps** category of the Flow elements pane. Note that you'll also get a notification to inform you that the app has been downloaded and installed on your system.



You can now use the app just like any other flow element. You can use it in your flows, define its properties, ... Apps also have a context menu that you can use to check the app details, to manage your subscription, ... When your trial is about to expire, you'll get a notification. If you want to continue using the app, you'll have to buy a license. See *Purchasing an app* on page 256.

5.3.5. Purchasing an app

Apps are sold through the Enfocus Appstore. Most apps are sold via yearly subscriptions, some are free of charge.

To purchase an app

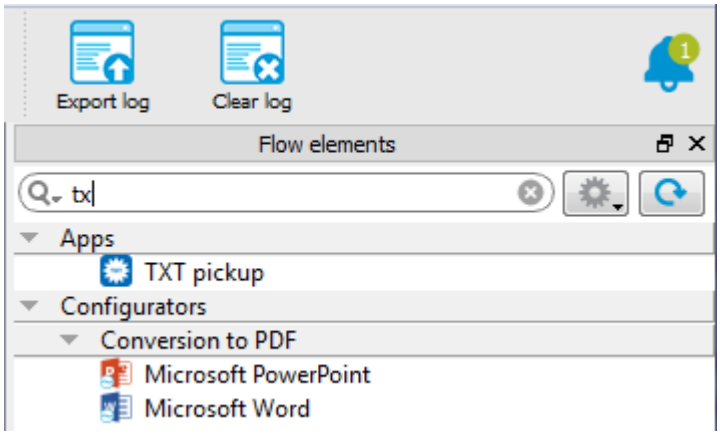
1. On the detail page of the app in the Enfocus Appstore, click the **Buy now** button.
2. Sign in with your Enfocus ID and password as required.
3. Follow the payment and registration instructions.
4. Assign the app to the Switch installation that you will use to work with the app.

   Note:
   - If you have bought several licenses for the same app, you can assign each license seat to a particular Switch installation.
   - If you don't want to assign the app yet to a particular Switch, click **.. or assign all later**. The app will not be installed locally (hence it cannot be used), but it remains available in the Enfocus Appstore (under **My apps**).

5. Click **Assign now**.
   The app is downloaded to the assigned Swith installation(s).
6. Do one of the following:
   - If Switch is running, you can start using the app immediately by clicking the **Refresh apps** button in the top right corner of the Flow elements pane. This will install the app in your local Switch.

     Note: If you don't click the **Refresh apps** button, the app will be installed automatically next time you start Switch.
   - If Switch is not running, next time you sign into Switch, the app is installed automatically in the background. You don't have to do anything.

   You'll find the new app in the **Apps** category of the Flow elements pane. Note that you'll also get a notification in Switch to inform you that the app has been downloaded and installed on your system.



You can now use the app just like any other flow element. You can use it in your flows, define its properties, ... Apps also have a context menu that you can use to check the app details, to renew

your subscription, or to uninstall the app if you don't need it anymore. See also *Uninstalling an app* on page 259.

5.3.6. Installing a new version of an app

If a new version is available, you can update the app for free (but you are not obliged to do so). You can also downgrade as required.

Proceed as follows:

1. Do one of the following:
   - When a new version of an app is available, you will get a notification in Switch. To get more information about this new version, click the notification.
   - Alternatively, go to the **My Apps** page on My Enfocus. Search the app concerned, and click **Change** beside the version.

   The Change Version page appears.
2. Select the version you would like to install.
3. Check the release notes and the compatibility section on the lower part of the page.
4. If you're sure you want to install the new version, click **Change version**.
5. Do one of the following:
   - If Switch is running, click the **Refresh apps** button in the top right corner of the Flow elements pane. This will update the app in your local Switch.
   - If Switch is not running, next time time you log into Switch, the app is updated automatically in the background. You don't have to do anything.

   In Switch, you'll see a dialog with information about the version change.
6. Click **OK**.

   You can still cancel the update if necessary.

   All flows are temporarily deactivated, the app is updated, and finally the flows are re-activated automatically. You can go on using the updated version of the app.

5.3.7. Assigning an unassigned app

In order to use an app, it must be assigned to a Switch installation. Apps that were purchased but not assigned to a Switch installation are "unassigned" apps. They remain available via your account section on our website.

To start using them, proceed as follows

1. Go to *http://www.enfocus.com*.
2. In the top right corner of the screen, click **Sign in** and sign in with your Enfocus ID.
3. In the sidebar, click **Switch** > **My Apps**.
4. Filter the apps by 'unassigned' and search the app you want to assign.

5. Select one of your Switch installations from the **Assign to** list.
6. Click **Assign**.
   The app is downloaded and installed on the selected Switch device.
7. Do one of the following:
   - Start the Switch installation selected in step 5 and sign in.
   - If Switch (on the device selected in step 5) is running and you're signed in already, click the **Refresh apps** button.

   The app is shown in the **Apps** category of the Flow elements pane.

5.3.8. Uninstalling an app

Uninstalling an app means that you remove the app from your local Switch. It will no longer be shown in the Flow elements pane and it will no longer be assigned to your Switch device, but it remains available in your account (under **Switch** > **My Apps**) (as long as you're paying the subscription fee).

There may be several reasons to uninstall an app, for example:

- You want to use the app on another Switch installation. In that case, you first have to unassign it from one system and then reassign it to the other system.
- You want to remove an expired app (displayed in gray in the Flow elements pane) from your Switch.

To uninstall an app

1. Launch Switch on the device on which you don't want to use it anymore.
2. In the **Flow elements** pane, in the **Apps** category, search for the app you want to uninstall.
3. Open the context menu.
4. Click **Uninstall**.
   A warning appears. Note that in case of an app bundle, all other apps belonging to that bundle will be uninstalled as well. It's not possible to uninstall only part of the app bundle.
5. Click **OK**.
   If the app is used in an active flow, the flow will be deactivated. It will not be possible anymore to activate the flow (unless you remove the app from the flow).

5.3.9. Assigning an app to a different Switch installation

You can use an app with a different Switch installation than the one that it's currently assigned to.

To do so

1. *Uninstall the app you want to reassign.*.
   The app will no longer be linked to the Switch installation on which they are currently used.
2. Go to *http://www.enfocus.com*.
3. In the top right corner of the screen, click **Sign in** and sign in with your Enfocus ID.

4. In the sidebar, click **Switch** > **My Apps**.
5. Filter the apps by **Unassigned**.
6. Assign the app you just uninstalled to the Switch installation of your choice.

   Note: If it does not appear in the list, you are not a Switch manager for that installation, so you don't have the right to assign apps. Ask the owner of the Switch installation to add you as a Switch manager or sign into the Switch installation, to link it to your Enfocus ID.

7. Sign into the Switch installation selected in step 6.

   If you were already logged in, make sure to click the **Refresh apps** button in the Flow elements pane.

   The app is listed in the Apps category and is ready for use.

5.3.10. Adding a Switch manager

If you want someone else to buy and install apps for you, you must make this person "Switch manager" for your Switch installation.

Note that this user will also have access to the *Insight Dashboard* for your Switch (if enabled).

To add a Switch manager

1. Go to *http://www.enfocus.com*.
2. In the top right corner of the screen, click **Sign in** and sign in with your Enfocus ID.
3. In the sidebar, select **Switch** > **My Switch**.
   Here you will see all information concerning the Switch installation(s) linked to your Enfocus ID, such as the name, the Switch version and the Switch managers. Note that all users having signed into the Switch installation concerned have been registered automatically as Switch managers. You can add or remove Switch managers as required.
4. Beside **Switch managers**, click **Edit**.
5. Enter the email address of the person that should have the right to buy and assign apps to your Switch installation.
6. Click **Confirm**.

The person that you have added as Switch manager will now see your Switch installation under **My Switch** in the Enfocus Appstore. When this person buys apps in the Enfocus Appstore he will be able to assign them to your Switch installation.

5.4. Using the Switch Web Portal

The Switch Web Portal allows users to access the Switch Server through a web browser. This means that users can access the Switch Server from another computer than the one that is running the Switch Server, without the need for a Switch Designer.

Currently, the following functionality is available:

- Viewing log messages issued by the Switch Server. This includes customizing the messages overview (sorting, filtering, etc) and exporting and clearing messages as required.
- Viewing and finding jobs processed by the Switch Server. This includes creating your own job board(s), which allows you to visualize the jobs present in certain flows and with certain flow stages. If you have purchased a Reporting Module license, you can use the data on these job boards to create dashboards with counters and graphs.
- Submitting and checking jobs, on condition that you have licensed the SwitchClient Module.

Note that users should be granted access via the Users pane.

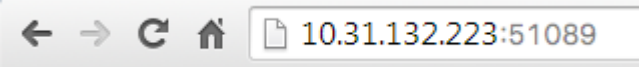
The connection can be encrypted as required (HTTPS); this can be configured through the user preferences (Switch preferences: Web Services).

5.4.1. Signing in to the Switch Web Portal

To sign in to the Switch Web Portal

1. Do one of the following:
   - To open the Web Portal **from within Designer**, click the Web Portal button in the Switch toolbar or choose **View** > **Web Portal**. Note that this option is not available in Remote Designer.
   - To open the Web Portal **in a browser**, open the browser of your choice and enter the IP address or the hostname of the computer running the Switch Server followed by ":" and the port number for the Switch Web Portal (as set in the Switch Preferences (Web Services category)). The default port number is 51089.

     For example:

     Note: Google Chrome, Safari, Edge and Firefox are supported.

   A login screen appears. The first time you'll see a banner stating that cookies on the site are used to enhance the user experience.

2. In the banner, click **Accept** to allow Switch to save your preferences.
   If you accept cookies, your preferences are saved by the browser. As a consequence, you don't have to set your preferences next time you sign in; they are remembered. If you click **Do not use cookies**, you can continue to work, but you will have to set your preferences again next time you log in.

3. Enter your user name and password.

4. Optionally, select the **Remember me** checkbox.

   This way, you don't have to log in each time you close your browser. If enabled, you remain logged in for 24 hours.

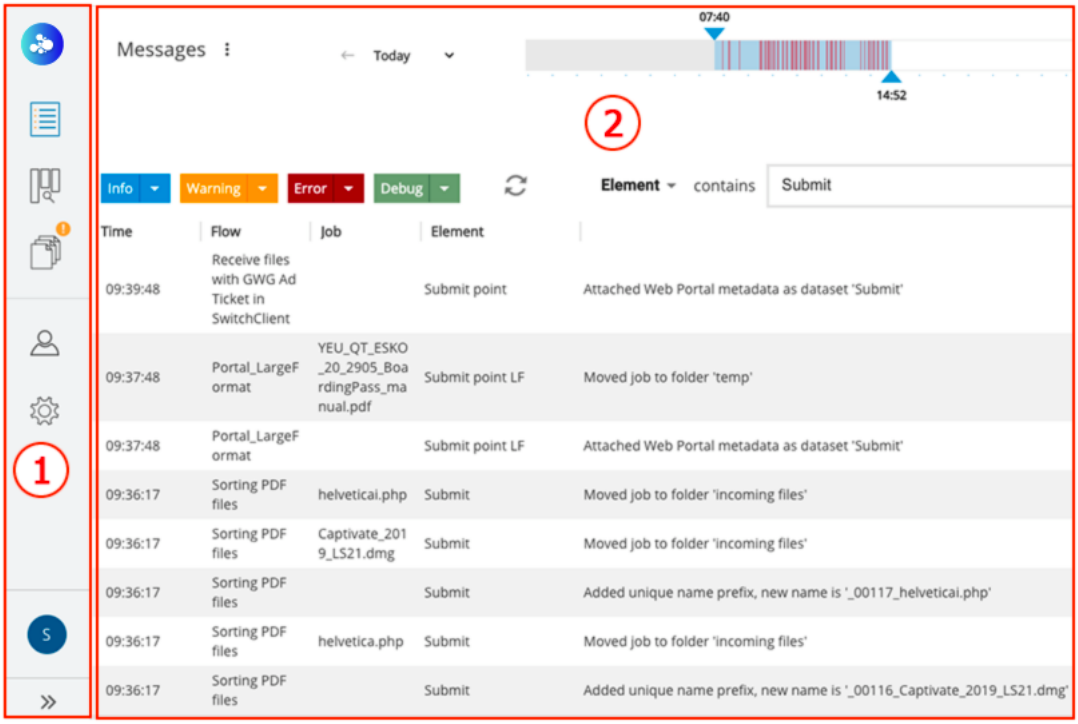
5. Click **Sign in**.

The Switch Server must be running, otherwise you will not be able to sign in.

The Switch Web Portal start page appears. What you can see and do, depends on your permissions (as configured by the Switch administrator through the Users pane). Refer to *The Switch Web Portal page layout* on page 262.

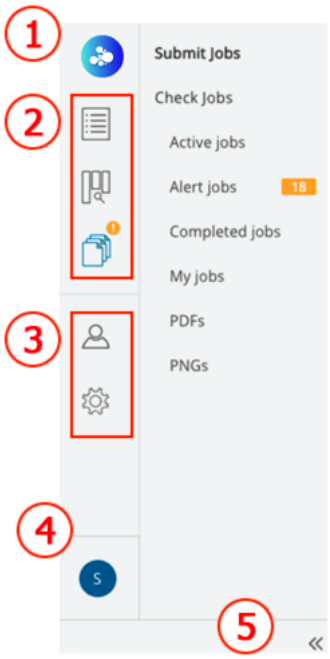
5.4.2. The Switch Web Portal page layout

The Web Portal page layout consists of 2 main parts: a sidebar menu with a number of views (1) and a workspace (2) that shows the view that is selected and highlighted in the screenshot below, the Messages view is displayed.



1. The sidebar menu

When you click one of the views in the sidebar menu, the sidebar expands automatically and displays the submenu of the selected view. You can also expand or collapse the sidebar manually (for example to have more space on your screen).

Sidebar menu	Description
	1. Switch logo and link to the homepage. 2. Buttons to display the different views (see below). The submenu of the selected view is shown to the right of the buttons. In this example, the Jobs view is selected (and highlighted in blue), giving access to two (sub)views: Submit jobs (selected) and Check jobs. Active jobs, Alert jobs, ... are filters in the Check jobs view. **Note:** Your permissions determine which and how many views you have on the Portal. 3. Buttons below the divider. The first one gives access to the Admin view (only available for users with admin rights), the second one provides extra information. 4. Account info, displaying the first letter of your username. Click this button if you want to change the language of the Portal or if you want to sign out. For more information, refer to *Changing the language of the Switch Web Portal* on page 264. 5. Arrow button to collapse the submenu.

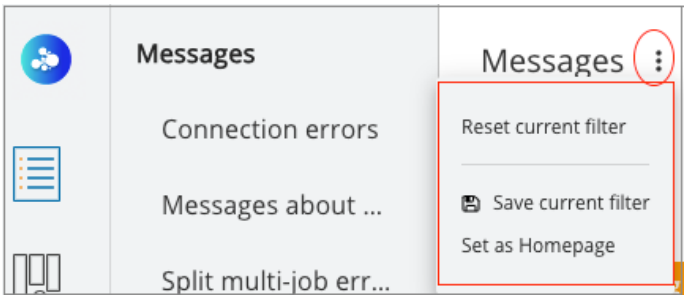
2. The selected view

The view chosen in the sidebar menu determines what's shown in the right part of the screen. In the table below you get more info about each of the views.

Through this view	You can...	More info
 Messages	View the log messages issued by Switch Server.	*Viewing log messages through the Switch Web Portal* on page 265
 Boards	Manage job boards and/or dashboards. Job boards provide info about the status of your jobs. Dashboards provide info about the number of jobs being processed, and these numbers are visualized by means of widgets (counters, tables, graphs). If you don't have access to this functionality, the button to create new dashboards is missing.	*Finding Switch jobs through the Switch Web Portal* on page 272. *Managing dashboards on the Switch Web Portal* on page 282.

Through this view	You can...	More info
Jobs	Submit jobs remotely via a Switch Submit point and check jobs that arrive in a Switch Checkpoint.	*Submitting and checking jobs through the Switch Web Portal* on page 305
Admin	Access the pages for administrators. Here you can: • Remotely start and stop your flows, view the flow design, print the flow documentation, and add annotations. • Get system info • View the number and identity of active users • Customize the logo on the Portal	*Using the Web Portal Admin view* on page 331
Info	Get access to: • The Switch documentation on the website • The Enfocus Support Portal (to report a problem) • The Support page on the Enfocus website • The Switch system requirements	

Note: Each page on the Portal has a context menu button ⋮ in the top left corner, next to the title of the page. When you click that button, you get a dialog with a number of page-specific options. One of the options that is always available is 'Set as Homepage'. For more information, refer to *Setting a homepage* on page 265.



5.4.3. Changing the language of the Switch Web Portal

By default the language on the Switch Web Portal is determined by your system's local settings.

To select a different language (i.e. one of the Switch languages), proceed as follows:

1. In the bottom left corner of the sidebar menu, click the blue circle with the first letter of your username.
   A small blue dialog pops up.
2. Click **Change Language**.
3. Click the language of your choice.

Possible languages:

- English (EN - English)
- Spanish (ES - Español)
- French (FR - Français)
- German (DE - Deutsch)
- Italian (IT - Italiano)
- Japanese (JA - Japanese)
- Portuguese (BR - Português)
- Chinese (CN - Chinese)

Your choice is remembered. Next time you sign in to the Web Portal (through the same browser), the content will be displayed in the chosen language.

5.4.4. Setting a homepage

When you're often using the same page on the Switch Web Portal, you can bookmark that page as your homepage.

To do so, proceed as follows:

1. Display the page you want to use as homepage, for example the Submit jobs view or a filter on the Messages view.
2. Next to the name of the page, click the button ⋮.
   A small dialog is displayed.
3. Click **Set as homepage**.

Next time you log in, the chosen homepage will be displayed as your start page. Clicking the Switch logo (in the top left corner of the sidebar menu) also gives access to this homepage.

5.4.5. Viewing log messages through the Switch Web Portal

If you have the right permissions, you can view the log messages in a browser without having to open a Switch Designer. The permissions are set through the Users pane.

To view the log messages

1. Sign in to the Switch Web Portal.
   See *Signing in to the Switch Web Portal* on page 261.
2. If the messages are not displayed, in the sidebar menu, click > **Messages**.
   The current date's log messages are displayed, in chronological order, most recent messages at the top. If the auto refresh option is turned on (indicated by the auto refresh icon), the list is automatically renewed. Info, warning and error messages are shown by default, debug messages are hidden. See also: *The Messages overview* on page 234.
3. If there are any saved message filters (listed under "Messages"), you can click them to immediately apply the filter.

You can now show more messages or filter out the messages you're not interested in, or export the messages to a csv file. Refer to *Filtering log messages* on page 237 and *Exporting log messages* on page 240.

5.4.5.1. The Messages overview

This topic describes the Messages overview.

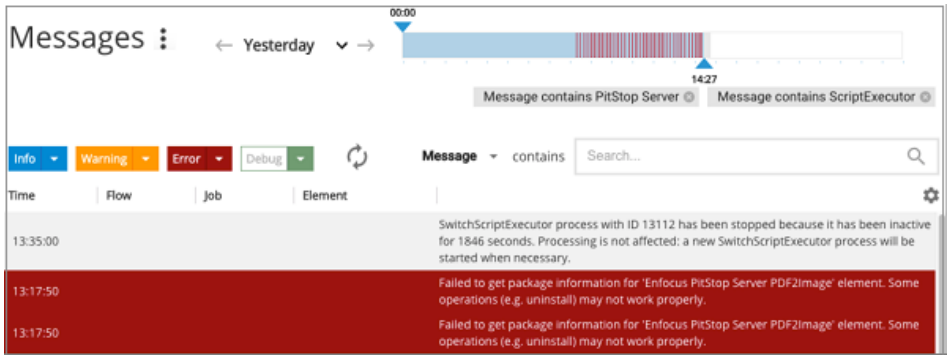
You can open this overview

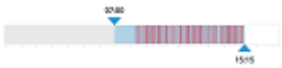
- Through the Switch Web Portal.
- From within Switch, by clicking the **Messages** button in the toolbar of the Switch Designer. Alternatively, you can press **F6** or select **View** > **Messages**.

Note: If opened from within Switch, it's possible to have the messages shown inside the Switch Designer (For more info, refer to *User interface category of the Switch preferences* ("Render HTML in Designer")).

Buttons and menus

The table below explains the meaning of the main buttons, labels, icons and menus in the Messages overview.



Button/menu	Description
← Yesterday ⌄ →	Indicates the date(s) on which the shown messages were issued, and allows you to select a different date or date range. • ← : Show messages of the previous day • → : Show messages of the next day • ⌄ : Show messages of a particular date or date range. You can also choose "Full history", i.e. all messages since the last message cleanup (as defined in the Switch preferences (Application data category)).
	Indicates the time frame in which the shown messages were issued. You can move the blue arrows to enlarge or reduce the time frame.

Button/menu	Description
	The red vertical lines represent error messages. This way you can immediately see when error messages were issued.
Message contains PitStop Server Message contains ScriptExecutor	The applied filters are listed right above the Search field. When two different filters are applied, all log messages that match one of the strings are shown (in this example: messages that have "PitStop Server" OR "ScriptExecutor" in the description).
Message contains Search...	This part of the overview allows you to configure filters, to select messages that contain certain strings (in the message itself, in the name of the flow, the name of the job, ...) Refer to *Filtering log messages* on page 237.
	Opens a menu with the following options: • **Flow, Job, Module, Element, Prefix**: Refers to the columns in the overview. Click to hide or show columns as required. • **Reset view**: Allows you to reset the columns to their default size and position: only Flow, Job and Element are shown by default. • **Export**: Allows you to export the *filtered* log messages to a .csv file. You can either open the file or save it locally. • **Clear all**: Allows you to remove all log messages from the log database. Note that there is no undo for this action!
Info Warning Error Debug	Message types, indicating the severity level of the message. If colored, the messages of that type are displayed in the overview, in a background with the corresponding color. In the example, info, warning and error messages are shown, whereas debug messages are hidden (default). You can click a message type to switch from hidden to shown and vice versa, or you can click the arrow to the right, to only show the messages of that particular type. **Note:** Info messages are displayed in a white and gray background. Note that the Debug button also shows or hides assert messages. See also the table below (Message types).
	By default, the page refreshes automatically, so you always have an up-to-date overview. You can turn off this option by clicking the auto refresh button , which will turn into a blue arrow .

Columns

The following table describes the columns in the Messages overview.

Remember that you can hide columns as required via the icon ⚙ just below the search field. It's also possible to resize the columns.

Column	Description
Time	Time when the message was triggered.
Flow	The name of the flow that triggered the message.
Job	The name of the job for which this message was issued.
Module	The Switch module (such as Control) or type of flow element (such as folder, Mail receive, ...) that triggered the message.
Element	The name of the flow element that triggered the message.
Prefix	The unique name prefix of the job referred to in the message, or blank if there is no unique name prefix.
Message	The message itself.

Message types

The following table describes the different types of messages that can appear in the Type column of the Messages overview.

Type	Description
Info	An informational message that has no other purpose than to inform the user of a certain occurrence. *Info messages are always shown in the Messages overview (unless a filter is applied).* The Messages overview displays all types of info messages (related to Switch Server and to Switch Designer).
Warning	A warning message that informs the user of a recoverable problem or non-fatal error. *Warnings are always shown (in orange) in the Messages overview (unless a filter is applied).*
Error	An error message that informs the user of a fatal error. *Errors are always shown (in red) in the Messages overview (unless a filter is applied).*
Debug	An informational message solely intended for debugging purposes (often generated by apps). *Debug messages are not shown by default. If the* ***Log debug messages*** *preference is enabled*, you can display them using the Debug message type filter. Refer to Switch Preferences: Logging.

Type	Description
Assert	A message solely intended for debugging purposes that is issued only when a coding error is discovered. *Assert messages are not shown by default. If the **Log debug messages** preference is enabled*, you can display them using the Debug message type filter. Refer to Refer to Switch Preferences: Logging.

Note: Scripters have access to all messages, to be able to debug their scripts.

5.4.5.2. Filtering log messages

By default, all info, warning, and error messages issued on the current date are shown in the Messages overview. You can however change this and only display the messages you're interested in.

To filter the log messages

1. Pick the **date(s)** of which you want to see the messages.

   By default, today's messages are shown.

To ...	Do the following ...
Show messages of the previous day	Click ←
Show messages of the next day	Click →
Show messages of a particular date or date range	Click ⌄
Show messages of a particular date or date range	Click ⌄ and select the appropriate option from the menu: • Today • Yesterday • Choose date(s): Opens a calendar. Click the date you want to select. In case of a date range, click the first and the last date. • Full history: Displays all messages since the last messages cleanup (as defined in the Switch preferences (Application data category)).

2. Pick the appropriate **time frame**:
   - To indicate the start time, click the blue indicator to the left of the slider and drag it to the time of your choice.
   - To indicate the end time, click the blue indicator at the right of the slider and drag it to the time of your choice.

By default, the messages of the current date are shown. The blue part indicates the currently shown time. The red vertical lines indicate when time error messages were issued.

Note: If the end time is not the current time, the auto refresh is disabled and the auto refresh button will turn into a blue arrow. If you click this blue arrow, auto refresh is turned on again and the end time is reset to the current time.

3. Pick the **type of messages** you want to see in the overview:
   - Click the name of the message type to show or hide it in the overview. If the name is shown in a colored background, the messages are shown in the same background color, if the name is shown in white, the messages are hidden. Note that info messages are shown in a white and gray background.
   - Click the small arrow next to the message type to open a menu with two options:
     - Hide messages of this type
     - Only show messages of this type

   By default, all types except for debug messages are shown.

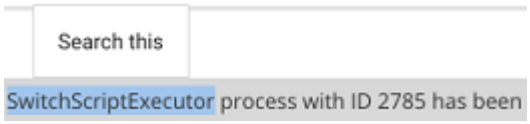
4. Set a **filter** as required:
   a. Select the column in which you want to search for a particular string. If the column doesn't matter, choose **Any**.
   b. In the search field, enter one or more strings to only view the messages that contain those strings. The case of the entered strings is not taken into account.
   c. Press enter or click the ⊕ button.

      The filter is applied immediately. The messages that match the filter are shown, and the filter definition is displayed just above the filter field.

   Remarks:

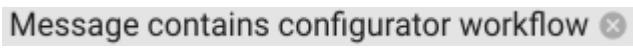
   - Alternatively, you can select a string somewhere in the overview and click **Search this** (which appears automatically). The filter is configured and applied automatically.

     Example:

     Resulting filter:

   - To view messages that contain several strings in one entry (e.g. configurator AND workflow), type those strings in one filter field.

- To view messages that contain either string x or string y (e.g. configurator OR workflow), type those strings in two different filter fields (see screenshot).

5. To clear a filter, click the cross button in the filter label.

   Alternatively, to clear all filters at once, click the Messages ⋮ button and choose **Reset current filter**.

   The label is removed and the messages overview is updated immediately.

6. To **save your filter**, so you can reuse it later on, proceed as follows:

   Note: This is not possible when you open the Messages overview in Designer (this is a beta feature in the *User interface category of the Switch preferences* (last setting))

   a. Click the ⋮ button.
   b. Click **Save current filter**.
   c. In the dialog that pops up, enter a meaningful name for the filter.
   d. Click **Save**.
      The new filter is added to the sidebar under "Messages". Note that you can delete it anytime (via the button ⋮ next to the name of the selected filter).

5.4.5.3. Exporting log messages

Log messages can be exported to a CSV file for processing by third-party tools. If you have set filters, these filters are taken into account; only the messages that are shown will be exported to a file.

To export log messages

1. Open the Log messages overview.
2. Click the icon ⚙ below the search field.
3. Click **Export**.
   A log.csv file is created.

5.4.5.4. Clearing log messages

Log messages are stored in a database on disk and thus remain available after quitting and restarting Switch. The application data preferences determine for how long messages are retained.

To permanently clear all log messages

1. Open the Log messages overview.
2. Click the icon ⚙ below the search field.
3. Click **Clear all**.

A confirmation dialog appears. If you click **Clear**, all messages will be removed from the log database. **Note that there is no undo for this action!**

5.4.6. Finding Switch jobs through the Switch Web Portal

5.4.6.1. About job boards

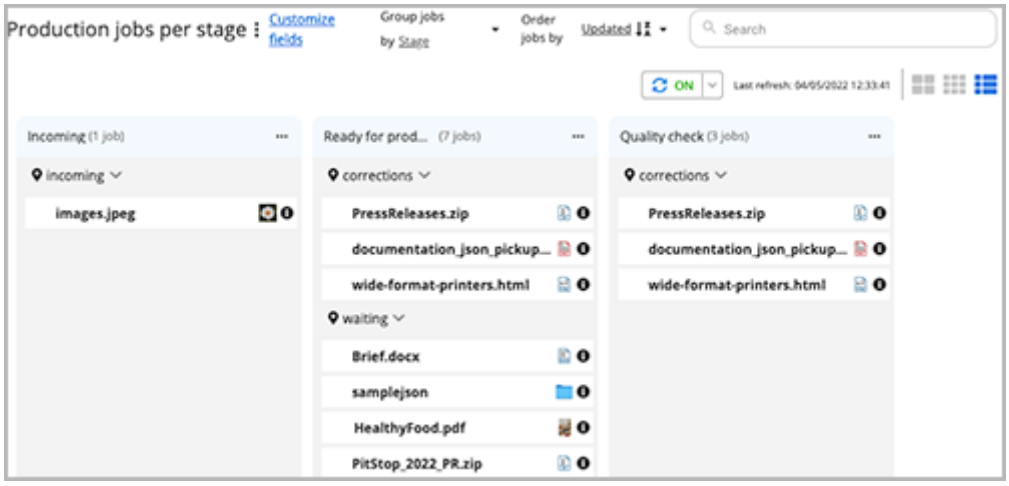
Job boards are handy to follow up on the status of your jobs. No need to use a (Remote) Designer to watch how your jobs move through the flows; instead you can open a browser on any computer, log into the Switch Web Portal and create your own job board(s) with only those flows and jobs that are of interest to you.

Job boards based on flows and stages

The *basic* job board is a job board that shows you, for certain flows, which jobs are in which stage.

Below is an example of such a board. The jobs can also be grouped by flow or state, using the *Group jobs by* field.

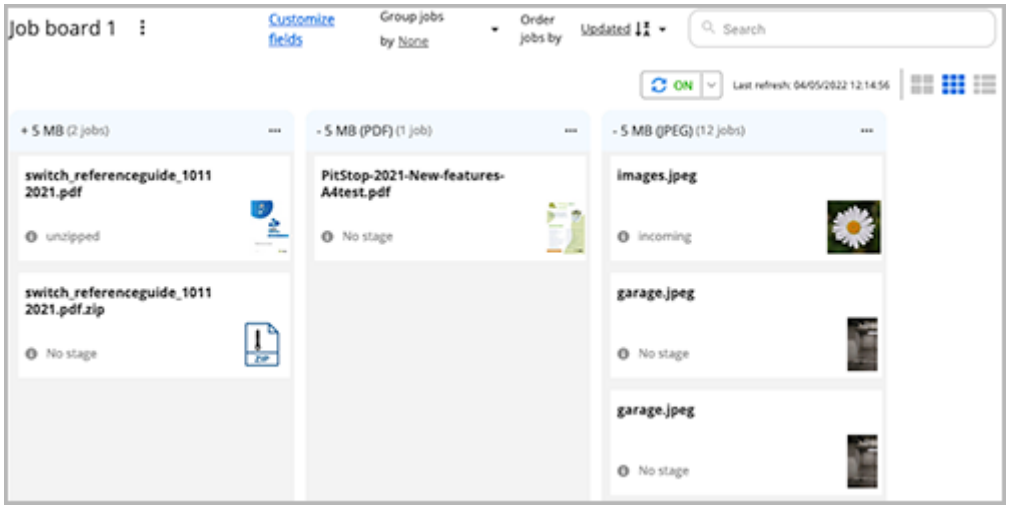
In this example, the thumbnails are very small.



Job boards based on advanced column filters

The *advanced* job board is a job board that allows you to display jobs based on custom filters. These filters can be configured using any job info field available in Switch.

Below is an example of such a job board. The jobs on this board are grouped by file size (bigger or smaller than 5MB); small files are further split up by file type. The thumbnails are medium-sized.



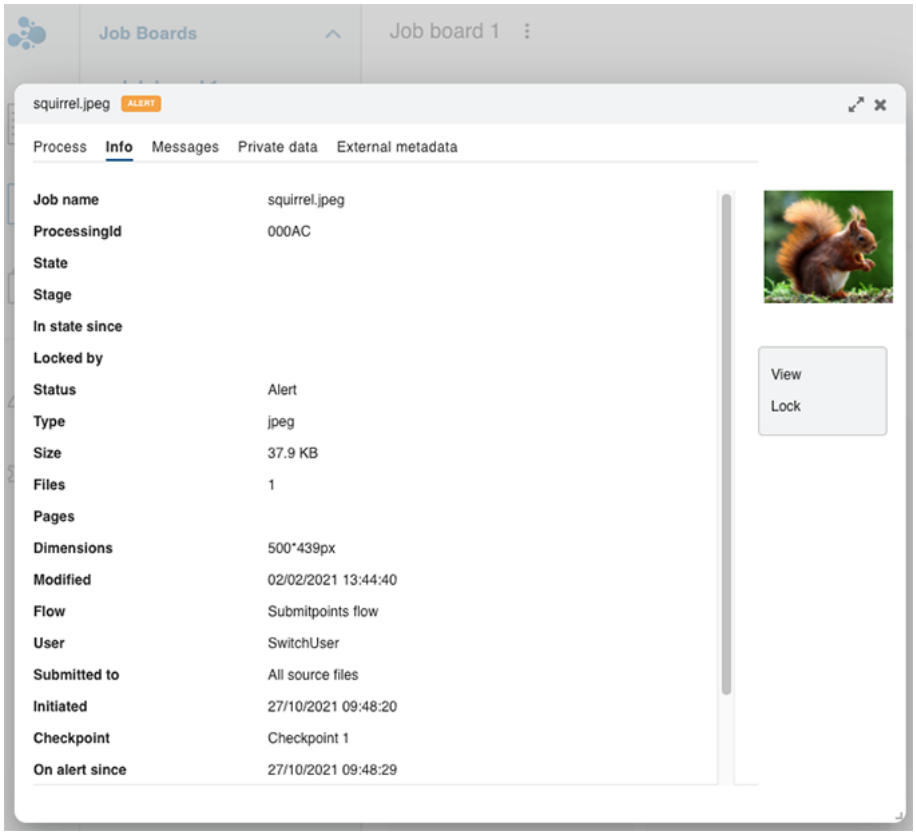
Note that there is **an extra filter** (available via the menu of the auto refresh option), 'Include jobs finished in the last x* hours', which allows you to determine how long finished jobs should remain on the job board.

Note: Access to job boards and dashboards is configured through the Users pane in Switch, hence it's possible that you don't have access to this functionality or that you can only view shared boards but not create new ones yourself.

* *Remark for Switch administrators:* Note that this value cannot be higher than the value of Keep internal job tickets for (hours) in the *Switch Application data preferences*; if the internal job ticket is removed, the job does not exist anymore in Switch, hence it cannot be shown anymore on a job board.

The job info dialog

To get more detailed info about a job on a job board, you just have to click it. This will open a new dialog with multiple tabs, depending on your user permissions. For example, users that have no access to messages won't have a Messages tab.



Note:

- SwitchClient users can process alerts jobs from within the job info dialog. For more information about the options, refer to *Processing one job at a time* on page 327 (step 5 - 7).
- Remember that job details and thumbnails are not updated automatically. If you want that, you need to insert a *Refresh job info element*.

5.4.6.2. Creating a job board based on flows and stages

A job board on the Switch Web Portal can display the jobs of your choice. On a basic job board, you can select the flows for which you want to display jobs and - if you want to - only show those jobs that have a certain job status or that are in a certain job stage.

Note: Job boards are linked to your user account. Other users can't see them, unless you share them.

To create a job board (basic mode)

1. In the sidebar on the left, click (Boards).
2. Do one of the following:
   - If it's your first board:

1. Click the plus button (next to *Boards* in the top left corner of the screen)
2. Select **Create Job Board**.

- If you already have one or more boards:
  1. Click **Job Boards** or **Dashboards** (if not yet expanded).
  2. Click one of the boards that are listed.
  3. Click the button beside the name of the selected board.
  4. Click **Manage Boards**.
  5. In the bottom right corner of the dialog that appears, click **New job board**.

3. Configure your board:
   a. Enter a name for your board.

      Next to the name, you can see the mode. By default, the Basic mode is selected. This mode is meant for job boards based on flows and stages.
   b. Click the blue **Customize fields** link and select or clear the checkboxes of the items that you want to display or hide on the job cards. Note that you can change the order of the selected items in the column on the right ("Selected"), by clicking the icon to the right of the item you want to move and by dragging it to its new place. To close the dialog, click **Done**.

      For more information, refer to *Job fields* on page 322.
   c. Click **Manage Flows on Board**.
   d. In the dialog that appears, select the flows you want to see on your job board. To do so, click **Select all** (if applicable) or click the flow name of the flows you want to select. Note that you can also search for flows (click the magnifying glass to trigger the search field).

      Flow groups are shown in blue, flow names in gray. You can select all flows in a group by clicking the group name.

      Note: Make sure to select all flows you want to see on your job board; in the next step you can divide these flows over different columns.
   e. Click **Done**.

4. Configure the first column of your job board:
   a. Enter a column name.
   b. Select at least one flow.
   c. Select the flow stages if applicable.

      Problem jobs and **No stage** are by default available. If stages have been defined in the selected flows, they will be added and can be shown as well.

      If nothing is selected, all jobs are shown, regardless of their job stage.

5. To add another column, click + add column and proceed in the same way. You can add as many columns as you need.

6. Click **Save**.
   The jobs that match the set criteria are shown on the board you just created. Note that you can display the jobs in large, medium or small card view via the buttons on the right, or if you want it for each column differently, by clicking the three dots in the column header. You can also further group them (by Flow, stage or state) and disable the auto refresh option as

required. You can order the jobs by different criteria. If you need more info about a job, you can simply click it, to get a job info dialog with all possible info.

5.4.6.3. Creating a job board based on job filters

A job board on the Switch Web Portal can display the jobs of your choice. You can configure your own advanced job filters, based on any info fields in Switch, to determine which jobs are displayed.

Note: Job boards are linked to your user account. Other users can't see them, unless you share them.

To create a job board based on job filters

1. In the sidebar on the left, click (Boards).
2. Do one of the following:
   - If it's your first board:
     1. Click the plus button (next to *Boards* in the top left corner of the screen)
     2. Select **Create Job Board**.
   - If you already have one or more boards:
     1. Click **Job Boards** or **Dashboards** (if not yet expanded).
     2. Click one of the boards that are listed.
     3. Click the button beside the name of the selected board.
     4. Click **Manage Boards**.
     5. In the bottom right corner of the dialog that appears, click **New job board**.
3. Configure your board:
   a. Enter a name for your board.
   b. Click the blue **Customize fields** link and select or clear the checkboxes of the items that you want to display or hide on the job cards. Note that you can change the order of the selected items in the column on the right ("Selected"), by clicking the icon to the right of the item you want to move and by dragging it to its new place. To close the dialog, click **Done**. For more information, refer to *Job fields* on page 322.
   c. Click **Advanced mode**.

      You'll get a warning that it's not possible to switch back from Advanced to Basic mode again.
   d. Click **Proceed**.
4. Configure the first column of your job board:
   a. Click + add column
   b. Enter a column name.

      Below the name of the column, all filters that are available are displayed.
   c. Do one of the following as required:
      - To check the configuration of the available filters, click the name of the filter. You can make changes if needed. Note that these changes may also affect other job boards

where the filter is used. For more info about the syntax, refer to *Creating a custom job filter* on page 324.

- To create a new filter, click **Create**. For more info about the syntax, refer to *Creating a custom job filter* on page 324.
- To remove, export, import or share filters, click **Manage**. For mor info, refer to *Managing custom job filters* on page 325.

d. Select the filter that you want to use in this column.

5. To add another column, click + add column and proceed in the same way. You can add as many columns as you need.

6. Click **Save**.
The jobs that match the filters are shown on the board you just created. Note that you can display the jobs in large, medium or small card view via the buttons on the right, or if you want it for each column differently, by clicking the three dots in the column header. You can also further group them (by Flow, stage or state) and disable the auto refresh option as required. You can order the jobs by different criteria. If you need more info about a job, you can simply click it, to get a job info dialog with all possible info.

5.4.6.4. Managing a job board

This topic explains how to handle the custom job boards on the Switch Web Portal.

Proceed as follows:

1. In the sidebar on the left, click (Boards).

2. Open the Manage boards dialog as follows:

a. Click **Job Boards** (if not yet expanded).

b. Click one of the job boards that are listed below Job Boards.

c. Click the button beside the name of the selected job board.

d. Click **Manage Boards**.

The **Manage boards** dialog appears. This dialog gives an overview of the boards you have access to. The boards without a value in the Sharing column are shared by other users; you can view them, but you cannot make any changes. The other boards are your own boards and are fully controlled by you.

3. Do one of the following as required:

To...	Do the following:
To create a new job board	Click **New job board** (blue button in the bottom right corner). See also *Creating a job board based on flows and stages* on page 274 and *Creating a job board based on job filters* on page 276
To show or hide a job board in the sidebar menu below 'Job boards'	Click the slider in front of the job board you want to show or hide. If the slider is blue, the job board is visible in the sidebar.

To...	Do the following:
	Note: This functionality is useful for job boards you want to keep for later use or for job boards that you want to use as dataset for a dashboard (for users of the Reporting module).
To edit a job board	Click the edit button (which becomes visible when you hover over the job board concerned). **Note:** Alternatively, you can click the button ⋮ beside the job board name. The menu that pops up also has an Edit option. You can now edit the board name and the columns: • To show other items on the job cards or behind the info icon, click the blue **Customize fields** link and select or clear the fields of your choice. **Note:** • Custom fields are fields are configured in *Refresh job info*. You can also show them on your job board. • To change the number of flows on board level (basic mode), click the **Manage flows on Board** button and select or clear the flows of your choice. • To add a new column, click + add column. • To move the columns to another position, click the icon and drag the columns you want to move sideways. • To update a filter (advanced mode), click the filter name and make the required changes. **Note:** Instead of dragging the sliders to make a selection, you can just click the group, flow or stage name to make a selection or to undo a selection. To return to view mode, click the **Save** button (in the top left corner, next to the name of the board).
To share a job board or to stop sharing it	Job boards can be shared with other members of the same user group (as configured in Switch). To share or stop sharing, in the Sharing column of the board concerned: **1.** Click **Private/Shared**.

To...	Do the following:
	2. In the dialog that pops up, select or clear the checkbox of the group(s) with whom you want to share your board. If no dialog pops up, you cannot share the board (for example because you're not configured as member of a group). **Note:** Shared boards can only be viewed (not edited!) by other users.
To import or export a job board	Boards can be exported (and kept as a backup) and imported again if needed. To export a board, click the export button next to the board you want to export. A Switch board is saved with extension .sboard. Note that the export button becomes visible when you hover over the board concerned. To import a board, click the **Import** button at the bottom of the dialog and select the board (*.sboard) of your choice.
To permanently remove a job board	Click the remove button.

4. To save the changes made in the Manage jobs dialog, click **Apply**.

5.4.6.5. Viewing and finding jobs on a job board

If you have the right permissions, you can view Switch jobs through the Switch Web Portal. The permissions are set by the Switch administrator through the Users pane.

To find jobs on a job board

1. In the sidebar on the left, click (Boards).

2. To display the available job boards (as required), click **Job Boards** .

3. Select the job board you want to see.

Boards displayed in dark gray are owned by you, boards displayed in light gray are shared boards (which cannot be edited by you).

The selected job board is displayed. The jobs are listed in columns. What is shown depends on the configuration of the board.

4. To see other fields displayed on the job cards, click **Customize fields** and select or clear the checkboxes of the fields that you want to show or hide. You can change the order of the fields by dragging the icons in the column on the right to the preferred position. Click **Done** to confirm.

Note: If you're not the owner of the job board, the selection is only applied to your web session and stored in the cache of your web browser.

