

Welcome to Advanced Automations in FME Flow!

Course Information

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TAs: Tim Shin and Luke Hicks

3 hours (with one 15 minute break)

Access to FME is provided through Strigo Labs. Course lessons and exercises are also in Strigo.

Each module is split into 2-3 parts that you will go through in the Strigo lessons pane.

Course Description

With Automations, you can set up integration workflows to run on a schedule or in response to events even more quickly. FME Flow's Automations interface enables users unfamiliar with scripting or web integrations to specify what they want to be done and when. Happy FME users refer to this as "Set it and Forget It." We'll equip learners to set up automated data integration for their organization so that data can flow freely without manual effort, covering advanced techniques including Automation parameters, the Automations writer, and the split-merge block.

Course Outline

1. Introduction and Housekeeping
2. Module 1: Getting Started with Automation Parameters and Output Attributes
3. Module 2: Job Orchestration in Automations with the Split-Merge Block
4. Module 3: Route Data Between Workspaces with the Automations Writer
5. Conclusion and Next Steps

Introduction

FME Flow Automations rely on sending messages between Triggers and Actions. Most often, the action following a trigger is running a workspace. Parameters are used to customize how the workspace runs with different input values. While the message sent from the trigger contains information that triggers the workspace to run, Automation Parameters and Output Attributes may be used to further customize information sent from the trigger and used in the action to run the workspace.

Content Overview

- Starting Resources
- Step-by-Step Instructions
 - Create Automation
 - Test Automation
 - Edit Automation
 - Process Building Updates
- Conclusion
- Additional Resources

Starting Resources

These are just for reference; the instructions guide you through accessing the data and workspaces.

- Starting FME Flow Project
 - Building Updates Resource Folder Path (Resources > Data > Building Updates)
 - Buildingupdates.gdb in Resources (Resources > Data > Output > buildingupdates.gdb)
 - Process Building Updates.fmw (Building Footprint Updates repository)
- FME Data
 - [Building Footprints shapefiles](#) | C:\FMEData\Data\Engineering\BuildingFootprints

Step-by-step Instructions

In this scenario, you're tasked with processing shapefiles of building footprint updates. The shapefiles are delivered to a data store and you have already created a workspace to process and write the updates to a geodatabase. The timing of building updates is inconsistent, and you find yourself manually checking for updates. Sometimes, there aren't any updates; other times, multiple updates are waiting to be processed, and the geodatabase is not up-to-date.

To save yourself time and ensure the geodatabase is updated whenever building updates arrive in a directory, you will create an FME Flow Automation that triggers when new building update shapefiles

are added. You will use Output Attributes from the trigger to test the automation and then pass the shapefiles to the workspace as a linked parameter when running in production.

Create Automation

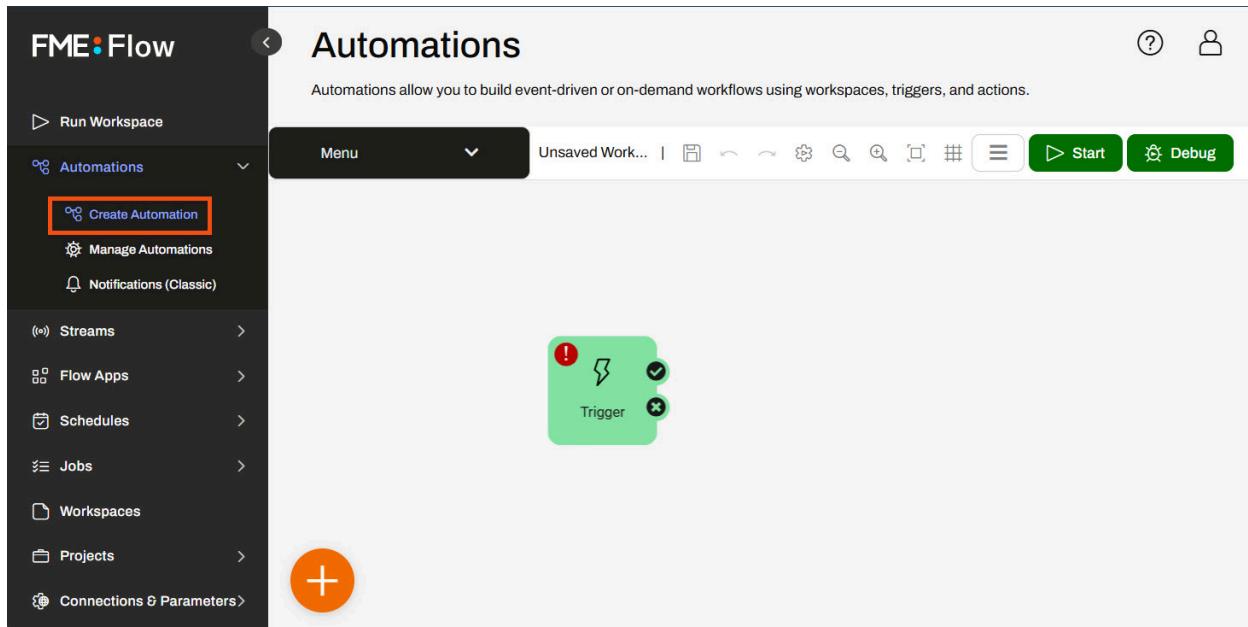
The starting workspace has already been published to FME Flow. The first step is to create an automation and set up the trigger to watch the file location for the building update shapefiles.

1. Create Automation

Log in to FME Flow

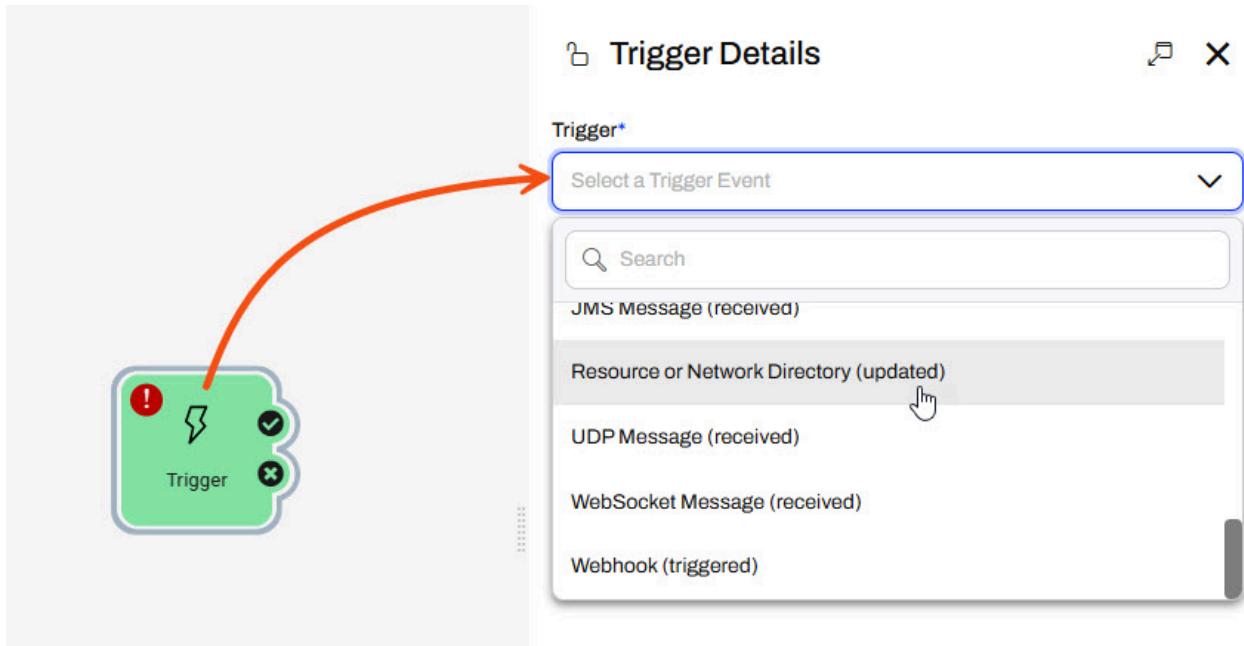
- Username: admin
- Password: FMElearnings