5. To reorganize the overview, click the **Group jobs by** list field in the top right corner of the screen, and select the option of your choice (**Flow**, **Stage**, **State** or **None** (which removes any previous grouping)).

   A group adds an extra level to a column.

   For example, suppose one of the columns of your board lists all problem jobs of all flows. With *'Group jobs by' set to 'None'*, the jobs are put arbitrary one after the other. With *'Group jobs by' set to 'Flow'*, the Problem jobs column is divided into different sections per flow, so you can easily see which problem job belongs to which flow.

6. To change the order of the displayed jobs, click **Order job by** and select the icon (ascending or descending order) next to the field by which you want to order the jobs.

7. To switch to smaller or larger job cards, click the appropriate button.

   From left to right: large, medium (=default) and small job cards. The currently selected view is displayed in blue.

   Tip: In small job card view, move your pointer over the info icon for extra information. What is shown, depends on the configuration of the board. In small and medium view, this field is shown by default.

   Note: It's also possible to have different job card sizes per column. To change the size of the job cards in a certain column, click the three dots in the column header and select the size of your choice.

   If the board has only one column, you can also switch between table and grid view.

   From left to right: table, grid view. The currently selected view is displayed in blue.

8. To search for a particular job for example to see if it reached a particular flow stage, enter (part of) the job name in the search field in the top right corner of the screen.

   The search is limited to the file name (name and extension).

9. To display recently finished jobs (by default, they are not shown),

   a. Make sure auto refresh is turned on.

   b. Click the arrow beside the auto refresh button.

   c. Enter a value in the **Include jobs finished in the last ... hours** field.

10. To see the log messages, metadata or private data of a particular job on the board, simply click the job concerned.

    Note that this feature is only available if you have turned off the auto refresh option.

11. To get detailed job information, click the job to get a job info dialog with all possible info.

Note:

- Problem jobs can easily be detected because the info icons and the stage name ("Problem jobs") are displayed in red. For Alert jobs the stage name is shown is orange.
- Some jobs may have a label with the text 'Rush' on it. This label refers to jobs that will be processed first. See also *Rushing jobs* on page 281.

5.4.6.6. Rushing jobs

If you want a certain job to be processed before all other jobs, you can 'rush' that job via a job board. This can be handy in case of urgent jobs, or if you want to retry a problem job without having to wait until other (already scheduled) jobs are processed.

Note:

- The rush job will take the next available slot, so it won't stop jobs that are being processed. If there is no free slot, for example because the maximum number of slots for concurrent elements has been reached, the rush job will have to wait until a slot becomes available. If there are free slots but the rush job is still busy, other jobs will be processed in the meantime.
- If you're rushing multiple jobs, they will be processed in the order in which they were set to rush.
- Child jobs have the same rush job rank as parent jobs.
- "Rush job" is a property of a job and is stored as such in the job ticket of the job.
- Note that your rush job(s) may delay processing of jobs of other users and other flows in Switch.

To rush a job, proceed as follows:

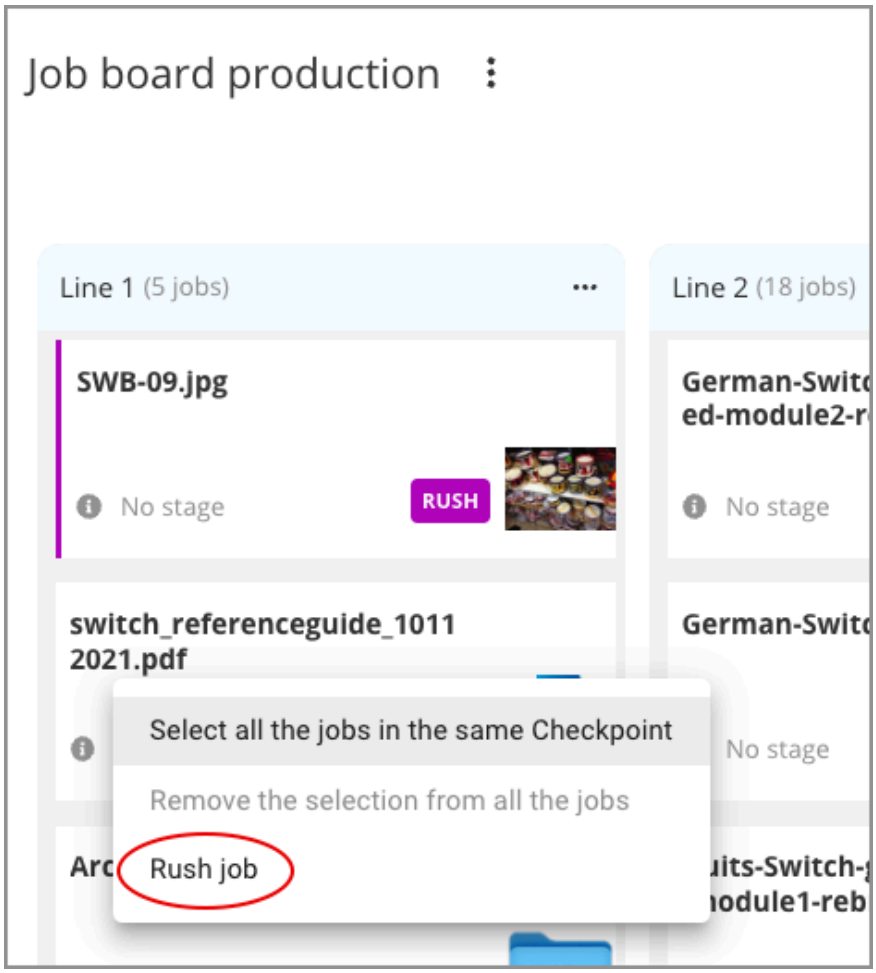
1. Find the job concerned on a job board.

See *Viewing and finding jobs on a job board* on page 279.

2. Do one of the following:

- Right-click the job on the job board, and on the context menu, click **Rush job**.
- Double-click the job, and on the opened job card, on the right, click **Rush**.

Note: If you do not have the Rush or Rush job option, you may not have the right permissions. For more information, contact your Switch administrator.



A label on the job card indicates that the job is rushed. Note that the color of the label can be customized through the Admin section of the Portal. See *Admin view: Customization* on page 338.

3. If you change your mind, you can undo this in a similar way:
   - Right-click the job on the job board, and on the context menu, click **Unrush job**.
   - Double-click the job, and on the opened job card, on the right, click **Unrush**.

Note that you can see the order in which rush jobs will be processed, by ordering the jobs on your job board by **Rush job rank**, in ascending (A-Z) or descending (Z-A) order.

5.4.7. Managing dashboards on the Switch Web Portal

5.4.7.1. About dashboards and widgets

As of Switch 2018 update 1, it is possible to create your own dashboards on the Switch Portal. This requires a license for the Reporting Module.

Dashboards on the Switch Web Portal can give you a quick overview of the *number of jobs* that are being processed by the Switch Server. You can for example display a counter (how many jobs failed, how many jobs are in a particular stage,...) or a graph with numbers per file type, flow,... It's also possible to visualize historical job data (e.g. number of problem jobs per week over the past 3 months).

The graphs and counters are actually **widgets** that can be configured at wish. The input for these widgets (i.e. the data that is visualized) comes from a job board. The widgets can be customized to a certain level: you can for example add a frame around a widget in the color of your choice, you can add a title, in case of a graph you have the choice between a bar, a donut or a pie chart,...

Currently, six different widgets are available for use on the Switch Web Portal. They are listed below. You can put the widgets in two different **layouts**: a Column layout (to put the widgets next to each other) or a List layout (to put them under each other, in a vertical arrangement). Note they can also be combined, you could for example have a column layout at the top and a list layout at the bottom.

Note: Access to job boards and dashboards is configured through the Users pane in Switch, hence it's possible that you don't have access to this functionality or that you can only view shared boards but not create new ones yourself.

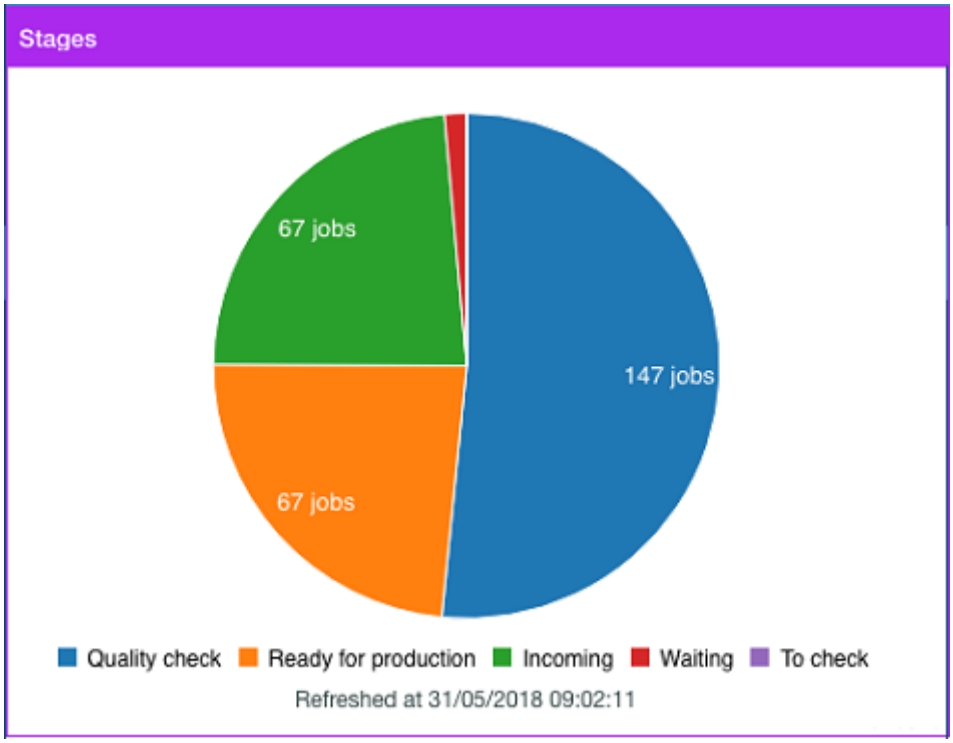
Live counter

This widget displays a number, representing the amount of jobs currently present on the selected job board.

See also: *Dashboard widgets - Live counter* on page 291

Live graph

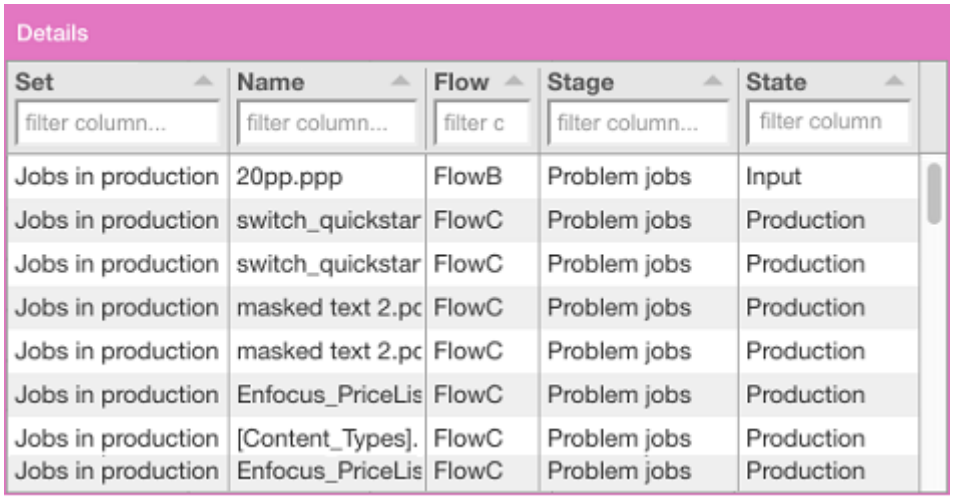
This widget counts both the total number of the jobs on the selected job board and the number of jobs per column, and presents this data as a graph.



See also: *Dashboard widgets - Live graph* on page 292

Live table

This widget displays **information about the jobs** counted in a live graph on the same dashboard. For example, if your graph gives an overview of the number of jobs per flow, the live table displays detailed information about these jobs (job name, flow name, stage and state of the job).



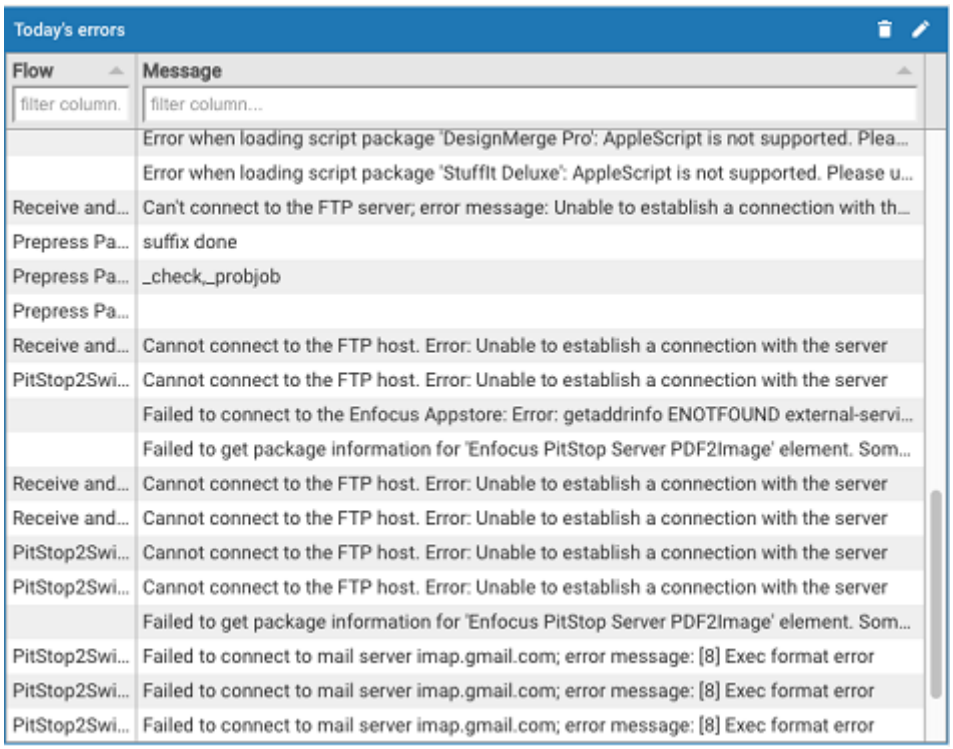
Details

Set	Name	Flow	Stage	State
filter column...	filter column...	filter c	filter column...	filter column
Jobs in production	20pp.ppp	FlowB	Problem jobs	Input
Jobs in production	switch_quickstar	FlowC	Problem jobs	Production
Jobs in production	switch_quickstar	FlowC	Problem jobs	Production
Jobs in production	masked text 2.pc	FlowC	Problem jobs	Production
Jobs in production	masked text 2.pc	FlowC	Problem jobs	Production
Jobs in production	Enfocus_PriceLis	FlowC	Problem jobs	Production
Jobs in production	[Content_Types].	FlowC	Problem jobs	Production
Jobs in production	Enfocus_PriceLis	FlowC	Problem jobs	Production

See also: *Dashboard widgets - Live table* on page 294

Messages

This widget gives a real-time overview of messages based on a messages filter (that you have configured yourself). You can choose the columns you want to display and the maximum number of messages.



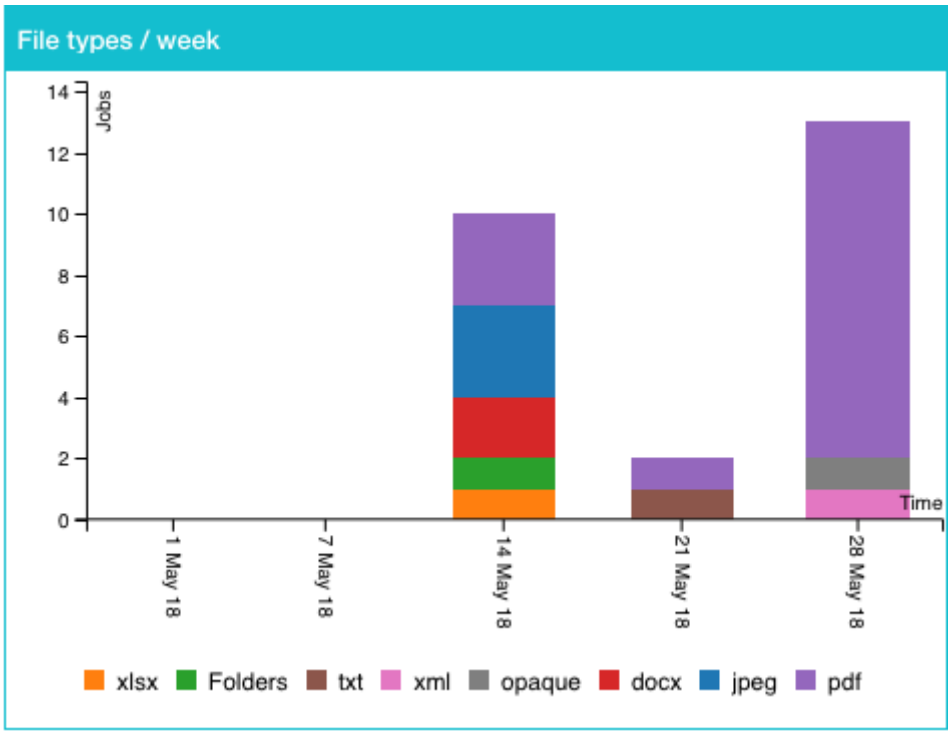
Today's errors

Flow	Message
filter column...	filter column...
	Error when loading script package 'DesignMerge Pro': AppleScript is not supported. Plea...
	Error when loading script package 'StuffIt Deluxe': AppleScript is not supported. Please u...
Receive and...	Can't connect to the FTP server; error message: Unable to establish a connection with th...
Prepress Pa...	suffix done
Prepress Pa...	_check,_probjob
Prepress Pa...	
Receive and...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
PitStop2Swi...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
	Failed to connect to the Enfocus Appstore: Error: getaddrinfo ENOTFOUND external-servi...
	Failed to get package information for 'Enfocus PitStop Server PDF2Image' element. Som...
Receive and...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
Receive and...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
PitStop2Swi...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
PitStop2Swi...	Cannot connect to the FTP host. Error: Unable to establish a connection with the server
	Failed to get package information for 'Enfocus PitStop Server PDF2Image' element. Som...
PitStop2Swi...	Failed to connect to mail server imap.gmail.com; error message: [8] Exec format error
PitStop2Swi...	Failed to connect to mail server imap.gmail.com; error message: [8] Exec format error
PitStop2Swi...	Failed to connect to mail server imap.gmail.com; error message: [8] Exec format error

See also: *Dashboard widgets - Messages* on page 295

History graph

This widget visualizes the evolution of the number of jobs or the job size over a particular period of time, for example the total number of problem jobs of the last month, grouped by week.



See also: *Dashboard widgets - History graph* on page 296

Custom HTML

This widget allows you to add a title, a logo, text and even a movie to your dashboard.

See also: *Dashboard widgets - Custom HTML* on page 299

5.4.7.2. Creating a dashboard

A dashboard is an overview screen with one or more widgets that visualize job data.

Before you start, make sure to *create a job board* with the data you want to display on the dashboard. Alternatively, you may use a shared job board. A job board to start from is necessary for all widgets, except for the history graphs and custom HTML. For example, if you want your dashboard to display the total number of problem jobs on the server, you need a job board that collects all problem jobs.

Note: Job boards and dashboards are linked to your user account. Other users can't see them, unless you share them.

To create a dashboard

1. In the sidebar on the left, click (Boards).
2. Do one of the following:
   - If it's your first board:
     1. Click the plus button (next to *Boards* in the top left corner of the screen)
     2. Select **Create Dashboard**.
   - If you already have one or more boards:
     1. Click **Job Boards** or **Dashboards** (if not yet expanded).
     2. Click one of the boards that are listed.
     3. Click the button beside the name of the selected board.
     4. Click **Manage Boards**.
     5. In the bottom right corner of the dialog that appears, click **New dashboard**.

If you don't see the New dashboard button, you may not have the permission to create boards.

3. Configure your board:
   a. Enter a name for your board.
   b. Configure the dashboard settings (in the right part of the screen):

      Note: If the dashboard setttings are not shown, you can make them visible by clicking the gear wheel button .

   c. Click the plus button and drag and drop one or more widgets onto the column of your choice (in case of a Column layout) or directly onto the dashboard and configure them as required:

      - *Dashboard widgets - Live counter* on page 291
      - *Dashboard widgets - Live graph* on page 292
      - *Dashboard widgets - Live table* on page 294
      - *Dashboard widgets - History graph* on page 296
      - *Dashboard widgets - Custom HTML* on page 299

      You can also drag "layouts" onto the global layout of your dashboard, for example to create a board with two columns (global Column layout) of which the first column is further divided into 2 sub-columns (drag a Column layout on the first column), and the second column has a list layout (drag a List layout on the second column). Available layouts:

      - *Dashboard layouts - Column layout* on page 300
      - *Dashboard layouts - List layout* on page 304

      Note that you can use the buttons in the top right corner of each widget and each layout to duplicate, select or remove a widget. The widget you want to configure must be selected in order to view or change its properties.

4. Click **Save**.
   The dashboard is added to the sidebar menu.

Note that you can still make changes by clicking the button beside the name of the dashboard. The dialog that opens has an Edit button.

5.4.7.3. Managing a dashboard

This topic explains how to handle the custom dashboards on the Switch Web Portal.

Remember that dashboards are only available if the Reporting Module is licensed.

Proceed as follows:

1. In the sidebar on the left, click (Boards).

2. Open the Manage boards dialog as follows:
   a. Click **Dashboards** (if not yet expanded).
   b. Click one of the dashboards that are listed below Dashboards.
   c. Click the button beside the name of the selected dashboard.
   d. Click **Manage Boards**.

   The **Manage boards** dialog appears. This dialog gives an overview of the boards you have access to. The boards without a value in the Sharing column are shared by other users; you can view them, but you cannot make any changes. The other boards are your own boards and are fully controlled by you.

3. Do one of the following as required:

To...	Do the following:
To create a new dashboard	Click **New dashboard** (blue button in the bottom right corner). See also *Creating a dashboard* on page 286.
To show or hide a dashboard in the navigation area	Click the slider in front of the dashboard you want to show or hide. If the slider is blue, the dashboard is visible in the sidebar. **Note:** This functionality is useful for dashboards you want to keep for later use.
To edit a dashboard	Click the edit button (which becomes visible when you hover over the dashboard concerned). **Note:** Alternatively, you can click the button beside the job board name. The menu that pops up also has an Edit menu option. You can now add or remove widgets and make changes to the widgets as required: • To add a widget, click the button, select a widget, and drag it onto the dashboard. • To remove a widget, click the remove button in the header of the widget. • To duplicate a widget, click the duplicate button in the header of the widget. • To make changes to a widget, click the widget. This places a check mark in the checkbox in the top right corner of the widget and displays the properties on the right side of the screen. You can now make the required changes. **Note:** It's also possible to edit multiple widgets at the same time. To do so, select the checkboxes of all widgets you want to edit. In the pane on the

To...	Do the following:
	right, you'll see 'Multiple blocks', the number of widgets that are selected, and the properties that can be edited. Do not forget to save your changes, by clicking the **Save** button (in the top left corner, next to the name of the dashboard).
To share a dashboard or to stop sharing it	Dashboards can be shared with other members of the same user group (as configured in Switch). To share or stop sharing, in the Sharing column of the board concerned: **1.** Click **Private/Shared**. **2.** In the dialog that pops up, select or clear the checkbox of the group(s) with whom you want to share your board. If no dialog pops up, you cannot share the board (for example because you're not configured as member of a group). **Note:** Shared boards can only be viewed (not edited!) by other users.
To import or export a dashboard	Boards can be exported (and kept as a backup) and imported again if needed. To export a board, click the export button next to the board you want to export. A Switch board is saved with extension .sboard. Note that the export button becomes visible when you hover over the board concerned. To import a board, click the **Import** button at the bottom of the dialog and select the board (*.sboard) of your choice.
To permanently remove a dashboard	Click the remove button.

4. To save the changes made in the Manage jobs dialog, click **Apply**.

5.4.7.4. Viewing a dashboard

If you have the right permissions, you can create and view dashboards through the Switch Web Portal. The permissions are set by the Switch administrator through the Users pane.

To view your (earlier created or shared) dashboards on the Switch Web Portal

1. In the sidebar on the left, click (Boards).

2. To display the available dashboards (as required), click **Dashboards** .

3. Click the dashboard you want to see.

Boards displayed in dark gray are owned by you, boards displayed in light gray are shared boards (which cannot be edited by you).

The selected dashboard is displayed. There may be several widgets present on the dashboard. Some of the widgets show extra information when hovering or clicking the legend. For more information, refer to the description of the widgets (*Dashboard widgets overview* on page 291).

5.4.7.5. Dashboard settings

The dashboard settings determine the general layout of the dasboard. You can open the dashboard settings by clicking the gear wheel button in the blue border of the dashboard.

Setting	Description
Dashboard Layout	Options are: • **Default layout**: The different widgets are placed one below the other (**vertical arrangement**). • **Column layout**: The widgets are placed next to each other (**horizontal arrangement with two or more columns**). **Note:** This setting is about the global layout of the dashboard. You can drag another layout onto the global layout, to further split up the screen parts. See *Dashboard layouts - Column layout* on page 300 and *Dashboard layouts - List layout* on page 304
Spacing	Space between two columns (Column layout) or two rows (default layout). Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px). **Note:** To see the effect of this setting, drag a couple of widgets onto the dashboard and change the values.
Padding (only for the default layout)	Space between the widgets and the border of the dashboard. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px).

Setting	Description
	Note: To see effect of this setting, drag a couple of widgets onto the dashboard and change the values.
Background Color	Click the color patch to pick the color of your choice. Once selected, the color patch gets the new color and the color code is displayed as well.

5.4.7.6. Dashboard widgets overview

This is an overview of the widgets available for use on a Dashboard on the Switch Web Portal.

Dashboard widgets - Live counter

About the Live counter widget

This widget displays a number, representing the amount of jobs currently present on the selected job board. Note that all jobs in all columns are taken together, resulting in one number, for example the number of problem jobs.

This number can be linked with a color, for example, if the number of jobs remains below a certain threshold, the background of the widget turns green; otherwise it turns orange or red.

The counter is updated at regular intervals (see properties), giving a live view on the Switch server. If the value goes up, an upwards arrow is displayed next to the counter; if the value goes down, a downwards arrow is displayed.

How to configure the Live counter widget

You can configure the properties listed in the table below.

Properties

Property	Description
Configuration	
Job board	Job board data that will be used for the dashboard. 'None' is not a valid option.
Set	By default, the data in all columns of the selected job board will be used ("All"), unless you select one particular column.
Color and limits	Background color of the widget based on the value of the counter. To change a value, click it and increase or decrease the value using the small arrow buttons. To change a color, click it to open the color picker and select the color of your choice. Note that there's also a small text field below the color patches. You can click it and type the text of your choice. This text will be displayed below the counter.

Property	Description
Include jobs finished in the last (hours)	The value chosen here determines how long after finishing the jobs will be included in the live counter. If you enter '0', only jobs that are still moving through the flow and haven't reached an output folder will be included. If the widget doesn't behave as expected, contact your Switch administrator. There may be a conflict with the Keep internal job tickets for (hours) in the *Switch Application data preferences*.
Refresh interval (in seconds)	This value indicates how often the number of jobs is recalculated.
Styling	
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Height	Height of the widget. Options are: • Small • Medium • Large
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

Dashboard widgets - Live graph

About the Live graph widget

This widget counts both the total number of the jobs on the selected job board and the number of jobs per column, and presents this info in a graph.

Note that this requires a job board with more than one column; each column is represented as a separate section in the graph. You can choose between a pie, a bar and a donut chart.

How to configure the Live graph widget

You can configure the properties listed in the table below.

Properties

Property	Description
Configuration	
Chart	Type of chart to be used. Options are: • Pie • Donut • Bar

Property	Description
	Tip: Use "Pie" and "Donut" to show how the parts (i.e. values per column) compare to the whole (total number of jobs); use "Bar" to show how the parts compare to each other or to show trends.
Job board	Data that will be used for the dashboard. For this type of charts, you should have a board with more than one column. 'None' is not a valid option.
Show grid lines *("Bar" only)*	If selected, grid lines are shown to make it easier to read the values. **Note:** This option is not relevant (hence not available) for pie and donut charts.
Include jobs finished in the last (hours)	The value chosen here determines how long after finishing the jobs will be included in the live graph. If you enter '0', only jobs that are still moving through the flow and haven't reached an output folder will be included. If the widget doesn't behave as expected, contact your Switch administrator. There maybe a conflict with the Keep internal job tickets for (hours) in the *Switch Application data preferences*.
Refresh interval (in seconds)	This value indicates how often the values are recalculated.
Use column names as labels *("Pie" only)*	When selected the names of the columns are displayed on the graph. • Default: "<number of jobs> jobs" e.g. "15 jobs" • This option enabled: "<column name>: <number of jobs>" e.g. "column1: 15"
Pick custom colors	When selected, you can change the default colors of each column that will be used in the graph. To change a color, simply click the color page and then click the color of your choice.
Styling	
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Height	Height of the widget. Options are: • Small • Medium • Large
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

How to use Live graphs

Smaller parts are not always easy to read, so when **hovering over one particular part of the chart**, this part is highlighted and you get a small dialog with the column name and the percentage value of the highlighted part.

When **clicking an item in the legend**, the corresponding part of the chart is disabled (grayed out in the legend) and taken out of the chart. Clicking once more will bring it back.

Dashboard widgets - Live table

About the Live table widget

This widget displays **information about the jobs** counted in a live graph or a live counter on the same dashboard. For example, if your graph gives an overview of the number of jobs per flow, the live table can display detailed information about these jobs (job name, flow name, stage and state of the job).

How to configure the Live table widget

You can configure the properties listed in the table below.

Properties

Property	Description
Configuration	
Parent	Live graph or live counter that is used as dataset for the live table. 'None' is not a valid option.
Visible columns	Enable the column(s) you want to see in the live table. Options are: • Set • Name • Flow • Stage • State At least one column must be selected.
Show header	When selected, the columns in the table have a column header.
Styling	
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Height	Height of the widget. Options are: • Small • Medium • Large
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:

Property	Description
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

How to use live tables

To **see the details of a particular part/category in the chart**, e.g. one slice of the pie, just click in the chart. Only the details of the corresponding jobs will be shown in the table. Clicking once more will reset the table.

To **search for a particular job/a set of jobs**, you can filter the table by entering a key word in the filter fields below the column headers. Note that these filter fields are not case sensitive.

To **sort the list in ascending or descending order**, click the column header of the column by which you want to order it. Note that the small arrow in the column header will become a bit darker, to indicate this.

Dashboard widgets - Messages

About the Messages widget

This widget displays log messages based on a saved messages filter. Refer to *Filtering log messages* on page 237.

How to configure the Messages widget

You can configure the properties listed in the table below.

Properties

Property	Description
	Configuration
Filter	Messages filter that is used as dataset for the live table. Note that you have to create the filter and save it through the Messages view. Refer to *Filtering log messages* on page 237. 'None' is not a valid option. **Note:** If the messages filter is removed afterwards, the widget won't work anymore... you'll get a warning ("Data could not be loaded").
Visible columns	The columns of the Messages overview that will be shown in the widget. Options: • Time • Type • Flow • Job • Module • Element • Prefix • Message

Property	Description
	At least one column must be selected.
Number of messages	Maximum number of messages to be shown. Options: • 10 • 20 • 50 • 100
Refresh interval (in seconds)	Indicates how often (e.g. every 10 seconds) Switch checks for new messages.
Show header	When selected, the columns in the table have a column header.
Styling	
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Height	Size of the table. Options: • Small • Medium • Large
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

How to use the Messages widget

To **search for a particular message/a set of messages**, you can filter the table by entering a key word in the filter fields below the column headers. Note that these filter fields are not case sensitive.

To **sort the list in ascending or descending order**, click the column header of the column by which you want to order it. Note that the small arrow in the column header will become a bit darker, to indicate this.

Dashboard widgets - History graph

About the History graph widget

A history graph **visualizes the evolution of the number of jobs or the job size over a particular period of time**, for example the total number of problem jobs of the last month, grouped by week. A further subdivision is possible, you can for example further group the jobs by file type, flow, stage or state.

Note that this graph only counts jobs that are completely finished, meaning that they have left the Switch flows. The maximum period of time to go back in the past is defined by the number of days set in the *Reporting preference*, for example for 120 days.

How to configure the History graph widget

You can configure the properties listed in the table below.

Properties

Property	Description
	Configuration
Chart	Type of chart to be used. Options are: • Line • Spline (curved line) • Bar • Pie
Show grid lines	If selected, grid lines are shown to make it easier to read the values. **Note:** This option is not relevant (hence not available) for pie charts.
Job board	Job board to be used for the history graph. 'None' is a valid option for history graphs: if selected, all jobs on the Switch server are taken into account! **Note:** Currently, only basic job boards are supported, hence job boards based on filters are not shown in the list. See *About job boards* on page 272.
Set	Column to be used. If 'None' is selected as Job board, this option is not available.
Unit	Determines what is counted and displayed: • Number of jobs • Total size
Group by	Determines how the values are grouped: • **None**: no grouping; the total number of jobs or the total size is mentioned. For example, 200 jobs on day1, 190 jobs on day 2, etc. • **Type**: the total number or the total size is further divided by file type. For example, 100 PDF files and 100 text files on day1, 90 PDF files and 100 text files on day2, ... • **Stage**: the total number or the total size is further divided by flow stage. For example, 75 jobs in stage1 and 125 in stage2 on day1, 70 in stage1 and 120 in stage2 on day2, ...

Property	Description
	Note: Stages that were not selected on the job board are not shown. • **State**: the total number or the total size is further divided by job state. For example, 33 jobs in state1 and 167 in state2 on day1, 22 in state1 and 168 in state2 on day2, ... • **Flow**: the total number or the total size is further divided by flow. For example, 50 jobs in flow1, 50 in flow2 and 100 in flow3 on day1, 99 in flow, 1 in flow2 and 90 in flow3 on day2, ... **Note:** Flows that were not selected on the job board are not shown. • **Element**: the total number or the total size is further divided by flow element. For example, 2 jobs have been put in the recycle bin, 7 jobs have been processed by the Enfocus PitStop Server configurator, ... Note that all elements in all flows are taken together, regardless of the name of the instance in the flows. For example, even if the recycle bins in your flows are called 'Trash1', 'Trash2', Trash3', in the graph you'll see 1 flow element 'recycle bin' (with all jobs collected in all 3 trash folders). As for the folder element: only input folders are taken into account. Intermediate and output folders nor problem folders are represented in the graph.
Period	Determines how the data will be grouped, i.e. which data will be taken together. • Day • Week • Month For example, if grouped by week, you'll get one value for all jobs of a particular week (optionally further divided by flow, file type, etc.) **Note:** This field is not available if the 'Pie' chart is chosen.
Days previously	Refers to the time period that will be shown in the graph. For example, if set to '200', the data of the last 200 days (= today minus 200 days) will be shown. Note that the maximum number of days that is possible is determined by the Reporting preference (see higher).
Use group names as labels *("Pie" only)*	When selected, the names of the grouped items (see the *Group by* option) are displayed on the graph. • Default: "<number of jobs> jobs" e.g. "15 jobs" • This option enabled: • Group by set to *None*: "Overall: <number of jobs>" e.g. "Overall: 15"

Property	Description
	• Group by set to *<item>*: for each <item>, <name of the item>:<number of jobs> e.g. if grouped by 'Element': "Submit point: 9","Checkpoint: 6",...
Show target line *("Spline" and "Line" only)*	When selected, a line will be drawn at a given target value. This option triggers the following property:
Target value	Value that determines where the target line will be drawn on the spline or line graph.
Styling	
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Height	Size of the table. Options: • Small • Medium • Large
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

How to use history graphs

Smaller parts are not always easy to read, so when **hovering over one particular part of the chart**, this part is highlighted and you get a small dialog with more information (for example the number of jobs/the total size per group; if there is no grouping, the dialog mentions the "overall" value).

When **clicking an item in the legend**, the corresponding part of the chart is disabled (grayed out in the legend) and taken out of the chart. Clicking once more will bring it back.

Dashboard widgets - Custom HTML

About the Custom HTML widget

This widget allows you to add text, tables, pictures, movies and links to your dashboard. You can use the text color and font of your choice, insert bullets, ...

How to configure the Custom HTML widget

You can type text in the text field and modify it using the tools in the editor.

An overview of shortcuts is available behind the question mark button. ?

Properties

Property	Description
Configuration	
Entry field	Content that will be displayed on the dashboard.
Styling	
Background color	Click the color patch to pick the color of your choice. Once selected, the color patch gets the new color and the color code is displayed as well.
Add padding	Adds extra space between the entered content and the border of the widget.
Title	Title. This is by default the widget type. If **Show frame** is selected, the title will be shown in the title bar of the widget. You can leave this field empty as required.
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.

5.4.7.7. Dashboard layouts overview

Dashboard layouts - Column layout

About the Column layout

The Column layout allows you to place several widgets next to each other in columns, for a horizontal arrangement. If no Column layout is chosen, the widgets will be placed one after the other, in a vertical arrangement.

How to configure the Column layout

By default, two columns are available, but you can add more columns by clicking the duplicate button above one of the columns.

Note that we recommend first configuring the Column layout; afterwards you can drag the widgets onto the layout.

Note that we recommend first configuring the List layout; afterwards you can drag the widgets onto the layout.

Note: Make sure that the checkbox in the top right corner of the widget is selected.

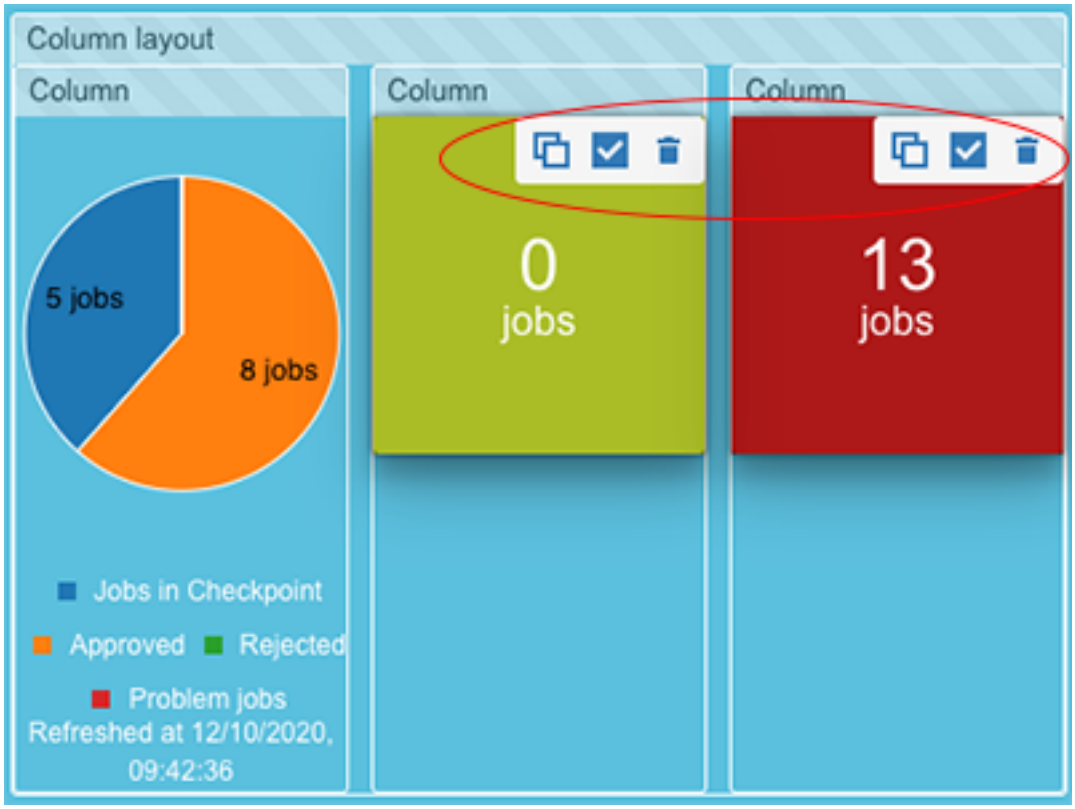
Properties

Property	Description
Configuration	
Configuration	Space between two columns. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px). **Note:** To see the effect of this setting, drag a couple of widgets onto the dashboard and change the values.
Allow wrap	If **Allow wrap** is selected, ...
Collapsible	If the Column layout is collapsible, a small arrow is displayed in the header of the widget, which can be clicked to collapse the whole block. **Note:** If you want to make it possible to collapse all columns separately, you must enable this option on column level (see Column properties below).
Styling	
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Title	Text that will be shown in the title bar of the widget. You can leave it empty as required.
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.
Background color	Click the color patch to pick the color of your choice. Once selected, the color patch gets the new color and the color code is displayed as well.

Column properties

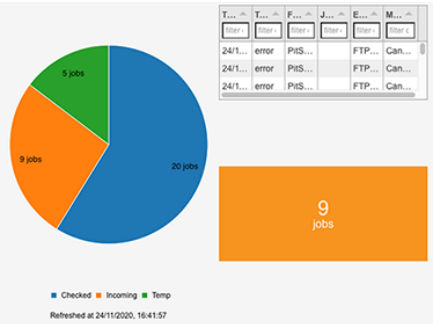
Each of the columns in a Column layout can be configured separately. You can as well configure a number of columns at the same time. To do so, just select the checkbox of the column(s) you want to configure.

Make sure to select the columns, and not the Column layout or the widgets inside the column! In the example below, two of the three columns are selected.



Note: To remind you that you have selected multiple columns and that the configuration only applies to that selection, the title of the configuration panel is "Multiple blocks" followed by the number of blocks (columns in this example) concerned.

Property	Description
	Configuration
Column	This property determines the column width. **Note:** If several columns are selected, the width values apply to all selected columns. For example, if 2 columns are selected and the width is set to 50 pixels, this means each of the selected columns will have a width of 25 pixels! Options are: • **Relative width** (default): Width is expressed as a percentage of the total column width. You must also specify the miminum column width (which can be determined by the content or by a fixed number of pixels). • **Variable width**: The column width can vary between a minimum and maximum threshold. The minimum column width can be determined by the width of the content, or by a set percentage or a set number of pixels. The maximum width can be determined by a percentage of the total width or a number of pixels. Note that you can switch between percentage and pixels by clicking the arrows to the right of the entry field.

Property	Description
	• **Fixed width**: The column width is a fixed number of pixels. • **Content width**: The column width adapts to the size of the content (i.e. the widget). You must set the maximum column width (either a percentage of the total width or a fixed number of pixels. Note that you can switch between percentage and pixels by clicking the arrows to the right of the entry field.
Collapsible	If a column is collapsible, a small arrow is displayed in the header of the widget, which can be clicked to collapse the column.
Spacing	Space between the selected column(s) and the other columns. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px).
Padding	Space between the widget and the border of the column. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px).
Stretch items	Determines how widgets inside a column are aligned: • If **Stretch items** is selected, the widgets are divided over the column so that the whole column is filled. • If **Stretch items** is cleared, the widgets are placed one after the other. This is a useful feature if widgets in columns have different heights. For example, in the next screenshot, **Stretch items** is selected in the second column, to add space between the Messages widget and the Live counter. Otherwise they would stick together. 
Styling	
Show frame	When selected, a thin frame is drawn around the columns and the following additional properties are displayed:
Title	Text that will be shown in the title bar of the column. You can leave it empty as required.
Frame color	Color that will be used for the column title and the frame around the column. Clicking the color patch will open a color picker dialog.

Property	Description
Background color	Click the color patch to pick the color of your choice. Once selected, the color patch gets the new color and the color code is displayed as well.

Dashboard layouts - List layout

About the List layout

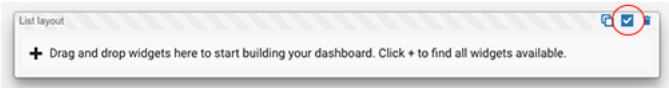
The List layout allows you to place several widgets one after the other, in a vertical arrangement.

How to configure the List layout

By default, one row is available, but you can add more rows by clicking the duplicate button in the top right corner of the widget.

Note that we recommend first configuring the List layout; afterwards you can drag the widgets onto the layout.

Note: Make sure that the checkbox in the top right corner of the widget is selected.



Properties

Property	Description
Configuration	
Collapsible	If the List layout is collapsible, a small arrow is displayed in the header of the widget, which can be clicked to collapse the whole block.
Spacing	Space between two rows (or widgets) in the List layout. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px). **Note:** To see the effect of this setting, drag a couple of widgets onto the dashboard and change the values.
Padding	Space between the widgets and the border of the List layout. Drag the slider to the right to increase, or to the left to reduce the value in pixels (0 px -50 px).
Styling	
Show frame	When selected, a thin frame is drawn around the widget and the following additional properties are displayed:
Title	Text that will be shown in the title bar of the widget. You can leave it empty as required.

Property	Description
Frame color	Color that will be used for the title bar and the frame around the widget. Clicking the color patch will open a color picker dialog.
Background color	Click the color patch to pick the color of your choice. Once selected, the color patch gets the new color and the color code is displayed as well.

5.4.8. Submitting and checking jobs through the Switch Web Portal

Submitting and checking jobs through the Switch Web Portal is only possible if you have licensed the **SwitchClient Module** or the **Web Services Module**.

Overview

An active SwitchClient/Switch Services Module gives access to the following functionality:

- Connect to one or more Switch Servers on the local network/internet.
- Submit jobs (files or job folders) and metadata describing these jobs to a Submit point in a flow.
- Review and act on jobs being held in a Checkpoint in a flow.
- View progress information and the status of submitted jobs.
- View log messages issued by processes on the server.

Good to know

- Access to particular Submit points and Checkpoints can be restricted, by configuring access rights at user or user group level.
- Metadata information attached to a job can be used to make automated routing decisions or to provide variable input to various tools and apps.
- If you want to connect to more than one Switch Server at a time, you must open a browser window per server and sign in to the Switch Web Portal for each server separately. The IP address of the server is displayed in the URL.

5.4.8.1. Setup in Switch

Allowing users to submit and check jobs via the Switch Web Portal, requires **some preparation in Switch**, usually done by a system administrator.

This includes:

- Installing and activating Switch (this includes activating the SwitchClient Module)
- Designing and activating one or more flows that will process the jobs submitted and monitored through the Switch Web Portal.
- Configuring user access rights (in the Users pane)
- Configuring or checking the communication settings (through the Switch user Preferences)

Installing and activating Switch and the SwitchClient Module

Licenses

A regular SwitchClient Module includes a license for **up to five concurrent connections**. If this is not sufficient, you can purchase additional licenses. The number of licenses can be raised by entering a new activation key in the **Manage licenses** dialog in Switch.

An active SwitchClient Module allows you access to the following flow elements:

- Submit point
- Checkpoint
- Checkpoint via mail

If SwitchClient is not licensed, the above flow elements will not be available and you will not be able to submit and check jobs through the Switch Web Portal.

How to proceed

Follow the guidelines and instructions described in the chapter on installing, activating and starting Switch. :

1. Install Switch.
2. Activate Switch, including the SwitchClient Module.
3. Activate additional licenses if required.

Designing flows for use with the Switch Web Portal

Managing files through the Switch Web Portal requires a particular flow design in Switch.

About flows in Switch

To design a flow, the Switch user drags flow elements (such as Submit points, processors and folders) on the canvas and connects them according to the desired job flow. After configuring appropriate property values for each flow element (and in some cases, the connections), the Switch user can activate the flow for execution. From then on, Switch automatically moves and processes jobs along the flow.

If you're new to Switch, we recommend having a look at the Switch Quick Start Guide (available on the *Enfocus website*).

Dedicated flow elements

Submit points and **Checkpoints** are flow elements designed for use with the Switch Web Portal. For more information, refer to the description under Flow elements: overview > Communication.

Note:

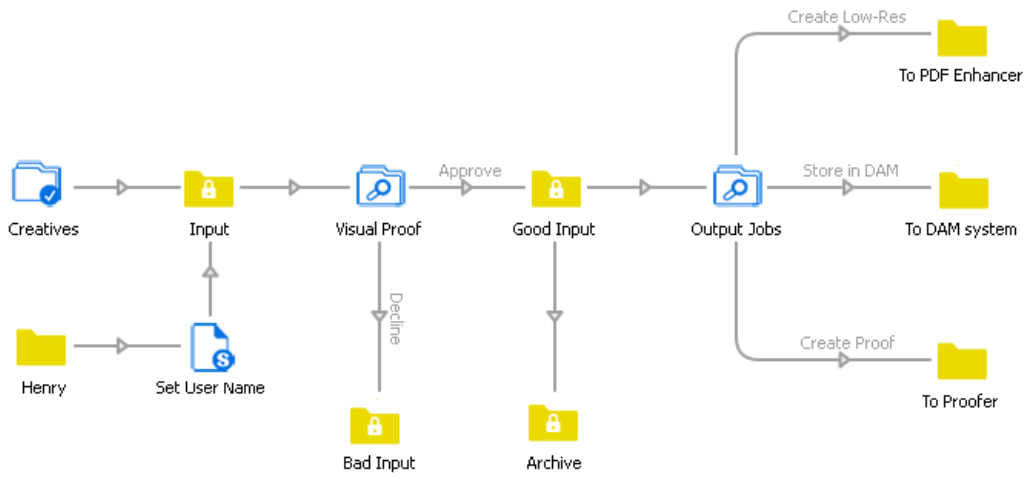
- Make sure the **flows you want to use with the Switch Web Portal are active**. A user with the appropriate access rights can *access* Submit points, Checkpoints and jobs in inactive flows but the jobs will not move along the flow.

- **The Switch Web Portal only interacts with the Switch Server**, not with the Switch Designer. Users can safely quit the Designer without disturbing the operations via the

Portal as long as the Switch Server is running. For more info on the behavior of Switch when exiting the flow designer, refer to the Switch user preferences (User interface).

Example flow

Here's a flow example as it is shown on the Switch canvas:



Since this example focuses on Web Portal features, there is a lot of interaction with human operators and little automated processing (other than moving jobs around). Real-life flows would probably include processing steps such as preflight or color conversion.

The **Submit point on the left** (*Creatives*) allows submitting jobs to the flow in a controlled way using the Switch Web Portal. The user's name is automatically remembered; multiple users can use the same Submit point since each user is identified to Switch through his/her user name and password. The "Set User Name" script serves to add a user name for jobs submitted through a regular hot folder (Henry).

The **first Checkpoint** (*Visual Proof*) holds the incoming jobs for inspection by a user through the Switch Web Portal. The user will see the names of the output connections (Approve and Decline) as buttons in the job card. Pressing one of these buttons moves a job along the corresponding connection.

The **second Checkpoint** (*Output Jobs*) allows a Switch Web Portal user to decide how the jobs will be stored or processed. This Checkpoint is configured to allow multiple outputs at the same time; for example both "Store in DAM" and "Create Proof".

Setting up a Submit point

When setting up a Submit point (*Creatives* in the example flow), you can configure it in such a way that the user must enter one or more data fields before submitting a job to this Submit point. The entered values are associated with the job as metadata.

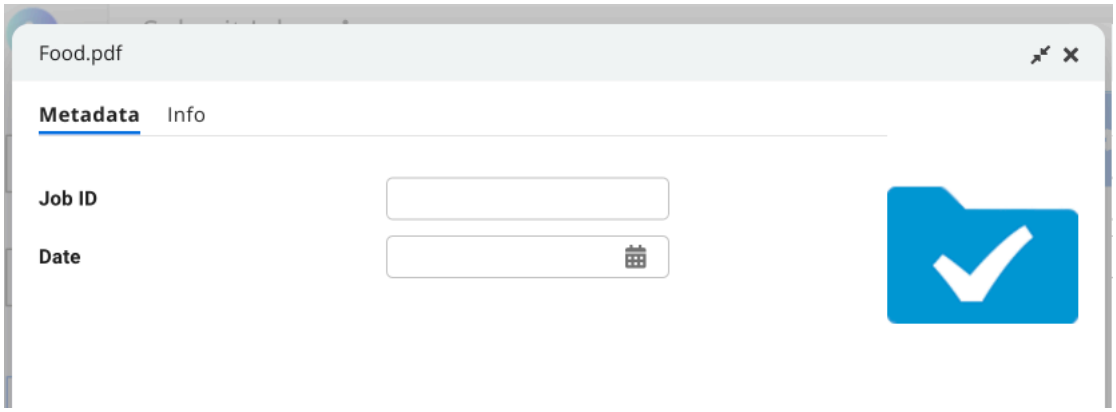
To enable this option, in the properties of the Submit point element:

1. Set **Submit** to **Job and metadata** or **Metadata only** (if the user should only submit a form, without a job).
2. In the **Metadata fields** property, define the metadata fields for which the user should provide a value, for example a Job ID and the date of submission.

3. The **Dataset name** field is completed automatically. This is the name of the dataset that will be created containing the contents of the metadata fields entered by the user.
4. **Invalidate user metadata cache on login** and **Invalidate metadata cache condition** have to do with caching dynamic values, which can be useful to speed up processing.

For a full description, refer to 'Defining metadata fields' in the Switch Reference Guide.

The following screenshot shows how a user will have to enter the data (Job ID and Date) configured in the Submit point.



Note: It's also possible to set up a Submit point that triggers an Action. In that case, the Submit point on the Switch Web Portal acts like a button: when a user clicks it, a dummy job (*.dummy) moves through the Switch flow and (depending on the flow) this job can start a process, call a database, ...

Setting up a Checkpoint

Similarly, when setting up a Checkpoint (*Visual Proof* and *Output Jobs* in the example flow), you can ask Switch to display additional information about the job, and the user may be asked to enter additional data fields before acknowledging a job. (This is the case if the **Enter and display metadata** property is set).

Furthermore, the **output connections of the Checkpoint determine which buttons will be shown** to the user for acknowledging a job.

For example, the *Visual Proof* Checkpoint in the example flow is configured in such a way that the user will see two radio buttons ('Decline' and 'Approve', named after the connections); clicking one of the buttons causes the job to move along the corresponding connection. This is the default behavior of a Checkpoint if two output connections are defined and no metadata has been enabled.

On the other hand, the *Output Jobs* Checkpoint in the example flow is configured in such a way that the user can select **more than one option**, causing a duplicate of the job to be sent out over each of those connections. This is possible if the **Allow multiple outputs** property is enabled.

In this example, the user that has to review the files will see 3 checkboxes (the names come from the output connections in Switch) and can select one, two, or three checkboxes as required.

Route job to: ☐ Create Low-Res ☐ Create Proof ☐ Store in DAM

For an overview of all properties, refer to the description of the Checkpoint flow element.

Metadata in Submit points and Checkpoints - default values

When defining the default values for the metadata fields, you can use a number of variables that automatically retrieve information from the computer that is used to submit or check jobs. As a consequence, this information does not need to be entered explicitly by the user; it can even be sent along with the job without being displayed.

The variables concerned are the so-called Connection variables:

- [Connection.Email]
- [Connection.FullUserName]
- [Connection.IP]
- [Connection.UserName]

If you use those as default values for your metadata fields, they will be replaced automatically with their actual values.

To make this happen, "bidirectional communication" is established between Switch and the Switch Web Portal:

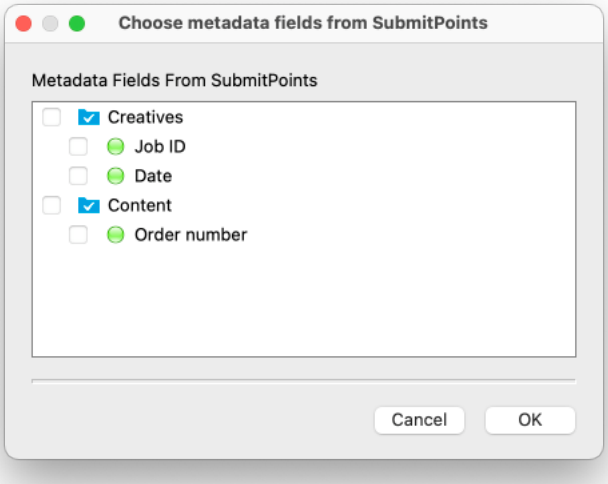
1. The Switch Web Portal requests the default value of the metadata fields, being a connection variable.
2. Switch Server sends the connection variable e.g. [Connection.IP] to the Portal.
3. The Portal replaces the variable with its actual value and sends the actual value along with the job back to Switch Server.

Use case: To keep track of the clients used to submits jobs, you could configure a metadata field "IP address" and set the default to [Connection.IP]. When a file is submitted, the IP address of the system used to submit this file is entered automatically and sent along with the job. It depends on the metadata field properties whether or not this field (with the actual value) is shown to the user and whether or not it can be changed.

Re-using metadata fields from a Submit point in a Checkpoint

Switch provides an easy way to re-use the metadata fields defined for Submit points in a particular Checkpoint.

To re-use an existing metadata field, simply click the button (instead of the green plus button) in the Define metadata fields dialog. This will open a dialog like the one shown below.

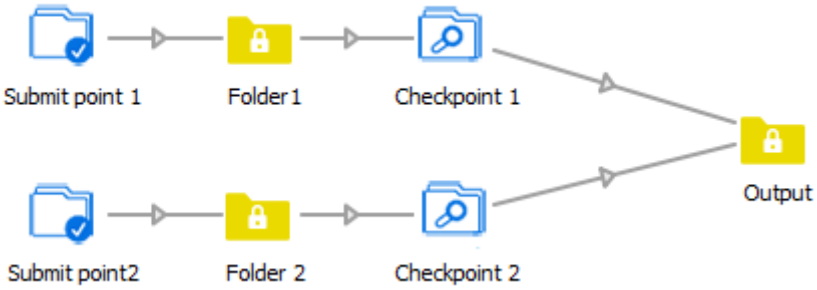


You can now select the metadata fields you want to re-use (based on the Submit points defined for the current flow). Note that the added metadata fields have only two editable options: **Read only** (yes/no) and **Display metadata field** (yes/no). The other options are grayed out and cannot be changed.

Remark: Although all Submit points present in the flow are shown, you must keep in mind that only the Submit point that is used for the job will send metadata. Refer to the example below: since all jobs in Checkpoint 1 come from Submit point 1, it does not make sense to add metadata from Submit point 2 to Checkpoint 1 (and vice versa).

If configured incorrectly, the connection variables (if used) will not be replaced with the actual values (users will see e.g. [Connection.UserName]) and metadata fields for which there is no value entered will be blank.

If configured correctly, when checking the Alert job on the Portal, the connection variables (if used) will be replaced with the actual values (e.g. EAW13DL399 instead of the [Connection.IP]) and the metadata fields that were completed at the time of submission will show the entered data.



Configuring user access

How to proceed

Follow the guidelines and instructions described in the chapter "Configuring Switch users". :

1. Set up the appropriate users and configure their user name, password, email address,...
2. Give them access to the appropriate Submit points and Checkpoints.

Configuring the communication settings

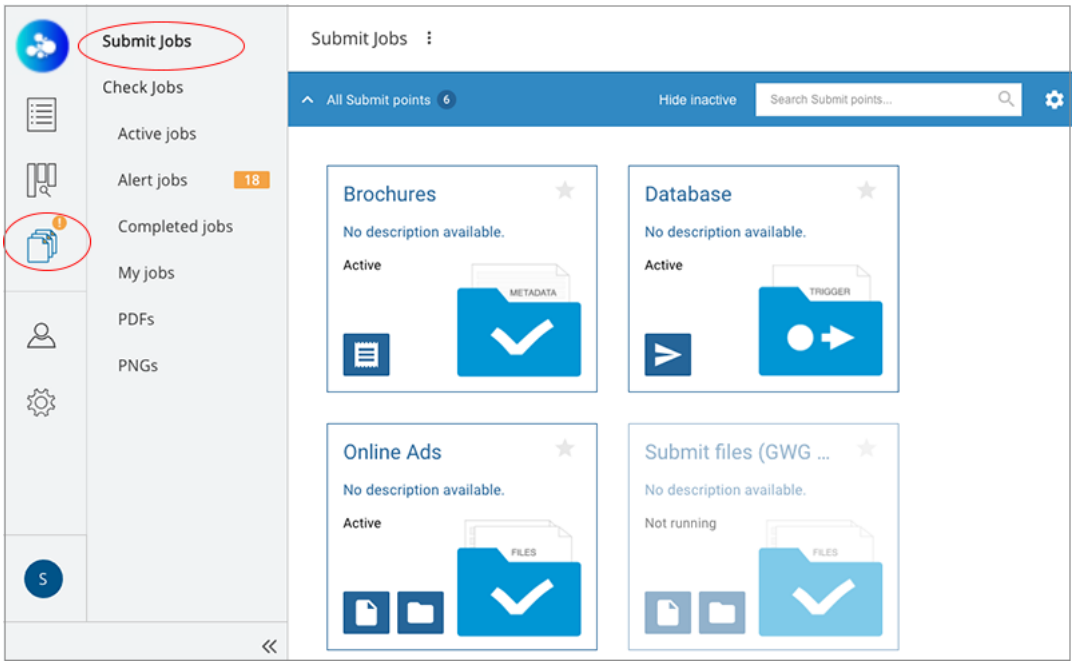
To configure the communication settings for communication with the Switch Web Portal

1. Navigate to:
   - On Windows: **Edit** > **Preferences**.
   - On Mac OS: **Enfocus Switch** > **Preferences**.

   The User preferences dialog appears.
2. In the left part of the dialog, click the **Web services** category.
3. Make sure the **Port for the Switch Web Portal** preference is set to 51089, unless there is a good reason to change it.
4. Click **OK**.

5.4.8.2. The Submit Jobs view

The Submit jobs view allows you to submit jobs to the Switch Server. You can see all Submit points that you have access to, based on your permissions (as set in the Users pane in Switch).



Note: One of the Submit points ("Submit files (GWG..)") in the screenshot is slightly grayed out, because the Switch flow is currently not running. As a consequence it is not possible to submit jobs to that Submit point. You can hide these inactive Submit points by clicking the **Hide inactive** button next to the search field.

Submit point types

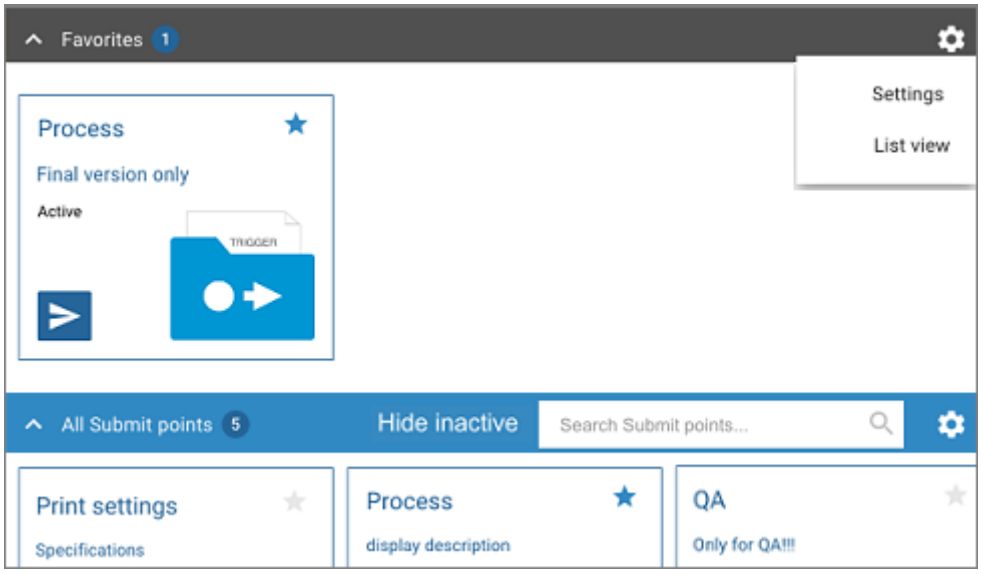
There are four different types of Submit points. You can recognize them by the image and text mentioned on the Submit point. It depends on the configuration in Switch which types are available on the Portal.

Submit point	Description
	This Submit point only accepts **job files and folders**, no metadata. Click the first button to upload separate files, click the second button to upload a folder (which can include files and subfolders, taken from different locations). Note that you can also drag and drop jobs onto the Submit point (but in that case you cannot add extra job files or folders afterwards). **Note:** • If only files are accepted, you'll only see the first button. If only folders are accepted, you'll only see the second button. • Certain file types may be disallowed; in that case, you will get a warning, when trying to submit such a file.

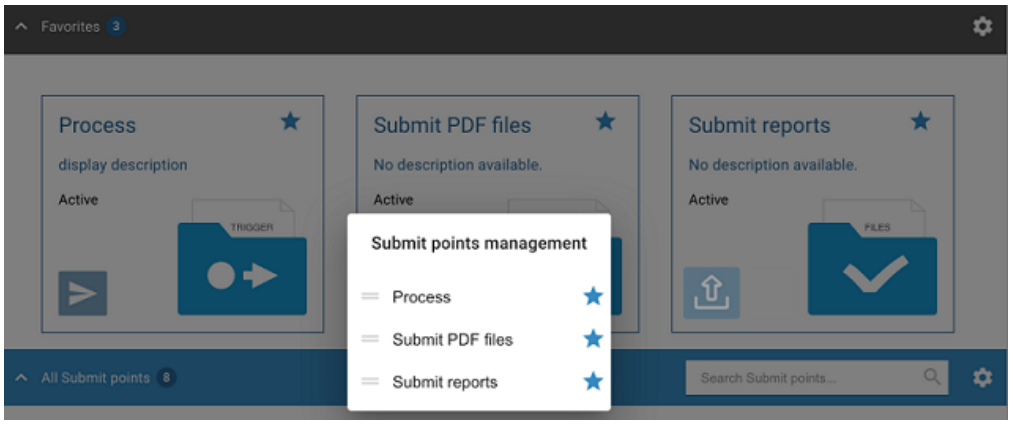
Submit point	Description
	This Submit point accepts both **job files and folders and metadata** (= extra information about the job that has to be supplied when uploading a job). Click the first button to upload separate files, click the second button to upload a folder (which can include files and subfolders, taken from different locations). Note that you can also drag and drop jobs onto the Submit point (but in that case you cannot add extra job files or folders afterwards). **Note:** • If only files are accepted, you'll only see the first button. If only folders are accepted, you'll only see the second button. • Certain file types may be disallowed; in that case, you will get a warning, when trying to submit such a file. Once you have uploaded the job(s), you can enter the requested information on the Metadata tab of the Submit jobs dialog.
	This Submit point **only** accepts **metadata**. You need to fill out a form. Click the button to open the form and supply the requested information.
	This Submit point allows you to send a **trigger**. When you click the button, a database is called, a process is started, ... (depending on the configuration in Switch). A notification will be shown to confirm that the trigger was sent.

Favorite Submit points

You can mark your favorite Submit point(s) by clicking the star icon , so it turns blue . Favorites are displayed in a collapsible, separate section at the top of the page. The number of favorites is mentioned in the header.



Via the menu in the top right corner, you can switch to List view (see further) and open the Submit points management dialog (by clicking "Settings"). The table below lists what you can do through this dialog.

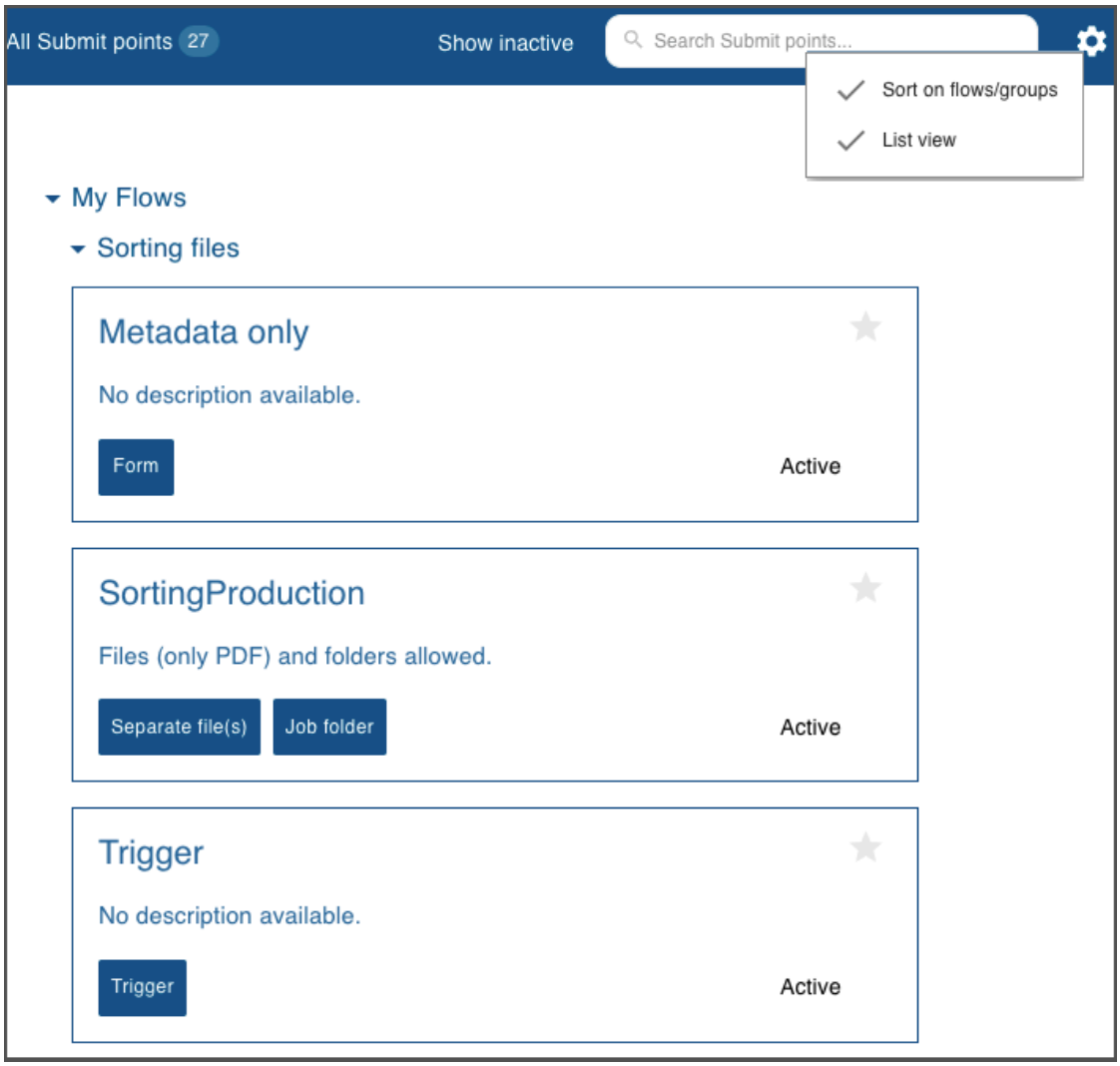


What you can do in the Submit points management dialog:	How:
Remove Submit points from the Favorites overview	Click the blue star icon ★ next to the Submit point you want to remove. Note that it's only removed from the Favorites section, not from the All Submit points section.
Change the order of the Submit points in the Favorites overview	Click the icon ═ preceding the Submit point and drag and drop the Submit point upwards or downwards as required.

List view

It's possible to display the Submit points in "list view", optionally even sorted by flow and flow group.

This view can be displayed via the gear wheel button next to the Search field.



Extra options

Clicking the button ⋮ next to *Submit Jobs* gives access to a context menu with two options:

- **Manage Submit points**: This option opens the *Manage Submit points URLs* dialog, where you can create direct links to one or more Submit points. Refer to *Creating a shareable Submit points URL* on page 319.

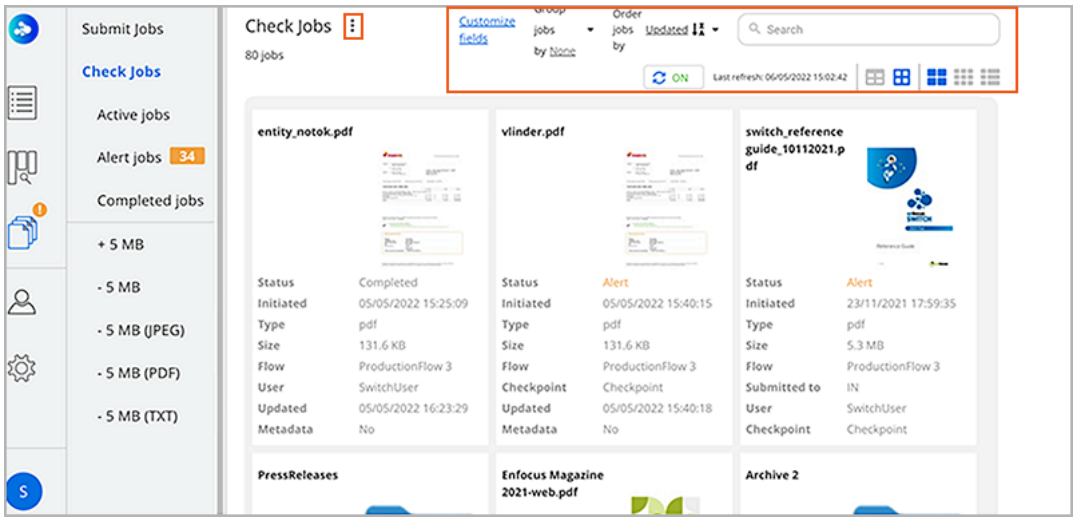
Note: This feature is only available if you're a Switch administrator.

- **Set as Homepage**: When you click this option, the Submit jobs view will become your default start page for the Switch Web Portal.

5.4.8.3. The Check Jobs view

This view allows you to view jobs submitted through a Submit point on the Switch Web Portal, and to check and route jobs waiting in a Checkpoint.

It depends on your user permissions (set in the Users pane in Switch) which jobs you can see and/or further process.



This view, similar to the job boards view, has a couple of buttons that the Submit Jobs view doesn't have:

Buttons	Meaning
Check Jobs ⋮	The button ⋮ beside Check Jobs gives access to a menu with two options: • **Create Filter**: This option enables you to create custom filters, to display only a subset of the jobs you have access to. Refer to *Creating a custom job filter* on page 324. • **Set as Homepage**: When you click this option, the Check Jobs view will become your default start page for the Switch Web Portal.
Customize fields	This link enables you to display or hide the fields of your choice. See *Job fields* on page 322.
Group jobs by None	By default, the jobs are not grouped, but you can group them by flow, state or stage.

Buttons	Meaning
	Note: This option is only available in grid view.
Order jobs by Updated	This button allows you to change the sort order of the jobs in the overview. In this example, the jobs are sorted in descending order (arrow down) by the date they were last updated (= value of the field "Updated").
Search	This search field enables you to quickly find the jobs you need.
ON Last refresh: 06/05/2022 15:25:42	The auto refresh option can be turned off if needed.
	These buttons allow you to Switch between table view and grid view (the latter is shown in the screenshot): • In table view, every row represents a job; the job details are shown in the different columns. • In grid view, every job card represents a job; the job details are listed on this card. The active button is shown in blue.
	These buttons allow you to Switch between large, medium or small job cards. The active button is shown in blue.

Filters

Check Jobs Active jobs Alert jobs 17 Completed jobs My jobs Filter: only PDFs Filter: only PNGs	Below *Check Jobs* you find a number of pre-configured filters (Active jobs, Alert jobs, Completed jobs and My jobs) plus the custom filters you have created yourself (in this example: *Filter: only PDFs* and *Filter: only PNGs*). When you click a filter, it's applied immediately. Refer to *Viewing jobs through the Switch Web Portal* on page 320. Also, note the **orange exclamation mark**: it's a notification that there is at least one alert job. This is most useful when the sidebar menu is collapsed. The counter next to *Alert jobs* indicates the number of jobs waiting to be processed.

5.4.8.4. Submitting jobs through the Switch Web Portal

It is possible to submit single files or multiple files, or files contained in a folder (for example a page layout with its accompanying images and fonts or the individual pages in a book). A job folder may contain nested subfolders (which can contain other files and folders, recursively).

If the files are contained in a folder, they will be considered as one job with one dataset; it will not be possible to enter metadata for each file separately.

It's also possible to submit metadata only (so a form without a job), or to send a trigger.

Note:

- Remember that the Switch Server must be running and that the Switch flow must be activated. Otherwise, the jobs will not be processed.
- Some Submit points require that you install Switch Helper on your computer. If (the appropriate version of) Switch Helper is not installed, you will get a warning and a link to download this free tool from the Enfocus website. Note that the Switch Helper tool does not function well when you're launching the Web Portal through an HTTPS connection in Firefox or Safari (due to security constraints implemented in these browsers), so we recommend using HTTP, or HTTPS but with a different browser (like Google Chrome or Edge).

To submit a job to a particular Submit point:

1. In the Switch Web Portal, in the sidebar menu, click > > **Submit Jobs**.
   You can see the Submit points you have access to. Note that not all Submit points accept all types of jobs... the accepted type ("files", "metadata", "trigger") is mentioned on the Submit point. Depending on the configuration, certain jobs may not be allowed. Refer to *Submit jobs view*.

2. Do one of the following:

   - To upload job files or folders, "drag and drop" the file(s) or folder(s) you want to submit onto the Submit point of your choice. Alternatively, click to upload one or more files (for submission as separate jobs) or to upload a job folder (and optionally add extra files or subfolders from different locations). If it's not allowed to submit either files or folders, the corresponding button will be missing.

     Note: To select multiple files or folders, hold down the **Ctrl** key while selecting.

   - To upload metadata only, click the "metadata only" Submit point and proceed to step 4 of this procedure.
   - To send a trigger, simply click the "trigger" Submit point. The trigger is sent immediately. You're done!

3. *If you have dropped multiple job files on a Submit point*, you'll be asked whether or not the jobs should be submitted as one job or as separate jobs.

   - To move all files and/or folders along the flow as a single entity (or job collection), click **One job**.

     Note: If **One job** is enabled, the value of job.origin will be the origin of the first job in the job collection.

   - To move all files and/or folders along the flow as separate jobs, click **Separate jobs**.

4. *If the Submit point has been configured to request additional information about the job* ("metadata"), the Submit jobs dialog will contain or more entry fields on the Metadata tab. Enter the requested information.

The Info tab mentions the name of the flow and the name of the Submit point used to upload the job.

5. Change the job name at the bottom of the dialog as required.

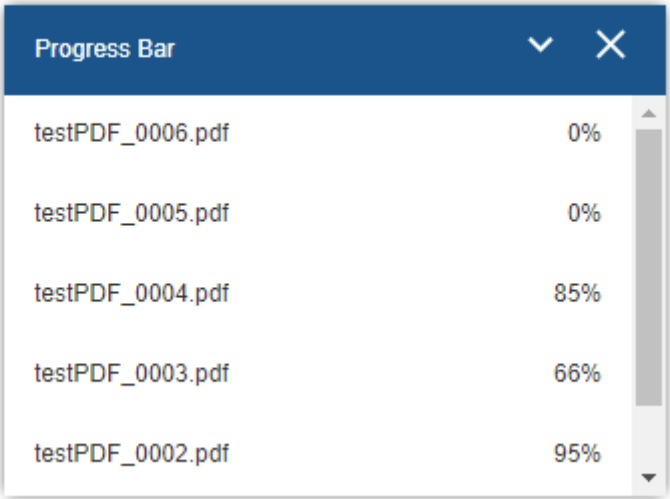
   The chosen job name will replace the file name. For example, if the job name is "testjob", the job file "customerX.pdf " will be renamed "testjob.pdf". The file extension remains the same.

   In case of a job folder, the job name will replace the name of the folder. The files contained in this folder will not be renamed.

   In case of multiple files being submitted in one go, you cannot enter a job name, unless you have chosen to process them as one job (see step 3); in that case, they are put in a folder and the chosen job name will be the folder name. If no name is chosen, the name of the first job in the list will be used as name for the folder.

6. Click **Submit**.

Note that the progress is displayed in the bottom right corner of the screen. The progress bar shows which files have been submitted successfully, and which are still uploading.



5.4.8.5. Creating a shareable Submit points URL

Submit point URLs are direct links to one or more Submit points. The URLs can easily be distributed, for example via email.

Note that only Switch administrators (= Switch users registered as administrator in the Switch Users pane) have the right to create shareable URLs.

To create a shareable Submit point URL

1. In the Switch Web Portal, in the sidebar menu, click > > **Submit Jobs**.

   If you don't see the **+Manage** link, you may not have the required user permissions.

2. Click the button ⋮ beside Submit jobs.

3. In the menu that is displayed, click **Manage Submit points**.
4. In the Manage Submit points URLs dialog, click **New URL**.
   A row is added to the dialog. The first column is empty: the URL will be added after you have selected the Submit point(s) and after having clicked **Apply**.
5. Enter a description.
6. Drag the slider to the left to disable the authentication option as required.
   - Note that the authentication option is only available if the Web Services Module is licensed. If that is not the case, users will always need to enter their credentials before getting access to the Submit point(s).
   - By default, authentication is enabled, meaning that the user needs to enter his Switch credentials to get access to the Submit point(s). Note that the user's other permissions are also taken into account. For example, if the user has no right to submit jobs, he won't see the Submit jobs view, so he won't be able to use the URL. The other way around, if the user has access to other functionality, or to more Submit points, he will have the same options as when he had signed in through the regular Web Portal address.
   - If authentication is disabled, everyone who clicks the link will have access to the selected Submit point(s). No credentials will be required. Only the selected Submit points are accessible, all other functionality on the Portal is hidden.
7. In the Submit points column, click **Select** to select the Submit point(s) concerned.
8. In the Expiration date column, click the **None** link to enter an expiration date as required.
   The URL will become invalid as of the set date. The format in which the date is displayed, is determined by your browser settings.
9. Click **Apply**.
   The URL is added.
10. To copy the URL (for distribution), click the **Copy URL to clipboard** icon.

You can later make changes to the configuration of the URL, for example add extra Submit points or change the authentication setting. This won't change the (probably already distributed) URL in the first column. You can remove the URL by clicking the red cross button that appears when you move your pointer over the URL.

Note: The use of the shareable URLs is logged and can be found in the Messages overview. This way it's possible to find out which jobs were submitted through which (shareable) URL. For security reasons, only part of the URL is shown in the Messages.

5.4.8.6. Viewing jobs through the Switch Web Portal

To view Switch jobs through the Switch Web Portal

1. In the Switch Web Portal, in the sidebar menu, click > > **Check Jobs**.
   You can see all jobs you are allowed to see based on your user permissions (set in the Switch Users pane).
2. To view only a particular set of jobs, apply a filter.

- Click one of the pre-configured filters in the sidebar menu below **Check Jobs**, for example 'My jobs'. Refer to *Job filters* on page 323.
- Create a filter yourself. Refer to *Creating a custom job filter* on page 324.

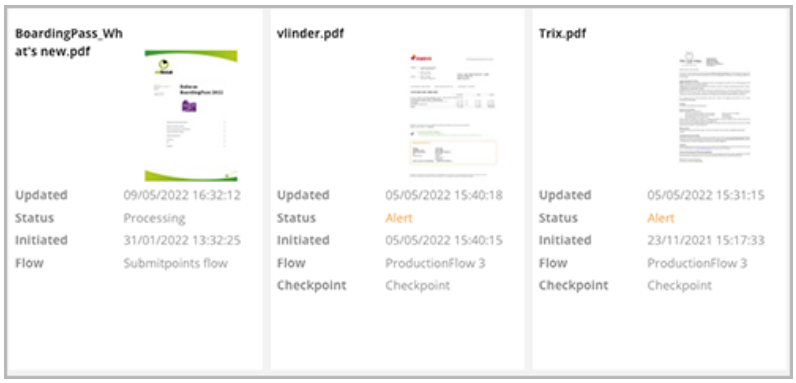
The jobs matching the selected filter (now highlighted in the sidebar menu) are shown. If you don't see the jobs you expected to see, check if:

- The Switch Server is running.
- The information displayed is up-to-date. Refresh your browser window to update the information from the Switch Server.

Note that you can stop filtering by returning to the Check Jobs view. In case of a custom filter, you can remove the filter by clicking the button ⋮ next to the filter name. In the menu that opens, click **Delete**.

3. To view the jobs presented in a different way, click the **Table view** or the **Grid view** button.

The first button enables table view, the second enables grid view.

View	Example
Table view	 Table-specific options: • Every column represents a field. To hide a column, show an extra column, or change the order of the columns, click the blue **Customize fields** link at the top of the screen. See *Job fields* on page 322. • To sort the overview, click the header of the column you want to use to sort the overview. An upward arrow appears and the jobs are shown in ascending order. If you want the jobs to be ordered in descending order, click the arrow once more, so it turns into a downward arrow.
Grid view	

For an overview of the other options that enable you to customize the Check Jobs view, refer to *The Check Jobs view* on page 316.

4. To view the details of a job and eventually review and process the job:
   - In table view, click the row concerned.
   - In grid view, click the **Process** button of the job you want to check and/or process.

   See also: *Reviewing and processing jobs through the Switch Web Portal* on page 327.

Job fields

The following table gives an overview of the job fields that can be shown on the job cards on the Switch Web Portal (both on job boards and the Check Jobs view).

Job fields	Overview
Available fields	**Default fields:** These fields are shown by default, unless you hide them through the **Customize fields** link. • Checkpoint • Flow • Initiated • Locked by • Metadata • Size • Status • Submitted to • Type • Updated • User **Other available fields:** • Dimensions • Family • Files • In state since • Modified • On alert since • Pages • Stage • State
Custom fields	• Custom fields are fields configured in *Refresh job info*. You can also show them on your job board.

- Large job cards can display up to 8 fields.
- The first field in the selection is shown when users hover over the info icon on the small job cards.
- Fields for which there is no value will not be shown on the job cards.

Customizing fields

- You can hide or show fields through the Customize fields link on the Check Jobs view or on the job boards. Note that you can change the order of the selected items in the column on the right ("Selected"), by clicking the icon ↑↓ to the right of the item you want to move and by dragging it to its new place.

- As the creator or owner of a job board, you predefine the fields to be shown, but other users can define their own personal view if they want, which will be applied to their web session and will be stored in the cache of their web browser.

Job statuses

The following table gives an overview of the statuses a job can have on the Switch Web Portal.

Status	Meaning
Processing	The job resides somewhere in the flow but not in a Checkpoint, and it is not finished yet. This includes jobs in the Problem jobs flow element.
Alert	The job resides in a Checkpoint and is waiting for intervention by an operator. The number of alert jobs is indicated by a counter in the sidebar menu of the Web Portal. In table view, alert jobs are displayed in orange.
Error	The job failed. You should contact your system administrator for more information.
Completed	The job has been processed and has arrived in the output folder of the flow.

Job filters

Default job filters

The table below provides an overview of the default, pre-configured filters in the Check jobs view on the Switch Web Portal.

Filter	Displays:
Active Jobs	All jobs that are somewhere in the flow, but not in an end folder (that is, not yet completed). This includes files that reside in the Problem jobs folder. **Note:** This only applies to jobs that are visible to you.
Alert Jobs	All jobs waiting in a Checkpoint. **Note:** You can only see the jobs in a Checkpoint that you are allowed to access (as configured in the Users pane in Switch).
Completed Jobs	Displays all the jobs that reside in an end folder in Switch.

Filter	Displays:
	Note: This only applies to jobs that are visible to you.
My Jobs	All jobs submitted by you, i.e. the current user, regardless of their current status (processing, alert, completed).

Custom job filters

You can as well create your own filters, for example you can create a filter to display all jobs in a particular Submit point or Checkpoint, all jobs with a particular status, all jobs initiated before or after a particular time, etc.

Refer to *Creating a custom job filter* on page 324.

Note that:

- These filters are not visible to other Switch users signing in to the Switch Web Portal.
- These filters can also be used to determine which jobs should be shown on your job boards. Refer to *Creating a job board based on job filters* on page 276.

No filter applied

If no filter is applied, you can see all jobs you are allowed to manage.

Creating a custom job filter

In the Check jobs view on the Switch Web Portal, you can create your own, custom filters.