Navigate to Automations > Create Automation on the side menu bar. An Automation canvas will open with a trigger ready to be configured.



2. Set Trigger to Resource or Network Directory

Open the Trigger Details and select a Resource or Network Directory (updated) trigger.



- Directory to Watch: \${FME_SHAREDRESOURCE_DATA}/Building Updates/
- Events to Watch for: CREATE
- Poll Interval: 5 seconds

Resource or Network Directory

Details

Parameters

Directory to Watch*

\$(FME_SHAREDRESOURCE_DATA)/Building L

...

▼

Watch Subdirectories*

Watch activity in the selected directory and all its subdirectories.

No

▼

Watch Folders*

Receive notifications for folders, in addition to files.

No

▼

Events to Watch for*

Events on the specified directory that will trigger a notification.

CREATE

▼

Poll Interval* ⓘ

How often to poll the specified directory

5

Seconds

▼

Validate

Cancel

Apply

Note: A poll interval of 5 seconds is very short and may impact performance in production environments. However, to minimize wait time in this tutorial, you can use the short poll interval without issue.

3. Review Output Attributes

Switch to the Output Attributes tab. Expand Success and Event Attributes. Notice the different attributes that are created in the Trigger. We will specifically use file.event and file.path later to get

information from the trigger to a downstream action. Optionally, you may deselect the Event Attributes that are not needed.

The screenshot shows the 'Resource or Network Directory' configuration dialog. The 'Output Attributes' tab is selected. Under the 'Success' section, the 'Event Attributes (5)' group is expanded, showing five attributes: 'time', 'source', 'file.event', 'file.path', and 'file.rootName', each with a checked checkbox. Below this is a 'Custom Attributes (0)' section with a plus sign button. Under the 'Failure' section, there is a plus sign button. At the bottom are 'Cancel' and 'Apply' buttons.

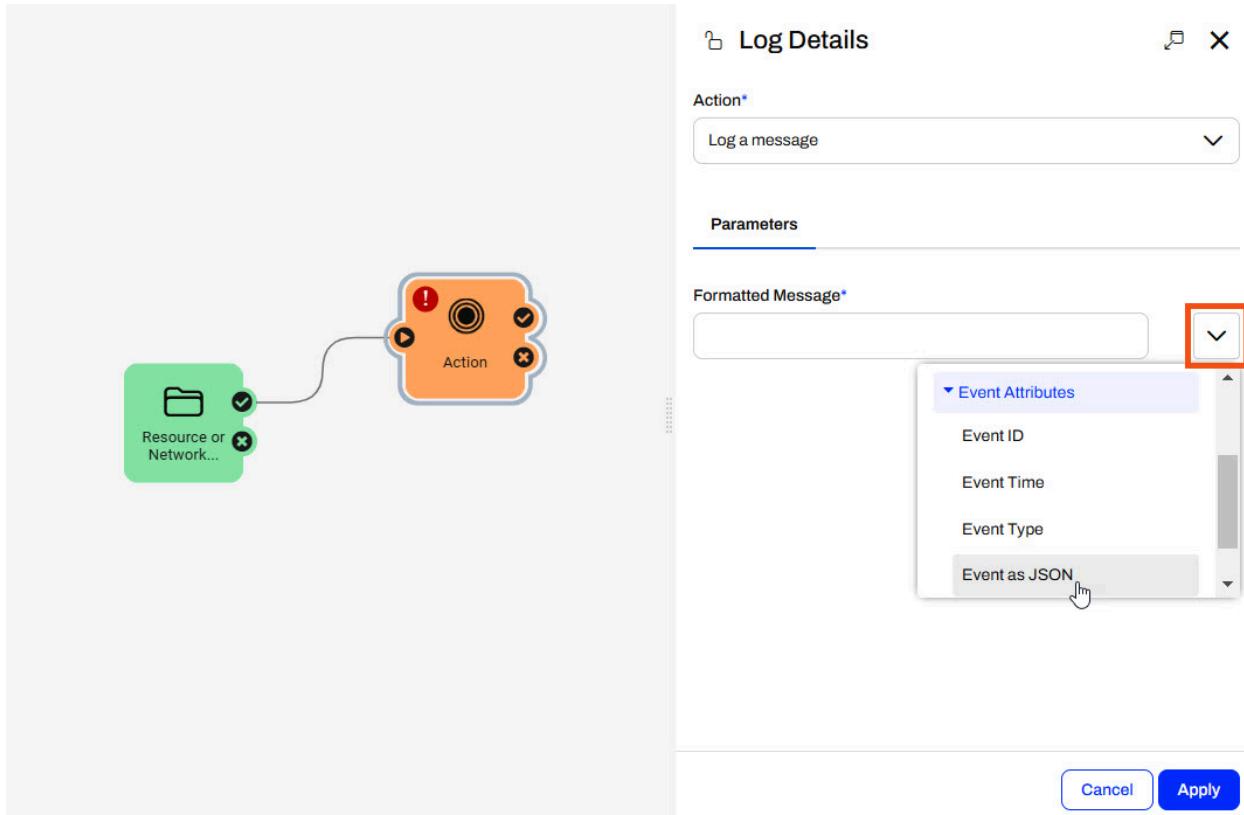
Attribute	Status
time	checked
source	checked
file.event	checked
file.path	checked
file.rootName	checked

4. Validate Trigger

Return to the Parameters tab and click Validate and Apply trigger settings. Before configuring the workspace to run in response to the trigger, it's a good idea to test the output from the trigger to ensure it will perform as expected.