You could for example create a filter that displays all jobs with a certain status that were submitted to a particular Submit point.

To create a custom filter

1. In the Switch Web Portal, in the sidebar menu, click > > **Check Jobs**.
2. Click the button ⋮ next to *Check Jobs* and choose **Manage filters**.
3. Click **New filter** (in the bottom right corner).
4. In the dialog that pops up, beside the **Close** button, enter a meaningful name for the custom filter.

   Each filter needs to have a unique name.
5. Configure a filter rule: select the appropriate filter field, choose an operator and enter the value of your choice.

   Example filter fields are: Checkpoint, On alert since, Files, Flow, ... "Familystarter" refers to the first job in a job family, being a set of jobs that have been generated from the same original job. For example, a PDF, its Preflight Report, the preflighted and the low res version, ... they all belong to the same job family.

Tip: User "is current user" is an interesting filter rule that allows re-using a particular filter for all users on the Web Portal. For example, if you create a filter that shows all alert jobs for the currently logged in user, you don't have to configure such a filter for each user separately.

6. To configure a second rule or rule set, click the appropriate button:
   - To add one rule, click the green **Add rule** button.
   - To add several rules, which are related to each other (through an AND/OR relation), click the green **Add group** button.

   If you have made a mistake, you can remove the rule concerned by clicking the red **Delete** button.

7. Once you have configured your rules, make sure to indicate the relation between the rules and the rule groups, by clicking the appropriate button:
   - And means that for each job it is checked if all rules apply. For example, with *Checkpoint = Checkpoint 1 AND job status = alert* only the jobs in Checkpoint 1 that have the alert status will be shown.
   - Or means that at least one of the rules should apply. For example, with *Checkpoint = Checkpoint 1 OR job status = alert*, all jobs in Checkpoint 1 are shown (regardless of their status) and all jobs that have the alert status (regardless of the Checkpoint they are in).

   The And/Or option is only relevant if you're configuring more than one rule.

   The following example results in a list of jobs submitted to Submit point 1 AND having a certain status, which can be either Alert OR Error.

8. If required, repeat step 5 until you have configured all rules you need.
9. Click **Apply** or **Apply and save** as required.

The newly created filter is displayed in the sidebar menu.

Managing custom job filters

This topic explains how to handle the **custom** filters in the Check jobs view on the Switch Web Portal.

The filters are listed in the sidebar menu below the pre-configured filters. They are sorted in alphabetical order (A-Z); you cannot change the order.

1. In the Switch Web Portal, in the sidebar menu, click > > **Check Jobs**
2. Open the Manage filters dialog as follows:
   1. Click the button ⋮ next to *Check Jobs*.
   2. Choose **Manage filters**.

      Note: The custom job filters are listed. Pre-configured job filters are not listed in the Manage filters dialog, as they cannot be edited, shared, exported/imported, or removed.
3. Do one of the following as required:

To ...	Do the following:
To create a new filter	Click **New filter** (blue button in the bottom right corner). See also *Creating a custom job filter* on page 324.
To edit a filter	Click the edit button (which becomes visible when you hover over the job filter concerned). **Note:** Alternatively, you can click the button ⋮ beside the job filter name. The menu that pops up also has an Edit menu option. You can now make changes as required. See also *Creating a custom job filter* on page 324.
To share a job filter or to stop sharing it	Job filters can be shared with other members of the same user group (as configured in Switch). To share or stop sharing, in the Sharing column of the job filter concerned: 1. Click **Private/Shared**. 2. In the dialog that pops up, select or clear the checkbox of the group(s) with whom you want to share your job filter. If no dialog pops up, you cannot share the job filter (for example because you're not configured as member of a group). **Note:** Shared job filters can only be viewed (not edited!) by other users.

To ...	Do the following:
To import or export a job filter	Job filters can be exported and imported again if needed. To export a job filter, click the export button next to the job filter you want to export. A Switch job filter is saved with extension .sfilter. Note that the export button becomes visible when you hover over the job filter concerned. To import a job filter, click the **Import filter** button at the bottom of the dialog and select the job filter (*.sfilter) of your choice.
To hide or show a job filter	To hide a job filter, drag the slider in front of the job filter name to the left, or click it. It will turn gray and the job filter will no longer be present in the sidebar. To show a hidden job filter, drag the slider in front of the job filter name to the right, or click it. It will turn blue and the job filter will again be present in the sidebar.
To permanently remove a job filter	Click the remove button. Note that the remove button becomes visible when you hover over the job filter concerned.

4. To save the changes made in the Manage filters dialog, click **Apply**.

5.4.8.7. Reviewing and processing jobs through the Switch Web Portal

Checkpoints are intermediate folders in a flow where jobs that arrive are being held until they are reviewed by an operator. Once reviewed, the operator indicates how they should move along the flow.

You can review these jobs one by one, or in batch as described below.

Processing one job at a time

To review a job being held in a Checkpoint:

1. In the Switch Web Portal, in the sidebar menu, click > > **Check Jobs**.
   All jobs that you have access to, regardless of their status, are displayed in the overview.

2. Click **Alert jobs**.

   This is a pre-configured filter. Alert jobs are jobs waiting in a Checkpoint you have access to. The counter indicates the number of alert jobs.

Remember that you can switch between table and grid view as required (buttons at the bottom of the screen).

3. Select the job you want to review and route:
   - In table view: Double-click the job concerned.
   - In grid view: In the job card of the job concerned, click the **Process** button.

   A dialog opens and displays more detailed information about the selected job.

4. Review the job as required, using the options in the right part of the dialog, below the thumbnail of the job.

   For an overview, refer to *Review options* on page 329.

5. On the Process tab, enter extra info ("metadata") if requested.

   This depends on the setup in Switch.

   Note: If you entered metadata before locking or replacing a job, you will be requested to enter it again.

6. Route the job:

   At the bottom of the dialog:
   - If you see radio buttons, choose one of the options.
   - If you see checkboxes, you can select more than one option if appropriate.

7. Click **Push**.
   The dialog is closed automatically. The job will move along the chosen connection(s) in Switch. The job status will change over 'processing' to 'completed', so it will no longer be present in the Alert jobs overview.

Processing multiple jobs as one

This topic explains how you can process a number of alert jobs in one go.

Note that this is only possible for:

- Alert jobs waiting in the same Checkpoint,
- Which all need to be moved along the same output connection,
- With the same metadata values.

To process multiple jobs proceed as follows:

1. In the Switch Web Portal, in the sidebar menu, click > > **Check Jobs**.
   All jobs that you have access to, regardless of their status, are displayed in the overview.

2. Click **Alert jobs**.

   This is a pre-configured filter. Alert jobs are jobs waiting in a Checkpoint you have access to. The counter indicates the number of alert jobs.

   Remember that you can switch between table and grid view as required (buttons at the bottom of the screen).

3. Click the checkboxes of the jobs you want to combine.

In grid view, the checkboxes become visible when you hover over the job cards. As soon as you have selected a job, the jobs waiting in a different Checkpoint are grayed out, because you can only combine jobs that are waiting in the same Checkpoint.

4. Click **Process multiple** in the bottom right corner of the screen.

   The number of jobs contained in the selection is shown.

5. To review the jobs one by one, use the arrows in the top left corner to navigate between them.

   For more information about the options in the right part of the dialog, below the thumbnail of the job, refer to *Review options* on page 329.

6. On the Process tab, enter extra info ("metadata") if requested.

   This depends on the setup in Switch. The metadata value should be valid for all jobs in the selection; it's not possible to have a different value per job file.

7. Route the job:

   - If you see radio buttons, choose one of the options.
   - If you see checkboxes, you can select more than one option if appropriate.

   Note that your choice applies to all jobs in the selection.

8. Click **Push**.
   The dialog is closed automatically. The jobs will move along the chosen connection(s) in Switch. The job status will change over 'processing' to 'completed', so it will no longer be present in the Alert jobs overview.

Review options

This is an overview of the options that are available when you're reviewing a job that is held in a Checkpoint.

Some of the options may be missing; this depends on the setup in Switch. For example, if editing or report viewing are not allowed, these options do not show up.

Option	Meaning
View	Allows you to view the job file(s). The job is opened in the browser, if the browser supports the job's file type (e.g. PDF, JPEG). If the browser cannot open the file and also in case of a job folder, you will be asked to save the file(s) or folder locally, or they will be downloaded. The behavior depends on your browser settings. When a job is being viewed, it cannot be modified or saved. The job is not locked automatically, so it remains editable for other users, unless you lock it by clicking the **Lock** option (see further). **Note:** You may have to turn off pop-up blockers.
Replace	Allows you to replace the current job file with another one. The uploaded file(s) will be further moved along the Switch flow.

Option	Meaning
	Note: If another user is trying to replace the job at the same time, a warning is displayed. You can then either cancel your replacement request or overrule the other user's replacement process and start your own. This can be useful if the other user has left the computer in the middle of a replacement request and cannot be reached, or in case of a system crash.
Report	Allows you to view a report with metadata, if there is one associated with the job. For more information, refer to the documentation on Checkpoints.
Lock / Unlock	Lock: Allows you to lock the job, so that the job (and the report) cannot be processed, edited, reverted or replaced by any other user. Other users can still view the job, save a local copy and open the individual job card, but they will get a message stating that the job is in use by another user. Unlock: Allows you to unlock jobs you have locked yourself. **Note:** Users that belong to the administrator group can unlock all jobs; group managers can unlock all jobs from users in their group.
Edit (in application)	Allows you to edit the job file in the native application. While a job is being edited, you can upload the changed job file or cancel editing. For the full procedure, refer to *Editing a job in a Checkpoint (Switch Helper)* on page 330. **Note:** This option is only available if you have installed the Switch Helper (a small tool that you can download from the *the Enfocus website*). If you haven't, you can also edit the job file, but you'll first have to download and save it locally. Refer to *Editing a job in a Checkpoint (no Switch Helper)* on page 331.

Editing a job in a Checkpoint (Switch Helper)

If you have installed the Switch Helper (a small tool that you can download from the *the Enfocus website*), you'll have an **Edit <in application>** button.

Note: This option is not available if you're launching the Web Portal through an HTTPS connection in Firefox or Safari (due to security constraints implemented in these browsers).

To edit a job

1. Click the **Edit** button.
   The file is opened in the native application, for example Adobe Acrobat. The **Edit** button on the Portal is replaced with an **Update** and a **Cancel** button.
2. Make the required changes.

3. Save the file in the native application.
4. Click the **Update** button to upload the changed version.

Editing a job in a Checkpoint (no Switch Helper)

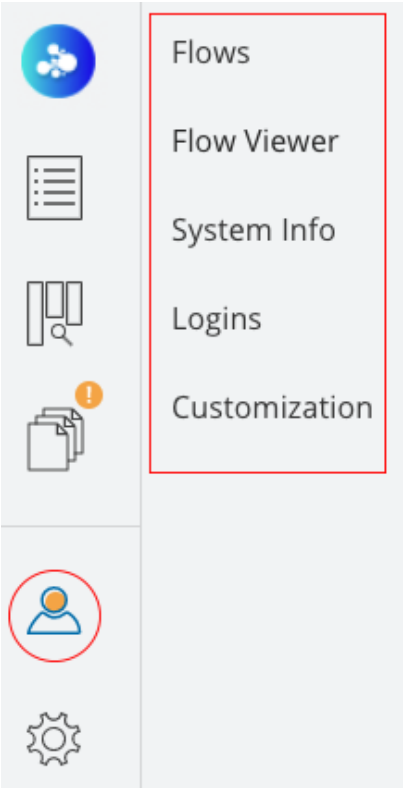
This procedure is applicable if you're using Switch 2017 or if you haven't installed the Switch Helper application.

To edit a job

1. Lock the job file(s), so no one else can make changes while you're busy with the file.
2. Save the job locally.
3. Make the required changes to your local copy.
4. Use the **Replace** button to upload the changed version.

5.4.9. Using the Web Portal Admin view

Switch administrators (i.e. users that are part of the Administrators group as set in the Users pane) have an additional view: the Admin view. This view gives access to additional functions, such as the option to start and stop flows remotely.



5.4.9.1. Admin view: Flows

Administrators can remotely start and stop Switch flows through this view.

However it's not possible to edit the flow properties; to do that, you still need Switch Designer. That's also the case if your flow is invalid or incorrectly configured.

Note that this view also gives a quick overview of all your flows, and shows which flows are running and which flows are stopped.

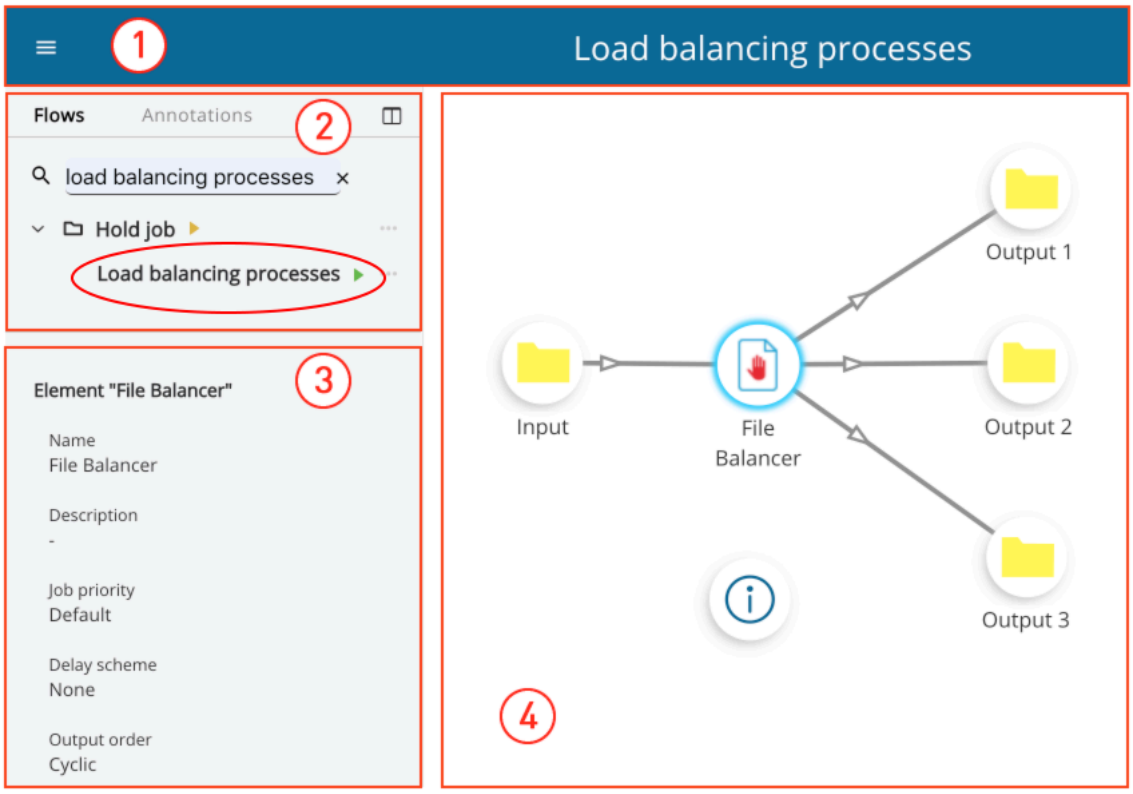
Note: Starting or stopping flow groups (so a number of flows in one go) is not possible through this view. That is only possible through the flow viewer.

5.4.9.2. Admin view: Flow viewer

Administrators have access to the flow viewer: a remote and read-only view on their Switch flows.

The flow viewer page layout

When you click the Flow viewer button in the Admin view, the flow viewer opens in a separate tab. Below the screenshot, you can find a description of the flow viewer's page layout.



Screen part	Description
1. Title bar and menu button	The title bar displays the name of the flow that is currently selected in the Flows tab of the Flows panel (2). This is also the flow that is displayed in the right part of the screen. The menu ☰ has two options: • Back to the Switch Portal • Print View
2. Flows panel with two tabs	The **Flows** tab gives an overview of the flow groups and the flows on the Switch Server (similar to the Flows pane in the Designer), in a tree structure. You can expand or collapse the flow groups by clicking the arrows in front of the flow group names. The selected flow is shown in the right part of the screen. Its properties are shown below the Flows panel. Note the flow status icons: ▶: The flow is running. 🕒: The flow is scheduled. ▶: One or more flows (but not all) of the flow group are running.

Screen part	Description
	The three dots button (to the right of the flow/flow group) enables you to stop or start the flow or the flow group. The **Annotations** tab displays the annotations added to the selected flow. The content can be viewed by clicking the annotation. Clicking the icon in the top right corner of the panel expands or collapses the side panel.
3. Properties panel	This panel shows either the properties of the flow (selected in the Flows tab) or the properties of a flow element (selected in the right part of the screen).
4. Canvas with the flow design	This is a read-only view of the flow selected in the Flows panel. Some tips to improve readability: • To zoom in and out: press CMD (CTRL on Windows) and "+" or "-" • To move the flow on the canvas: click somewhere near the flow until the cursor changes to and then drag the flow to the place of your choice. • To modify the size of big flows so they fit on the screen, open the context menu and click **Scale to fit**.

Note: You can leave the flow viewer via the menu in the top left corner; choose **Back to the Switch Portal**.

Viewing flow and flow element properties

To view the properties of a flow and/or the properties of the flow elements through the Switch Web Portal, proceed as follows:

1. Click > > **Flow Viewer**.
2. In the Flows panel, with the Flows tab selected, select the flow of which you want to see the properties.
   - You can use the search field to quickly find the flow you need.
   - If the flow is part of a flow group, click the arrow icon to expand the flow group.

   The flow properties are displayed below the Flows panel.
3. To view the properties of a particular flow element, click the element in the canvas.
   The properties of the selected flow element are shown below the Flows panel.

Note: To go back to the properties of the flow, click somewhere on the canvas (not on a flow element), or click the flow name in the Flows panel.

Starting and stopping flows

To start and stop flows remotely, proceed as follows:

1. Click > > **Flow Viewer**.
2. In the Flows panel, with the Flows tab selected, do one of the following:
   - If you want to start or stop all flows in a flow group in one go, select the flow group.
   - If you want to start or stop one single flow, select that flow.
3. Click the three dots button ⋯.
4. Select the appropriate option from the menu that appears:
   - In case of a flow group, click **Start Group** or **Stop Group** as required.
   - In case of a single flow, click **Start Flow** or **Stop Flow** as required.

Note:

- If a flow cannot be activated (for example because the properties are not configured correctly), a warning appears. It's not possible to make changes to a flow via the Flow viewer, so you'll have to fix the flow in Switch Designer.
- If you start a flow group, but not all flows could be activated, an orange icon is shown next to the name of that flow group.

Adding annotations to a flow

To add an annotation to a flow in the flow viewer (admin only), proceed as follows:

1. Click > > **Flow Viewer**.
2. Place your mouse pointer on the canvas, somewhere near the flow element about which you have a remark or a question.

   You can afterwards still move (click and drag) the annotation as required.
3. Open the context menu and choose **Add Annotation**.
4. Enter the requested info:
   - Choose an icon. This icon will be visible on the canvas.

Icon	Meaning
	Info

Icon	Meaning
	Warning
	Question
	Note

- Add a short description (mandatory)
- Add a more detailed description (optional)

5. Click **Post**.

The annotation is added to the canvas and to the Annotations tab in the Flows panel. You (and any other Switch administrator) can view the content by clicking the corresponding icon on the canvas or in the Anntotations tab. Note that the name of the user who created the annotation is also mentioned, as well as the creation date and time.

Viewing, editing and deleting annotations

The small circles with an info, note, question or warning icon in the flow design on the canvas represent annotations. You can view and edit your own annotations and those of the other Switch administrators (if any).

To view the content of an annotation in the flow viewer (admin only), proceed as follows:

1. Click > > **Flow Viewer**.
2. Select the flow of which you want to view the annotations.
3. Do one of the following:
   - Switch to the Annotations tab in the Flows panel and click the annotation that you want to view.
   - Switch to flow design and click the annotation that you want to view.

   The content of the annotation as well as the name of the author and the creation date and time are shown.
4. To edit the annotation, proceed as follows:
   a. Click the 3 dots in the top right corner of the annotation.
   b. From the menu that appears, choose **Edit**.
   c. Make the required changes (all fields can be modified).
   d. Click **Post**.

The modification date or the name of the editor are not displayed.

5. To delete the annotation, proceed as follows:
   a. Click the 3 dots ⋮ in the top right corner of the annotation.
   b. From the menu that appears, choose **Delete**.
   c. Click **Delete** to confirm.

      A notification is shown in the top right corner of the screen (Success: "<annotation>" deleted!)

Viewing and printing the flow documentation

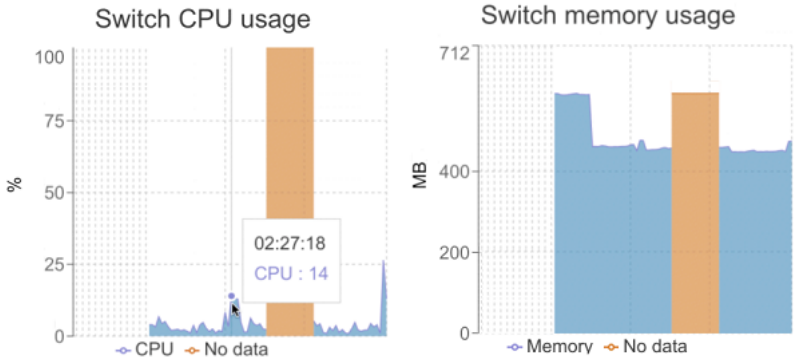
Note: Via the print function you can also save the flow documentation as a PDF.

To view and print the flow documentation (including the annotations) through the Switch Web Portal, proceed as follows:

1. Click > > **Flow Viewer**.
2. Select the flow that you want to print in the Flows tab of the Flows panel.
3. In the top left corner of the screen, click the menu and choose **Print View**.
   The print documentation (the flow plus all properties) is shown in a separate dialog.
4. To save or print the documentation, click **Print**.
5. Do one of the following:
   - To save the flow documentation: from the **Destination** list, select **Save as PDF** and click **Save**.
   - To print the flow documentation: from the **Destination** list, select the printer of your choice and click **Print**.

5.4.9.3. Admin view: System info

In this view, administrators can find information about the Switch processes (CPU, memory, Pid, time the process was started). A live graph shows the total Switch CPU usage and the Switch memory usage.



The orange bars indicate that there is no information for that time period (e.g. because the browser was minimized, or because you switched to a different tab etc.).

If you want more details about the data on the graph, just hover your mouse over the graph to display a tooltip with the exact numbers (see screenshot).

5.4.9.4. Admin view: Logins

The Logins view gives administrators an overview of the active users (currently logged in), as well as an overview of the users that logged in during the last 30 days.

5.4.9.5. Admin view: Customization

Here administrators can change the look and feel of the Web Portal, by uploading their company's logo and by adjusting the colors to match their company's brand.

Logos

You can upload up to two logos:

- **Large Logo**: The image uploaded here will be used for for display on the Web Portal login page.

  Small Logo: The image uploaded here will be shown at the top of the navigation bar and in the browser tab.

Note: The uploaded image must be a PNG or a SVG file. The size is adjusted automatically; aspect ratio 1:1 (for example 400x400 px for the large logo) is preferred.

Colors

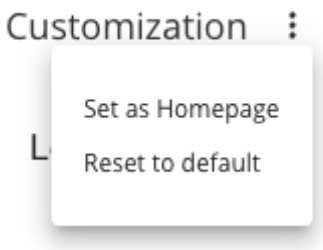
You can change the following colors in the Portal:

- **Sidebar color**: Color of the navigation sidebar.
- **Sidebar font color**: Color of the font used in the navigation sidebar.
- **Accent color**: Color of the font in the navigation sidebar that is used when you hover over the elements in the sidebar, or when you select them.
- **Rush job color**: Color used to highlight rush jobs on job boards (i.e. the color of the label and of the thin line on the left of the job card).

Reverting changes

The changes made here are applied immediately.

To revert your changes and bring back the original look and feel, click the button ⋮ beside Customization (at the top of the page) and choose **Reset to default**.



5.5. Working with the additional Switch modules

This section discusses the Switch modules that can be added to the Switch Core Engine. It starts with the feature matrix, which gives an overview of what you can do with each module.

Note that, in order to be able to use a particular module, you must have a valid license. For more information on activating modules, refer to *Installing, activating and starting Switch* on page 11.

5.5.1. Feature matrix

The following table indicates what you can do in Switch, depending on the activated modules:

Feature	Switch Core Engine	Metadata module	Scripting module	Switch Client module	Reporting module
Switch Server and Designer	✔				
Flow design (canvas, flows pane, elements pane, properties pane, ...)	✔				
Flow execution (feedback on canvas, messages overview, dashboard pane, statistics pane)	✔				
Built-in tools (see *Flow elements matrix* on page 162), apps	✔				

Feature	Switch Core Engine	Metadata module	Scripting module	Switch Client module	Reporting module
Hierarchy info and email info (internal metadata)	✔				
Variables and read-only embedded metadata (EXIF, IPTC, XMP)		✔			
Writing and updating external Xpath-based metadata (XMP)		✔			
External metadata (XML, JDF) and writable embedded metadata		✔			
Script expressions and script elements			✔		
Script development environment (SwitchScripter)			✔		
Scripted plug-ins (if licensed by Enfocus)			✔		
Setup for the Switch Web Portal (users pane, Submit point, Checkpoint)				✔	

Feature	Switch Core Engine	Metadata module	Scripting module	Switch Client module	Reporting module
Access to dashboards on the Switch Web Portal					✔

5.5.2. Metadata Module

The Metadata Module enhances the use of metadata in Switch flows: in addition to Switch-specific metadata, it gives access to **other types of metadata** originating from other applications or stored in other formats that are common in the graphical industry.

5.5.2.1. Getting started with the Metadata Module

Access to other types of metadata

Metadata is information about the job you are processing, such as its size, creation date, number of pages, paper type, ... In Switch, this information can be used to route jobs, to rename them, to make decisions, etc.

With the Metadata Module, you have - in addition to Switch-specific metadata - access to XMP metadata (embedded in side the job and available in most jobs created with Adobe products) and to metadata in external files (XML or JDF tickets) submitted with the job.

You can:

- Use metadata in Switch just like regular variables to process your jobs dynamically.
- Visualize metadata for jobs submitted through the Switch Web Portal or processed with a Connector.
- Use the Metadata tools (listed below) to export metadata and convert XML information, preflight logs and reports into other XML formats, HTML or human-readable information.

Metadata tools

With the Metadata Module, you get access to the tools in the Metadata category of the Flow Elements pane:

- *XML Pickup*
- *JDF Pickup*
- *XMP Pickup*
- *XMP Inject*
- *Opaque pickup*
- *Export metadata*

Note: Want to know how these tools work? Take a look at the *eLearning course* about this topic (for subscribers and maintenance users only).

Metadata variables

Once you have "picked up" the metadata set you need using one of the Metadata tools, you can select the variable of your choice from the Metadata variables group. This group is only available if you have an active license for the Metadata Module.

5.5.2.2. Metadata

Metadata overview

What is metadata

In the Switch context, metadata is descriptive information about a job (file or job folder) in a structured electronic form. Metadata is often used to store administrative information associated with a job, and to exchange such information between systems. Metadata can be distinguished from the job contents proper, even if it happens to be embedded in the job.

Historically, metadata has been stored in various proprietary or standard formats. TIFF, EXIF and IPTC tags (often found in image files) are classic examples. More recently, the industry has moved to store metadata as XML, building on the strengths of this ubiquitous format. JDF and Adobe XMP, two XML-based formats, are often used in the publishing industry in addition to generic XML.

Metadata categories

Switch recognizes three categories of metadata depending on the storage mechanism used to convey the information, as described in the following table.

Category	Description
Internal	Switch-specific information stored in the internal job ticket for each job; for example hierarchy info and email info
Embedded	Metadata that is embedded inside the job (as part of the file); for example EXIF or IPTC tags, or an embedded Adobe XMP packet; see *Embedded metadata* on page 385.
External	Metadata that travels with the job but is stored as a distinct entity; for example an XML or JDF file, or a standalone Adobe XMP packet (possibly extracted from the job file); see *External metadata* on page 388.

Support for metadata

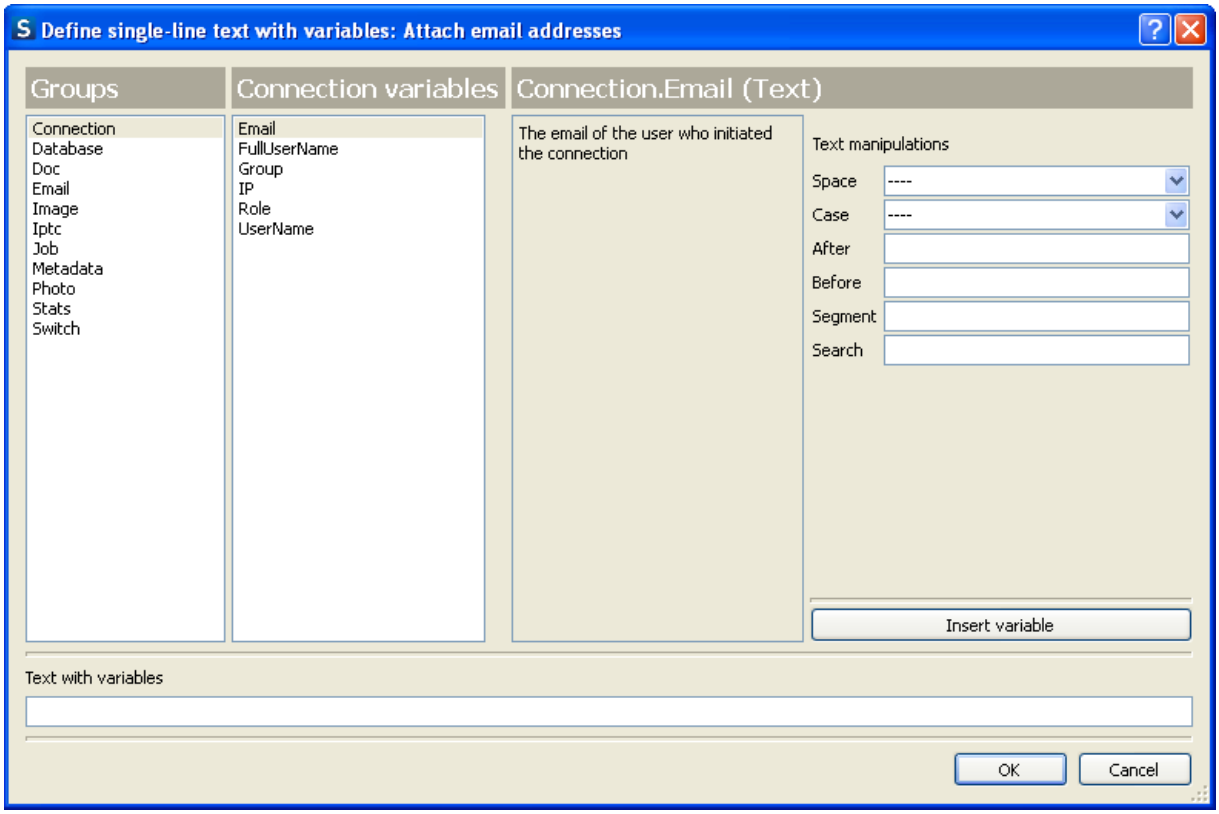
Switch supports working with metadata in various ways as defined in the following table.

Feature	Benefits
Internal job ticket	Maintaining hierarchy info, email info and other internal metadata used by the Switch tools
Variables	Read-only access to embedded metadata (EXIF, IPTC, XMP) and file information

Feature	Benefits
Pick-up and export	Picking up external metadata (XML, JDF, XMP) from foreign sources and exporting it for external use
Scripting	Read-write access to embedded metadata and external metadata

Defining text with variables

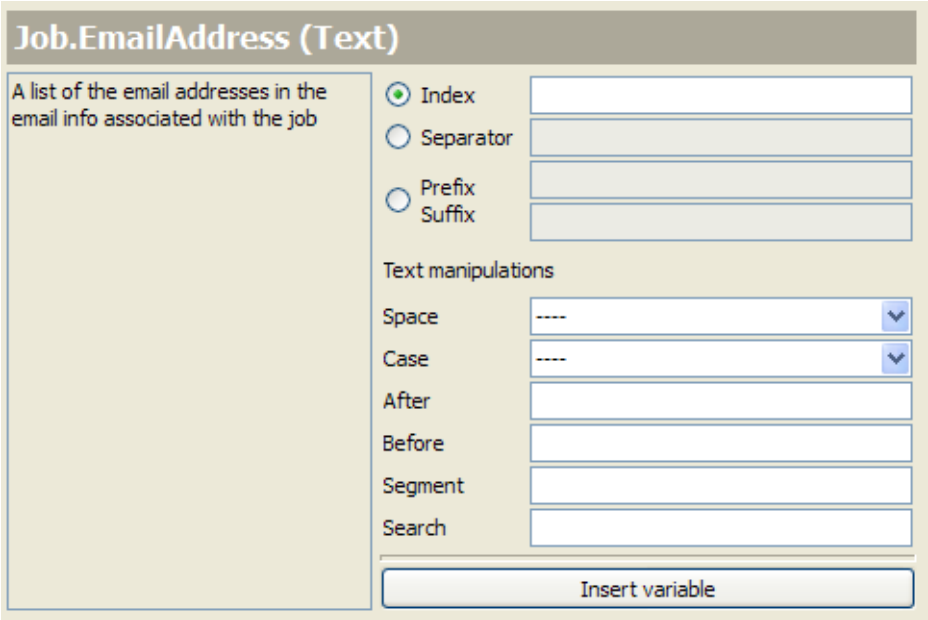
Text properties that support variables can be edited with the **Define single-line text with variables** property editor.



The text field at the bottom contains the text being edited. Variables are simply mixed-in with static text and enclosed in square brackets [ ] (see *Variables* on page 353). The list boxes and text fields in the top portion of the property editor offer guidance for dealing with variables, as explained below.

Arguments

The rightmost column shows any arguments relevant for the selected variable; for example:



See *Data types* on page 356, *Formatting* on page 357, *Indexed variables* on page 360, and *String manipulations* on page 361.

Entering text

You can type constant text in the text field at the bottom at any time. You can also leave the field empty and just insert one or more variables using the procedures explained in the following sections.

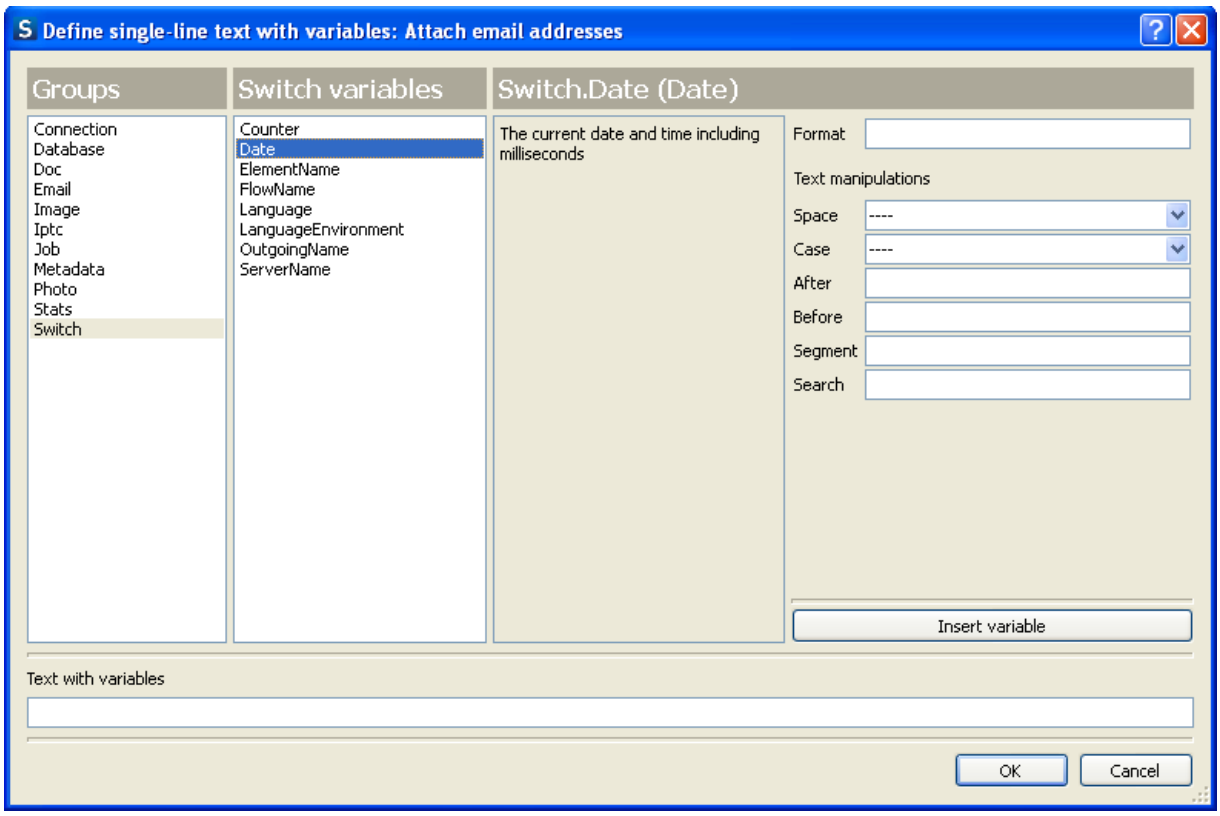
If you understand variable syntax, you can enter or modify variables directly in the text field. However, it makes more sense to let the Property editor assist you with inserting and updating variables, as explained below.

Inserting a variable

Note: Switch interprets the opening square bracket '[' as the beginning of a new variable. To use the square bracket as static text, you need to double it: '[[']. Note that there is no need to double the closing square bracket.

Example:

- **Input:** This the value of the [[Job.Name] variable: [Job.Name] *(the first instance of [Job.Name] is to be interpreted as static text; the second as a variable)*
- **Result for a job with the name TestFile.pdf:** This is the value of the [Job.Name] variable: TestFile.pdf *(only the second instance of [Job.Name] is replaced by the actual job name)*



To insert a new variable in the text, proceed as follows:

1. In the text field at the bottom, place the text cursor in the location where you'd like to insert a variable; make sure it is not inside a pair of square brackets [ ] that mark a variable; if the text field is empty, just leave the cursor at the start of the field.
2. Select a variable group in the leftmost list ("Switch" in the example above); the list to the right adjusts to list all the variables in this group.
3. Select a variable in the second list ("Date" in the example above); the text area to the right adjusts to provide a brief description of the variable, the title bar indicates the variable's data type, and the rightmost column shows any arguments relevant for this variable (see *Characteristics of variables* on page 354).
4. If the rightmost column contains any text fields, enter the appropriate values for the variable's arguments (see *Metadata* on page 385); leave a field blank to use its default value.
5. Once you are satisfied with the selected variable and argument values, click the **Insert variable** button.

Updating a variable

To update a variable that was previously inserted, proceed as follows:

1. In the text field at the bottom, place the text cursor inside the variable you would like to update, that is, inside the pair of square brackets [ ] that mark the variable; the fields in the top portion of the property editor automatically synchronize with the contents of the variable.

2. Adjust the argument values for the variable in the text fields at the right, or select a new variable (possibly in another group) as desired.
3. Once you are satisfied with the changes, click the **Update variable** button.

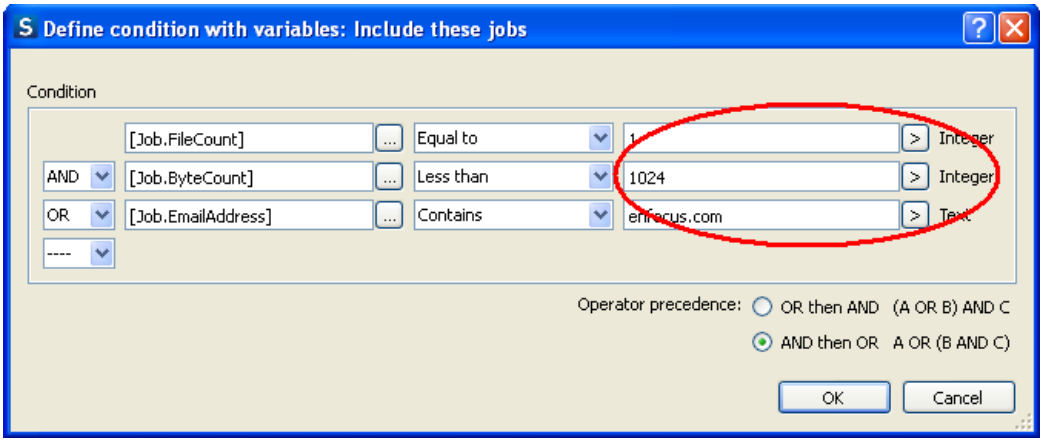
Defining a condition with variables

Conditional properties that support variables can be edited with the **Define condition with variables** property editor. A conditional property has a Boolean result (true or false). For example, the file filtering properties on connections are conditional properties.

The property editor discussed here offers a user interface to create comparison expressions with support for locating a variable and entering its arguments.

Its more advantageous to compare variables from a job with other variables (for example: from an external source like database or dataset). Therefore, Switch allows users to select multiple variables when setting up a condition. Select one of the following three property editors in the drop-down menu (highlighted in the screen given below):

- Inline value
- Text with variables...
- Script expression...



The example condition is true if the job being tested contains a single file smaller than 1MB or if one of the associated email addresses has the 'enfocus.com' domain.

Defining a condition

The property editor has two distinct parts:

- The main dialog box which allows defining one or more comparisons between a variable and a constant value, forming the condition.
- The pop-up dialog box which serves to locate a variable and enter its arguments, similar to defining text with variables.

The group and variable listboxes in the pop-up are synchronized with the corresponding dropdown menus for the currently selected comparison in the main dialog box.

Defining a single comparison

When the property editor for a certain property is displayed for the first time, a single comparison row is shown. To define this comparison, proceed as follows:

1. Click this button beside the first textbox. The **Define text with variables** dialog box appears.
2. Select a variable group in the first listbox. The second listbox adjusts to list all the variables in this group. Select a variable in the second listbox.
   - The text area to the right adjusts to provide a brief description of the variable, the title bar indicates the variable's data type, and the rightmost column shows any arguments relevant for this variable (see characteristics of variables).
3. Click **Insert variable** button.
   - **Define text with variables** pop-up dialog box closes.
   - The selected variable group and variable are inserted in the first textbox of the main dialog box.
4. The dropdown menu next to the textbox adjusts to list the appropriate comparison operators for the variable's data type. Select the desired comparison operator.
5. In the last dropdown menu, select the appropriate property editor. Enter or select the appropriate values.
6. Once you are satisfied with the configuration, click the **OK** button.

Defining multiple comparisons

The property editor allows defining a condition that combines multiple comparisons. Each comparison is represented as a separate row in the lower portion of the property editor. The radio button in front of each row indicate which of the comparisons is currently synchronized with the upper portion of the property editor; it is called the currently selected comparison.

The dropdown menu to the left of each row (starting with the second row) indicates the logical operator (OR or AND) used to combine the consecutive comparisons. It is also used to add and remove comparison rows.

- To add a new comparison:
  1. Locate the dropdown menu at the bottom left (in front of an empty row) displaying "----".
  2. In that dropdown menu, select the desired logical operator "AND" or "OR" instead; a new comparison row is added.
- To remove a previously added comparison:
  1. Locate the dropdown menu at the start of the comparison row displaying the logical operator "AND" or "OR".
  2. In that dropdown menu, select "----" instead; the comparison row is removed.

  You cannot remove the first condition since it does not have a logical operator dropdown menu.
- To change the logical operator combining two comparisons:

1. Locate the dropdown menu at the start of the second comparison row displaying the logical operator "AND" or "OR".
2. In that dropdown menu, select the other logical operator instead; be careful NOT to select "----" because that would cause the comparison row to be removed.

Operator precedence

If three or more comparison rows are combined with different logical operators (that is, both "AND" and "OR" are used), the meaning of the condition depends on the order in which the logical operations are performed. Thus in that case the property editor displays an extra section at the very bottom, allowing to select operator precedence:

- OR then AND: the logical OR operations are performed first, then the logical AND operations.
- AND then OR: the logical AND operations are performed first, then the logical OR operations.