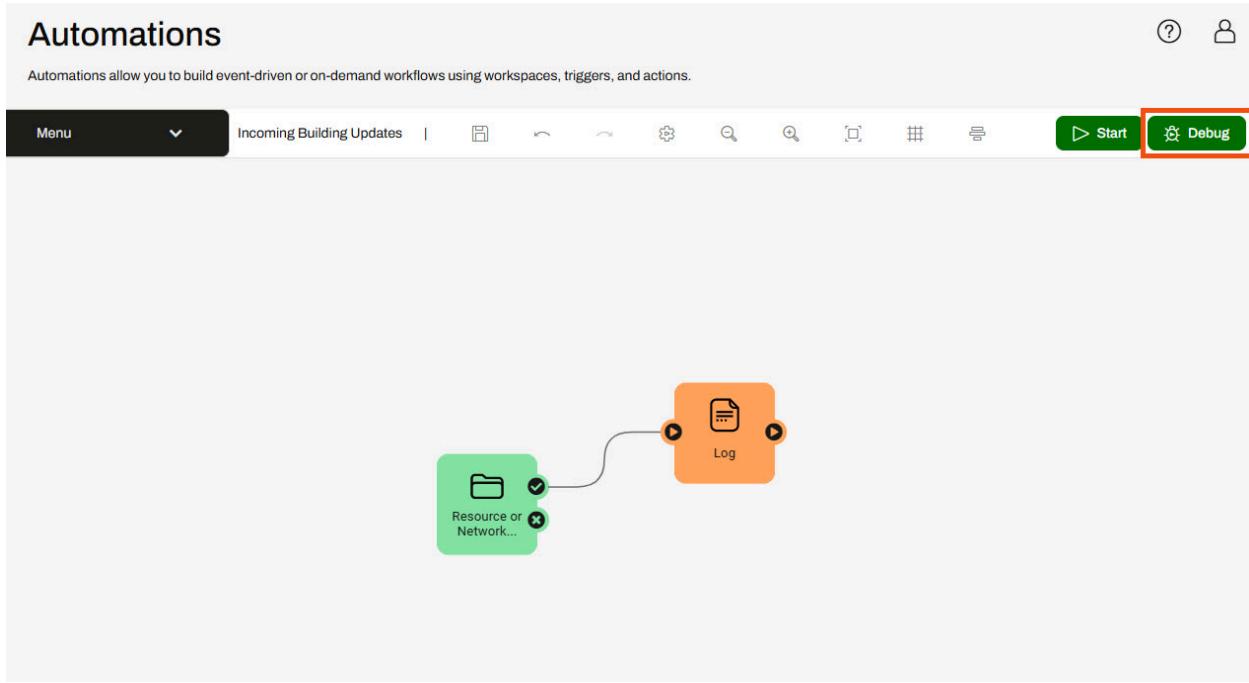
5. Create a Log a Message Action

Attach a Log a Message action to the trigger's success port. Click the drop-down button for the Formatted Message parameter and expand Event Attributes. Select Event as JSON. Click Apply.



6. Save Automation

Save the automation as *Incoming Building Footprints* and Start the Automation in Debug Mode.



Note: Log files generated in Debug mode are not saved after Debug mode is stopped. This is good for testing the automation because it doesn't flood the Production logs with messages only for testing purposes. You can also access Debug logging for the automation individually.

Test the Automation

You will need to upload a file to the resource location to ensure that the Resource or Network Directory trigger is functioning as expected.

1. Upload Files

With the automation running, navigate to Resources > Data > Building Updates. Click the Upload button and select Files. Upload a shapefile of updates from C:\FMEData\Data\Engineering\BuildingFootprints. Make sure to include all four shapefile sidecar files.

The screenshot shows a file management interface with the following details:

Uploaded 4/4 [Up](#) [?](#) [User](#)

Resources > Data > Building Updates

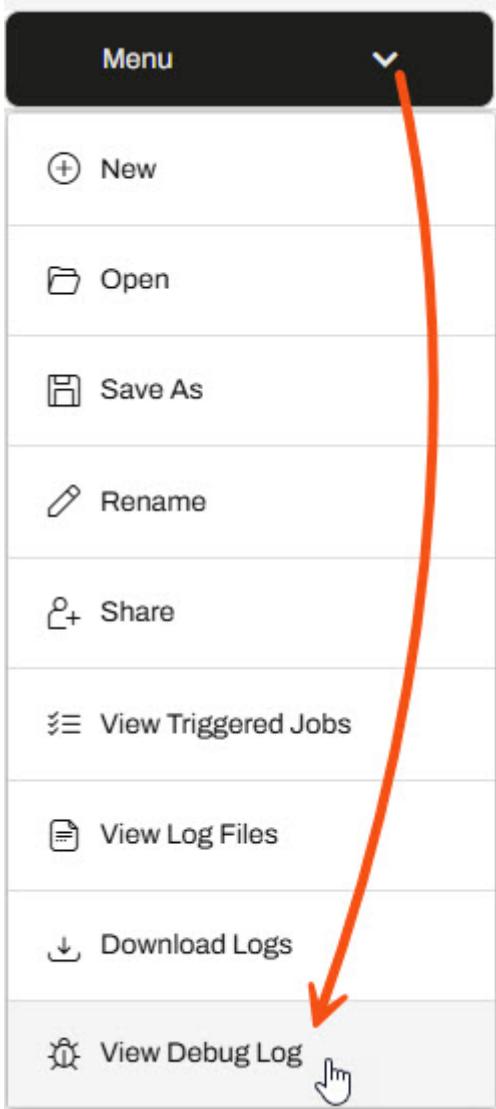
Search: Actions: [New](#) [Actions](#) [Upload](#) [Refresh](#) [Delete](#)

<input type="checkbox"/>	NAME ^	SIZE	DATE
<input type="checkbox"/>	update001.dbf	34.75 KB	Today at 15:46:26
<input type="checkbox"/>	update001.prj	413.00 B	Today at 15:46:27
<input type="checkbox"/>	update001.shp	30.38 KB	Today at 15:46:27
<input type="checkbox"/>	update001.shx	612.00 B	Today at 15:46:27

Navigation: << < **1** > >> Showing 1 to 4 of 4 entries [100](#)

2. View Automation Log

Return to the *Incoming Building Footprints* Automation and click Menu > View Debug Log.



Notice that four CREATE events are logged for each shapefile sidecar file.

```
2025-02-14T22:52:45.795Z | 801004 : Start watching: C:\ProgramData\Safe Software\FMEFlow\resources\data\Building Updates, Subdirectories: false, Folders: false, Filter: CREATE, Interval: 5 seconds
2025-02-14T23:01:40.962Z | 801006 : Sending CREATE event for path: C:\ProgramData\Safe Software\FMEFlow\resources\data\Building Updates\update001.dbf ...
2025-02-14T23:01:41.023Z | {"automation.id": "b28fdf9f-b085-4f7a-9576-609747a3a179", "file.path": "$(FME_SHAREDRESOURCE_DATA)Building Updates\\update001.dbf", "file.rootName": "update001", "file.event": "CREATE", "source": "dirwatch", "time": "2025-02-14T15:01:40-08:00", "event.id": "29750ee2-7f37-400e-be23-99b1ddc67c24", "automation.name": "Incoming Building Updates"}
2025-02-14T23:01:41.029Z | 801006 : Sending CREATE event for path: C:\ProgramData\Safe Software\FMEFlow\resources\data\Building Updates\update001.prj ...
2025-02-14T23:01:41.058Z | {"automation.id": "b28fdf9f-b085-4f7a-9576-609747a3a179", "file.path": "$(FME_SHAREDRESOURCE_DATA)Building Updates\\update001.prj", "file.rootName": "update001", "file.event": "CREATE", "source": "dirwatch", "time": "2025-02-14T15:01:41-08:00", "event.id": "0d4cdd76-cefb-46af-a365-32a5452034b4", "automation.name": "Incoming Building Updates"}
2025-02-14T23:01:41.059Z | 801006 : Sending CREATE event for path: C:\ProgramData\Safe Software\FMEFlow\resources\data\Building Updates\update001.shp ...
2025-02-14T23:01:41.082Z | {"automation.id": "b28fdf9f-b085-4f7a-9576-609747a3a179", "file.path": "$(FME_SHAREDRESOURCE_DATA)Building Updates\\update001.shp", "file.rootName": "update001", "file.event": "CREATE", "source": "dirwatch", "time": "2025-02-14T15:01:41-08:00", "event.id": "f9f9a852-76d1-4545-aafe-0fb3dc8efc89", "automation.name": "Incoming Building Updates"}
2025-02-14T23:01:41.083Z | 801006 : Sending CREATE event for path: C:\ProgramData\Safe Software\FMEFlow\resources\data\Building Updates\update001.shx ...
2025-02-14T23:01:41.109Z | {"automation.id": "b28fdf9f-b085-4f7a-9576-609747a3a179", "file.path": "$(FME_SHAREDRESOURCE_DATA)Building Updates\\update001.shx", "file.rootName": "update001", "file.event": "CREATE", "source": "dirwatch", "time": "2025-02-14T15:01:41-08:00", "event.id": "278edd2d-69b8-40e2-9c98-f32562207f93", "automation.name": "Incoming Building Updates"}
```

Edit the Automation

Now that you know your trigger is working, the rest of the automation can be configured to run your workspace. However, you only want the workspace to run for shapefiles, not any other files that might get added to the Resource location, and you only want it to run once for each shapefile added. Currently, four CREATE events are triggered due to the shapefile sidecar files.

First, you will configure a Filter action to only allow the workspace to run if a .shp file is added to the Resource location. Second, you will configure the workspace to run. Both actions will need to use an Output Attribute from the trigger to pass along information about the file uploaded to the Resource location.

1. Stop Automation

Go back to the *Incoming Building Footprints* Automation canvas and stop the Automation.

2. Edit Log a Message Action

Open the Log a Message action and change it to a Filter Messages action. While all four shapefile files are necessary to process the shapefile, only one create event needs to be triggered.

- Attribute: File Path
- Contains: .shp

Filter Details



Action*

Filter messages



Parameters

Attribute*

File Path



Contains*

.shp

Cancel

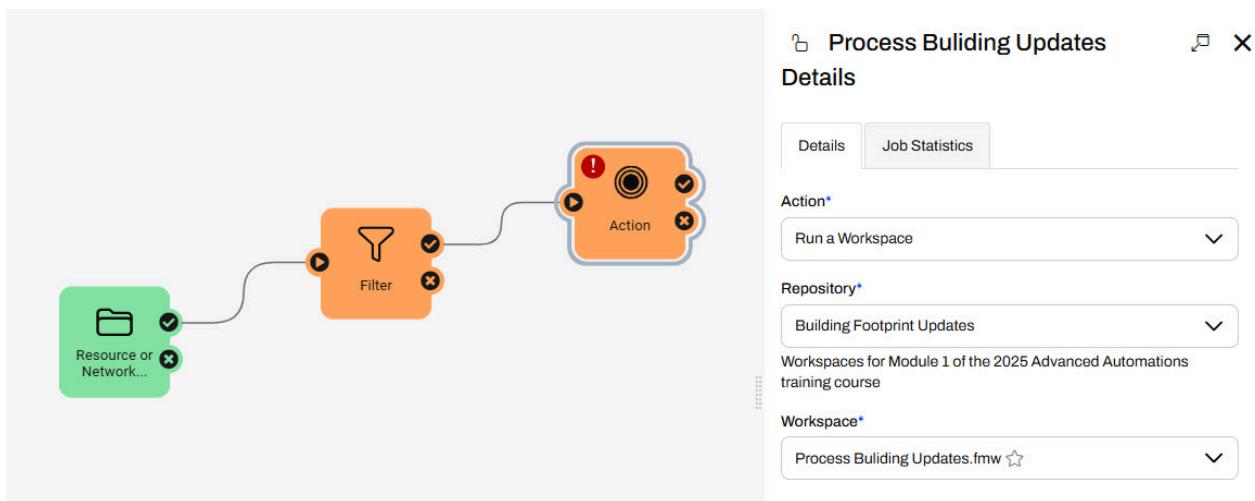
Apply

Click Apply.

3. Add a Run a Workspace Action

From the Filter action success port, add a Run a Workspace action.

- Repository: Building Footprint Updates
- Workspace: Process Building Updates



- Source Esri Shapefile(s): Click the drop-down arrow and select the Directory > File Path attribute

Parameters Output Attributes Advanced Retry

Reset ↻

Source Esri Shapefile(s)*

"C:\FMEData\Data\Engineering\BuildingFoot" ... ▼

Feature Types to Read

File Geodatabase*

"C:\FMEData\Data\Engineering\BuildingFoot.gdb"

► Event Attributes

▼ Directory

File Action (Create/Modify/Delete)

File Path File Path File Root Name

- File Geodatabase: Click the ellipsis to open Resources and select Data > Output > buildingupdates.gdb