The following table provides some examples of conditions with their meaning for each choice of operator precedence.

Condition	OR then AND means	AND then OR means
A OR B AND C	(A OR B) AND C	A OR (B AND C)
A OR B AND C OR D	(A OR B) AND (C OR D)	A OR (B AND C) OR D
A AND B OR C AND D	A AND (B OR C) AND D	(A AND B) OR (C AND D)
A AND B OR C OR D	A AND (B OR C OR D)	(A AND B) OR C OR D

Comparison operators

Variable data type	Comparison operators	Comparison value
Text	Equal to Not equal to Contains Does not contain Starts with Does not start with	Any text string
	Matches Does not match	A regular expression
Boolean	True False	None
Integer Rational	Equal to Not equal to Less than	A decimal integer or floating point number, example, "-12" or "0.56" A constant expression using + - * / operators; example:

Variable data type	Comparison operators	Comparison value
	Less than or equal Greater than Greater than or equal	• 5 * 1024 * 1024 • 2/3 • 6.77 + 8.55
Date	Equal to Not equal to Earlier than Earlier than or same Later than Later than or same	An ISO 8601 formatted date/time (equivalent to format string "yyyy-MM-ddThh:mm:ss.zzz") or any portion thereof. If present, the date part of the string must have one of the following formats: "yyyy-MM-dd", "yyyy-MM", "yyyy". For example, you may enter "yyyy-MM" for the format string and "2019-01" as the comparison value to compare year and month.

Sample jobs

Defining text with variables and Defining a condition with variables offer a mechanism to display actual metadata variables derived from sample jobs while configuring the property value(s) in the editor.

Limitations

A job can be a sample job only if it has a unique name prefix and a valid internal job ticket.

Sample jobs should be entered as live jobs into the flow being edited so that they can be managed by Switch and variables can be tracked.

Working with sample jobs

To benefit from this feature, you should design a prototype of the desired flow and process one or more sample jobs through the flow to the point where the jobs have accumulated the relevant metadata.

Follow these steps to work with a sample job in your flow:

1. Create a valid prototype of the desired flow.
2. Activate the flow.
3. Put the connections which are present at the end of the flow on hold to prevent jobs from completing the flow. This allows Switch to detect all the variables that are available in the sample job.
4. Place sample jobs in the flow and let them process to the desired stage.
5. Deactivate the flow.
6. Do one of the following:

- Bring up the desired property editor that supports variables.
- Click the **Inspect jobs** button in the toolbar.
- Click the **Flow** > **Inspect jobs** menu option.

7. In the upper part of the dialog that pops up, select the job that you want to inspect.

   Note that, in the top right corner, there is a **search field** where you can enter a string to search for the sample job you need. Click the search button and select the option of your choice (Search sample job name / prefix / flow element).

   If there are no sample jobs in the flow, this part of the dialog will be collapsed and the **Show sample jobs** checkbox will be cleared. You may clear this checkbox yourself to improve the speed, because loading a dialog with a huge amount of sample jobs may affect the performance.

8. Select the variable you want to check by clicking the appropriate item in each column. For example, if you want to check the date the job was processed by Switch (represented by the Switch.Date variable):

   - In the first column (Groups), select Switch.
   - In the second column (Switch variables), select Date.
   - In the third column, enter the format of your choice, e.g. dd.MM.yyyy

   The *sample value* is shown in the lower part of the third column. If there's no value specified, you'll see the string 'Sample value'. The *variable* is shown in the bottom right corner. You can use the **Copy to clipboard** button to copy-paste it to the property editor where you want to use it.

Building a location path

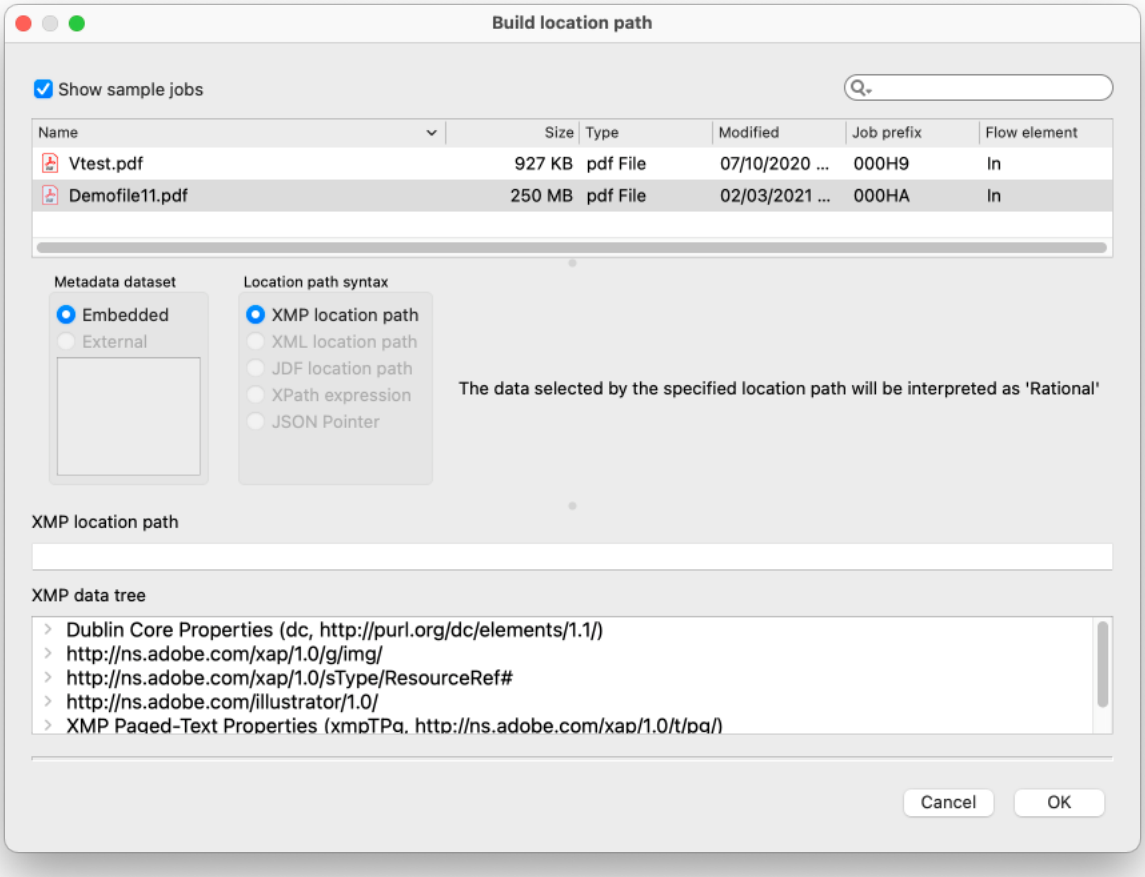
The "Build location path" dialog offers assistance with building location paths for the variables in the Metadata group using picked up metadata by a sample job. The dialog supports the various data models known in Switch.

See also *XMP location path syntax* on page 406.

Showing the dialog

The property editors **Defining text with variables** and **Defining a condition with variables** show a button called **Build location path** when a variable in the Metadata group is selected and at least one valid sample job is available (See *Working with sample jobs* on page 349).

When you click this button, the **Build location path** dialog is displayed. When you click the **OK** button after some modifications, the selected Metadata variable is updated accordingly.



Metadata dataset

This section lists the various datasets associated with the job. You can select the embedded dataset (which is always available, even if it is empty) or one of the external datasets associated with the job (if any).

Location path syntax

The data model for the selected dataset determines the available options for the location path syntax. Unavailable options are automatically disabled in the user interface.

The selected location path syntax determines the layout and behavior of the dialog's bottom portion, as described in the following sections.

Location path

For the choices "XMP/XML/JDF location path" and "JSON Pointer" the bottom part of the dialog displays the following two items:

- An editable text field labeled "xxx location path" or "JSON Pointer" respectively.
- A tree view representing the metadata in the sample document, labeled "xxx data tree".

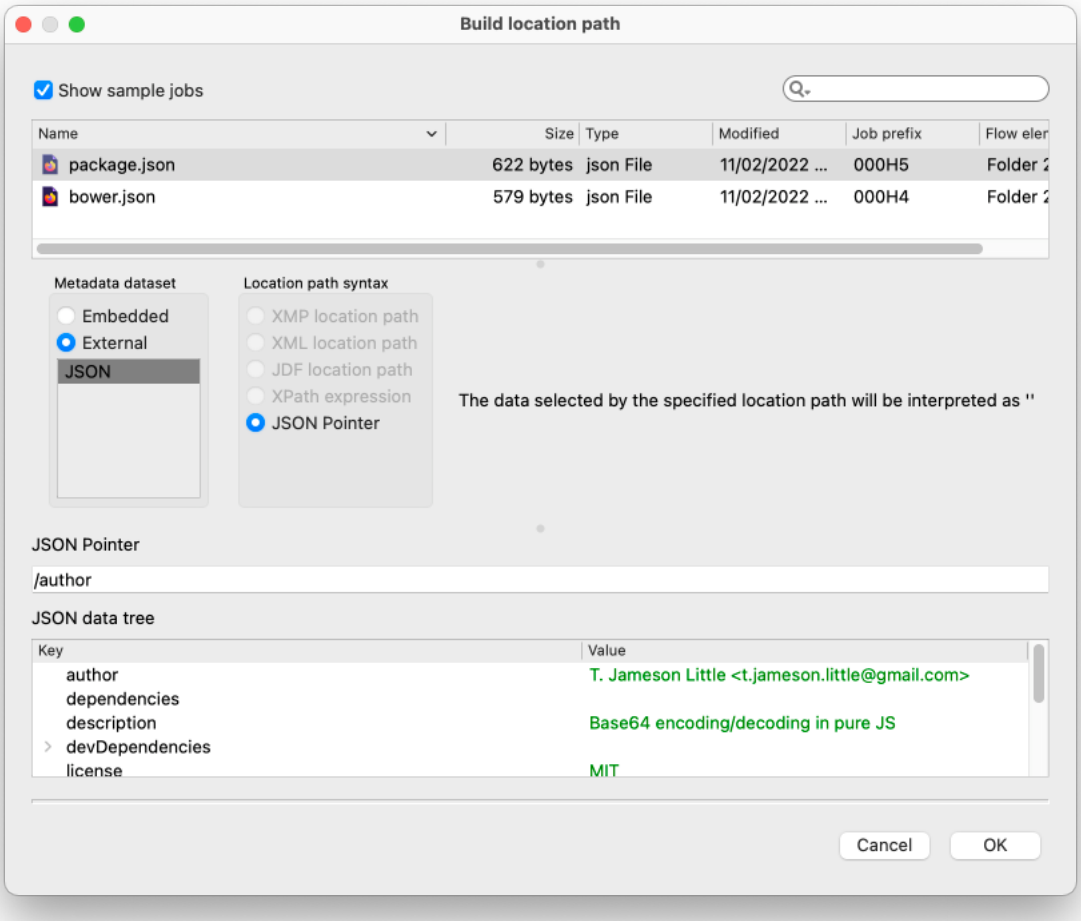
You can expand and collapse the nodes in the tree view, but the tree is not otherwise editable.

When you select a node in the tree view, the dialog displays the corresponding location path (JSON pointer) in the editable text field (discarding anything that was already there).

Vice versa, when you modify the contents of the editable text field, and the contents represents a valid location path (JSON Pointer) pointing to an existing node, the dialog selects that node in the tree (and expands and scrolls the view to make it visible if needed).

For the JSON data model, the tree view uses different colors when showing the values to specify the value types. In case of an array value, the array items indexes are shown in the 'Key' column using the Italic font style.

The OK button is enabled only if the location path (JSON Pointer) is valid and the selected node is compatible with the selected result data type; otherwise an appropriate alert message is shown at the bottom of the dialog.



XPath expression

For the choice "XPath expression" the bottom part of the dialog displays the following items:

- An editable text field labeled "XPath expression".

- A read-only text field that displays the result type and value of the expression as it is evaluated against the metadata, for example: "Integer: 5", "Boolean: false" or "Node set: 3 element nodes"
- A control bar with buttons and checkboxes (see below).
- A read-only multi-line text field that displays the XML for the sample metadata and highlights the nodes in the result node set, if any.

When you modify the contents of the editable text field, and the contents represents a valid XPath expression, the text fields are automatically updated to reflect the expression's result.

The control bar offers buttons to navigate between the nodes in a result node set, and two checkboxes that affect the XML display:

- Auto-indent: when turned on, the XML is "pretty-printed" with nested indentation.
- Color-code: when turned on, each XML node type is displayed in a different color.

The **OK** button is enabled only if the XPath expression is valid and its data type is compatible with the selected result data type; otherwise an appropriate alert message is shown at the bottom of the dialog.

5.5.2.3. Metadata reference

Variables

Using variables

Switch allows the use of variables in the values of many text properties and for defining file filters. A variable is a special, well-recognizable text string that gets replaced by a dynamic value when the flow is being executed. The dynamic value is recalculated each time in the context of the job being processed.

Variables provide access to run-time information about the flow environment and about a job, including embedded metadata fields (and external metadata fields), without the need for scripting. This lowers the barrier for accessing dynamic information in a flow definition since most users will find it is much easier to use a variable than to create a script expression.

Entering Variables

Text properties

Variables in text properties are simply mixed-in with static text. Users can insert a variable in two distinct ways:

- Directly type the variable with the appropriate syntax when entering the text; this requires understanding variable syntax.
- Use the define text with variables property editor for locating the variable and entering its arguments; the formatted variable is automatically inserted in the text.

Most users will prefer the second method; however in both cases the final result is regular text (with variables). When the value of a text property that supports variables is needed while executing a flow, Switch scans the text for variables and replaces them by their dynamic value in the context of the current job. All text outside variables remains unchanged.

Conditional properties

A conditional property has a Boolean result (true or false). For example, the file filtering properties on connections are conditional properties.

A variable-based conditional property is entered through a special property editor that offers a user interface to create basic comparison expressions with support for locating a variable and entering its arguments. See defining a condition with variables.

When the value of a condition with variables is needed while executing a flow, Switch replaces the variables by their dynamic value in the context of the current job and evaluates the expression.

Using sample jobs

The variable-related property editors (Defining text with variables and Defining a condition with variables) offer a mechanism to select a sample job and to display actual metadata values derived from that job while you are configuring (portions of) the property value in the editor.

The Build location path dialog offers assistance with building location paths for the variables in the Metadata group using actual metadata associated with a sample job.

List of variables

Switch offers a library of variables organized in groups, accessing Switch-specific flow and job information, various types of metadata embedded in or a associated with a job, and statistics derived from the file's contents.

See *Known variables* on page 362 for a complete list.

Characteristics of variables

Name

Each variable is identified by a name including the group name and the variable name proper. For example: "Switch.Counter" or "Photo.ExposureTime".

See *Basic syntax* on page 355.

Arguments

Some variables can have arguments to help determine the dynamic value or the value's formatting. For example, the "Switch.Counter" variable supports two arguments called "Width" and "Id", and the "Switch.Date" variable supports an argument called "Format".

See *Basic syntax* on page 355, *Formatting* on page 357, *Indexed variables* on page 360, *String manipulations* on page 361.

Data type

Each variable has a specific data type, which is indicated with the variable's description. The data type is important for two reasons:

- For some data types, the formatting of the variable's text representation can be influenced by specifying an appropriate argument for the variable.
- When using a variable in a condition, the data type determines the type of comparison performed.

See *Data types* on page 356, *Formatting* on page 357, *String manipulations* on page 361.

Indexed variables

Some variables access a list of values rather than a single value. These variables are called indexed variables. For example, the "Job.EmailAddress" variable accesses a list of all email addresses associated with the job.

Depending on the arguments specified with it, an indexed variable may evaluate to a concatenated list of all items (with a customizable separator) or to one particular item from the list.

See *Indexed variables* on page 360.

Basic syntax

Variable name

In its simplest form, a variable is specified as follows:

```
[Group.Variable]
```

The variable name is surrounded by square brackets. Whitespace is not allowed in the variable specification.

Variable names contain two segments separated with a period. The first segment is the group name; the second segment is the variable name within the group.

Arguments

Some variables can contain arguments that help determine the variable's dynamic value. Arguments are specified as follows:

```
[Group.Variable:ArgumentName1="Value",ArgumentName2="Value"]
```

In this example, two arguments are defined with names "ArgumentName1" and "ArgumentName2". If a variable has arguments, the variable name is followed by a colon which is followed by the arguments. For each argument, the argument name is followed by an equal sign and the value of that argument between single or double quotes. The value can contain single quotes if it is double-quoted, or double quotes if it is single-quoted. A comma separates the arguments if there is more than one. A variable specification must not contain any whitespace except when required in a quoted argument value.

Nested variables

The Expression argument of the [Switch.Calculation] variable and the SQL arguments of Database variables can contain nested variables. These variables are used to define the value of the argument.

```
[Group.Variable:ArgumentName1="[Variable1]"]
```

Nested variables have the same syntax as the regular variables and are always surrounded by square brackets.

Some examples:

- [Switch.Calculation:Expression="[Job.Size]"]
- [Database.TextIndexed:SQL="SELECT JobName FROM Jobs",Connection="DBConnection",Separator=", "]

- [Database.Text:SQL="SELECT JobName FROM Files WHERE FileName='[Job.Name]'",Connection="DBConnection"]

Note: Nested variables are not allowed in other types of arguments. If you use them, they will be ignored and treated as regular text.

Nesting can be multi-level, i.e. nested variables can contain other nested variables.

Example:

- [Database.Text:SQL="SELECT PublisherName FROM Jobs WHERE JobName='[Database.Text:SQL="SELECT JobName FROM Files WHERE FileName='[Job.Name]'",Connection="DBConnection"]'",Connection="DBConnection"]

  (where the nested variable [Job.Name] is included in the variable [Database.Text:SQL="SELECT JobName FROM Files WHERE FileName='[Job.Name]'",Connection="DBConnection"])

Note: If used in an argument that supports nested variables, the opening square bracket '[' is interpreted by Switch as the beginning of a new variable. To use the square bracket as static text, you need to double it: '[[']. Note that there is no need to double the closing square bracket.

Example:

- **If there is a variable** [Database.Text:SQL="SELECT [[JobName] FROM Files WHERE FileName='[Job.Name]'",Connection="DBConnection"]
- **For a job with the name TestFile.pdf**, the SQL request SELECT [JobName] FROM Files WHERE FileName='TestFile.pdf' will be executed.

See also:

- *Data types* on page 356
- *Formatting* on page 357
- *Comparing* on page 359
- *Indexed variables* on page 360
- *String manipulations* on page 361

Data types

Each variable has a specific data type, which is indicated with the variable's description. The data type is important for two reasons:

- For some data types, the formatting of the variable's text representation can be influenced by specifying an appropriate argument for the variable.
- When using a variable in a condition, the data type determines the type of comparison performed with the dynamic value.

The following table lists the supported data types for variables.

Data type	Description
Text	Text string
Alt Text	Possibly localized text string (that is, there may be multiple language versions)

Data type	Description
	Switch always uses the default language; so this data type is equivalent to Text
Text Indexed	List of items of type Text (see indexed variables)
Boolean	Boolean value true or false
Integer	Integer number
Rational	Rational number formed by division of two integers
Date	A moment in time, including date and/or time information

See also:

- *Basic syntax* on page 355
- *Formatting* on page 357
- *Comparing* on page 359
- *Indexed variables* on page 360
- *String manipulations* on page 361

Formatting

The following table describes the formatting options for each data type, including:

- The default representation which is used when no formatting arguments are present.
- The supported formatting arguments, if any, and the corresponding representation.

Data type	Description of data type / Formatting argument	Representation as a text string
Text	Text string	Text string
Alt Text	Possibly localized text string	Text string (Switch always uses the default language)
Text Indexed	List of items of type Text	See indexed variables
Boolean	Boolean value true or false	"True" or "False" (or all-lower-case versions)
Integer	Integer number	Decimal representation (including minus sign if needed; no plus sign; no leading zeros)
Rational	Rational number formed by division of two integers	Decimal representation of the form: numerator, forward slash, denominator; example: "2/3" or "-17/4"
	Precision="integer"	Decimal floating point representation with the specified number of digits after the decimal point (minimum precision is 1, max is 15)

Data type	Description of data type / Formatting argument	Representation as a text string
Date	A moment in time, including date and/or time information	String representation in the subset of the ISO 8601 format allowed in XMP Date fields (see Adobe XMP specification, version dated September 2005, page 75) Equivalent to format string "yyyy-MM-ddThh:mm:ss.zzz"
	Format="format-string"	String representation in the format specified by the format string, which must conform to the syntax described below

Date format string

The following format expressions are recognized and replaced in the date format string:

Expression	Output
d	the day as number without a leading zero (1 to 31)
dd	the day as number with a leading zero (01 to 31)
ddd	the abbreviated day name (example: 'Mon' to 'Sun')
dddd	the long day name (example: 'Monday' to 'Sunday')
M	the month as number without a leading zero (1-12)
MM	the month as number with a leading zero (01-12)
MMM	the abbreviated month name (example: 'Jan' to 'Dec')
MMMM	the long month name (example: 'January' to 'December')
yy	the year as two digit number (00-99)
yyyy	the year as four digit number
h	the hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display)
hh	the hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display)
H	the hour without a leading zero (0 to 23, even with AM/PM display)
HH	the hour with a leading zero (00 to 23, even with AM/PM display)
m	the minute without a leading zero (0 to 59)
mm	the minute with a leading zero (00 to 59)

Expression	Output
s	the second without a leading zero (0 to 59)
ss	the second with a leading zero (00 to 59)
z	the milliseconds without leading zeros (0 to 999)
zzz	the milliseconds with leading zeros (000 to 999)
AP or A	use AM/PM display; AP will be replaced by either "AM" or "PM"
ap or a	use am/pm display; ap will be replaced by either "am" or "pm"
t	the timezone (for example "CEST")
'...'	any sequence of characters enclosed in single quotes is treated as literal text

See also:

- *Basic syntax* on page 355
- *Data types* on page 356
- *Comparing* on page 359
- *Indexed variables* on page 360
- *String manipulations* on page 361

Comparing

Type of comparison

A variable's data type determines the type of comparison performed in a condition involving the variable. This is important because comparison semantics for numbers, strings and dates are very different.

Variable data type	Comparison semantics
Text	String
Alt Text	String
Text Indexed	String
Boolean	Boolean
Integer	Number
Rational	Number
Date	Date

Value used for comparison

When used in a condition, the variable's value is obtained in two steps:

- First the text representation of the variable is formatted as usual (see formatting); this allows influencing the value in interesting ways, such as rounding a rational number or extracting a date from a date/time.
- Then the value is converted to the data type appropriate for the comparison type (example: string, number, ...); as indicated in the table above.

See also:

- *Basic syntax* on page 355
- *Data types* on page 356
- *Formatting* on page 357
- *Indexed variables* on page 360
- *String manipulations* on page 361

Indexed variables

Some variables access a list of values rather than a single value. These variables are called indexed variables. All indexed variables support the indexing arguments described in this section.

In general, if an Index argument is provided for an indexed variable, the variable evaluates to a single value from the list. Otherwise, the variable evaluates to a sequence that contains all values in the list. The following table describes the indexing arguments and their effect in more detail.

Indexing arguments provided(don't combine!)	Description of result
None	Concatenation of all values in the list separated by a semicolon, all on the same line If there are no values, the result is the empty string
Index="integer"	The list value indicated by the specified one-based index If the Index argument is provided, all other arguments are ignored
Separator="separator-string"	Concatenation of all values in the list separated by the specified string, all on the same line If there are no values, the result is the empty string If the Separator argument is provided, the Prefix and Suffix arguments are ignored
Prefix="prefix-string" Suffix="suffix-string"	Concatenation of all values in the list, each on a separate line of the form: <prefix-string><value><suffix-string> If there are no values, the result is the empty string

Examples

Text in a property value	Evaluates to
[Job.EmailAddress:Index="1"]	tvr1@enfocus.com

Text in a property value	Evaluates to
[Job.EmailAddress]	tvr1@enfocus.com;tvr2@enfocus.com
[Job.EmailAddress:Separator=", "]	tvr1@enfocus.com, tvr2@enfocus.com
The email addresses for this job are: [Job.EmailAddress:Prefix=" - "]	The email addresses for this job are: - tvr1@enfocus.com - tvr2@enfocus.com

See also:

- *Basic syntax* on page 355
- *Data types* on page 356
- *Formatting* on page 357
- *Comparing* on page 359
- *String manipulations* on page 361

String manipulations

Variables of data type Text, Alt Text and Text Indexed support additional arguments to perform simple manipulations on the text value of the variable. For Indexed variables, the manipulation is performed on each item in the list (that is, before the items are sequenced).

If multiple arguments are present, the manipulations are performed in the order as they are listed in the table (regardless of the order in which they occur in the variable).

Argument	Value	Result
Space	One of "trim", "norm"	trim = leading and trailing white space removed norm = trimmed and consecutive white space compressed to a single space
Case	One of "upper", "lower", "first", "word"	The string converted to the specified case (first = first character is upper case, word = first character of every word is upper case)
After	Search string (non-empty)	The substring after (and not including) the last occurrence of the search string
Before	Search string (non-empty)	The substring before (and not including) the first occurrence of the search string
Segment	Start and end index (one-based) separated by a comma or a hyphen; if one of the indices is missing this	The substring between and including the characters indicated by the indices

Argument	Value	Result
	indicates the start or end of the string	
Search	Regular expression (use anchors to match start or end of string)	The first substring that matches the regular expression

See also:

- *Basic syntax* on page 355
- *Data types* on page 356
- *Formatting* on page 357
- *Comparing* on page 359
- *Indexed variables* on page 360

Known variables

Switch offers a library of variables organized in groups, as listed in the table below. Follow the links in the first column in this table for a list of variables in each group, with corresponding technical reference information.

A description for each variable is displayed in the property editors for defining text with variables and defining a condition with variables. This description is not repeated in the help topics.

Group	Type of information	Source
Connection	Client connection attributes like user name, IP...	Switch settings, system environment
Database	Database fields **Note:** This group is only available if you have an active license for the Switch Databases Module.	Database (ODBC dataset)
Doc	Title, keywords, author(s), copyright terms	Embedded metadata: XMP
Email	Components of the email message through which this job was originally delivered	Mail receive flow element
Image	Resolution, orientation, color mode	Embedded metadata: EXIF (TIFF tags)
Iptc	Contact, location, headline, instructions	Embedded metadata: IPTC
Job	Filename, size, email info, hierarchy info, fail info, origin	File system, internal job ticket

Group	Type of information	Source
Metadata	Arbitrary field in any dataset associated with the job	External metadata or embedded metadata
Office	Microsoft Office variables, such as Application (Excel, PowerPoint, Word), Author, Description, Presentation Format, ...	Embedded Microsoft Office metadata
Photo	Exposure time, aperture, focus, flash	Embedded metadata: EXIF (EXIF tags)
Stats	File format, number of pages, page labels, colorants	File format & contents
Switch	Flow element name, date/time, counter	Flow definition, system environment

Connection group

These variables are Switch-specific. They provide access to the attributes of the client connection. The third column indicates the scripting API function that returns the variable's dynamic value.

Variable name	Data type	Scripting API equivalent
Connection.Email	Text	ClientConnection.getEmail()
Connection.UserName	Text	ClientConnection.getUserName()
Connection.FullUserName	Text	ClientConnection.getFullUserName()
Connection.IP	Text	ClientConnection.getIP()

Note: The variables from this group are valid only in context of a client connection. Please refer to the note in the description of the method Environment.getClientConnection(). When used without an active client connection, the Connection variables will return empty values. This amounts to the empty string for Text variables and 0 for Integer variables.

Database variables

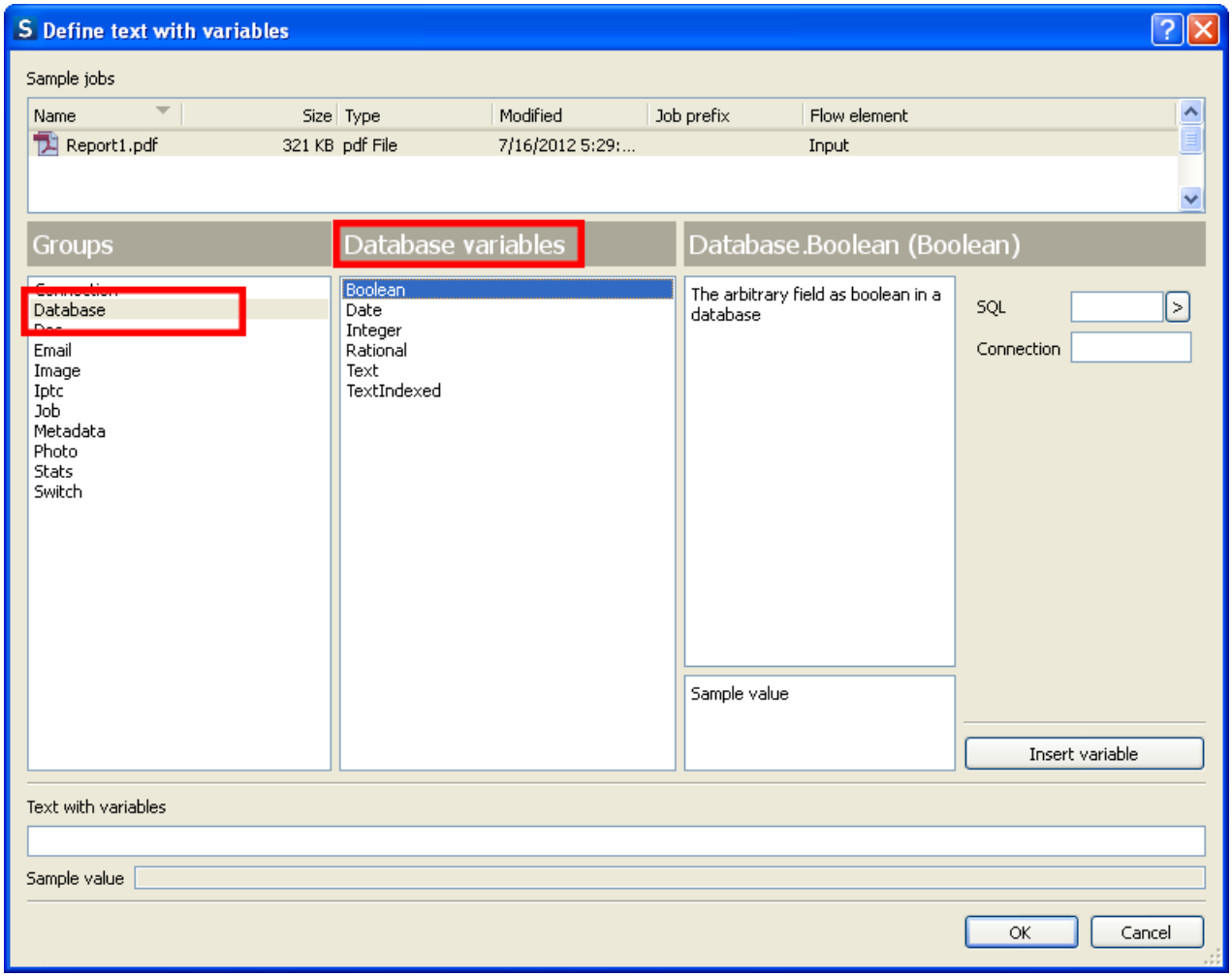
What are database variables?

Database variables are variables that at run-time are replaced with values from a database. These variables can only be used if you have an active license for the Switch Databases Module.

You can use the database variables in the same way as the regular Switch variables:

- Use them as values for the *tools and app* properties.
- Use them as values for *conditions*, for example to filter jobs on a connection.
- Use them as values to fill a drop-down menu in the Submit point and Checkpoint *metadata* properties.

They are also accessible in the same way as other variables, i.e. via the **Define Text/Condition with Variables** option in the properties of the Switch tools. They are collected in a separate group: the "Database" variable group (see screenshot).



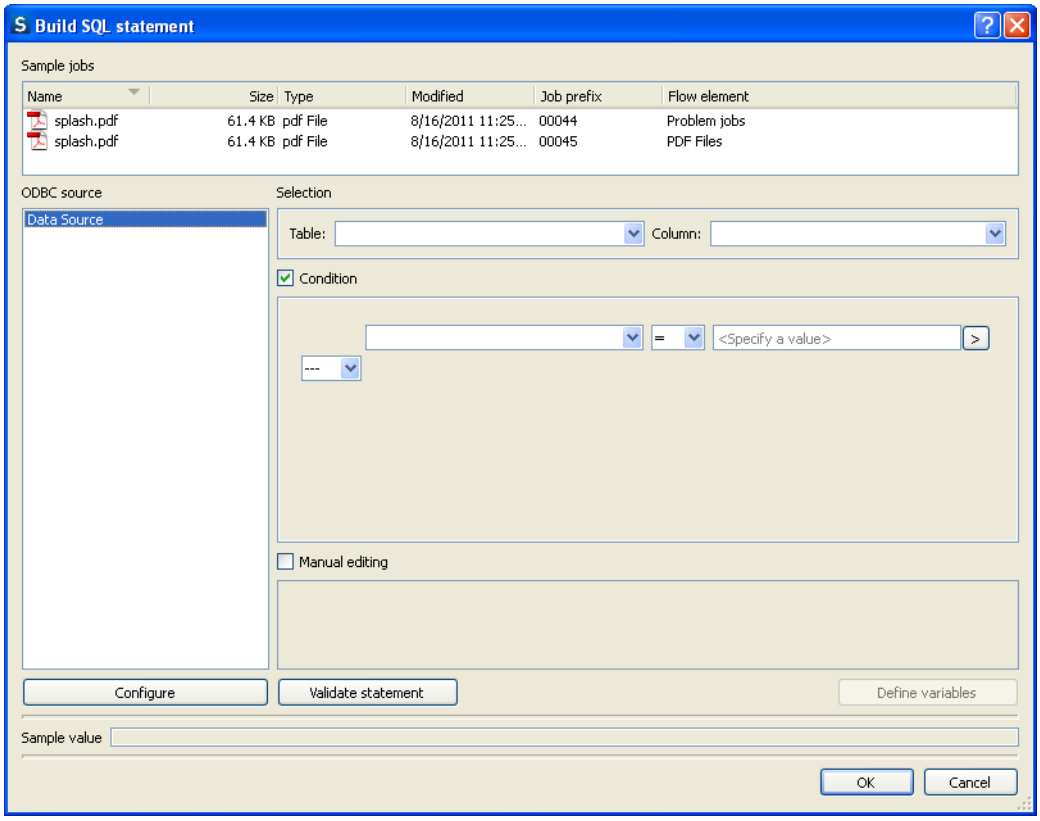
The table below lists the available data types.

Variable name	Data type
Database.Text	Text
Database.TextIndexed	Text Indexed
Database.Boolean	Boolean
Database.Integer	Integer
Database.Rational	Rational
Database.Date	Date

How to build an SQL statement?

After you have selected the Database group in the first column, and the data type in the second column, you must create an SQL statement. The Build SQL statement dialog box (see screenshot) will assist you in creating the SELECT statement and obtaining the appropriate values from the database.

Tip: We recommend using a sample job, so you can see immediately if your SQL statement is valid and correct.



To build an SQL statement, proceed as follows:

1. Click the button beside the **SQL** textbox and choose **Build SQL statement**.
2. Select a data source.
   a. Click the **Configure** button.
   b. In the **ODBC data sources** dialog, select a data source from the list of predefined data sources (Refer to *ODBC data sources* for more information on how to define the data sources).
3. Select a table and a column in the **Table** and the **Column** drop-down menus.
4. Select the **Condition** checkbox and specify or select the conditions in the first and the third menu, choose the comparison operator in the middle drop-down menu and choose the AND or OR logical operator in the last drop-down menu.
5. Alternatively, in order to choose more than one column or to choose a column from any other table or not to choose any columns, select the **Manual editing** checkbox and enter the statement manually.

6. After setting the SQL statement, click the **Validate statement** button to check if the query is valid. If the query returns any value or error, it is displayed on screen. The **Sample value** menu displays the sample value for a query. If a query returns multiple values, they will be listed in a comma separated list. For example: "val11,val12,val21,val22...".
7. Click the **OK** button to insert the statement.

Doc group

These variables access embedded metadata fields in the Adobe XMP format. The third column indicates the XMP location path for the variable in the XMP data model.

The metadata fields accessed by the variables in this table can be viewed and edited using the "File > File Info..." dialog in Adobe Creative Suite applications. The fourth column indicates the label of the field that corresponds to each variable.

The "Alt Text" data type indicates a possibly localized text string (that is, there may be multiple language versions). Switch always uses the default language; so this data type is equivalent to Text.

Variable name	Data type	XMP location path	Acrobat Document Properties label	Photoshop File Info label
Doc.Application	Text	xmp:CreatorTool	Application	Description / Application
Doc.Author	Text	dc:creator/*[1]		Description / Author
Doc.Authors	Text Indexed	dc:creator	Author	Description / Author
Doc.AuthorTitle	Text	photoshop: AuthorsPosition		Description / Author Title
Doc.Category	Text	photoshop: Category		Categories / Category
Doc.City	Text	photoshop:City		Origin / City IPTC Image / City
Doc.Copyright Notice	Alt Text	dc:rights		Description / Copyright Notice
Doc.Copyright Status	Boolean	xapRights: Marked		Description / Copyright Status
Doc.Copyright Terms	Alt Text	xapRights: UsageTerms		IPTC Status / Rights Usage Terms
Doc.Copyright URL	Text	xapRights: WebStatement		Description / Copyright Info URL
Doc.Country	Text	photoshop: Country		IPTC Image / Country

Variable name	Data type	XMP location path	Acrobat Document Properties label	Photoshop File Info label
Doc.Created	Date	xmp:CreateDate		Description / Created
Doc.Credit	Text	photoshop:Credit		Origin / Credit IPTC Status / Provider
Doc.DateCreated	Date	photoshop: DateCreated	Created	Origin / Date Created
Doc.Description	Alt Text	dc:description	Subject	Description / Description
Doc.Description Writer	Text	photoshop: CaptionWriter		Description / Description Writer
Doc.Format	Text	dc:format		Description / Format
Doc.Headline	Text	photoshop: Headline		Origin / Headline IPTC Content / Headline
Doc.Instructions	Text	photoshop: Instructions		Origin / Instructions IPTC Status / Instructions
Doc.Keywords	Text Indexed	dc:subject	Keywords	Description / Keywords
Doc.Modified	Date	xmp:ModifyDate	Modified	Description / Modified
Doc.Source	Text	photoshop: Source		Origin / Source IPTC Status / Source
Doc.State	Text	photoshop:State		Origin / State-Province IPTC Image / State
Doc. Supplemental Categories	Text Indexed	photoshop: Supplemental Categories		Categories / Supplemental Categories
Doc.Title	Alt Text	dc:title	Title	Description / Document Title
Doc. Transmission Reference	Text	photoshop: Transmission Reference		Origin / Transmission Reference IPTC Status / Job
Doc.Urgency	Integer	photoshop: Urgency		Origin / Urgency

Email group

These variables access the components of the email message through which this job was originally delivered. The values are empty if the job was not delivered via email or if the email message did not contain the requested component.

The Mail receive flow element associates this information with the job as a metadata dataset. Refer to *Email message schema* on page 393 for details on the format of this metadata. The third column in the table lists the element name in this schema corresponding to each variable.

(*) See email message schema.

Variable name	Data type	Element name (*)
Email.Body	Text	body
Email.Cc	Text	cc
Email.Date	Text	date
Email.From	Text	from
Email.MessageId	Text	message-id
Email.ReplyTo	Text	reply-to
Email.Sender	Text	sender
Email.Subject	Text	subject
Email.To	Text	to

Image group

These variables access embedded metadata fields in the EXIF format (synchronized with Adobe XMP). The third column indicates the hexadecimal TIFF tag corresponding to each variable.

Variable name	Data type	XMP location path	TIFF tag
Image.Artist	Text	tiff:Artist & dc:creator/*[1]	0x013B
Image.ColorMode	Integer	photoshop:ColorMode	--
Image.Copyright	Alt Text	tiff:Copyright & dc:rights	0x8298
Image.DateTime	Date	tiff:DateTime & xmp:ModifyDate	0x0132 & 0x9290
Image.ICCProfile	Text	photoshop:ICCProfile	--
Image.ImageDescription	Alt Text	tiff:ImageDescription & dc:description	0x010E

Variable name	Data type	XMP location path	TIFF tag
Image.ImageLength	Integer	tiff:ImageLength	0x0101
Image.ImageWidth	Integer	tiff:ImageWidth	0x0100
Image.Make	Text	tiff:Make	0x010F
Image.Model	Text	tiff:Model	0x0110
Image.Orientation	Integer	tiff:Orientation	0x0112
Image.Photometric Interpretation	Integer	tiff:Photometric Interpretation	0x0106
Image.ResolutionUnit	Integer	tiff:ResolutionUnit	0x0128
Image.SamplesPerPixel	Integer	tiff:SamplesPerPixel	0x0115
Image.Software	Text	tiff:Software & xmp:CreatorTool	0x0131
Image.XResolution	Rational	tiff:XResolution	0x011A
Image.YResolution	Rational	tiff:YResolution	0x011B

IPTC group

These variables access embedded metadata fields in the IPTC format (synchronized with Adobe XMP). The third column indicates the XMP location path for the variable in the XMP data model. The Iptc4xmpCore prefix has been omitted in the location paths.

The metadata fields accessed by the variables in this table can be viewed and edited using the **File > File Info...** dialog box in Adobe Creative Suite applications. The fourth column indicates the label of the field that corresponds to each variable.

(*) The Iptc4xmpCore prefix has been omitted in the location paths.

Variable name	Data type	XMP location path (*)	Photoshop File Info label
Iptc.City	Text	photoshop:City	IPTC Image / City
Iptc.ContactAddress	Text	CreatorContactInfo/ CiAdrExtadr	IPTC Contact / Address
Iptc.ContactCity	Text	CreatorContactInfo/ CiAdrCity	IPTC Contact / City
Iptc.ContactCountry	Text	CreatorContactInfo/ CiAdrCtry	IPTC Contact / Country
Iptc.ContactEmail	Text	CreatorContactInfo/ CiEmailWork	IPTC Contact / E-mail(s)

Variable name	Data type	XMP location path (*)	Photoshop File Info label
Iptc.ContactPCode	Text	CreatorContactInfo/ CiAdrPcode	IPTC Contact / Postal Code
Iptc.ContactPhone	Text	CreatorContactInfo/ CiTelWork	IPTC Contact / Phone(s)
Iptc.ContactState	Text	CreatorContactInfo/ CiAdrRegion	IPTC Contact / State-Province
Iptc.ContactWebsite	Text	CreatorContactInfo/ CiUrlWork	IPTC Contact / Website(s)
Iptc.CopyrightNotice	Alt Text	dc:rights	IPTC Status / Copyright Notice
Iptc.Country	Text	photoshop:Country	IPTC Image / Country
Iptc.CountryCode	Text	CountryCode	IPTC Image / ISO Country Code
Iptc.Creator	Text	dc:creator/*[1]	IPTC Contact / Creator
Iptc.CreatorJobTitle	Text	photoshop:Authors Position	IPTC Contact / Creator's Job Title
Iptc.DateCreated	Date	photoshop:DateCreated	IPTC Image / Date Created
Iptc.Description	Alt Text	dc:description	IPTC Content / Description
Iptc.Description Writer	Text	photoshop:CaptionWriter	IPTC Content / Description Writer
Iptc.Headline	Text	photoshop:Headline	IPTC Content / Headline
Iptc.Instructions	Text	photoshop:Instructions	IPTC Status / Instructions
Iptc.Intellectual Genre	Text	IntellectualGenre	IPTC Image / Intellectual Genre
Iptc.JobID	Text	photoshop: TransmissionReference	IPTC Status / Job Identifier
Iptc.Keywords	Text Indexed	dc:subject	IPTC Content / Keywords
Iptc.Location	Text	Location	IPTC Image / Location
Iptc.Provider	Text	photoshop:Credit	IPTC Status / Provider
Iptc.RightsUsage Terms	Alt Text	xmpRights:UsageTerms	IPTC Status / Rights Usage Terms

Variable name	Data type	XMP location path (*)	Photoshop File Info label
Iptc.Scene	Text Indexed	Scene	IPTC Image / IPTC Scene
Iptc.Source	Text	photoshop:Source	IPTC Status / Source
Iptc.State	Text	photoshop:State	IPTC Image / State-Province
Iptc.SubjectCode	Text Indexed	SubjectCode	IPTC Content / IPTC Subject Code
Iptc.Title	Alt Text	dc:title	IPTC Status / Title

Job group

These variables are Switch-specific. The third column indicates the scripting API function that returns the variable's dynamic value.