Process Buliding Updates Details

Run a Workspace

Repository*

Building Footprint Updates

Workspaces for Module 1 of the 2025 Advanced Automations training course

Workspace*

Process Buliding Updates.fmw

Parameters Output Attributes Advanced Retry

Source Esri Shapefile(s)*

File Path

Feature Types to Read

File Geodatabase*

"\$(FME_SHAREDRESOURCE_DATA)/Output/buildingfoot

Reset

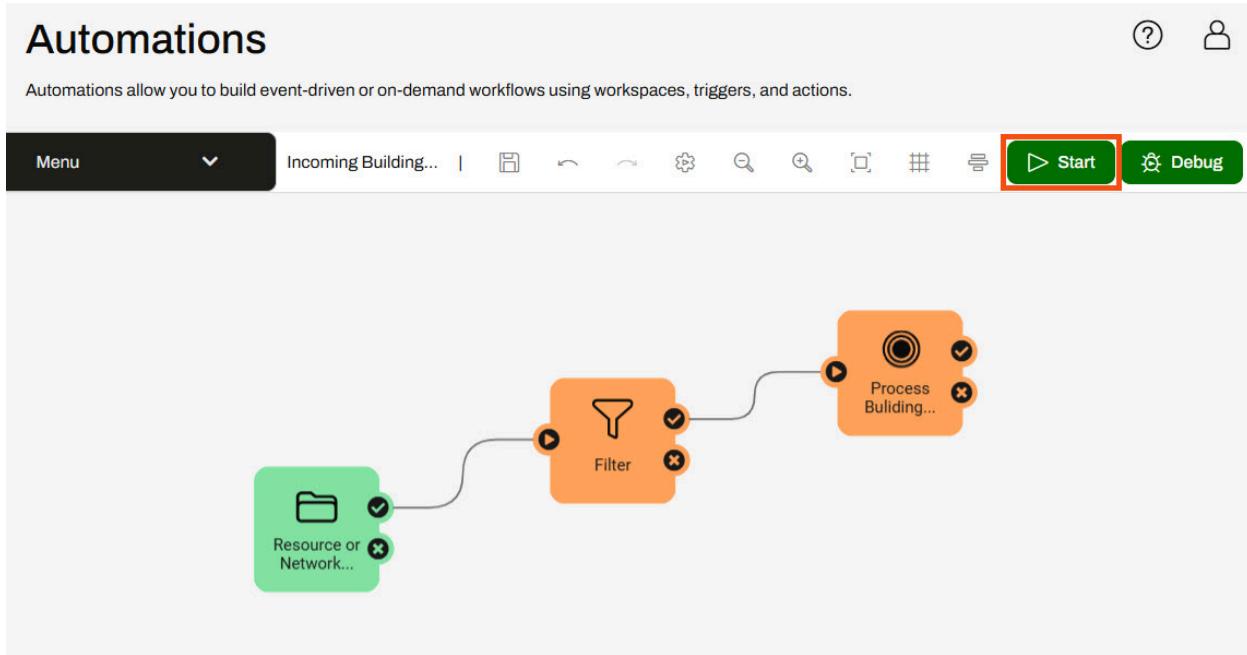
Cancel Apply

Click Apply.

Now that you have built your automation and configured all the required actions, you will run it in Production mode.

4. Start Automation

Click Start the Automation to run it in Production mode.



Process Building Updates

1. Upload More Files

Return to Resources > Data > Building Updates and upload another shapefile of updates. Make sure to include all four shapefile sidecar files.

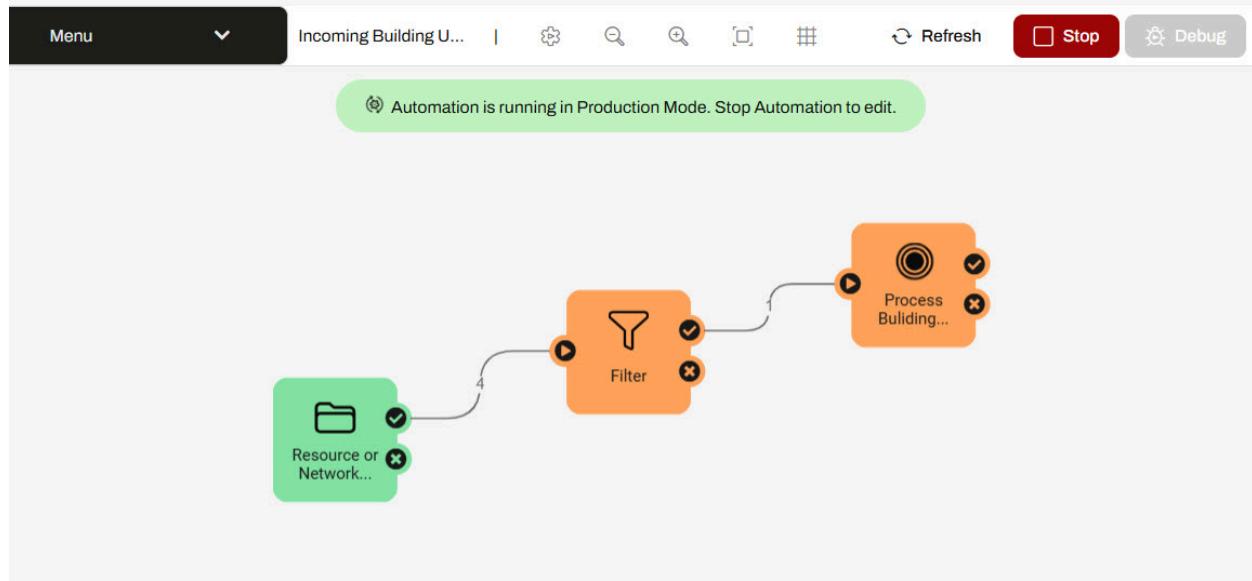
2. Review Automation Counts

Return to the Automation and notice the message counts in the automation with four messages leaving the trigger and only one leaving the filter to trigger the workspace.

Automations



Automations allow you to build event-driven or on-demand workflows using workspaces, triggers, and actions.



3. View Triggered Jobs

In the Menu dropdown, click View Triggered Jobs to see that the workspace ran and updated the file geodatabase with the building footprint updates.

A screenshot of the ArcGIS application interface. At the top, there is a dark header bar with the word "Menu" and a dropdown arrow icon. Below this is a vertical list of menu items:

- New** (with a plus sign icon)
- Open** (with a folder icon)
- Save As** (with a save icon)
- Rename** (with a pencil icon)
- Share** (with a share icon)
- View Triggered Jobs** (with a three-dot menu icon) - This item is highlighted with a red arrow pointing to it from the top right.
- View Log Files** (with a log file icon)
- Download Logs** (with a download icon)

Below the menu is a table view showing a single job entry:

ID	WORKSPACE	REPOSITORY	USERNAME	RAN BY	STATUS	LOGS	STARTED	FINISHED	SOURCE NAME	SOURCE TYPE
1	Process Building Updates.fmw	Building Footprint Updates	admin	admin	✓		Today at 16:38:58	Today at 16:39:02	Incoming Building Updates	Automations

At the top right of the table, there are three small buttons: "Remove", "Edit", and "Delete".

Conclusion

You've successfully created an Automation to process shapefiles containing updates to building footprints, then updated a geodatabase with the new data. To pass the incoming shapefiles to the workspace for processing, you used Output Attributes and Linked Parameters to transfer the information.

Overall, your new automation will save you time checking for building footprint updates, and the geodatabase will be updated promptly with the updates.

Additional Resources

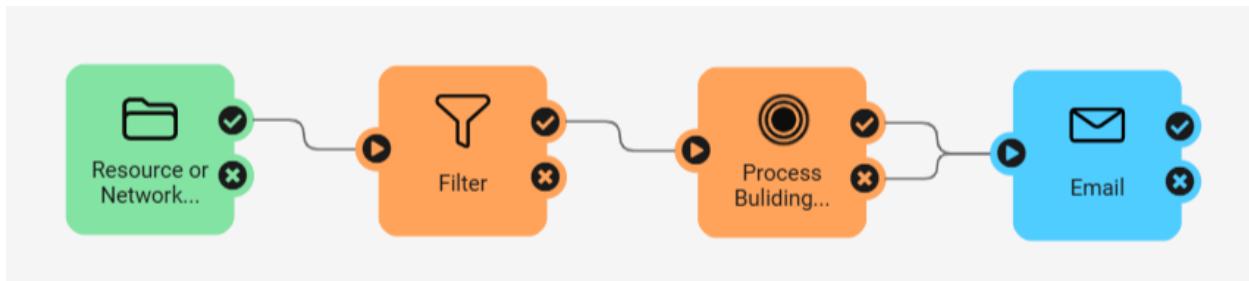
- [Webinar: Essentials of Automations: Attributes & Parameters](#)
- [Working with Automation Parameters and Custom Attributes in an Automation | User and Global Keys](#)

Optional

If you've finished early, try adding an Email (send) External Action to your automation after the Process Building Updates workspace.

1. Add Email (send) External Action

Add an External Action to the Success and Failure ports of the Process Building Updates workspace action. Select Email (send) in the External Action Details.



2. Set up Email External Action

Expand the Load Template options and select Gmail. This will configure the SMTP Server and SMTP Server Port.

Fill out the following Email Details:

- SMTP Account: peakautotraining@gmail.com
- SMTP Password: krebfsuめwvnkbyj
- Connection Security: SSL/TLS
- Email To: Enter your email here
- Email From: peakautotraining@gmail.com

✉ Email Details



Parameters

Output Attributes

Retry

▼ Load Template

SMTP Server*

Mail exchange server domain name or IP address used for sending email.

smtp.gmail.com

SMTP Server Port*

Mail exchange TCP port used for sending email.

465

SMTP Account ?

peakautotraining@gmail.com

SMTP Password ?

.....



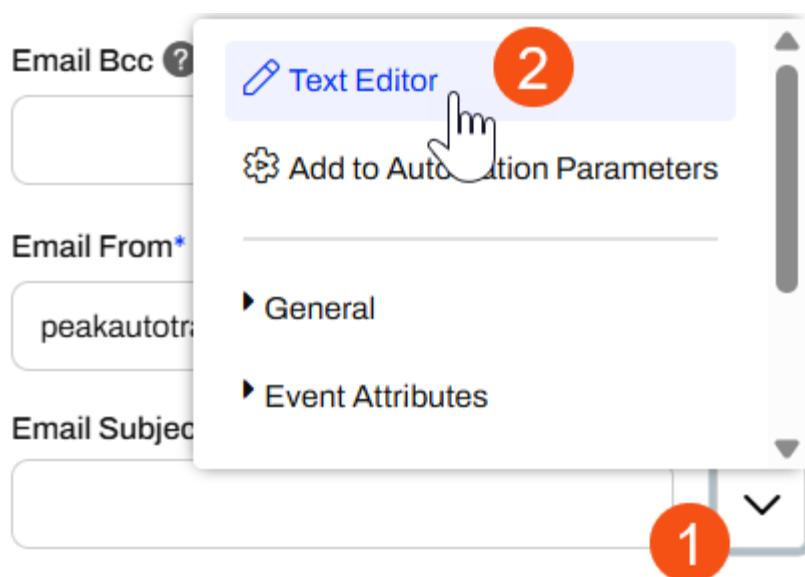
Connection Security*

The encryption mechanism used for the connection, if any.

SSL/TLS



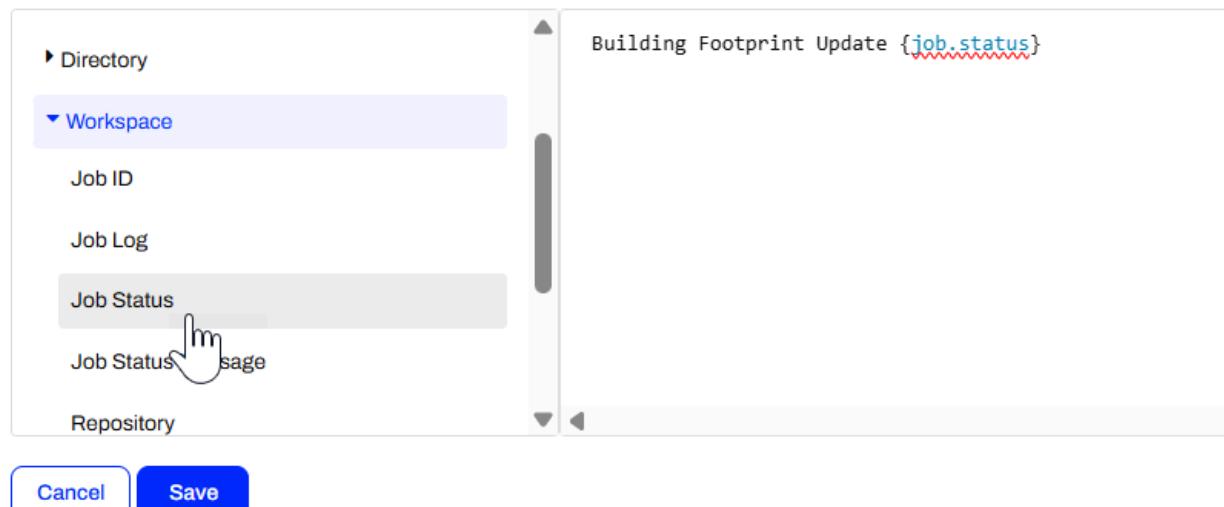
Next to Email Subject, click the drop-down arrow and select the Text Editor.



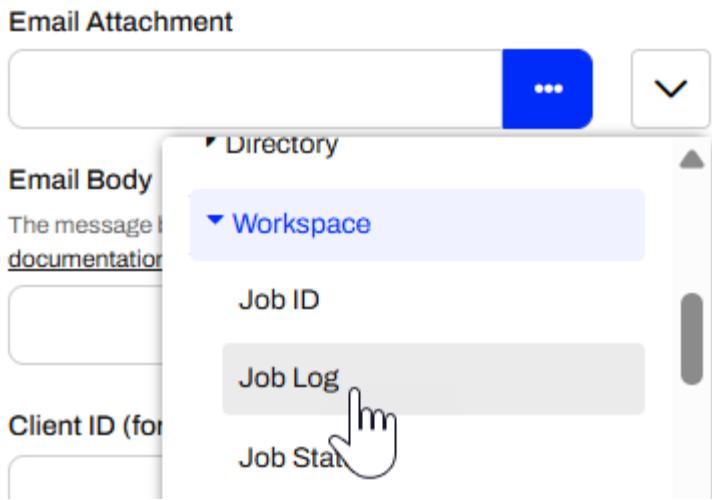
Use the Job Status parameter, nested under the Workspace tab to customize an email subject line:

Building Footprint Update {job.status}

Text Editor



Under Email Attachment, use the drop-down to attach the Job Log, which is also nested under the Workspace tab.