Variable name	Data type	Scripting API equivalent
Job.ByteCount	Integer	Job.getByteCount()
Job.EmailAddress	Text Indexed	Job.getEmailAddresses()
Job.Extension	Text	Job.getExtension()
Job.FileCount	Integer	Job.getFileCount()
Job.Hierarchy	Text Indexed	Job.getHierarchyPath()
Job.IsFile	Boolean	Job.isFile()
Job.IsFolder	Boolean	Job.isFolder()
Job.JobState	Text	Job.getJobState()
Job.Name	Text	Job.getName()
Job.NameProper	Text	Job.getNameProper()
Job.Path	Text	Job.getPath()
Job.Priority	Integer	Job.getPriority()
Job.PrivateData	Text	Job.getPrivateData()
Job.Size	Text	--
Job.UniqueNamePrefix	Text	Job.getUniqueNamePrefix()
Job.UserEmail	Text	The user's email address associated with the job (as entered in the Users

Variable name	Data type	Scripting API equivalent
		pane). If no user information has been linked to the job, the variable remains empty. Job.getUserEmail()
Job.UserFullName	Text	The user's full name associated with the job (as entered in the Users pane). If no user information has been linked to the job, the variable remains empty. Job.getUserFullName()
Job.UserName	Text	Job.getUserName()
Job.FileCreationDate	Date	The creation date/time of the job file or folder as taken from file system File(job.getPath()).created
Job.EmailBody	Text	The email body text in the email info associated with the job Job.getEmailBody()
Job.NestedName Indent=" "	Text Indexed	A list of indented names (including extension) for all files and folders in the job; by default each level indents with 4 spaces; on a particular level names are sorted alphabetically; see example below The Indent argument specifies the string added for each indentation level (default value is 4 spaces) Script that recursively iterates over job contents

Nested name example:

The variable [Job.NestedName:Prefix="-> ",Indent=". "] might be replaced by the following lines:

```
-> My job folder
-> . First.pdf
-> . Second.pdf
-> . Subfolder
-> . . Readme.txt
-> . Third.pdf
```

The following variables access a job's occurrence trail to provide information on the job's origin and on why the job was sent to the problem jobs folder. Each of the variables access the most recent occurrence of a particular type, as listed in the table.

Variable name	Data type	Most recent occurrence of type	Scripting API equivalent
Job.FailElement	Text	Failed	Occurrence.getElement()
Job.FailFlow	Text	Failed	Occurrence.getFlow()
Job.FailMessage	Text	Failed	Occurrence.getLocalizedMessage()
Job.FailModule	Text	Failed	Occurrence.getModule()
Job.FailTime	Date	Failed	Occurrence.getTimeStamp()
Job.Origin	Text	Produced	Occurrence.getOrigin()

Job.Origin

Use this variable to get **the original location of the job before it was injected or submitted into the flow**:

- For a **Submit point**,
  - If the *Requires Switch Helper property* property is set to *Yes*, this is the original upload folder.
  - If the *Requires Switch Helper property* property is set to *No*, this is the path to the backing folder of the Submit point that was used to submit the job.

  Note: If multiple jobs from different locations are submitted as part of one folder, the Job.Origin of the job will be the path of the first job in the folder.

- For an **FTP receive** element, this is the path to the file on the FTP server that was used to download the file.
- For a **Mail receive** element, this is the 'From' address of the email.
- For a **Script** element, this is the path that was passed into "createNewJob". Note that the "createNewJob" function can be called with or without a path parameter, so it's up to the script writer to provide the Job.Origin value or to leave it empty.

Note: For other elements, this variable is empty!

Metadata group

These variables allow access to an arbitrary field in any dataset associated with the job (external metadata or embedded metadata).

There is a variable for each data type supporting the appropriate formatting and/or indexing arguments. This enables the user to express the expected data type for the metadata value and control its formatting.

Variable name	Data type
Metadata.Text	Text

Variable name	Data type
Metadata.TextIndexed	Text Indexed
Metadata.Boolean	Boolean
Metadata.Integer	Integer
Metadata.Rational	Rational
Metadata.Date	Date

Selecting a data field

The variables in the Metadata group support the following arguments for selecting a particular metadata field from a particular dataset.

Argument	Value
Dataset	The name of the external dataset to be accessed, or empty/missing to indicate the embedded dataset
Model	The data model used for querying the data set; when empty/missing the data model is derived from the dataset; allowed values are "XML", "JDF", "XMP" or "JSON". This argument can be omitted except when forcing a JDF data model to be queried using regular XML semantics (that is, using "evalToString" rather than "getString")

Path	The location path or JSON pointer for selecting a field (or calculating a value) using syntax appropriate for the data model:
	• XML: XPath expression (which includes XPath location paths)
	• JDF: JDF location path (which is really the same as an XPath location path)
	• XMP: XMP location path
	• JSON: JSON Pointer
	All prefixes used in the location path or expression must occur in the default namespace map for the data set; there is no way to specify explicit mappings.
	Make sure to use the correct prefix:
	For the XML data model, use the prefix "dn", for example:
	`[Metadata.Text:Path="/dn:XML/dn:ResourcePool/dn:CustomerInfo/@DescriptiveName",Dataset="Xml",Model="XML"]`
	For the JDF data model, use the prefix "jdf", for example:
	`[Metadata.Text:Path="/jdf:JDF/jdf:ResourcePool/jdf:CustomerInfo/@DescriptiveName",Dataset="Jdf",Model="JDF"]`

Argument	Value
	For more information, refer to "XML data model" and "JDF data model" in the Switch Scripting Guide, available on the Enfocus website.

Data type conversions

Switch does not guarantee that the value of a variable in the Metadata category conforms to the string representation of its data type. The user is responsible for selecting the correct data type by using the appropriate variable in the Metadata category.

The variable is always set to the string value of the query (for Text Indexed, each item in the list is converted separately).

In other words:

- For the JDF and XMP data models there is never a conversion, because the result of the query is always a string (the text content of the node specified by the location path).
- For the XML data model, the result of the XPath expression is converted to a string using XPath semantics (unless it was a string to begin with).
- For the JSON data model, the result of the JSON Pointer evaluation is a JSON value. The value of the variable will be the string representation of this JSON value in case its data type is string, number or boolean. If the JSON value data type is object, array or null then the variable value will be an empty string. However for a TextIndexed variable, the JSON Pointer can evaluate to an array and then each array item is processed using the same rule: object, array and null values become empty strings; other values will be represented by strings.

Office group

These variables access metadata fields embedded in Microsoft Office documents (Excel files, Word documents, PowerPoint presentations).

Note: If a Microsoft Office document is password protected, Switch has no access to the metadata, hence these variables cannot be used.

Variable name	Data type	Description
Office.Application	Text	Name of the application that created the document, for example: *Microsoft Office Word*
Office.AppVersion	Text	Version of the application that created the document; string of the form XX.YYYY (X and Y representing numerical values), for example: *14.0000*
Office.Author	Text	Author of the document
Office.Category	Text	Category of the document
Office.Company	Text	Name of a company associated with the document
Office.ContentStatus	Text	Status of the document content, for example: *Draft*, *Reviewed*, *Final*, ...

Variable name	Data type	Description
Office.ContentType	Text	Type of document content, for example: *Whitepaper*, *Security Bulletin*, *Exam*, ...
Office.Created	Date	Date and time when the document was created, for example: *2014-02-05T10:10:36.000Z*. You can modify the format, for example: *dd:MM:yy mm:ss (UTC time zone)* will result in *05:02:14 10:36*
Office.Custom	Text	The metadata value selected from the document using XPath expression provided in the 'Path' argument. The argument 'Set' defines the metadata set where the required value is searched for. The possible values for the 'Set' argument are 'Core' and 'Extended' (used as the default value). For more details, refer to the section below.
Office.Description	Text	Textual description of the document
Office.DocSecurity	Integer	Security level of the document: • 0 = None • 1 = Document is password protected • 2 = Document is recommended to be opened as read-only • 4 = Document must be opened as read-only • 8 = Document is locked for annotation
Office.HyperlinkBase	Text	Base string used for evaluating relative hyperlinks in this document
Office.HyperlinksChanged	Boolean	Indicates whether or not hyperlinks were changed: • True = One or more hyperlinks in this part were updated exclusively in this part by a producer • False = No hyperlinks were updated
Office.Identifier	Text	Identifier of the document
Office.Keywords	Text	Keywords that specify the topic of the document
Office.Language	Text	Language of the document
Office.LinksUpToDate	Boolean	State of the hyperlinks in the document: • True = Hyperlinks are up-to-date • False = Hyperlinks are outdated
Office.Manager	Text	Name of a supervisor associated with the document

Variable name	Data type	Description
Office.Modified	Date	Date and time when the document was last modified
Office.ModifiedBy	Text	Author of the last modification in the document
Office.NumberOfCharacters	Integer	Total number of characters in the document
Office.NumberOfCharacters WithSpaces	Integer	Last count of the number of characters (including spaces) in this document
Office.NumberOfHiddenSlides	Integer	Number of hidden slides in the presentation
Office.NumberOfLines	Integer	Total number of lines in the document when last saved by a conforming producer
Office.NumberOfMMClips	Integer	Total number of sound or video clips that are present in the document
Office.NumberOfNotes	Integer	Number of slides in the presentation containing notes
Office.NumberOfPages	Integer	Total number of pages in the document
Office.NumberOfParagraphs	Integer	Total number of paragraphs found in the document
Office.NumberOfSlides	Integer	Total number of slides in the presentation
Office.NumberOfWords	Integer	Total number of words in the document when the document was last saved
Office.PresentationFormat	Text	Intended format for the presentation, for example a presentation intended to be shown on video has PresentationFormat *Video*, a presentation to be shown on screen, could have *On-screen (4:3)*, ...
Office.Printed	Date	Date and time when the document was last printed
Office.Revision	Integer	Revision number
Office.ScaleCrop	Boolean	Display mode of the document thumbnail: • True = Thumbnail is scaled to fit the display • False = Thumbnail is cropped to show only sections that fit the display
Office.SharedDoc	Boolean	Indicates whether or not the document is shared:

Variable name	Data type	Description
		• True = Document is currently shared between multiple producers • False = Document is not shared
Office.Subject	Text	Subject of the document
Office.Template	Text	Name of an external document template containing format and style information used to create the document.
Office.Title	Text	Title of the document
Office.TotalTime	Integer	Total time that the document has been edited. The default time unit is minutes.
Office.Version	Integer	Version number

Office.Custom

Use this variable if there is a metadata tag in your Office document that does not have a dedicated Switch variable. The [Office.Custom] variable allows you to retreive the value of this tag, on condition that you have the correct XPath expression. Note that the data type of this variable is 'Text', so only text manipulation arguments are available for it.

The metadata value is selected from the document using the XPath expression provided in the **Path** argument. All prefixes used in the expression must occur in the default namespace map for the metadata XML file. There is no way to specify explicit mappings. The default namespace is automatically available using prefix 'dn'.

The argument **Set** defines the metadata set where the required value is searched for. The possible values are 'Core' and 'Extended' (used as the default value):

- The 'Core' set corresponds to the document properties (normally located in the file docProps/core.xml). Normally, the XPath for this set will begin with '/cp:coreProperties'.
- The 'Extended' set contains extended properties (normally located in the file docProps/app.xml). The XPath begins with '/dn:Properties' where 'dn' is the prefix for the default namespace, automatically provided by Switch.

Examples

```
[Office.Custom:Path="/dn:Properties/dn:Application"] - This gives the same result as
 [Office.Application]
[Office.Custom:Path="/dn:Properties/dn:TitlesOfParts/vt:vector/
vt:lpstr[1]",Set="Extended"] - The title of some document part
[Office.Custom:Path="/cp:coreProperties/dc:title",Set="Core"] - This gives the same
 result as [Office.Title]
```

More information about the Office Open XML format and its metadata can be found here: *http://en.wikipedia.org/wiki/Office_Open_XML_file_formats*.

Photo group

These variables access embedded metadata fields in the EXIF format (synchronized with Adobe XMP). The third column indicates the hexadecimal EXIF tag corresponding to each variable.

Variable name	Data type	XMP location path	EXIFF tag
Photo.ApertureValue	Rational	exif:ApertureValue	0x9202
Photo.BrightnessValue	Rational	exif:BrightnessValue	0x9203
Photo.ColorSpace	Integer	exif:ColorSpace	0xA001
Photo.CompressedBitsPer Pixel	Rational	exif:CompressedBitsPerPixel	0x9102
Photo.Contrast	Integer	exif:Contrast	0xA408
Photo.CustomRendered	Integer	exif:CustomRendered	0xA401
Photo.DateTimeDigitized	Date	exif:DateTimeDigitized	0x9004 & 0x9292
Photo.DateTimeOriginal	Date	exif:DateTimeOriginal	0x9003 & 0x9291
Photo.DigitalZoomRatio	Rational	exif:DigitalZoomRatio	0xA404
Photo.ExposureBiasValue	Rational	exif:ExposureBiasValue	0x9204
Photo.ExposureIndex	Rational	exif:ExposureIndex	0xA215
Photo.ExposureMode	Integer	exif:ExposureMode	0xA402
Photo.ExposureProgram	Integer	exif:ExposureProgram	0x8822
Photo.ExposureTime	Rational	exif:ExposureTime	0x829A
Photo.FlashEnergy	Rational	exif:FlashEnergy	0xA20B
Photo.FlashFired	Boolean	exif:Flash/exif:Fired	0x9209 bits
Photo.FlashFunction	Boolean	exif:Flash/exif:Function	0x9209 bits
Photo.FlashMode	Integer	exif:Flash/exif:Mode	0x9209 bits
Photo.FlashRedEyeMode	Boolean	exif:Flash/exif:RedEyeMode	0x9209 bits
Photo.FlashReturn	Integer	exif:Flash/exif:Return	0x9209 bits
Photo.FNumber	Rational	exif:FNumber	0x829D
Photo.FocalLength	Rational	exif:FocalLength	0x920A
Photo.FocalLengthIn35mm Film	Integer	exif:FocalLengthIn35mmFilm	0xA405

Variable name	Data type	XMP location path	EXIFF tag
Photo.FocalPlane ResolutionUnit	Integer	exif:FocalPlaneResolutionUnit	0xA210
Photo.FocalPlaneX Resolution	Rational	exif:FocalPlaneXResolution	0xA20E
Photo.FocalPlaneX Resolution	Rational	exif:FocalPlaneYResolution	0xA20F
Photo.GainControl	Integer	exif:GainControl	0xA407
Photo.ImageUniqueID	Text	exif:ImageUniqueID	0xA420
Photo.ISOSpeed	Integer	exif:ISOSpeedRatings/*[1]	0x8827
Photo.Lens	Text	aux:Lens	--
Photo.LightSource	Integer	exif:LightSource	0x9208
Photo.MaxApertureValue	Rational	exif:MaxApertureValue	0x9205
Photo.MeteringMode	Integer	exif:MeteringMode	0x9207
Photo.PhotographicSensitivity	Integer	exifEX:PhotographicSensitivity	0x8827
Photo.PixelXDimension	Integer	exif:PixelXDimension	0xA002
Photo.PixelYDimension	Integer	exif:PixelYDimension	0xA003
Photo.Saturation	Integer	exif:Saturation	0xA409
Photo.SceneCaptureType	Integer	exif:SceneCaptureType	0xA406
Photo.SensingFunction	Integer	exif:SensingFunction	0xA217
Photo.SensitivityType	Integer	exifEX:SensitivityType	0x8830
Photo.Sharpness	Integer	exif:Sharpness	0xA40A
Photo.ShutterSpeedValue	Rational	exif:ShutterSpeedValue	0x9201
Photo.SpectralSensitivity	Text	exif:SpectralSensitivity	0x8824
Photo.SubjectDistance	Rational	exif:SubjectDistance	0x9206
Photo.SubjectDistance Range	Integer	exif:SubjectDistanceRange	0xA40C
Photo.UserComment	Alt Text	exif:UserComment	0x9286
Photo.WhiteBalance	Integer	exif:WhiteBalance	0xA403

Stats group

These variables access statistics derived from the actual file contents for a number of supported file formats. The values are empty for a job in an unsupported file format and for a job folder.

File format

For a list of supported file formats, please refer to the description of the FileStatistic class in the Scripting documentation available on the Enfocus website.

Variable name	Data type	Scripting API equivalent
Stats.FileFormat	Text	FileStatistics.getFileFormat()

Content statistics

The Stats group includes an additional variable for each additional statistic supported by the FileStatistics class (see Supported statistics). The variable has the same name and data type as the statistic (where string maps to Text and string list maps to Text Indexed).

Variable name	Data type	Supported for
Stats.NumberOfPages	Integer	All supported formats
Stats.SamplesPerPixel	Integer	JPEG, TIFF, PNG
Stats.PixelXDimension	Integer	JPEG, TIFF, PNG
Stats.PixelYDimension	Integer	JPEG, TIFF, PNG
Stats.ColorMode	Integer	JPEG, TIFF, PNG
Stats.ColorSpace	Integer	JPEG, TIFF, PNG
Stats.ICCProfile	Text	JPEG, TIFF, PNG
Stats.Colorants	Text Indexed	TIFF
Stats.CellWidth	Integer	TIFF
Stats.CellLength	Integer	TIFF
Stats.TileWidth	Integer	TIFF
Stats.TileLength	Integer	TIFF
Stats.ColorIntent	Integer	PNG
Stats.Version	Text	PDF
Stats.PageWidth	Rational	PDF

Variable name	Data type	Supported for
Stats.PageHeight	Rational	PDF
Stats.PageLabels	Text Indexed	PDF
Stats.Colorants	Text Indexed	PDF
Stats.Fonts	Text Indexed	PDF
Stats.SecurityMethod	Text	PDF
Stats.PageBoxesEqual	Boolean	PDF
Stats.MediaBoxWidth	Integer	PDF
Stats.MediaBoxHeight	Integer	PDF
Stats.CropBoxWidth	Integer	PDF
Stats.CropBoxHeight	Integer	PDF
Stats.BleedBoxWidth	Integer	PDF
Stats.BleedBoxHeight	Integer	PDF
Stats.TrimBoxWidth	Integer	PDF
Stats.TrimBoxHeight	Integer	PDF
Stats.ArtBoxWidth	Integer	PDF
Stats.ArtBoxHeight	Integer	PDF
Stats.PDFXVersionKey	Text	PDF
Stats.ColorSpaceFamilies	Text Indexed	PDF
Stats.TransparentColor	Boolean	PDF
Stats.FontTypes	Text Indexed	PDF
Stats.PageRotation	Rational	PDF

Note: The FileStatistics class allows reading both defined and effective values of PDF page (and page boxes) width and height. The corresponding variables from the Stats group support this by providing the 'Type' argument with possible values 'Defined' and 'Effective'.

Switch group

These variables are Switch-specific. The third column indicates the scripting API function that returns the variable's dynamic value.

Variable name	Data type	Scripting API equivalent
Switch.Calculation	Rational	This allows you to use variables (that are by default treated as text) to do calculations. It is also possible to manually enter this syntax while selecting other variables. Therefore, you can perform calculations on variables that result in a number anywhere in the Switch application, provided you have access to the variables pane from there. The 'Expression' argument specifies the arithmetic expression to be calculated. The expression may contain other Switch variables, constant numbers, parentheses, the arithmetic operators ('+', '-', '*', '/' and '%') and the 'round' function. Note that the behavior of the round() function (which rounds the value of a number to the nearest integer) is sometimes different from Excel. For example, -10,5 is rounded to -10 (< >Excel: -11). The values are stored as double-precision floating point numbers. Therefore rounding of values like 7.555 (p=2) -may be rounded to 7.55. Example of the Calculation variable syntax : [Switch.Calculation:Expression = "[Stats.PageHeight] *0.352777778",Precission="1"] x [Switch.Calculation:Expression = "[Stats.PageWidth] *0.352777778",Precission="1"]
Switch.Counter	Text	-- (see below)
Switch.Date	Date	-- (the current date/time)
Switch.ElementName	Text	Switch.getElementName()
Switch.FlowName	Text	Switch.getFlowName()
Switch.Language	Text	Environment.getLanguage()
Switch.LanguageEnvironment	Text	Environment.getLanguageEnvironment()

Variable name	Data type	Scripting API equivalent
Switch.ServerName	Text	Environment.getServerName()
Switch.OutgoingName	Text Indexed	A list of names for the outgoing connections in alphabetical order; if a connection name is empty the target folder name is used as a fallback; if the folder name is empty as well, the connection is not listed Script that iterates over connections, determines the (fallback) name and sorts the list

Note:

- Switch.OutgoingName cannot be used to define metadata fields in Checkpoints and Submit points.

Counter operation

The Switch.Counter variable evaluates to an automatically incrementing decimal integer with a fixed number of digits. For example, if the variable has never been used before, it will evaluate to "00001". Next time, it will evaluate to "00002" and so forth. After the counter reaches "99999" it circles back to "00000".

The most recently used value of the counter is retained across multiple invocations of the Switch Server.

Counter: number of digits

The Width argument specifies the number of decimal digits in the number; leading zeros are inserted when needed. The default value for width is 5; the minimum value is 1 and the maximum value is 15. An invalid value is replaced by the nearest valid value.

The internal counter is always 15 digits wide; the Width argument specifies how many of the right-most digits are actually shown.

Identifying counters

A counter variable refers to a particular physical counter through an identifier (ID). Switch uses the same physical counter for all counter variables with the same ID, even if these variables are used in properties of a different flow element or in a different flow (in the same Switch instance). A physical counter is incremented each time a counter variable with its ID is evaluated, regardless of where the variable occurred.

A counter variable can explicitly specify an ID or it can rely on the default value.

If the "ID" argument is present and has a non-empty value, this explicitly specifies the ID. Otherwise a default ID is generated that is unique to the flow element in which the counter is used. This makes the counter variable "local".

If a property uses the same counter variable more than once, each invocation of the variable is deemed a new invocation and will cause the counter to be incremented. For example, assuming no counters have been used yet in a flow element, the property value

```
Demo [Switch.Counter] - [Switch.Counter]
```

evaluates to

```
Demo 00001 - 00002
```

Metadata

Embedded metadata

Switch offers direct access to metadata embedded in a job in the EXIF, IPTC and Adobe XMP formats, without the need for a separate "pick-up" action. Switch provides read-only access to embedded metadata through variables and read-write access to embedded metadata through scripting.

Also see "Metadata overview".

Embedded metadata formats

Switch supports the following embedded metadata formats:

Format	Description	Reference
EXIF	A binary format designed to store information about a photograph Generated by all digital cameras and used by many desktop applications and asset management systems	Exif Version 2.2 specification dated April 2002 (JEITA CP-3451)
IPTC	A binary format designed to store news-related information in photographs Used by many applications including asset management systems	IPTC – NAA Information Interchange Model Version 4 dated July 1999 IPTC Core Schema for XMP Version 1.0 Revision 8 dated March 2005
XMP	An XML-based format defined by Adobe Embedded in images or compound documents; used by Adobe Creative Suite and many other applications	Adobe XMP specification dated September 2005

Also see "Supported file formats" below.

Read-only access through variables

Switch allows the use of variables in the values of many text properties and for defining file filters. Variables provide access to run-time information about a job including embedded metadata fields.

Examples of embedded metadata fields that can be accessed through variables include:

Group	Type of information	Metadata format
Doc	Title, keywords, author(s), copyright terms	XMP
IPTC	Contact, location, headline, instructions	IPTC
Image	Resolution, orientation, color mode	EXIF (TIFF tags)
Photo	Exposure time, aperture, focus, flash	EXIF (EXIF tags)

Read-write access through scripting

Enfocus Switch offers complete access to embedded metadata through the scripting API:

- The Job.getEmbeddedDataset() function retrieves a dataset object representing the job's embedded metadata.
- The XMP data model query functions allow reading fields in the embedded dataset.
- The XMP data model update functions allow writing or updating fields in the embedded dataset for certain supported file formats.

Rather than providing separate data models for each embedded metadata format, Switch synchronizes the binary EXIF and IPTC tags with the XMP properties – offering a unified view of all metadata using the XMP data model. See *Supported file formats* on page 386.

Supported file formats

The following table lists the embedded metadata capabilities for the supported file formats.

File format	Metadata access	XMP packet handling	EXIF & IPTC synchr.	Image data synchr.
JPEG, TIFF	Read and write (*)	Smart read and write (*)	For reading and writing (*)	For reading
Photoshop	Read and write (*)	Smart read and write (*)	For reading and writing (*)	None
PNG	Read and write (*)	Smart read and write (*)	None	For reading
PDF	Read and write (*)	Smart read and write (*)	None	None
InDesign, PostScript	Read-only	Smart read-only	None	None

File format	Metadata access	XMP packet handling	EXIF & IPTC synchr.	Image data synchr.
Other formats	Read-only	Generic read-only	None	None

(*) Write access is available only through scripting

XMP packet handling

There are two distinct methods to locate XMP packets embedded in a file:

- Scan the complete file for the magic markers at the head and tail of a packet: this works for any file format, but may possibly locate the wrong packet in case a composite document contains multiple packets.
- Interpret the file format's structure to track down the packet: this guarantees that the correct packet has been located and it is usually much faster, but it requires a specific algorithm for each distinct file format.

As indicated in the table, Switch offers three levels of support for embedded XMP packets depending on the file format:

- Smart read and write: interprets the file format to allow reading, updating and inserting an XMP packet.
- Smart read-only: interprets the file format to locate the appropriate document-level XMP packet but does not allow changes.
- Generic read-only: uses generic packet scanning to locate one of the XMP packets in the document; does not allow changes.

EXIF and IPTC synchronization

As indicated in the table, for some file formats Switch performs two-way synchronization between binary EXIF and IPTC tags on the one hand and XMP properties on the other hand, similar to the behavior of the Adobe Creative Suite applications.

For supported file formats, when creating the embedded dataset for a job, Switch performs these steps:

- Locate the primary embedded XMP packet and parse it into an XMP object model; if there is no XMP packet start with an empty XMP object model.
- Read the appropriate binary EXIF and IPTC tags, if present and merge their values into the XMP object model as the equivalent XMP properties.
- Offer access to the resulting unified XMP object model.

For supported file formats, when saving changes for a writable embedded dataset, Switch performs these steps:

- If any changes were made to the dataset as compared to the original XMP packet, save the complete unified XMP information in an updated or inserted XMP packet.
- If changes were made to one or more synchronized properties that are "user-editable", update or insert the corresponding binary EXIF or IPTC tags. Properties that reflect characteristics of the image (and thus should never be edited by a user) are not updated in the binary tags.

Image data synchronization

As indicated in the table, for some file formats Switch retrieves basic information about the image from the image data itself and writes this information to the appropriate fields in the XMP packet. This ensures that the following fields are always present for these formats:

Variable name	XMP location path
Image.ColorMode	photoshop:ColorMode
Image.ICCProfile	photoshop:ICCProfile
Image.SamplesPerPixel	tiff:SamplesPerPixel
Photo.ColorSpace	exif:ColorSpace
Photo.PixelXDimension	exif:PixelXDimension
Photo.PixelYDimension	exif:PixelYDimension

Locating the backing file

The backing file for an embedded dataset is determined as follows:

- If the job is an individual file, use it as the backing file.
- Otherwise if the job folder immediately contains a single Adobe InDesign file (that is, at the uppermost level), use that InDesign file as the backing file.
- Otherwise use the job folder path for the backing file and return an empty read-only dataset.

External metadata

Switch offers substantial support for importing, exporting, transforming and using metadata through a combination of:

- Standard tools for picking up and exporting metadata associated with a job.
- Complete access to metadata from the Switch scripting environment.

For example, using simple script expressions you can route a job and set its processing parameters based on metadata provided with the job.

Also see metadata overview.

Picking up metadata

Switch allows permanently associating metadata with a job moving through the flow (by storing a reference to it in the job's internal job ticket). Each distinct set of metadata fields (for example, a JDF job ticket or an XMP packet) are stored in a separate metadata dataset. Switch supports several types of datasets, each with a specific data model that determines the semantics for querying values from the dataset. See below for information on supported data models.

Metadata can originate from a number of different sources including a job ticket provided with a job, an XMP packet embedded in a file, statistics derived from a file's contents and manual data entry through the Switch Web Portal. Certain flow elements, including several built-in metadata pickup tools, can associate a new metadata dataset with a job being processed through the tool. Each dataset is given a unique name. Therefore, multiple datasets of the same type can be associated with a job (for example: two JDF job tickets, each in its own dataset with a distinct name).

To pickup metadata from a particular source, a flow designer must explicitly place the appropriate pickup tool or app in the flow, at a location before the metadata is actually queried. See below for a list of typical metadata sources and the corresponding Switch tools.

Using metadata

The Switch scripting API provides access to the contents of all metadata datasets already associated with a job and offers the appropriate functions for querying metadata values in each dataset, depending on its data model. Furthermore, the scripting API allows adding a new dataset or replacing an existing one.

Using script expressions, a flow can route a job and set its processing parameters based on the contents of metadata fields associated with the job. Script elements offer complete freedom for importing, exporting, transforming and using metadata at will.

Variables in the Metadata group provide access to any external metadata field associated with a job. Switch allows the use of variables in the values of many text properties and for defining file filters.

Updating metadata

The datasets picked up in the manner described above are called external datasets, as opposed to the embedded dataset which references information stored inside the file - see embedded metadata.

Switch does not support updating the value of individual metadata fields within an external dataset. This limitation does not apply to an embedded dataset (see *Read-write access through scripting* on page 386) or to hierarchy info and email info (which is stored directly in the internal job ticket and not in a metadata dataset).

Note that, despite this limitation, it is possible to replace an external dataset as a whole by a new version.

Exporting and transforming metadata

Any metadata dataset associated with a job can be exported as a separate file (in the same format) using the export metadata tool. The result can be further transformed to an appropriate XML, HTML or text file using the XSLT transform tool.

Metadata data models

Switch supports the following metadata data models and corresponding querying mechanisms:

Data model	Description	Query mechanism	Scripting API
XML	Any well-formed XML file (with or without XML namespaces); refer to the XML 1.0 specification	XPath 1.0 expression and/ or location path	Dataset functionality, XML data model
JDF	A JDF file conforming to the JDF 1.3 specification	XPath 1.0 location path	Dataset functionality, JDF data model
XMP	An Adobe XMP packet or file conforming to the Adobe XMP specification dated September 2005	Adobe XMP location path (subset of XPath)	Dataset functionality, XMP data model
Opaque	An arbitrary data file (allows associating information such as a human readable report with a job)	None	Dataset functionality,

Data model	Description	Query mechanism	Scripting API
			Opaque data model
JSON	A JSON file conforming to the RFC 8259	JSON Pointer (defined by RFC 6901)	Dataset functionality, JSON data model

Metadata resources

The following table lists various metadata sources and the corresponding metadata data models. The default dataset name can be overridden in most cases to allow associating more than one dataset of the same type with a job.

Source	Pickup tool	Data model	Default dataset name
Email message components	Mail receive	XML	Email
Manual entry in the Switch Web Portal	Fields defined in Submit point or Checkpoint	XML	Submit or Check
Separate XML file	XML pickup	XML	Xml
Separate JDF file	JDF pickup	JDF	Jdf
Separate XMP file	XMP pickup	XMP	Xmp
Embedded XMP packet	XMP pickup	XMP	Xmp
Any data file	Opaque pickup	Opaque	Opaque
Adobe Acrobat JDF	Uncompress MIME file; then JDF pickup	JDF	Jdf
QuarkXPress Job Jacket	JDF pickup	JDF	Jdf
PDF contents statistics	Apago PDFspy app	XML	Pdf
Preflight results	Enfocus PitStop Server configurator (with XML report); then XML pickup	XML	Xml
Text log or PDF preflight report	Any app with outgoing traffic light connections (set the "carry this type of files" property to "data with log")	Opaque	Log

Pickup modes

The metadata pickup tools (XML pickup, JDF pickup, XMP pickup) allow associating metadata from various sources as a metadata dataset with a job's internal job ticket. The tools support several distinct mechanisms to locate the metadata source and its corresponding asset, as described in the following subsections.

Terminology

- Metadata source: the file (or sometimes the portion of a file) that contains the metadata to be picked up.
- Asset: the file or job folder that is being described by the metadata and that will be moved along in the flow after its internal job ticket has picked up the metadata.
- Pickup mode: a particular mechanism/algorithm to locate the metadata source and its corresponding asset.

Metadata alongside asset

The metadata source (which is always a single file) and the corresponding asset (which may be a file or a job folder) are both placed in one of the pickup tool's input folders (the same folder or a different one) at the top level (that is, immediately under the input folder). Both have the same name but a different filename extension. The supported filename extensions are defined through flow element properties for the pickup tool.

The pickup tool waits until both the asset and the metadata source have arrived and then performs the following steps:

- Create a new metadata dataset with a copy of the metadata source as its backing file.
- Associate this dataset with the asset's internal job ticket under the dataset name specified through a flow element property for the pickup tool (replacing any existing association with the same name).
- Remove the metadata source.
- Move the asset to the output folder.

Property	Description
Metadata filename pattern	One or more file types or filename extensions that are recognized as metadata files
Orphan timeout (minutes)	The time delay after which an incoming metadata source or an incoming asset is considered orphaned because it can't be matched to a counterpart Orphaned jobs are moved to the problem jobs folder

Metadata in job folder asset

The asset (which is always a job folder) is placed in one of the pickup tool's input folders and the metadata source (which is always a single file) resides inside the job folder. The pickup tool provides flow element properties for locating the metadata source within the job folder (nesting level and filename pattern).

The pickup tool waits until the job folder has fully arrived and then performs the following steps:

Locate the metadata source; if none is found the next two steps are skipped.

- Create a new metadata dataset with a copy of the metadata source as its backing file.
- Associate this dataset with the asset's internal job ticket under the dataset name specified through a flow element property for the pickup tool (replacing any existing association with the same name).
- Move the job folder asset to the output folder.

Note that the metadata source is not removed in this case.

Property	Description
Metadata file filters	File filter that determines which of the files in the job folder represents the metadata; files are scanned starting at the topmost nesting level (at each level the scan order is arbitrary); the file filter is evaluated in the context of each file and the first file that matches is used as metadata source
Search depth	The number of nesting levels in which to look for the metadata; "1" means the topmost level only

Metadata refers to asset

The metadata source (which is always a single file) is placed in one of the pickup tool's input folders and it contains a reference to the asset (which may be a file or a job folder) in some other location accessible through the file system. Thus the asset itself is never directly placed in a flow input folder.

The pickup tool provides flow element properties for locating the asset reference inside the metadata source (a location path) and for determining whether the original copy of the asset should be removed or not.

When the pickup tool detects an incoming file, it expects it to be a metadata source and it performs the following steps:

- Locate the asset reference in the metadata source, locate the asset, and ensure that it is readable. If any of these steps fail, report an error and quit.
- Create a new metadata dataset with a copy of the metadata source as its backing file.
- Associate this dataset with the asset's internal job ticket (which in fact is the metadata source's job ticket) under the dataset name specified through a flow element property for the pickup tool (replacing any existing association with the same name).
- Copy or move (depending on the property settings) the asset from its original location to the output folder.
- Remove the metadata source.

Property	Description
Asset path	A script expression or a single line text with variables that evaluates to the file or folder path referring to the asset to be copied.
Delete asset	Determines whether the original copy of the asset is deleted after it has been copied into the flow; this can be an explicit value or a script expression.

Disadvantages of using "Metadata refers to asset"

- The **path has to be complete**, and the **file has to be locally accessible**. If for example only the filename is available, or the reference to the asset is HTTP-based, this method cannot be used.
- The script expressions are evaluated before the incoming metadata has been picked up (before the asset has been located), hence the **script expressions cannot access any metadata to calculate the return value**.

A more **recommended method** therefore is to use XML pickup with pickup mode "Metadata is asset". The dataset can then be used in the default app Inject job or the free app Inject Wildcard for local files or in the default app HTTP request to inject an external file into the flow. Moreover this method has better error handling and is more reliable than "Metadata refers to asset".

Metadata embedded in asset

The asset (which is always a single file) is placed in one of the pickup tool's input folders and the metadata source is embedded in the asset file according to some format (which depends on the pickup tool).

When the pickup tool detects an incoming file, it expects is to be an asset and it performs the following steps:

- Extract the metadata source from the asset and store it into a standalone file; if the asset does not contain embedded metadata of the appropriate type, the next two steps are skipped.
- Create a new metadata dataset with this standalone file as its backing file.
- Associate this dataset with the asset's internal job ticket under the dataset name specified through a flow element property for the pickup tool (replacing any existing association with the same name).
- Move the asset file to the output folder.

Property	Description
Synchronize EXIF/ IPTC fields	If set to "Yes", for supported file formats the values of binary EXIF and IPTC tags are merged with the embedded XMP packet before it is picked up (the packet embedded in the asset remains unchanged) If set to "No", the embedded XMP packet is picked up without change - if present

Metadata is asset

The pickup tool with a fourth pickup mode: "Metadata is asset" is used to implement for JDF, XML and XMP pickup.

When a job (example: JDF) file is sent to a pickup tool using this feature, the resulting file is the JDF file with its own content as JDF metadataset. So tools have only three properties: Name, Dataset name and Pickupmode. There is no need for additional properties when this pickup mode is selected.

Email message schema

The mail receive tool automatically picks up the contents of incoming email messages as metadata. Specifically, for each incoming message the mail receive tool creates a metadata dataset that contains the relevant components of the message, such as the sender, to, cc, and reply-to addresses and the complete email body text. This dataset is then associated with the job ticket for all files delivered by the message under the standard dataset name "Email".

Data model and schema

The email message dataset uses the XML data model with a simple schema without namespaces.

The XML document element name is "email". It contains an element for each message component as described in the table below; each element contains the text of the corresponding message component. If a message component is not present or it contains only white space, the corresponding element is missing.

Leading and trailing white space is removed (except for the body text, where it may be significant). Otherwise, no parsing or reformatting is performed. For example, a list of email addresses (including its separators) is stored exactly as it was provided in the incoming message.

Element name	Message component
message-id	An identifier for the message (assigned by the host which generated the message)
subject	The subject line of the message
date	The date and time when the message was sent (formatted as it appeared in the message header)
from	The email address(es) of the author(s) of the message
sender	The single email address of the sender of the message; if there is a single author the sender is identical to the author, otherwise the sender should be one of the authors
reply-to	The email addresses to which a response to this message should be sent
to	The email addresses of the primary recipients of this message
cc	The email addresses of the secondary recipients of this message
body	A plain-text rendition (without markup) of the body text of this message

Processing results schema

The FTP send and Mail send tools produce a log file with processing results. This log file is carried along the outgoing log connections.

This log file can be associated with the job as a metadata dataset by using a "data with log" connection (see the "Carry this type of files" property of traffic light connections).

Data model and schema

The processing results log file uses the XML data model with a simple schema without namespaces.

The XML document element name is "ProcessingResults". It contains a sequence of elements with a name and contents as described in the following table. If a data item is not applicable, the corresponding element may be missing.

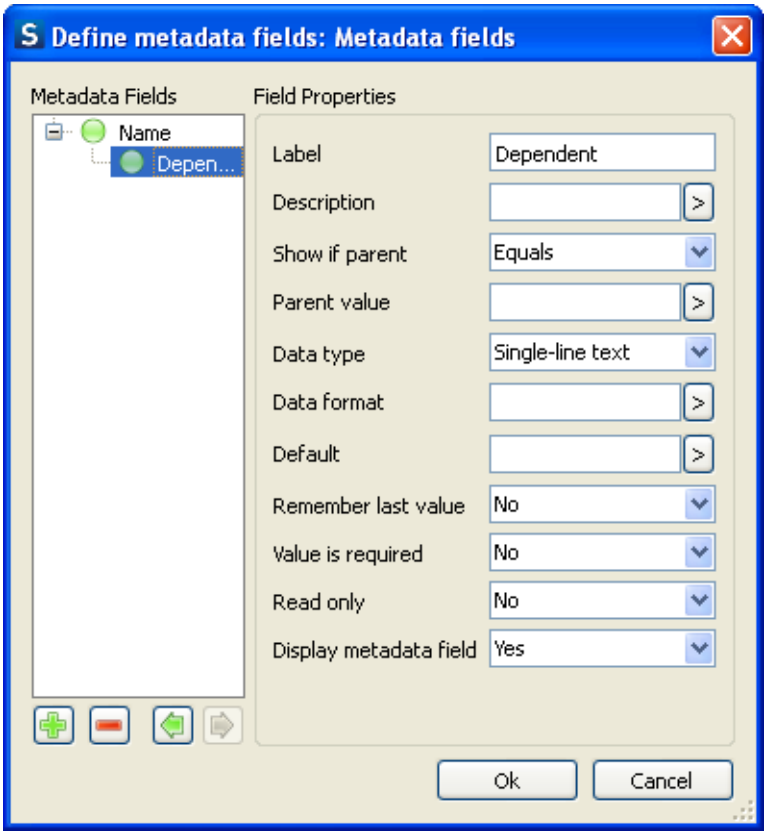
Element name	Data type	Description
Destination	Text	For FTP, the complete target URL for the job For Mail, the list of destination email addresses
FlowElementName	Text	The name of the flow element that produced this log file (as displayed in the canvas)
FlowElementType	Text	The type of the flow element that produced this log file (e.g. "FTP send" or "Mail send")
FlowName	Text	The name of the flow (as displayed in the flows pane) containing the flow element that produced this log file
JobArrivalStamp	Integer	The arrival stamp for the processed job as an unsigned integer number; a lower arrival stamp indicates a job that arrived in the flow earlier (and vice versa) Several jobs may have the same arrival stamp, for example when multiple jobs are generated from the same original job
JobByteCount	Integer	The size in bytes of the processed job; if it is a job folder, all files in subfolders are included in the count, recursively
JobExtension	Text	The processed job's filename extension, or the empty string if there is none
JobFileCount	Integer	The number of files in the processed job, including all files in subfolders, recursively (folders and subfolders themselves do not contribute to the count)
JobFiles	Sequence of "File" elements	A sequence of one or more "File" elements representing the files in the processed job in arbitrary order; each File element has the Text data type and contains the relative path of a file within the job (using a forward slash as path separator) Folders are NOT represented in this list
JobIsFile	Boolean	True if the processed job is a single file, false otherwise
JobIsFolder	Boolean	True if the processed job is a folder, false otherwise
JobName	Text	The file or folder name for the processed job, including filename extension if present, but excluding the unique filename prefix

Element name	Data type	Description
JobNameProper	Text	The file or folder name for the processed job excluding filename extension and excluding the unique filename prefix
JobOrigin	Text	An indication of the origin of the processed job before it was injected in the flow; for example, a Submit point writes the absolute path of the original job (on the client computer) in this field
JobPath	Text	The absolute file or folder path for the processed job as it resided in the input folder before being processed, including unique filename prefix
JobPriority	Integer	The job priority assigned to the processed job as a signed integer number
JobUniqueName Prefix	Text	The unique filename prefix used for the processed job, without the underscores; for a job called "_0G63D_myjob.txt" this would be "0G63D"
JobUserName	Text	The user name associated with the processed job, if any
ProcessingEnded	Date	The date-time when the operation was completed (in the ISO 8601 format also used for Switch date variables)
ProcessingStarted	Date	The date-time when the operation started (in the ISO 8601 format also used for Switch date variables)
ServerAddress	Text	The name or IP address of the destination server
ServerLoginName	Text	The user name used to login at the destination server
ServerPort	Integer	The port of the destination server

Defining metadata fields

The Submit point and the Checkpoint tools allow defining metadata fields which can be viewed and/or edited by the Switch Web Portal user when submitting or routing a job. The values of display-only fields are determined by evaluating a script expression so that they can depend on metadata associated with the job. After a user submits a job or moves it along, the values of editable fields (as entered by the user) are associated with the job as metadata (with the client fields schema).