For the Email Body, use the Text Editor to customize a message that includes additional information about the Automation or the Workspace translation. Some parameters you may want to include are:

- Automation Name
- File Root Name
- Job Status Message
- Time Started
- Time Finished
- Workspace Name

3. Validate Email

Click Validate to ensure all your Email parameters are complete. If you encounter an error, ask a TA for help. Once everything is Valid, click Apply to close the Email Details.

4. Save and Start Automation

Save and Start the Automation. Trigger the Automation again by adding another shapefile of updates to the Resource folder. Check your email to see if you received the email you configured. If you didn't, check the log files and triggered jobs to ensure the Automation ran as expected. Ask a TA for help if needed.

Now, you have generated an alert to know if new Building Footprint Updates have been processed automatically. You will also know immediately if the updates fail and further action and attention are required.

Introduction

You can scale your FME Flow environments with multiple engines to allow for parallel processing of workspaces, especially within Automations. While running multiple workspaces at once in an Automation is efficient, the Automation will trigger downstream actions as soon as a previous action is completed. You can use Merge actions and Split-Merge Blocks to combine and wait for messages from upstream actions before triggering subsequent actions.

In this tutorial, you will use the Split-Merge Block to divide the flow of data update processes across multiple workspaces and wait for all processes to complete before performing a final validation and making final products.

Content Overview

- Starting Resources
- Step-by-step Instructions
 - Create Automation and Add a Trigger
 - Add Workspaces to the Automation
 - Add Split-Merge Block
 - Save and Start the Automation
 - Inspect Jobs
- Conclusion
- Additional Resources

Starting Resources

These are just for reference; the instructions guide you through accessing the data and workspaces.

Starting FME Flow Project

- Routine Data Update repository and workspaces
 - SpeedyDataUpdate.fmw
 - LongerDataUpdate.fmw
 - PostProcessing_LDU.fmw
 - Validation.fmw
 - MakeDataProduct.fmw

Step-by-step Instructions

In this scenario, you perform recurring data updates and generate an output product after successfully completing validation. You have multiple workspaces performing the data update, and

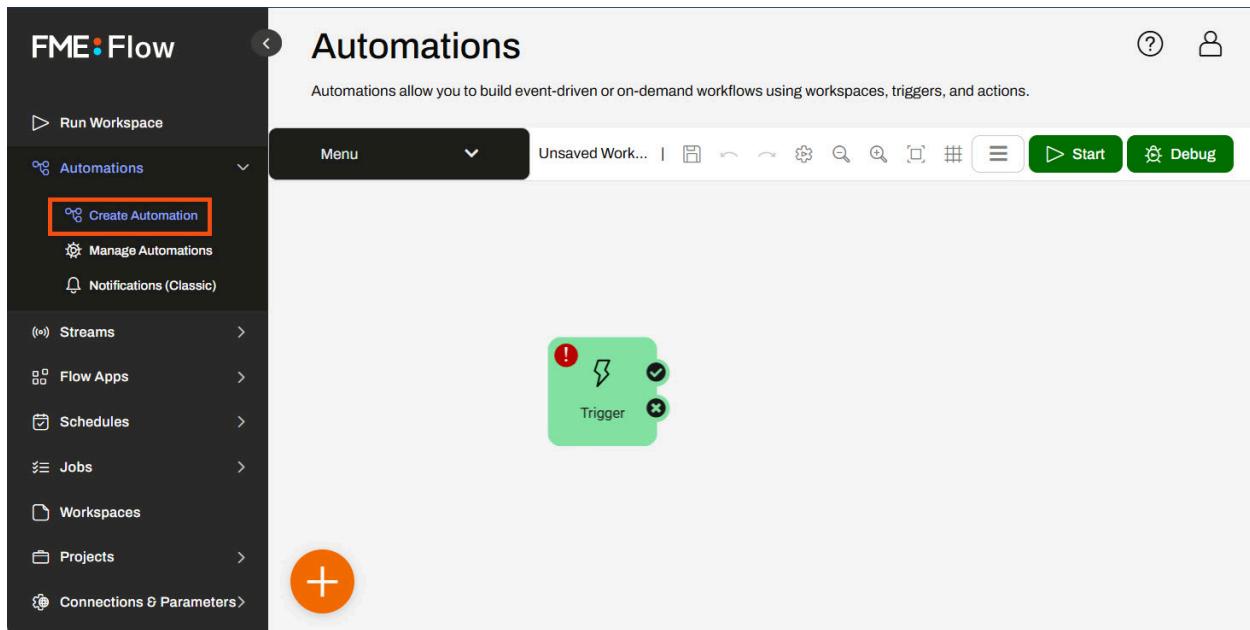
they vary by run time; one takes a fairly long time and requires post-update processing. You plan to use parallel processing in an FME Flow Automation to maximize engine resources and complete all the tasks in order. You need to merge the parallel processes after they are complete to perform validation and make the final product, for which you will use the Split-Merge Block.

Create Automation and Add a Trigger

First, you need to create an Automation that runs once daily to update and process the data.