Defining metadata fields



The property editor for editable metadata fields allows creating an ordered list of field definitions (using the buttons under the listbox on the left-hand side). For each field definition, the property editor allows editing the properties described in the table below (using the edit fields and controls on the right-hand side).

Property	Description
Label	The label shown in front of the field.
Description	Description for this field shown as tool tip when user hovers over the label or the data field in the Switch Web Portal.
Show if parent and *Parent value*	*Only available if the Metadata field has a parent. Dependencies are set using the arrow keys in the field list.* These properties allow you to set a condition for showing the child. For example, if the parent field is "Add Bleed?", the child field "Amount of bleed" only needs to be displayed if the value of "Add Bleed?" is Yes (So: *Show if parent equals Yes*). **Note:** If you choose the "Matches" option for "Show if Parent" property then regular expression will be used for all parent values.
Data type	The field's data type: Dropdown list (Single-line text, Password, Date, Number, Hours and minutes, No-yes list, Dropdown list).

Property	Description
Data format	Only available when "Data type" is set to single-line text or number. Format the metadata field using a regular expression. Leave empty to not set any special formatting (Single-line text, Regular expression).
Data values and Ignore duplicates	*Only available when "Data type" is set to "Dropdown list".* Define the drop down list (Edit multi-line text, Define multi-line text with variables, Define script expression, Define values from dataset, Define values from ODBC data source). The **Ignore duplicates** option defines if a value can be shown twice in the dropdown list.
Default	The default value for the field (Single-line text, Single-line text with variables, Condition with variables, Date and Script expression), i.e. the value that is shown when the form is displayed to the user. ***Using variables:*** It is possible to use variables to define the default value for your metadata field (Single-line text with *variables*, Condition with *variables*). However, most variables (e.g. doc author, page height, number of pages, ...) are not suited, as the requested information is only available *after* the job has been submitted to the Switch Server. At the time of submitting the job, only the variables of the Switch variables group (e.g. date, flow name, server name, ...) are available and can be displayed to the user. Some examples: • [Job.Size] as default value is invalid; this will result in see "0 bytes" as the job size is unknown as long as the job hasn't been submitted to the Switch Server. • [Switch.Date:TimeZone="UTC"] is valid and will show the current date and time (= the date/time you're using the Switch Web Portal to submit the file). ***Mismatches:*** In case "Data type" is Dropdown list with dynamically generated content, this default value might not correspond with one of the list items. In this case the "Default value" is empty in the Switch Web Portal. In case the "Data type" format and the default values format do not match, Switch tries to force the formatting of the data type property (example, Data type is hour and minute and the Default value is a text variable). If forcing is not possible, the Default value is empty in the Switch Web Portal.
Remember last value	If set to "Yes", the most-recently value entered by the user (in this field) is displayed. In case "Data type" is Dropdown list with dynamically generated content, the previous value might become irrelevant. The previous value is however stored so we can also compare it with the content of the list. If the stored value matches one of the data values, then this value is

Property	Description
	shown. If the stored value no longer appears in the list, no value is shown.
Read only	Set this to "Yes" to make this field read-only, so it cannot be edited by the user.
Value is required	If set to "Yes", the user must enter a non-blank value (relevant only if Data type is string).
Display metadata field	If set to "Yes" this field is displayed to the user and when set to "No" it is hidden. See *Using metadata* on page 389 and *Defining metadata fields* on page 396 for more information.
Cache dynamic values	This property determines if the dynamic metadata field values are calculated once and then stored in the cache (to save processing time) or recalculated each time metadata is requested for the job or Submit point. On the Switch Web Portal metadata is requested when submitting and processing a job (= when the form for entering metadata is displayed to the user). Dynamic values are values that are calculated using script expressions, defined using variables, or taken from a database. An example is a metadata field "Product" that is defined as a dropdownlist with products taken from a database. If cached, the products are retrieved from the database only once; if not cached, Switch retrieves the products each time metadata is requested. Options are: • **Do not cache** (default): The dynamic values are recalculated whenever they are requested. This takes more time but is advised in case of fast changing data (e.g. quickly changing database values, the [Switch.Counter] variable, ...). • **Cache per user**: The dynamic values are calculated once and then stored for each user separately. When a different user logs in, the dynamic values are calculated again and stored in that user's cache. This option is recommended if the dynamic values are based on user names or email addresses, such as a variable like [Connection.UserName]. • **Cache for all users**: The dynamic values are stored in a common cache for all users. For example, when user 1 submits a job, the dynamic metadata field values are calculated and stored in the common cache. If user 2 submits a job, the stored values are re-used (instead of recalculated). This option is recommended for job-dependent variables or script expressions. **Note:** • Fixed or static values are always cached. • Options to clear the cache (e.g. at user login or on a certain condition) can be set in the properties of Submit points and Checkpoints.

Note: For the **Checkpoint** tool, when a user selects "Define values from dataset" in the **Data Values** field, the **Build location path** window appears using which XPath expressions can be created. The regular variables from a dataset returns only one single value where as the result of the XPath can be a list of values.

Note: For the **Submit point** and the **Checkpoint** tools, when a user selects the "Define values from ODBC data source", **Build SQL statement** window appears. The regular variables from database returns only one single record where as the result of the SQL statement can be a list of records.

Note: Switch.OutgoingName cannot be used to define metadata fields in Checkpoints and Submit points.

Note: Node.js script expressions are not yet supported in Checkpoints and Submit points.

Update metadata

Click the button present below the **Metadata fields** list to access a dialog box which displays a two level tree: first level table tree of all Submit points (level 1) and second level for their metadata fields (level 2).

In the list, a Submit point can be checked (including all its fields) or an individual field can be selected. The fields that are checked are added to the **Metadata fields** list. Possible dependencies are preserved.

The fields from a Submit point are clearly marked (using color or some other mark). Therefore, user can distinguish such fields from a newly added Checkpoint field. All properties from these fields are grayed-out, except the **Show if parent equals ...** property, the **Read only** property and the **Display metadata field** property.

Behavior of updated fields in the Switch Web Portal

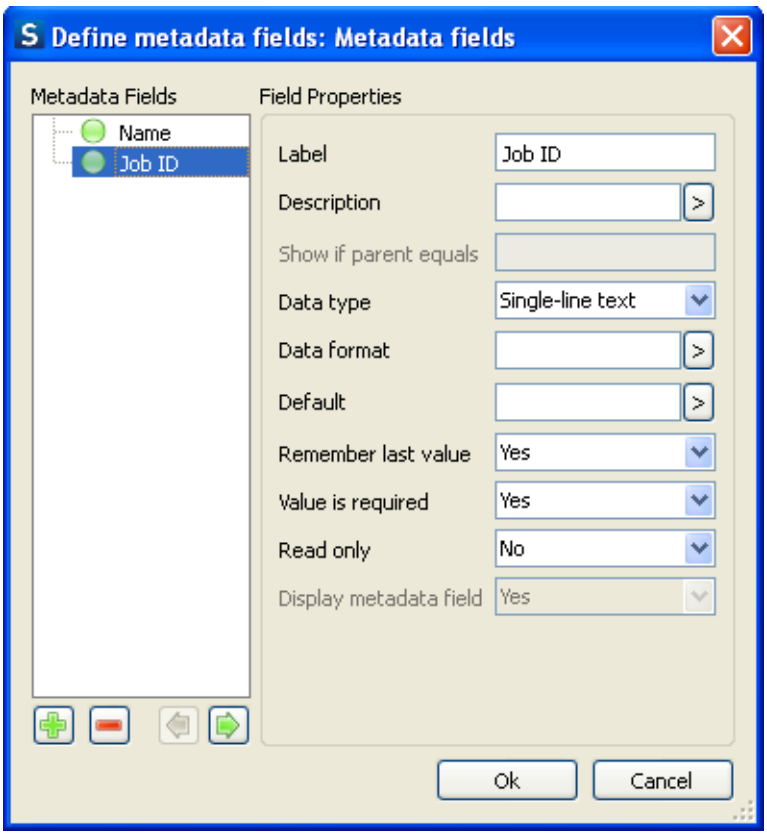
The **metadata** from the **submit dataset** is shown as the **default value**.

On the Switch Web Portal, users can read and change this data (if allowed). The new value is written to the **check dataset**. So technically, this is not a real update from the data but a copy from a field of one dataset (submit) to another (check). The Switch user can of course use the same name for the submit and check dataset. In this case the first dataset is overwritten.

If metadata fields are changed or added on a Submit point, the user will probably wish to update those fields in the Checkpoint too. Switch however does not offer an automatic update mechanism, so the user has to delete the field and re-import it again.

If users delete a field from a Submit point, they are also responsible for deleting that field from the Checkpoint metadata list as well. If a user does not remove the deleted field from the Checkpoint metadata list, then the field is still shown but the default value will then be empty.

Defining display-only fields



The property editor for display-only metadata fields allows creating an ordered list of field definitions (using the buttons under the listbox on the left-hand side). For each field definition, the property editor allows editing the properties described in the table below (using the edit fields and controls on the right-hand side).

Property	Description
Label	The label shown in front of the field
Description	A hint displayed when the cursor hovers over the field
Data type	The field's data type: Boolean or string
Calculated value	A script expression that evaluates to the value of the metadata field; it is evaluated in the context of the job being viewed by the user so that it can use metadata associated with the job

Client fields schema

The Submit point and Checkpoint tools pickup metadata fields entered by the user when submitting or routing a job through the Switch Web Portal.

Specifically, when a user submits a job and the list of field definitions in the Submit point's "Metadata fields" property is not empty, the Submit point:

- Creates a metadata dataset containing the contents of the metadata fields entered by the user.

- Associates this dataset with the job ticket for the submitted job under the dataset name specified in the "Dataset name" property.

Similarly, when a user routes a job residing in a Checkpoint and the list of editable field definitions in the Checkpoint's "Metadata fields" property is nonempty, the Checkpoint creates a metadata dataset and associates it with the job's job ticket under the specified dataset name.

Note that a Checkpoint always creates a completely new dataset, i.e. it does not update or modify an existing dataset (even if the job was previously moved through the same or another Checkpoint). If the job already has dataset association with the same name, the reference to the old dataset is removed and replaced by the new one.

Data model and schema

The client fields dataset uses the XML data model with a simple schema without namespaces.

The XML document element name is "field-list". It contains a "field" element for each item in the list of editable metadata field definitions associated with the Submit point or Checkpoint under consideration. The "field" elements occur in the same order as in the list of field definitions, and a "field" element is present even if the corresponding field's value is empty.

Each "field" element in turn contains zero or one occurrence of each element listed in the table below. Within the contents of those child elements leading and trailing white space is removed.

Element name	Description of element contents	Element is present
tag	The field name; in the current implementation this is equal to the human-readable field label	Always
type	The field's data type; that is, "boolean", "string" or "choice"	Always
format	A regular expression that matches the values allowed for the field (relevant only if data type is string)	If type is string and if regexp is not blank
required	Equals "true" if the user is required to enter a non-blank value, "false" otherwise (relevant only if data type is string)	If type is string
value	The value for the field: • For boolean data types: "true" or "false" • For string data types: the value entered by the user after removing any leading and trailing white space (may be the empty string unless required is set to true)	Always
items	The field's possible choices	if type is choice

Introduction to XPath 1.0

XPath 1.0 is used in the Switch scripting API for querying the contents of XML documents in the XML and JDF data models and in the XML module.

Note: The current version of Switch does not support XPath 2.0.

Refer to the XPath 1.0 specification, the XML 1.0 specification, the XML namespaces specification, and widely available literature for full details on XPath 1.0.

The remainder of this topic provides a brief introduction to a very small subset of XPath 1.0.

Expressions and location paths

XPath models an XML document as a tree of nodes. There are different types of nodes, including element nodes, attribute nodes and text nodes. XPath defines a way to address specific nodes in the node tree, to compute a string-value for each type of node and to perform more general calculations with these values.

The primary construct in XPath is the expression. An expression is evaluated to yield an object, which has one of the following four basic types:

- node-set (an unordered collection of nodes without duplicates).
- boolean (true or false).
- number (a floating-point number).
- string (a sequence of Unicode characters).

One important kind of expression is a location path. A location path selects a set of nodes. The result of evaluating an expression that is a location path is the node-set containing the nodes selected by the location path. Location paths can recursively contain expressions that are used to filter sets of nodes.

Location paths

A location path is a sequence of one or more location steps separated by a slash. Each location step in turn (from left to right) selects a set of nodes relative to the context node determined by the previous step. The initial context node is determined by the location path's context (for the data model queries in Switch this is always the document's root node; in the XML module it is the node being queried). A slash in front of a location path makes the location path absolute, that is, the "/" refers to the root node of the document.

Here are some examples of location paths:

para

selects the para element children of the context node

*

selects all element children of the context node

text()

selects all text node children of the context node

@name

selects the name attribute of the context node

@*

selects all the attributes of the context node

para[1]

selects the first para child of the context node

para[last()]

selects the last para child of the context node

*/para

selects all para grandchildren of the context node

/doc/chapter[5]/section[2]

selects the second section element in the fifth chapter element in the doc document element

chapter//para

selects the para element descendants of the chapter element children of the context node

//para

selects all the para descendants of the document root and thus selects all para elements in the same document as the context node

//olist/item

selects all the item elements in the same document as the context node that have an olist parent

.

selects the context node

.//para

selects the para element descendants of the context node

..

selects the parent of the context node

../@lang

selects the lang attribute of the parent of the context node

para[@type="warning"]

selects all para child elements of the context node that have a type attribute with value warning

para[@type="warning"][5]

selects the fifth para child element of the context node that has a type attribute with value warning

para[5][@type="warning"]

selects the fifth para child element of the context node if that child has a type attribute with value warning

chapter[title="Introduction"]

selects the chapter child elements of the context node that have one or more title child elements with string-value equal to Introduction

//field[name="JobID"]/value

selects all value elements in the document that have a parent field element and a sibling name element with string-value equal to JobID

chapter[title]

selects the chapter child elements of the context node that have one or more title child elements

employee[@secretary and @assistant]

selects all the employee child elements of the context node that have both a secretary attribute and an assistant attribute

Expressions

The location paths listed in the previous section contain a few examples of simple expressions used to filter nodes (such as @type="warning" to filter out elements with a particular attribute value). Expressions can also stand on their own, and can be used to express calculations based on the result of a location path. XPath provides a limited number of functions for use in expressions.

Here are some examples of expressions:

para

evaluates to the text contents of the para element(s)

@type

evaluates to the text contents of the type attribute

(2 + 3) * 4

evaluates to the number 20

number(@type) > 10

evaluates to true if the contents of the type attribute represents a number that is greater than 10; and to false otherwise

count(//field)

evaluates to the number of field elements in the document, regardless of their position in the node tree

count(/doc/chapter[5]/section)

evaluates to the number of section elements in the fifth chapter element in the doc document element

string-length(normalize-space(para))

evaluates to the number of characters in the text contents of the para element, after removing leading and trailing white space and replacing sequences of white space characters by a single space

Namespaces

The examples above assume that the XML document being queried does not use namespaces. In practice however many XML documents do use namespaces to avoid conflicting element and attribute names when information of a different type or origin is mixed.

A namespace is identified by a Unique Resource Identifier (URI) which resembles a web page address but in fact is just a unique string (most URIs do not point to an actual web page). Rather than repeating this URI each time, element and attribute names use a namespace prefix (a shorthand) to refer to a namespace. The mapping between namespace prefixes and namespace URIs is defined in namespace declarations in the XML file.

For example:

xml:lang

is the name of a standard xml attribute for indicating a natural language

jdf:node

is the name of a node element in the JDF specification, assuming that the jdf prefix is mapped to the JDF namespace URI

Namespaces and XPath

If the XML file being queried uses namespaces, the XPath expressions and location paths must use namespace prefixes as well. The mapping between those prefixes and the corresponding namespace URIs must be passed to the query function separately, since this information can't be expressed in XPath.

Note that namespace URIs must match between the XPath expression and the XML file; the namespace prefixes may differ.

XPath does not have the concept of a default namespace. If the XML file being queried defines a default namespace, the XPath expression must specify a namespace prefix to refer to elements in that namespace. The default_switch_ns prefix can be used to specify elements using the default namespace.

Introduction to Adobe XMP location paths

The Adobe XMP specification dated September 2005 defines the XMP data model (the abstract node hierarchy represented by an XMP packet or file). Other Adobe publications define a mechanism to address a specific node in the XMP data model, using a syntax that is a (very small) subset of the XPath 1.0 location path syntax. In this documentation we refer to this mechanism as XMP location paths.

XMP location path syntax

An XMP location path points to a specific node in an XMP node hierarchy (whether the node exists or not).

An XMP location path is a series of one or more XMP location steps separated by a slash. Each location step address the next child element, depending on the structure of the document.

Each location step is one of the following:

- A prefixed field name
- An array index selector
- A language selector

A language selector may occur only as the very last location step. The first location step is always a prefixed field name.

Field name

A field name addresses a named element (also called a field).

For example:

xmp:SomeProperty

Addresses a field named "SomeProperty" in the namespace to which the "xmp" namespace prefix is mapped.

Index selector

An index selector addresses an item in an array. Indices are one-based, that is, the first item in an array has index 1. The last item in an array can be addressed with the special index "last()". In all cases the index must be enclosed in square brackets and preceded by an asterisk.

For example:

*[1]

*[4]

*[last()]

Address the first, the fourth and the last item of an array, respectively.

Language selector

A language selector addresses an item in a collection with language alternatives (a collection of strings with the same meaning but localized for different human languages). The language is indicated by a 2-letter language code (ISO 639), optionally followed by a 2-letter country code (ISO 3166). The special language code "x-default" indicates the default language. The language code must be embedded in special XPath syntax for addressing the xml:lang attribute.

For example:

*[@xml:lang='enUS'] *[@xml:lang='x-default']

Address U.S. English and the default language item, respectively.

Examples

The following examples address properties in the XMP Dublin Core schema, which is usually associated with the "dc" prefix. Thus these examples assume that the "dc" prefix is mapped to the Dublin Core namespace URI (http://purl.org/dc/elements/1.1/).

Examples:

dc:format

Addresses the top-level data format property.

dc:creator/*[1]

Addresses the first item in the list of document creators, which by convention is the primary author of the document.

dc:description/*[@xml:lang='x-default']

Addresses the default item in the list of language alternatives for the document's description.

5.5.3. Scripting Module

5.5.3.1. Script element

If you have an active license for the Scripting Module, you have access to the **Script element** in the Flow elements pane. This allows you develop your own scripts (using the SwitchScripter application, which comes with Switch), for example to extend the capabilities of Switch. You can also create your own apps using SwitchScripter, for interaction with third-party applications that are not yet supported by Switch.

Note:

- When using Switch to automate a third-party application using apps, you should make sure that you comply with the vendor's End User License Agreement and have obtained the appropriate software license.
- If you want to make your scripts available to other Switch users, you may consider becoming an Enfocus app creator. By being an app creator you can turn scripts into apps and make them available in the Enfocus Appstore for other users to purchase or download. More information and our email to contact us can be found at *https://www.enfocus.com/en/appstore/about*.

For more information, refer to the *Switch Scripting documentation on the Enfocus website*. There is also a guide with sample scripts available on the Enfocus website.

5.5.3.2. Script expressions

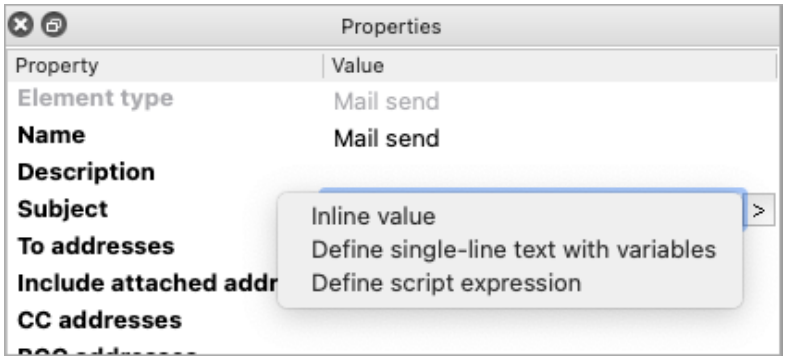
A script expression is a JavaScript program that gets evaluated in the context of a job (file or job folder) to determine the value of a particular property of a flow element or connection. This allows the property value to depend on the job or its associated metadata.

Both legacy JavaScript and Node.js TypeScript can be used in script expressions. Other languages are not supported.

Associating a script expression with a property

Many flow element and connection properties in Switch offer an extra property editor that allows entering a script expression.

For example, the "Subject" property of the Mail send flow element allows a script expression in addition to a regular explicit value ("inline value") and single-line text with variables.

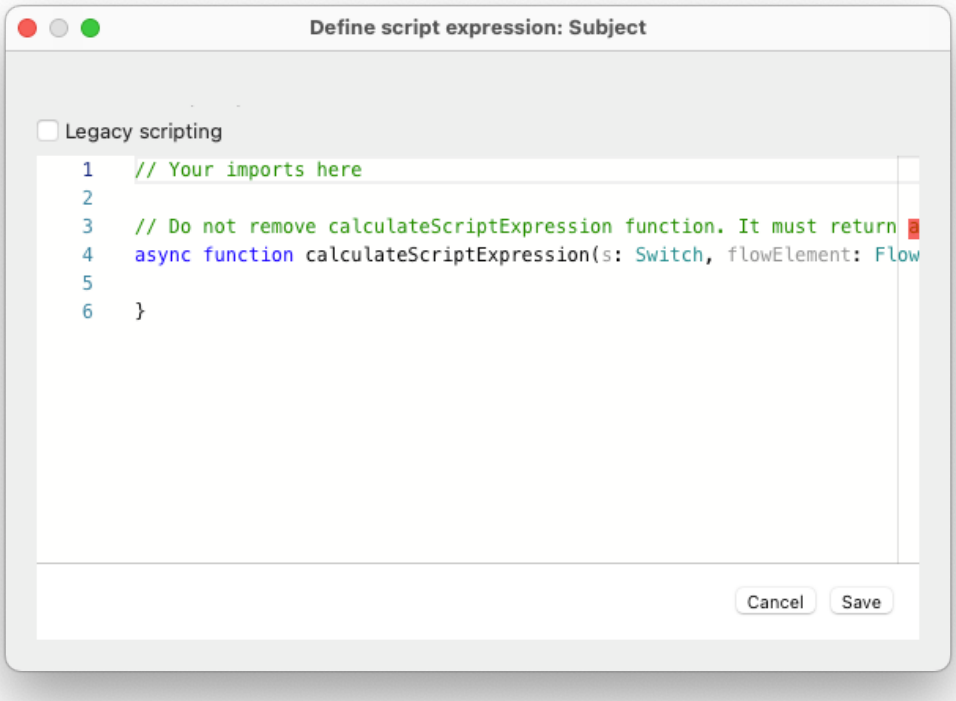


To associate a script expression with a property value, proceed as follows:

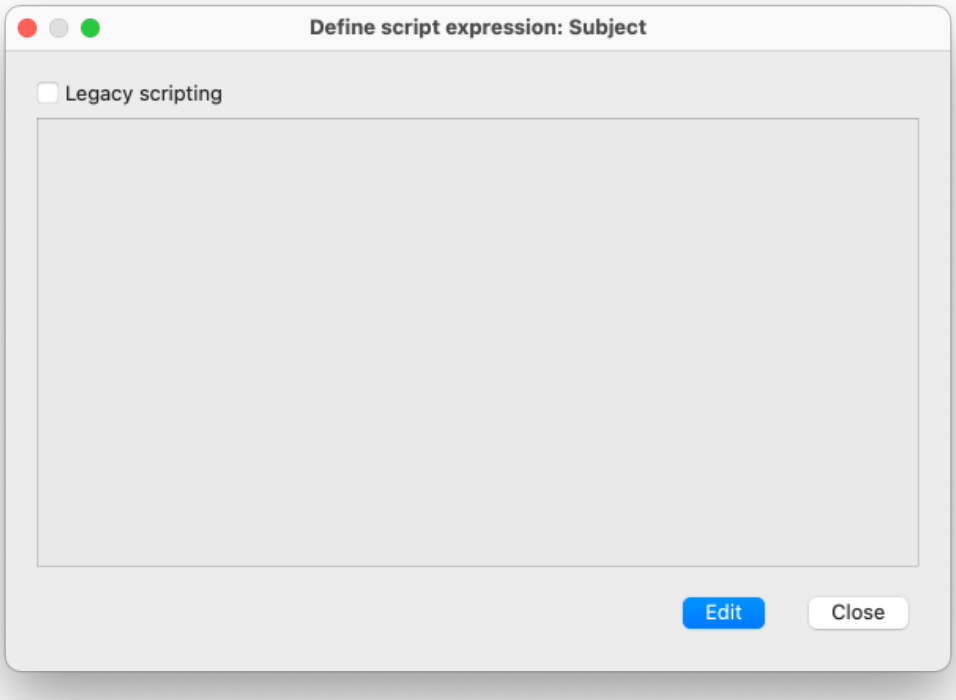
1. Click the arrow button next to the property that you want to define.
   The menu options are shown.

2. From the list, select **Define script expression**.
   The Define script expression dialog pops up. What you see, depends on the value of the *Render HTML in Designer* preference. This preference determines whether the Node.js script expression editor is shown in Designer or in a separate browser window.

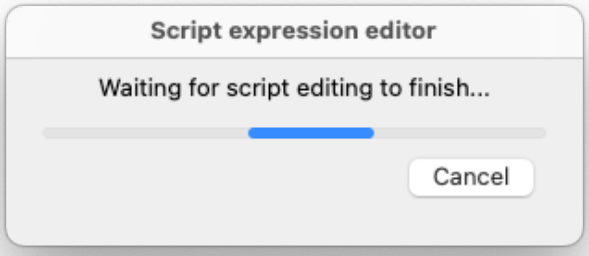
   - *Render HTML in Designer set to Yes*:



- *Render HTML in Designer set to No, so the editor will be shown in your default browser*:



3. Do one of the following:
   - If you want to use *legacy JavaScript*, select the **Legacy scripting** checkbox and enter your script expression in the text field. The value of a script expression's property is set to the result of evaluating the main body of the script as an expression. The main body may invoke functions defined in the script expression itself or provided as part of the Switch scripting API. For more details, please check the Switch legacy scripting documentation.
   - If you want to use *Node.js TypeScript*:
     - If the script expression editor is opened in Designer, you can immediately write your script expression.
     - If the script expression editor is not yet active, click **Edit**. The script expression editor will open in a separate browser window. You can now write your script expression in the browser window. Access to the Switch Designer user interface will be blocked until you're done.



In case of Node.js TypeScript, the script expression must be put as the body of the calculateScriptExpression() entry point. The value of a script expression's property is set to the result of evaluating the calculateScriptExpression() entry point. The entry point may invoke functions defined in the script expression itself or provided as part of the Switch scripting API. For more details, refer to the Switch Node.js scripting documentation. For more information on the Node.js editor, refer to *https://microsoft.github.io/monaco-editor/*.

4. To develop and test your script expression, save it, activate the flow and process some sample jobs.

Note: Script expressions in legacy JavaScript can still be developed and tested in SwitchScripter. Afterwards you just have to load them in the appropriate editor dialog box.

Script expressions: examples

Note: Although some of the examples in this section use legacy JavaScript, we recommend using Node.js TypeScript.

String value example

Script expression in Node.js TypeScript

```
async function calculateScriptExpression(s: Switch, flowElement: FlowElement, job:
 Job): Promise<string | number | boolean> {
    const theDefaultAddress = "addr@host.com";
    const theEmailAddresses = await
 job.getPrivateData('EnfocusSwitch.emailAddresses');

    if (typeof theEmailAddresses === "string" && theEmailAddresses === "") {
        return theDefaultAddress;
    }
    return theEmailAddresses.join(";");
}
```

When this script expression is evaluated in the context of a job being processed, the script expression will return the email addresses which are added to each job's email info as the job passes through the folder (specified in the "Attach email addresses" property of the input folder).

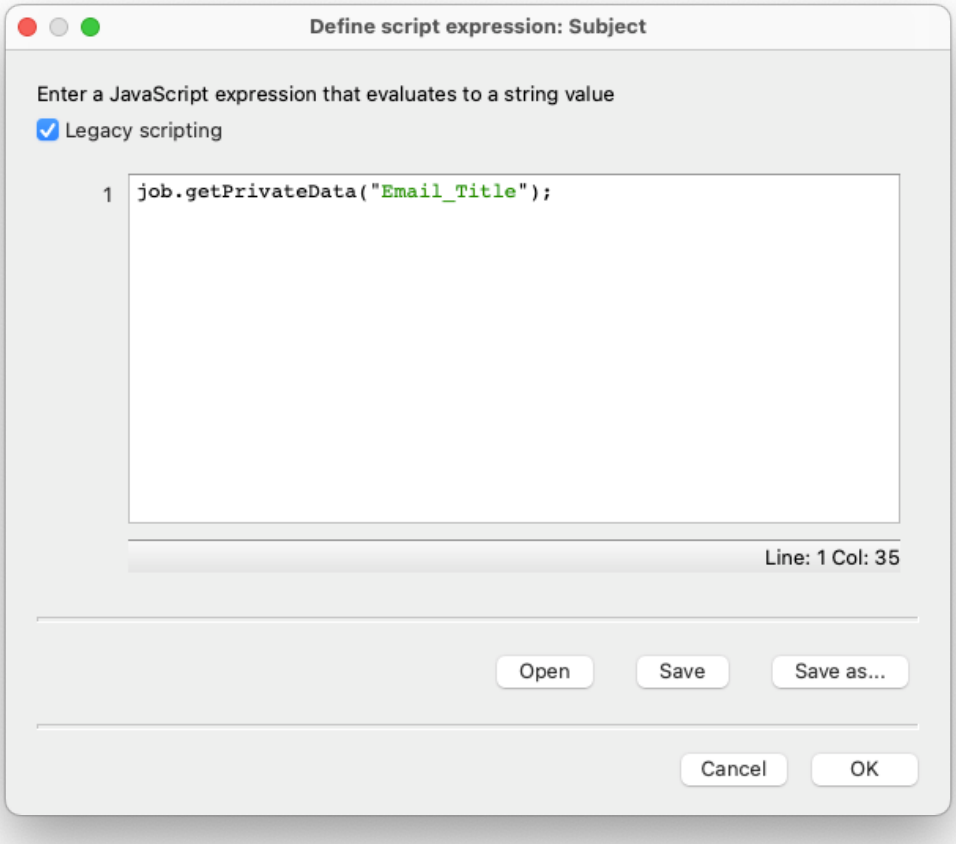
In the screenshot below, the script expression used to define the "To addresses" property of Mail send.

Script expression in legacy JavaScript

```
job.getPrivateData("Email_Title");
```

When this script expression is evaluated in the context of the job being processed, the script expression will return a string value (or a value that can be meaningfully converted to a string under the JavaScript rules).

In the screenshot below, the script expression is used to define the "Subject" property of Mail send, so the resulting value will be used as the subject line of the email that will be sent out for the job.



Boolean value example

Script expression in Node.js

```
async function calculateScriptExpression(s: Switch, flowElement: FlowElement, job:
 Job): Promise<string | number | boolean> {
    return false;
}
```

This is an example of a Node.js script expression associated with the master property of a script element or app.The master property contains a "No-yes list" (boolean property type) and "Script expression" editors. The dependent property will be shown only if the master property equals "No".

Script expression in legacy JavaScript

```
job.getByteCount()==(1024*10);
```

When this script expression is evaluated in the context of the job being considered as a possible match for the filter, the script expression will return a Boolean value, i.e. true or false (or a value that can be meaningfully converted to a Boolean under the JavaScript rules). If the resulting value is true, the job will be considered to match the filter, otherwise it won't.

This script expression could for example be associated with the *Include these jobs* property of a connection leaving a folder.

Number value example

Script expression in Node.js

```
async function calculateScriptExpression(s: Switch, flowElement: FlowElement, job:
 Job): Promise<string | number | boolean> {
    return PdfDocument.getNumberOfPages(await job.get(AccessLevel.ReadOnly));
}
```

When this script expression is evaluated in the context of the job being processed, the script expression will return the number of pages in the PDF document associated with the job.

Array value example

Script expression in Legacy JavaScript

When the main editor is “Multi-line text with variables” the script element or app expects an array in return, but in that case it works a bit differently. Instead of returning the array as is, a joined version of it using \n as a separator should be returned:

```
var mailAddresses = [“123@abc.com”,”456@def.com”];
                    //mailAddress;//do not return just this
                    mailAddresses.join(“\n”);//but do it like this
```

In the script element or app, the return value can then be easily turned into an array again by splitting the string based on \n. Note that not all existing scripts and apps implement this behavior, so although we recommend this approach it may not always work as described here.

Note: If a script expression evaluates to a complex JavaScript object, then before returning the value, the script expression code can convert the object to a string value using the JSON.stringify() function. Later the flow element script code can convert it back to the object using the JSON.parse() function. Both functions are available in legacy JavaScript and Node.js TypeScript.

5.5.4. Database Module

The Database module is an advanced module that allows **read/write access to databases (through ODBC data sources) without the need for extensive scripting**. With the database module, business or job management software can be used in conjunction with Switch workflows to further automate job decisions.

An active Database module license provides you with access to:

- The **ODBC data sources** option in the **User preferences** dialog (required *to set up a database connection and to use database variables)*.
- The ***Database connect*** flow element (available in the Database category of the Flow elements pane). This flow element allows you to configure certain settings in databases without having to script them.
- ***Database variables***. This allows you to use any values from your database in Switch.
- **Database values** when defining metadata for a *Submit point* on page 119 on the Switch Web Portal or a Connector in Connect ALL (see the Connect documentation on the Enfocus website).

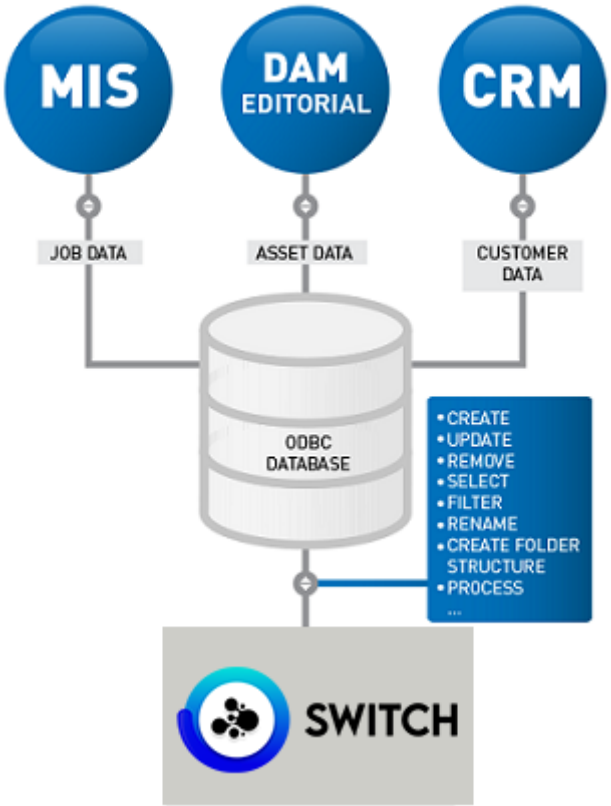
5.5.4.1. Getting started with the Database Module

The Switch Database Module automates the communication between any database and Switch.

This means *you can use database information* in Switch, for example to make decisions based on existing job or customer information. For example, if information about the paper type of a job is available in your MIS system, you can attach this information to the job and use this information to decide whether or not it should go to an Ink Optimizer.

Moreover, you can also *change the information in your database* from within your workflow to store information obtained in the workflow, for example to indicate that the job is done or to store preflight information. You can as well add or delete records in your database.

The illustration below shows how data from different types of databases (MIS/DAM/CRM database) can communicate with Switch through ODBC data sources ("connections to the database").



If you're using *the Switch Web Portal or Connect ALL to submit jobs to Switch*, the Database Module offers an extra feature, i.e. the possibility to present database values to the users and give them the chance to attach the appropriate values to the job. For example, instead of asking the users to type the correct customer ID (risk of typos!), you could show them a list of customer IDs available in the database to choose from.

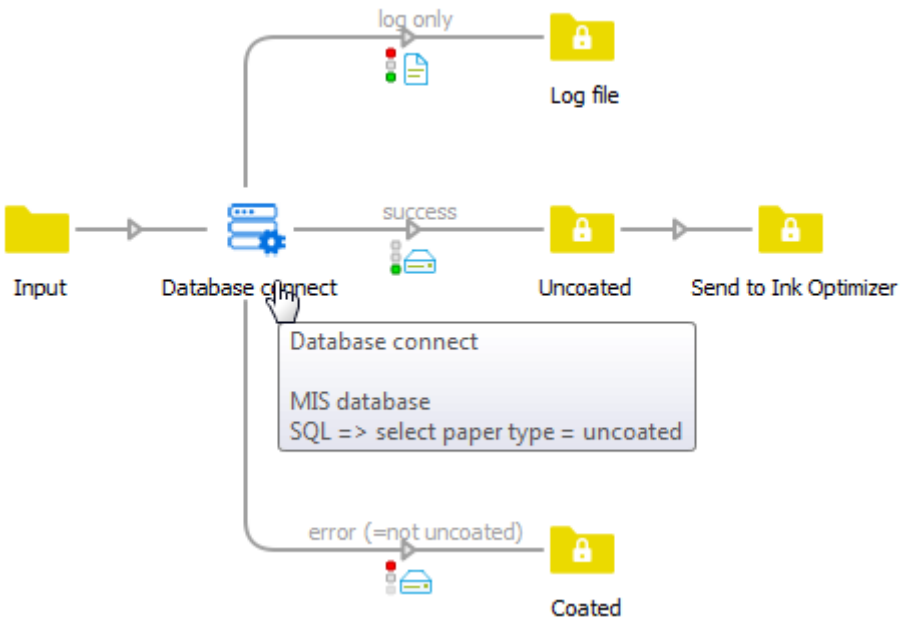
Database connect

An active license for the Database Module gives access to the **Database connect** flow element.

This element allows you to establish a connection with the database of your choice (using ODBC data sources) and to build an SQL statement to determine what data should be collected, added, modified, filtered, changed...

When a job passes through this flow element, the SQL statement is executed. To keep an eye on the changes, you can log the result of the SQL statement.

In the following example, when a job arrives in the Database connect flow element, Switch connects to the MIS database and checks the paper type for the current job. Only if the job matches the SQL statement, the job is “successful” and the job will be sent to the Ink Optimizer. For each job, a log file is created and stored in a separate folder.



Database variables

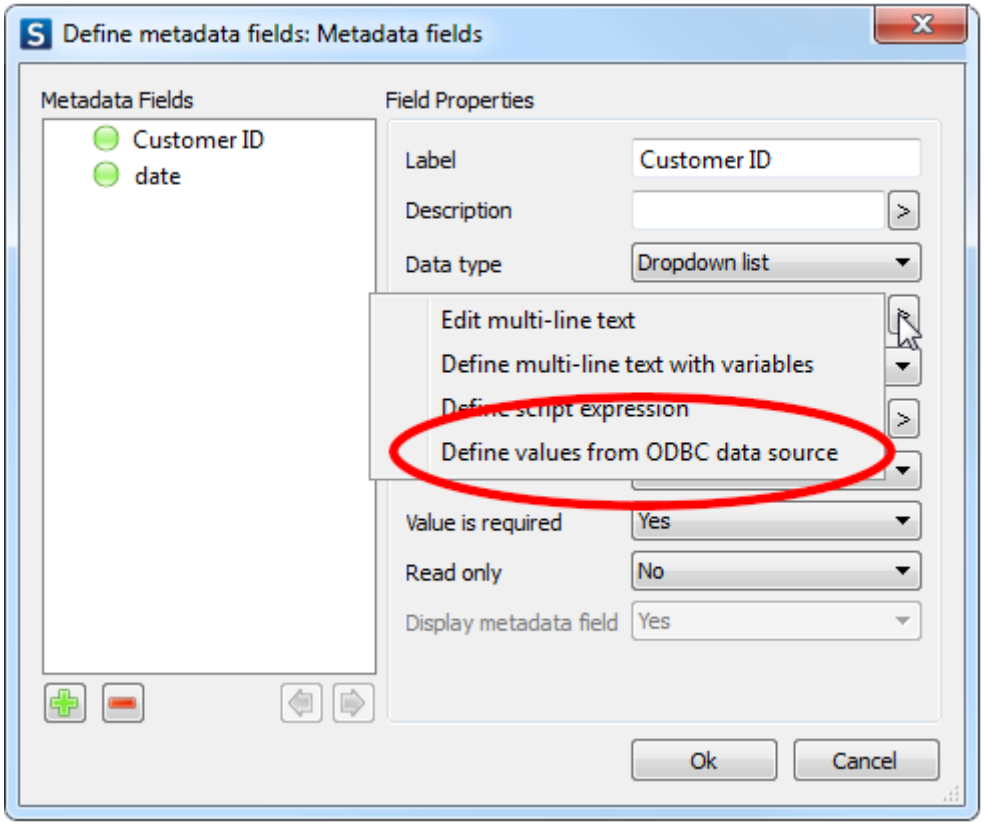
Additionally, the Database Module gives access to an extra set of variables, e.g. the Database variables which also retrieve data from your database but which can be used wherever variables can be used in Switch (so not only in combination with the Database connect flow element).

Variables in Switch are “placeholders” - they are replaced with actual values when a job is being processed. For example, if you want that the customer receives a notification whenever a job is finished, you should use the [Job.EmailAddress] variable (in the Mail send element) to make sure that the email is sent to the right email address (i.e. the address associated with the job). However, if you have activated the Database Module, you can select (additional) email addresses available in your database. The variable will start with "Database", e.g. [Database.Text:SQL=" SELECT Email FROM Customers"] (SQL statement to select records from the column "Email" in the table "Customers").

Database fields in the Switch Web Portal and Connect ALL

A Submit point (in Switch) or a Connector (created with Connect ALL) can be configured to ask for metadata when a job is submitted. Metadata is additional information about the job, sent along with the processed job in the background as an XML, TXT or CSV file (called Job Ticket). It is often used to store administrative information associated with the job or to exchange such information between systems.

If you have licensed the Database Module, you can define your metadata fields using values from your database (again using an SQL statement).



Note: It is only possible to visualize content from the database, for example the possible values for a particular field. It is NOT possible to extract the correct value for a particular job; the operator who submits a job to a Submit point or a Connector has to select it manually.

5.5.4.2. Database Module - Setup

To able to use the features of the Database Module, make sure to:

- *Activate your license for the Database Module*
- *Set up your ODBC database connection*.

About ODBC data sources in Switch

Guidelines

Please take into account the following guidelines when accessing ODBC data sources in Switch:

Before you set up the connection to the data source, you should have defined your database (i.e. the Database Source Name (DSN)) in the **DSN settings of your operating system**. Read the documentation of your database to learn how to set up the DSN.

Windows users can find more information on the Microsoft website: *http://msdn.microsoft.com/en-us/library/ms710252%28v=VS.85%29.aspx*

Mac users should install an ODBC Administrator, for example *http://www.odbcmanager.net/*, to be able to set up ODBC connections on Mac.

Note: Switch allows you to use both User and System DSN on Windows and Mac platforms.

Make sure to install a 64-bit ODBC driver.

- **Example Windows OS:** In case of MySQL database, the ODBC driver installer mysql-connector-odbc-5.1.8-winx64.msi is used. When you launch this installer and choose the **Custom** installation, you will see that two drivers are available: 32-bit and 64-bit. Install the 64-bit driver and preferably disable the 32-bit driver, to avoid mix-up of driver versions in the future. This will guarantee that Switch uses the correct driver.

For more information on ODBC drivers and data sources, refer to *http://msdn.microsoft.com/en-us/library/ms710285%28v=VS.85%29.aspx* .

- **Example Mac OS X:** In the MySQL database, two versions of Mac OS X ODBC drivers are available: 32-bit and 64-bit. You must use the 64-bit version (mysql-connector-odbc-5.2.7-osx10.7-x86-64bit.dmg).

Make sure to use the 64-bit version of the ODBC Administrator tool to configure your data sources (DSNs).

On 64-bit Windows computers, two ODBC Administrator tools are available:

- 32-bit version: ..\windows\sysWOW64\odbcad32.exe
- 64-bit version: ..\windows\system32\odbcad32.exe

Use the 64-bit version from \windows\system32\odbcad32.exe to configure your DSNs for Switch.

- If you install only the 64-bit ODBC driver and then launch the 32-bit version of the tool, you will not be able to configure any DSNs, because the 32-bit version of the tool does not show the 64-bit ODBC drivers.
- If you have installed the 32-bit ODBC drivers, then in the 32-bit version of the tool you will see the 32-bit driver and you will be able to configure DSNs for that driver. However, Switch will not work with these DSNs and you will get the error message The specified DSN contains an architecture mismatch between the Driver and Application".

For more information on managing data sources, refer to *http://msdn.microsoft.com/en-us/library/ms712362%28v=VS.85%29.aspx* .

Using the INGRES database in combination with Switch?

You should set the following flag (in the INGRES database):

```
return NULL for SCHEMA columns in ODBC catalog function result sets
```

Otherwise, you will get an error ("invalid table") when setting up SQL statements.

Setting up an ODBC database connection

If you want to use Switch with an ODBC data source (and you have licensed the Database module), you must set up a connection to the preferred database.

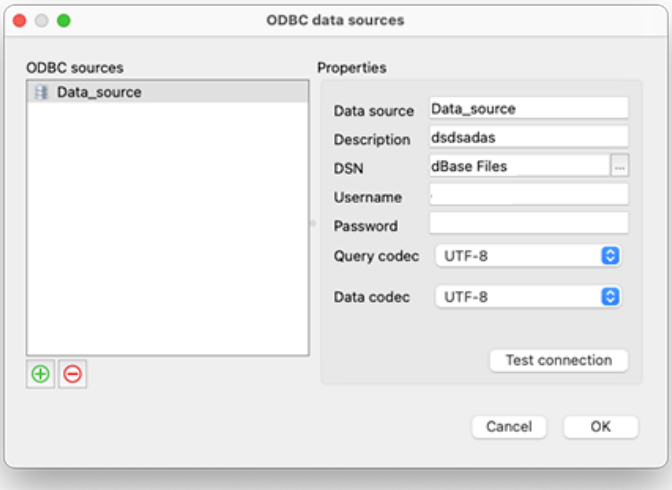
Note:

- If you have more than one database, you can configure different database connections as required.
- The database engine can run on a different computer than Switch.

To configure an ODBC database connection

1. In Switch, navigate to **Edit** > **User Preferences** > **ODBC data sources**.
2. Do one of the following:
   - Select the **ODBC data source information** field and click ...
   - Double-click the **ODBC data source information** field.

   The ODBC data sources dialog appears.
3. To add and configure an ODBC data source, click .
   The ODBC sources field now contains one data source, temporarily called *Data Source*. You can rename it in the next step of this procedure.



4. In the **Properties** pane, in the **Data Source** text field, provide a name for the data source.
5. In the **Description** text field, provide a small definition for the data source.
6. To select the DSN (Database Source Name) from the library, click ...

   The DSN must be defined in the DSN settings of your operating system. For more information, refer to *About ODBC data sources in Switch* on page 51.
7. Provide a **Username** and **Password**.

   These two fields can also be left blank if username and password are not required, or if they have already been defined for the DSN.
8. From the drop-down menus, select the appropriate **Query codec** and **Data codec**, if required.
9. To test the database connection, click **Check connection**.
   If the connection succeeded, a message box appears displaying the message Connection successful.

   Note: In case of problems, you will see an error message generated by the ODBC tool of your operating system.
10. To close the message, click **OK**.

    If you have more than one database, repeat step 3 to 10 and add as many data sources as you have databases.
11. To close the **ODBC data sources** dialog, click **OK** once more.

5.5.4.3. Database connect

This default Switch app helps in configuring certain settings in the databases (like selecting Datasource, adding SQL statement etc) without the use of scripting. It is only available if you have licensed the *Database module*.

Drag and drop the **Database Connect** to the workspace.

For more information about this app, refer to the *app documentation* on the Enfocus Appstore.

5.5.4.4. Database variables

What are database variables?

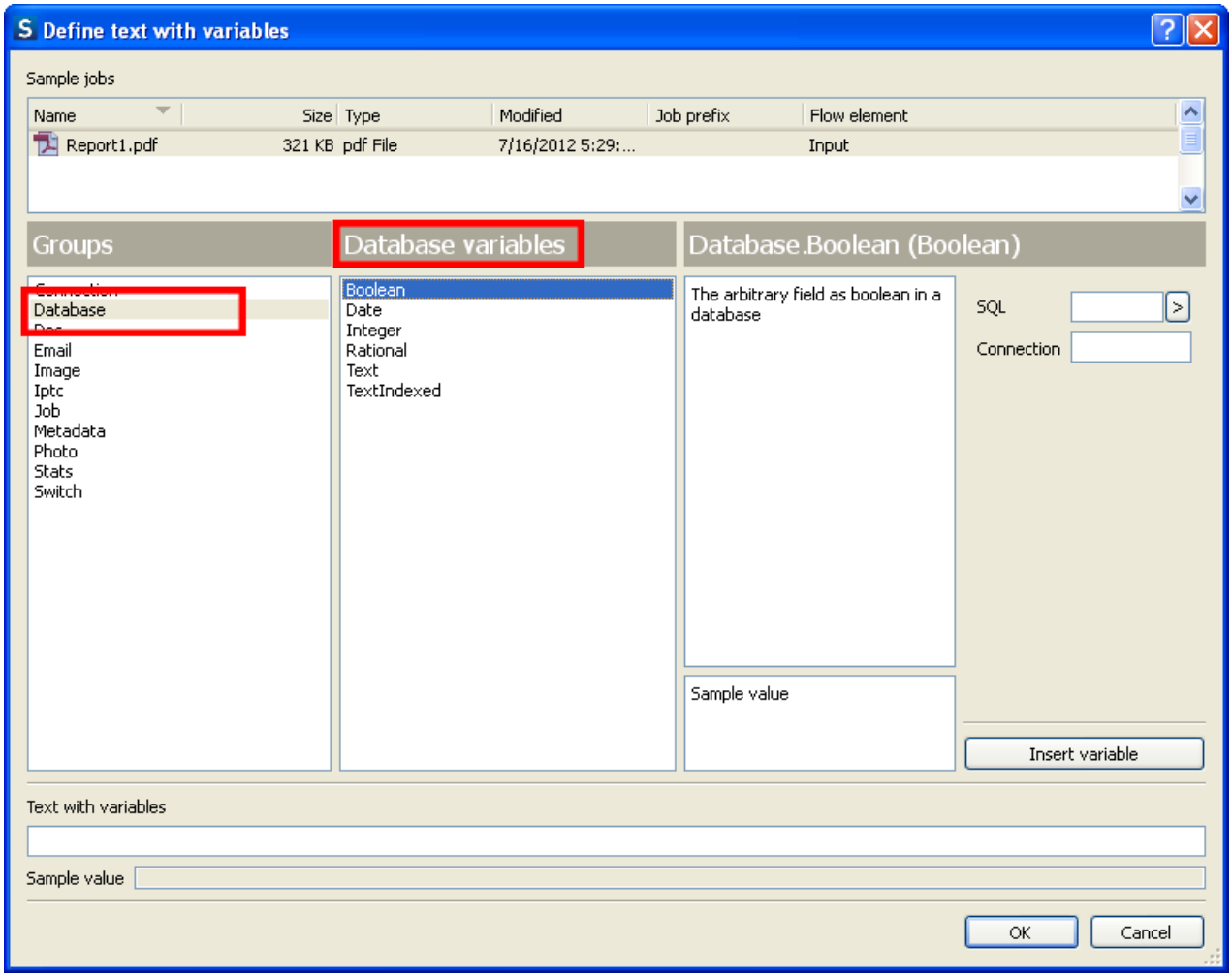
Database variables are variables that at run-time are replaced with values from a database. These variables can only be used if you have an active license for the Switch Databases Module.

You can use the database variables in the same way as the regular Switch variables:

- Use them as values for the *tools and app* properties.

- Use them as values for *conditions*, for example to filter jobs on a connection.
- Use them as values to fill a drop-down menu in the Submit point and Checkpoint *metadata* properties.

They are also accessible in the same way as other variables, i.e. via the **Define Text/Condition with Variables** option in the properties of the Switch tools. They are collected in a separate group: the "Database" variable group (see screenshot).



The table below lists the available data types.

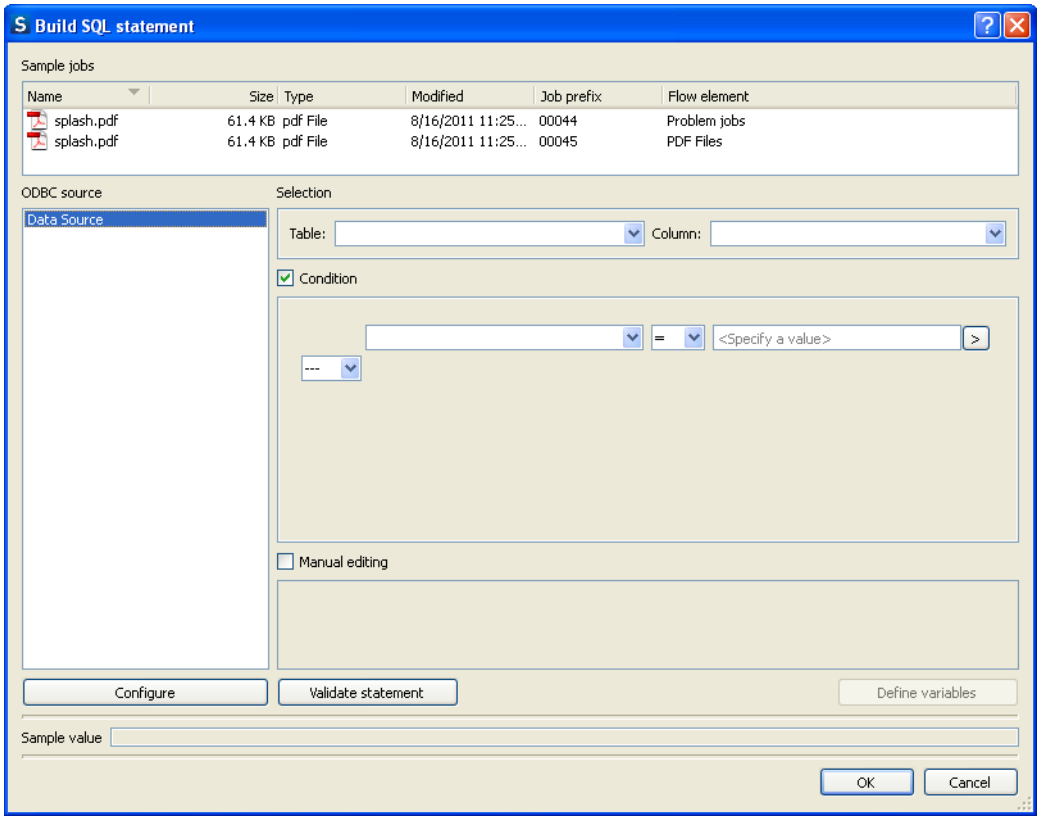
Variable name	Data type
Database.Text	Text
Database.TextIndexed	Text Indexed
Database.Boolean	Boolean
Database.Integer	Integer
Database.Rational	Rational

Variable name	Data type
Database.Date	Date

How to build an SQL statement?

After you have selected the Database group in the first column, and the data type in the second column, you must create an SQL statement. The Build SQL statement dialog box (see screenshot) will assist you in creating the SELECT statement and obtaining the appropriate values from the database.

Tip: We recommend using a sample job, so you can see immediately if your SQL statement is valid and correct.



To build an SQL statement, proceed as follows:

1. Click the button beside the **SQL** textbox and choose **Build SQL statement**.
2. Select a data source.
   a. Click the **Configure** button.
   b. In the **ODBC data sources** dialog, select a data source from the list of predefined data sources (Refer to *ODBC data sources* for more information on how to define the data sources).
3. Select a table and a column in the **Table** and the **Column** drop-down menus.

4. Select the **Condition** checkbox and specify or select the conditions in the first and the third menu, choose the comparison operator in the middle drop-down menu and choose the AND or OR logical operator in the last drop-down menu.
5. Alternatively, in order to choose more than one column or to choose a column from any other table or not to choose any columns, select the **Manual editing** checkbox and enter the statement manually.
6. After setting the SQL statement, click the **Validate statement** button to check if the query is valid. If the query returns any value or error, it is displayed on screen. The **Sample value** menu displays the sample value for a query. If a query returns multiple values, they will be listed in a comma separated list. For example: "val11,val12,val21,val22...".
7. Click the **OK** button to insert the statement.

5.5.5. SwitchClient Module

SwitchClient is a Switch module allowing users to access the Switch Server remotely, via Submit points (to submit jobs) and Checkpoints (to monitor jobs).

With an active license of the SwitchClient Module, users can for example:

- Connect to one or more Switch Servers on the local network/internet.
- Submit jobs (files or job folders) and metadata describing these jobs to a Submit point in a flow.
- Review and act on jobs being held in a Checkpoint in a flow.
- View progress information and the status of submitted jobs.
- Access the REST API and build a custom Job Client.

Good to know

- Access to particular Submit points and Checkpoints can be restricted, by configuring access rights at user or user group level. For more information, refer to *Configuring Switch users* on page 62.
- Metadata information attached to a job can be used to make automated routing decisions or to provide variable input to various tools and apps.
- SwitchClient comes with a documented REST API, which enables our customers to build their own Switch client tailored to their specific needs. The API can be accessed without a licensed Web Services module for *limited, internal usage*. Note that currently there are two limitations of SwitchClient module, which can be solved by using the Switch Web Services module:
  - The Switch Web Services module allows an unlimited amount of client users, while SwitchClient module, by default, allows only 5, and then you can buy extra client connections keys.
  - The Switch Web Services module allows anonymous access (users don't have to provide any credentials, they just need to know a link) to shared Submit points.

5.5.6. Switch Web Services

The Switch Web Services is a REST-based development tool designed to create custom Switch client interfaces within existing applications or web-based interfaces. This can be useful for external users when they need access to jobs or workflows, or in cases where access to jobs needs to be built into existing application interfaces.

Note that an active Switch Web Services license gives access to the functionality to *submit and check jobs through the Switch Web Portal*.

For more information on the Switch Web Services, please contact your local Enfocus reseller or contact Enfocus directly.

5.5.7. Reporting Module

The Reporting Module allows you to create, display and share dashboards on the Switch Web Portal. You can configure the data you want to use (by defining job boards) and choose from different widgets to display live data or historical data (to get statistics).

For more information, refer to the chapter on *Managing dashboards on the Switch Web Portal* on page 282.

5.6. Stopping the Switch Server

For maintenance reasons, it may be necessary to shut down the Switch Server.

To stop the Switch Server

1. Launch Switch with a local Designer.
2. From the **File** menu, select **Stop Switch Server**.

Note: Note the difference with the option **Stop processing**, which only causes the Switch Server to stop processing flows.

The Switch Server is terminated and the Designer is closed. Remote Designers will not be able to connect to the Switch Server. Connecting with a local Designer will restart the Server.

5.7. Quitting Switch

Quitting Switch means exiting the Switch Designer.

The behavior of the Switch Server (whether or not it is stopped when quitting) depends on the setting of **When exiting the flow designer** in the *Switch preferences: User interface* on page 34.

To quit Switch

Do one of the following:

- Click the **Close** button ( ) in the top right corner of the application.
- (Windows) From the **File** menu, select **Quit Switch**.
- (Mac) From the **Enfocus Switch** menu, select **Quit Enfocus Switch**.

6. The Switch Insight Dashboard

The Switch Insight Dashboard is a dashboard that allows you to visualize the usage of your Switch. The charts on this dashboard will for example show you:

- How many files were processed by the Switch Server.
- How many problem jobs were found.
- Which flows and flow elements were used most.
- Which file types were processed most.
- Which production times were busy and which weren't.
- etc.

The Switch Insight Dashboard is free for maintenance users. Note however, that you should explicitly opt in via the Insight Dashboard menu option in Switch (see *Enabling your Switch Insight Dashboard* on page 425). Otherwise, the Switch Insight Dashboard won't be made available.

Once you have opted in, you can consult your Switch Insight Dashboard from within Switch or via the account section on enfocus.com (see *Consulting your Switch Insight Dashboard* on page 426).

Note that this Dashboard is visible to all Switch managers:

- Anyone who has signed in at least once to the Switch Designer.
- Anyone who has been added as Switch manager via the account section on enfocus.com (see *Adding a Switch manager* on page 260).

6.1. Enabling your Switch Insight Dashboard

Enfocus provides a free, personal Switch Insight Dashboard with weekly statistics, exclusively for its Switch maintenance customers.

To make use of this feature, proceed as follows:

1. Make sure you're signed into Switch with your Enfocus ID.

   You can sign in through the About Enfocus Switch dialog (Sign in tab):

   - On Windows, go to **Help** > **About Switch**
   - On Mac, go to **Enfocus Switch** > **About Enfocus Switch**

     This is necessary because your Switch Insight Dashboard will be linked to your Enfocus ID (and Switch Server).

2. Click **Insight Dashboard** > **Opt in/Opt out**.
3. Read the information and click **Yes, I'd like my Dashboard**.

Your personal Dashboard is prepared and will be available the next day. Note that you can opt out whenever you want (via the same menu).

6.2. Consulting your Switch Insight Dashboard

Once you have enabled your Switch Insight Dashboard, you have access to charts and statistics about your usage of Switch. There are two ways to consult your Insight Dashboard:

- From within Switch: Click **Insight Dashboard** > **My Switch Insight Dashboard**.
- Via the Enfocus website:

  1. Go to *http://www.enfocus.com*.
  2. In the top right corner, click **Sign in**.
  3. Enter your Enfocus ID and password and click **Sign in**.
  4. Click your username to open the account section.
  5. Click **My Dashboards** > **My Switch Insight Dashboard**.

Note that you can make your Switch Insight Dashboard visible to other users, by making them manager of your Switch (see *Adding a Switch manager* on page 260). Remember however that this also gives them other permissions (e.g. to buy apps).

7. Advanced topics

7.1. Managing application data

About the Switch application data

Switch stores a lot of **application-specific data**, such as:

- Flow definitions (defined or imported with the flow designer).
- Auto-managed backing folders (and their contents, i.e. jobs being processed through flows).
- Internal job tickets pointing to jobs being processed.
- Log messages.

All this data is stored in a nested folder hierarchy under a single root folder, which is called the **application data root**.

The location of the application data root can be found in the *Application data preference*.

Administrator tools

We provide Switch administrators with two tools related to the application data:

- The *Application Data Root Tool* allows you to back up, restore and/or change the application data root. Note that changing the *data in* the application data root is not allowed!
- The *Data Collecting Wizard* allows you to collect application data for the Enfocus Support team (when they need more information on your Switch setup).

7.1.1. The Application Data Root Tool

About the Application Data Root Tool

The Application Data Root Tool allows you to:

- *Create a backup of all your Switch data*. We recommend doing this before upgrading or downgrading Switch. It's also needed when you want to move your Switch installation to a different computer.
- *Restore a previous version* (on condition you have made a backup), for example in case of problems with a newer installation.
- *Determine a new location for the Switch application data*. This is a way to keep data of multiple Switch versions/installations on one and the same system, for example for beta testing.

The tool can be found in the Switch installation directory:

- Windows: C:\Program Files\Enfocus\Enfocus Switch\ApplicationDataRootTool.exe
- Mac OS: /Applications/Enfocus/Enfocus Switch/ApplicationDataRootTool.app

Use case 1: Moving your Switch installation to a different computer

Note: This new computer may have a different operating system as well,as switching between operating systems is supported (Mac to Win or vice versa).

If you want to move your Switch installation to a different computer, these are the steps to take:

1. Make a backup of your Switch application data root location (using the Application Data Root Tool). Make sure to include all info about active jobs (select the checkbox!) and do not forget to make a backup of your user-managed folders yourself.
2. Copy the backup to the new computer.
3. Install Switch on the new computer.
4. Restore the backup of the application data root tool (using the Application Data Root Tool). Include the active jobs.

Use case 2: Using different data application root folders for (beta) testing
Best practice:

1. Install the test version (do not launch Switch Designer!).
2. Set a new Switch application data root location (using the Application Data Root Tool). Do not move any existing data.
3. Start Switch Designer and test the new version. All data used for testing will be stored in the new data root location.
4. When testing is finished, change the application data root location back to the original location (using the Application Data Root Tool).

7.1.1.1. Making a backup of your Switch installation

This procedure explains how you can make a backup of your Switch application data using the Application Data Root Tool. The backup includes all data related to flows, properties, preferences, etc. and (optionally) information about active jobs. Note however that data in *user-managed folders* is never stored via the Application Data Root Tool! If you want to keep this data, make sure to keep it somewhere safe yourself.

Important: You must be logged in with the user account that was used to start Switch Server. On Windows, you can select the appropriate user via the backup tool; on Mac, you must make sure to be logged in with the correct user before starting up the tool.

Proceed as follows:

1. Make sure Switch is not running.

   Remember that you can stop all Switch processes via the Switch Designer, by clicking **File** > **Stop Switch Switch Server**.

   Ideally, you make a backup before installing a new version of Switch, or right after it, just before opening the Switch Designer for the first time

2. Launch the Application Data Root Tool.

   The tool can be found in the Switch installation directory:

   - Windows: C:\Program Files\Enfocus\Enfocus Switch\ApplicationDataRootTool.exe
   - Mac OS: /Applications/Enfocus/Enfocus Switch/ApplicationDataRootTool.app

3. On Windows, select the user account that was used to start the Switch Server.

- If the required user is not in the list, you can add it yourself. Note you will be asked to enter this user's password.
- Depending on the configuration of your system, it may be necessary to run the Application Data Root Tool as an administrator or with elevated permissions.
- Roaming user profiles and users with an empty password are not allowed to select another user; instead, they should start the Application Data Root Tool using the user account concerned.

4. Select the **Create a backup of the current Switch application data root** radio button.

   The current application data root folder is mentioned at the top of this dialog. This is relevant if you have multiple folders with Switch data on your system. If you want a backup of a different application data root folder, you must first change the application data root folder (last option in the tool) to the one you want to back up.

5. Select a backup location.

6. If applicable, clear **Include jobs in auto-managed folders and info related to all active jobs in the flows**

   This option is selected by default and makes sure that job data, such as job tickets, datasets, global data, ... of jobs in *auto-managed* folders is included in the backup. This is the preferred option if you're moving Switch data to another location (so you still need this data). If you only want to take a backup and restore it later after running production for a couple of weeks, you probably won't need the job info, because the jobs concerned will have been processed already by that time. Note that this also means that the historical data for this period will be lost.

7. Click **Proceed**.

The Switch data root folders are copied to the new location and can be used to restore the current version as required.

7.1.1.2. Restoring a previous version of your Switch installation

If you have made a backup of your Switch installation, you can easily restore it to go back to a previously installed version of the software. Note that the data in the application data root will be overwritten, so it may be good to first make a backup.

Important: You must be logged in with the user account that was used to start Switch Server. On Windows, you can select the appropriate user via the Application Data Root Tool; on Mac, you must make sure to be logged in with the correct user before starting up the tool.

Proceed as follows:

1. Make sure Switch is not running.

   Remember that you can stop all Switch processes via the Switch Designer, by clicking **File** > **Stop Switch Switch Server**.

2. Launch the Application Data Root Tool.

   The tool can be found in the Switch installation directory:

   - Windows: C:\Program Files\Enfocus\Enfocus Switch\ApplicationDataRootTool.exe

- Mac OS: /Applications/Enfocus/Enfocus Switch/ApplicationDataRootTool.app

3. On Windows, select the user account that was used to start the Switch Server.
   - If the required user is not in the list, you can add it yourself. Note you will be asked to enter this user's password.
   - Depending on the configuration of your system, it may be necessary to run the Application Data Root Tool as an administrator or with elevated permissions.
   - Roaming user profiles and users with an empty password are not allowed to select another user; instead, they should start the Application Data Root Tool using the user account concerned.
4. Select the **Restore a backup of the Switch application data root to the current Switch application data root location** radio button.

   If you are not happy with the current application data root location (mentioned at the top of the dialog), you should first change it by selecting the last option in this dialog.
5. Select the location where the backup was stored.
6. Optionally select **Restore jobs in auto-managed folders and info related to all active jobs in the flows**.

   Obviously, job data can only be restored if it has been included in the backup (refer to *Making a backup of your Switch installation* on page 428).

   Remember that jobs in user-managed folders are not included in the backup.
7. Click **Proceed**.

   Note that all data in the current data root location will be overwritten.
8. Read the warning and click **Yes** to confirm.

7.1.1.3. Changing the application data root

If you want to easily switch between Switch installations, you can use different locations for the application data. For example, you could move to another data root for testing a new version, and afterwards move back to the original version.

Important: You must be logged in with the user account that was used to start Switch Server. On Windows, you can select the appropriate user via the Application Data Root Tool; on Mac, you must make sure to be logged in with the correct user before starting up the tool.

Proceed as follows:

1. Make sure Switch is not running.

   Note that you can stop all Switch processes via the Switch Designer, by clicking **File** > **Stop Switch Switch Server**.
2. Launch the Application Data Root Tool.

   The tool can be found in the Switch installation directory:
   - Windows: C:\Program Files\Enfocus\Enfocus Switch\ApplicationDataRootTool.exe

- Mac OS: /Applications/Enfocus/Enfocus Switch/ApplicationDataRootTool.app

3. On Windows, select the user account that was used to start the Switch Server.
   - If the required user is not in the list, you can add it yourself. Note you will be asked to enter this user's password.
   - Depending on the configuration of your system, it may be necessary to run the Application Data Root Tool as an administrator or with elevated permissions.
   - Roaming user profiles and users with an empty password are not allowed to select another user; instead, they should start the Application Data Root Tool using the user account concerned.
4. Select the **Set new Switch application data root location** radio button.
5. Click **Browse** to select the new application data root folder.

   This should be an empty folder on your local system. (Note that only for upgrade installations (upgrade from Switch 2018 or earlier) it's still possible (but not recommended) to use a network location).
6. If applicable, clear **Move data from the current Switch application data root to the new location**

   This option is selected by default but can be cleared as required, for example if you want a clean installation.
7. Click **Proceed**.

Next time Switch is started, the new location will be used to store the Switch application data. Note that you can double-check the location of the application data root in the *Application data preference* in Switch Designer.

7.1.2. The Data Collecting Wizard

About the Data Collecting Wizard

The Data collecting wizard is a tool that automatically collects the Switch data files, which are requested by the Enfocus Support team when they need more information on your Switch setup.

The tool collects the following data:

- Flows
- Preference files
- Job tickets
- logs .db3 file (ServerLogs.db3)
- Information about the Switch files installed on the user's system (layout, name, size, modification date)
- Relevant registry/plist records
- Information from the **Support** tab in the **About** dialog box
- Job datasets

The tool creates a zip package that can be sent to the Enfocus Support team.

Note: As the file size might be an issue (the .db3 files may be a few GB in size and the jobtickets may be a 100MB or more), you can as a user exclude certain data files from the collection.

Two versions

The Data Collecting Wizard is provided in two versions:

- **A stand-alone version** (**SwitchDataCollector.exe or SwitchDataCollector.app**), available in the Switch installation folder.
  - *Windows*: C:\Program Files (x86)\Enfocus\Enfocus Switch
  - *Mac OS*: /Applications/Enfocus/Enfocus Switch
- A **built-in version**, available from within Switch through the File menu (**File** > **Collect application data**).

The main difference between the two versions, is the way the flows are collected. Flows in a Switch installation are a combination of XML and Property sets in various folders. When a user chooses "Export" in the Designer UI, the XML and Property sets are combined in a file with extension .sflow. As this logic is difficult to extract outside Server, the *stand-alone version does not offer the .sflow files (only the raw XML and Property sets)*. Besides, in the stand-alone version you have to collect either all or none of the .sflow files. You cannot make a selection.

Apart from that, only the stand-alone version allows you to collect data if Switch is not launched or cannot be launched anymore for any reason. If Switch is running, you are asked to quit.

Using the Data Collecting Wizard

Refer to *Collecting application data* on page 432.

7.1.2.1. Collecting application data

To collect the Switch application data

1. Do one of the following:
   - Locate the SwitchDataCollector in the Switch installation directory (make sure Switch is closed!).
   - In Switch, choose **File** > **Collect application data**.

   For more information about the difference, refer to *The Data Collecting Wizard* on page 431.

   The Switch Data Collecting Wizard Welcome screen appears.
2. Click **Next**.
3. Select the data you want to include in the resulting zip package.

   You have the following choices:
   - **Logs**: Server logs in a .db3 file (entire folder "<app_data_root>\logs")
   - **Preferences**: Switch preferences XML (entire folder "<app_data_root>\settings")
   - **Datasets**: Jobs datasets (entire folder "<app_data_root>\datasets")

- **Application settings**: Switch settings extracted from the registry (on Windows) or plist files (on Mac). The extracted data is put into an ApplicationSettings.txt file. On Mac, actual plist files are also included in the zip. This checkbox cannot be cleared.

- **Layout description**: Description of Switch installation files, saved into a file called 'Report.txt'. It includes a listing of all files and folders with their attributes (size, modification date, permissions etc.) from the Switch installation folder. This checkbox cannot be cleared.

- **Internal log messages**: Internal log files for all processes with a more detailed description of errors and operations. This checkbox cannot be cleared.

Note: If the file size becomes too big or if collecting files takes too much time, you may want to exclude certain data types.

4. Choose a destination for the resulting zip package and click **Next**.

   You can as well change the name of the zip package as required. The default name has the following format: "Switch Data "<current date> <nn-nn-nn>.zip", e.g. Switch Data 2015-09-14 10-29-30.zip.

5. Select the flows you want to collect and click **Next**.

   If you're using the stand-alone version of the tool, you must either select all flows or none; it's not possible to select a subset.

   Îf you're using the Designer version, all flows are displayed in alphabetical order. They are selected by default, but you can clear the ones you don't need. Note that advanced features (like grouping, sorting, flags etc) are not supported.

   A summary of the chosen options is shown. You can still make changes as required by clicking the **Back** button.

6. Click **Commit**.
   The data collection starts.

   Note:

   - If the wizard is launched from the Switch Designer, it deactivates all active flows, before collecting the data. Afterwards, the flows are re-activated.
   - You can stop the data collection (for example if it takes too much time) by clicking **Abort**. However, aborting can be performed only between steps, for example: between collecting flows and exporting logs. The Wizard will wait until the previous step is finished and will only then abort the collection process.

7. Once the zip package has been created, click **Close**.
   The zip package is placed in the location chosen in step 4. The structure is very simple: each data part is placed in a separate subfolder, e.g. Application Data, ExportedFlows, Report, and Settings. The content of the Application Data subfolder mirrors the contents of the actual Switch application data root.

   If the wizard was launched from Switch, the Report folder will contain a file named "AboutDialog.txt, which contains information extracted from the **About** box in Designer.

7.2. Switch performance tuning

The performance of Switch is affected by the processes that are being executed, such as *file handling*, *network transfers* and *external processes*.

To avoid that Switch slows down because too many processes are running at the same time, there are limits set to the number of concurrent processes. Changing these limits allows you to tune the Switch performance.

Note: Do not forget that other aspects, such as computer specifications and network speed can also affect overall performance.

File handling tasks

Handling files, such as copying or moving files and folders is limited to 5 simultaneous tasks (see *Execution slots* on page 249). It is *not* possible to change this number of concurrent file transfers.

Flow elements involved:

- Export metadata
- Job dismantler
- Recycle bin
- XML pickup, JDF pickup, XMP pickup, Opaque pickup
- Problem jobs
- Submit hierarchy
- Submit point
- Checkpoint
- Generic application
- XSLT Transform
- Archive hierarchy
- File type
- Folder element

Network transfer tasks

The number of concurrent network file transfers can be set in the Switch preferences (**Preferences** > **Processing** > **Concurrent network transfer tasks**). The default is set to 2 and the maximum limit is 100.

Flow elements involved:

- FTP send
- FTP receive
- Mail send
- Mail receive
- Checkpoint via mail

File processing tasks

The number of tasks required to process files by using one of the flow elements listed below simultaneously can be set in the Switch preferences (**Preferences** > **Processing** > **Concurrent processing tasks**).

By default this preference is set to 4 simultaneous processes (that is the maximum available with a regular Switch Core Engine license), but licensing additional processes can expand this limit to a maximum of 100.

Flow elements involved:

- All flow elements in the Apps section
  - Excluding the PitStop Server configurators
- The following elements in the Basics section:
  - Set hierarchy path
  - Ungroup job
  - Split multi-job
  - Assemble job
  - Execute command
- The following elements in the Tools section:
  - Sort by preflight state
  - Archive
  - Unarchive
  - Split PDF
  - Merge PDF
  - Hold job
  - Inject job
  - Rename job
  - Sort job
  - Log job info
  - Sort files in job
- The Script element in the Scripting section:

  Custom scripts are affected by the "Concurrent processing tasks" preference as soon as the script is a "heavy script". A script is considered to be "heavy", if it takes longer than one second to execute.

  Light scripts, timerFired, webhookTriggered and flowStopTriggered calls belong to separate categories and these processes are calculated in a different way. For more details, see *Execution slots* on page 249.
- The following elements in the Communication section:
  - HTTP request
  - Pack job
  - Unpack job
  - Monitor confirmation
- The XMP inject element in the Metadata section.
- The Database connect element in the Database section.
- The following elements in the Legacy section:
  - Compress
  - Uncompress

PitStop Server tasks

The number of concurrent PitStop Server tasks can be set in the Switch preferences (**Preferences** > **Processing** > **Concurrent PitStop Server tasks**). The default is set to **Automatic**, which is based on the hardware configuration of the server. You can set this value manually up to 99 concurrent tasks.

Flow elements involved:

- Enfocus PitStop Server
- Enfocus PitStop Server PDF2Image

Accumulative limitation
Each task listed has its own upper limit. In addition to this, Switch is limited to an upper limit of 200 for all simultaneous tasks. This is the accumulation of File Handling, Network Transfers and External processes.

For more information on Switch Preferences see *User Preferences*.

For more information on tuning performance for file processing tasks, see *Changing flow properties*.

7.3. HTTPS with self-signed certificates

HTTPS servers use **certificates to prove** their **identity**. For example, if you try to connect to https://example.com, a certificate allows the web client to be sure, that it has connected to the intended website and that the connection has not been intercepted by an attacker.

Whether a web client can trust the certificate or not is dependent on whether the certificate was signed by a **trusted central authority (CA)**, such as DigiCert Inc, Let's Encrypt, Google, ... They are already trusted on your system by default and they provide certificates for public-facing domains.

However, in case you want to have **a certificate for a service in your internal network** (like a VPN or just LAN), you would need to use your own trusted CA, or, in the simplest of cases, use **self-signed certificates**. With this setup you need to explicitly configure web clients to trust that CA or certificate.

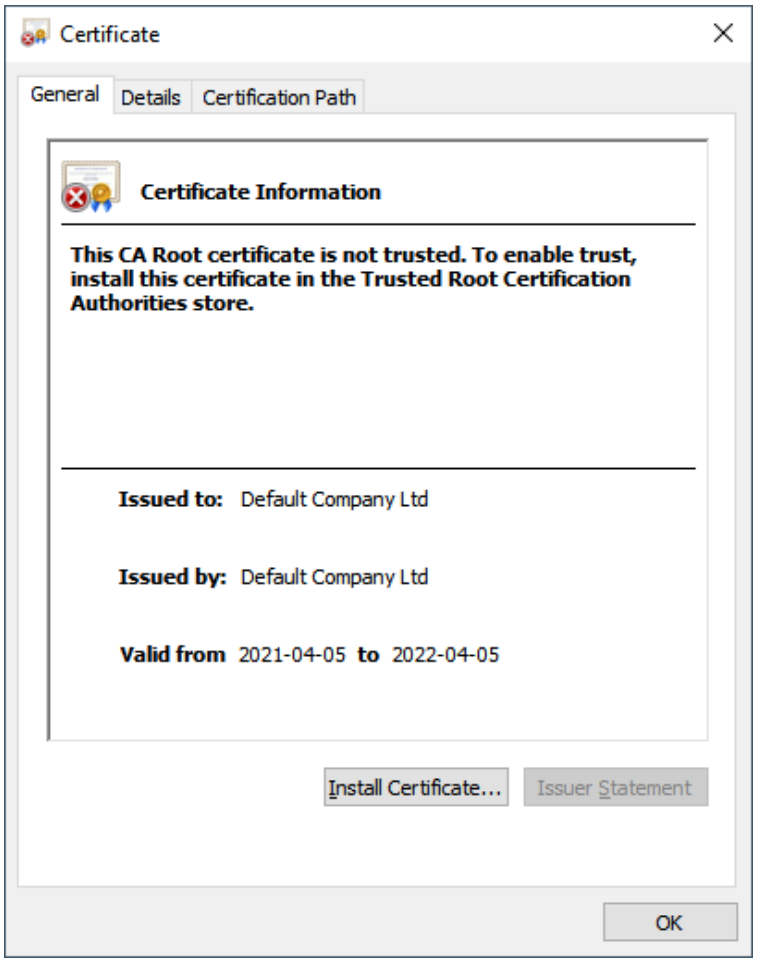
With this in mind, if you use Switch Web Service with HTTPS enabled and a self-signed certificate for its identity, you will encounter issues when using Remote Designer or Switch Helper, as they will not trust that certificate by default. To avoid this, you must make your certificates trusted on a client system as described further.

7.3.1. Making your self-signed certificate trusted (Windows)

- Make sure to download your certificate to the client machine. You can either download it from the Server itself or via browser when connecting to the Switch Web Portal (see your browser documentation on how to do that).
- The certificate file should have the .crt extension - this will simplify the process.

To enable trust, you must install the certificate in the Trusted Root Certification Authorities Store. Proceed as follows:

1. Double-click the certificate file.
   This opens a dialog with certificate information.



2. Click **Install Certificate**.
   This opens the Certificate Import Wizard.
3. Select **Current User** as Store Location and click **Next**.
4. Select **Place all certificates in the following store** and click **Browse...**.
5. Select **Trusted Root Certification Authorities** and click **OK**.
6. Click **Next** and then **Finish**.
7. You will get a security warning, telling you to make sure you trust the certificate you are adding. Click **Yes** to confirm.

The certificate is now a trusted certificate. If you double-click the certificate file again, it will no longer show warnings.

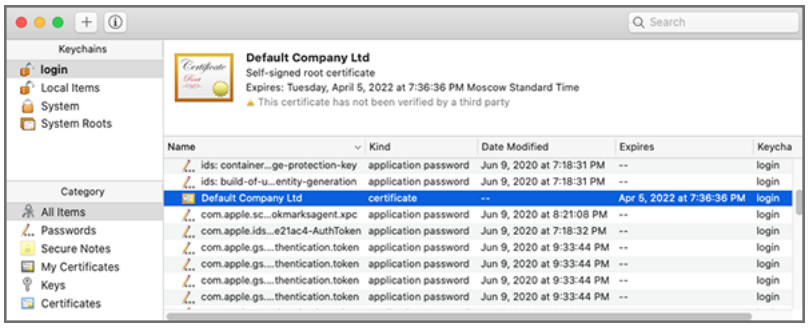
Important: If the private key used to sign the certificate, is compromised, you can no longer trust the certificate. In that case, you must remove the certificate from the trusted storage, otherwise it will compromise your system security!

7.3.2. Making your self-signed certificate trusted (Mac)

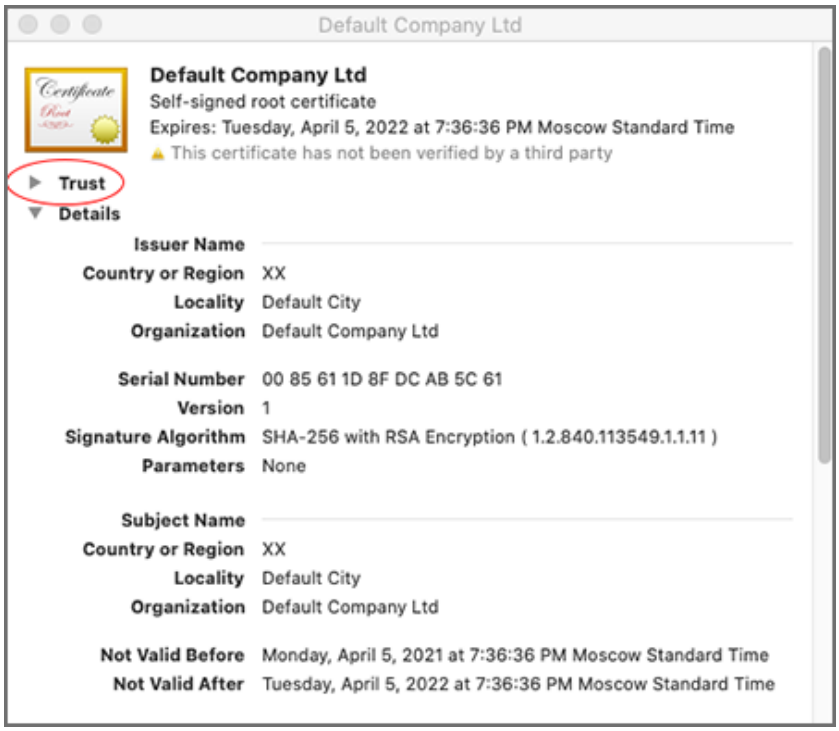
- Make sure to download your certificate to the client machine. You can either download it from the Server itself or via browser when connecting to the Switch Web Portal (see your browser documentation on how to do that).
- The certificate file should have the .crt extension - this will simplify the process.

Proceed as follows

1. Double-click the certificate file.
   This opens the Keychain Access app and automatically adds the certificate into your login keychain.



2. Find your certificate in the list and double-click it.
   This opens a dialog with certificate information.



3. Expand the Trust section and set the following options to **Always Trust**:
   - **Secure Sockets Layer (SSL)**
   - **X.509 Basic Policy**
4. Close the certificate dialog.
5. In the confirmation dialog that appears, confirm your changes:
   a. Enter your password.
   b. Click **Update Settings**.

The certificate is now a trusted certificate.

Important: If the private key used to sign the certificate, is compromised, you can no longer trust the certificate. In that case, you must remove the certificate from the trusted storage, otherwise it will compromise your system security!

8. Need more help?

1. Consult the product documentation

Documentation	Description	Where to find?
Quick Start Guide	Switch basic information Consult this guide if you're new to Switch.	Go to *the Switch manuals on the Enfocus website*. Alternatively, to go there from within the application, select the **Help** > **Online resources** > **Online documentation** menu.
Reference Guide	Switch detailed information and advanced topics	Go to *the Switch manuals on the Enfocus website*. Alternatively, to open the help from within the application, press **F1** or select the **Help** > **Switch help** menu.
Switch Scripting Documentation	Switch scripting reference	Go to *the Switch manuals on the Enfocus website*. Alternatively, to go there from within the application, select the **Help** > **Online resources** > **Online documentation** menu.
Example Scripts	Example scripts, with a short explanation and the option to download	Go to *the Switch manuals on the Enfocus website*. Alternatively, to go there from within the application, select the **Help** > **Online resources** > **Online documentation** menu.

2. Consult the Solution articles in the Enfocus knowledge base

The Enfocus knowledge base provides answers to frequently asked questions, workarounds, and tips and tricks.

To access the knowledge base, go to: *https://www.enfocus.com/en/support/known-issues-and-solutions*.

Note: Alternatively, you can go there from within Switch, by selecting the **Help** > **Solution articles** menu.

3. Visit the Enfocus Community

The Enfocus Community is a forum where you can exchange ideas with other users of Enfocus software.

URL: *http://forum.enfocus.com/*

4. Contact your reseller

A list of authorized resellers is available on the Enfocus web site (*http://www.enfocus.com/FindReseller.php*).

5. Contact Enfocus customer support

If you cannot find the answer to your question in Switch help or on the web, create a case on the website at *http://www.enfocus.com/supportportal*.

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