1. Create Automation

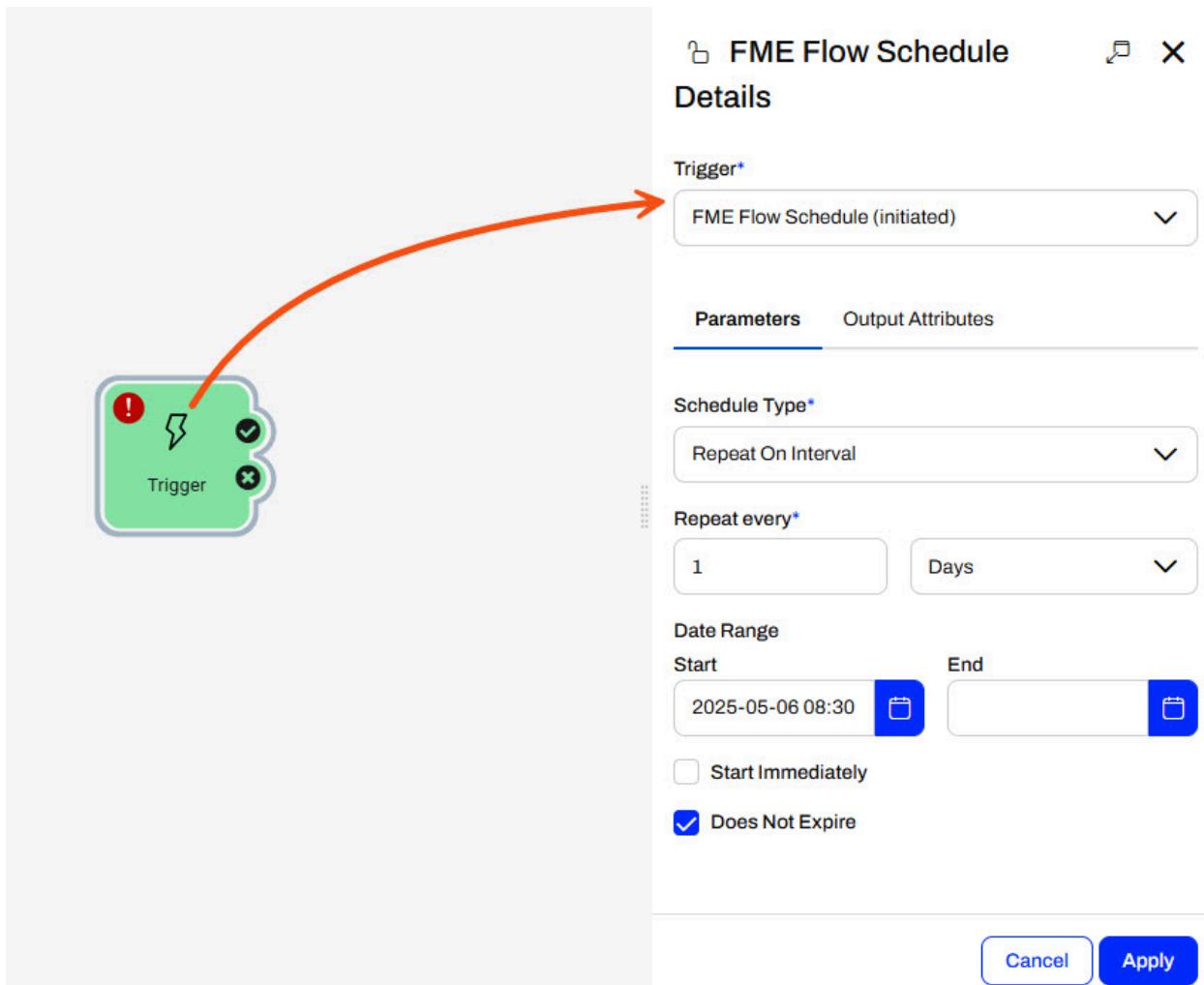
Navigate to Automations > Create Automation on the side menu bar.



2. Create Schedule Trigger

Configure the starting trigger to be an FME Flow Schedule trigger and configure it to run once a day.

- Schedule Type: Repeat on Interval
- Repeat every: 1 days



Click Apply.

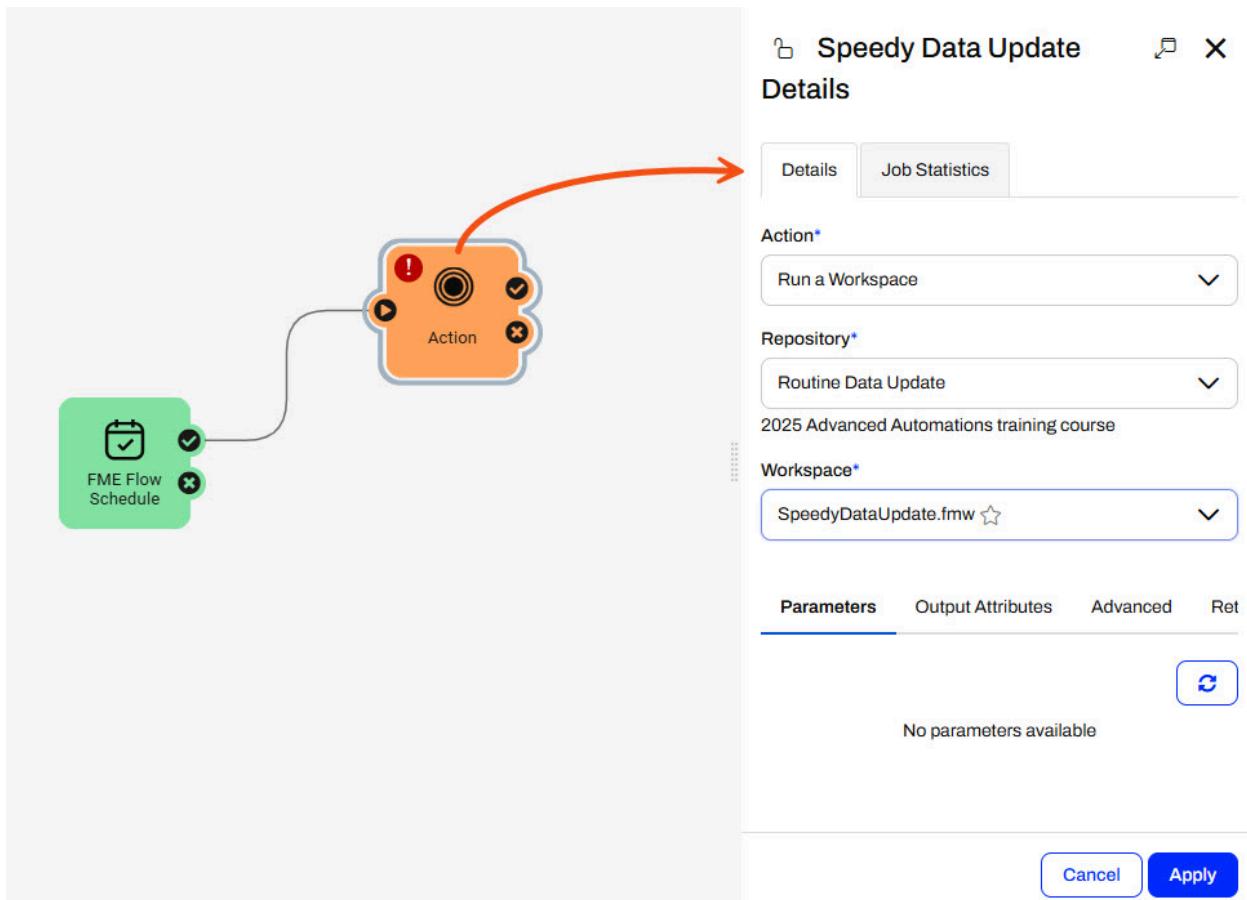
Add Workspaces to the Automation

You will add data update workspaces to run after the Automation is triggered in parallel. Following the data updates and post-processing, you will add workspaces to perform validation and make the final data product in sequence.

1. Add Run Workspace Action

Add a Run a Workspace action connected to the success port of the Schedule trigger.

- Repository: Routine Data Update
- Workspace: SpeedyDataUpdate.fmw

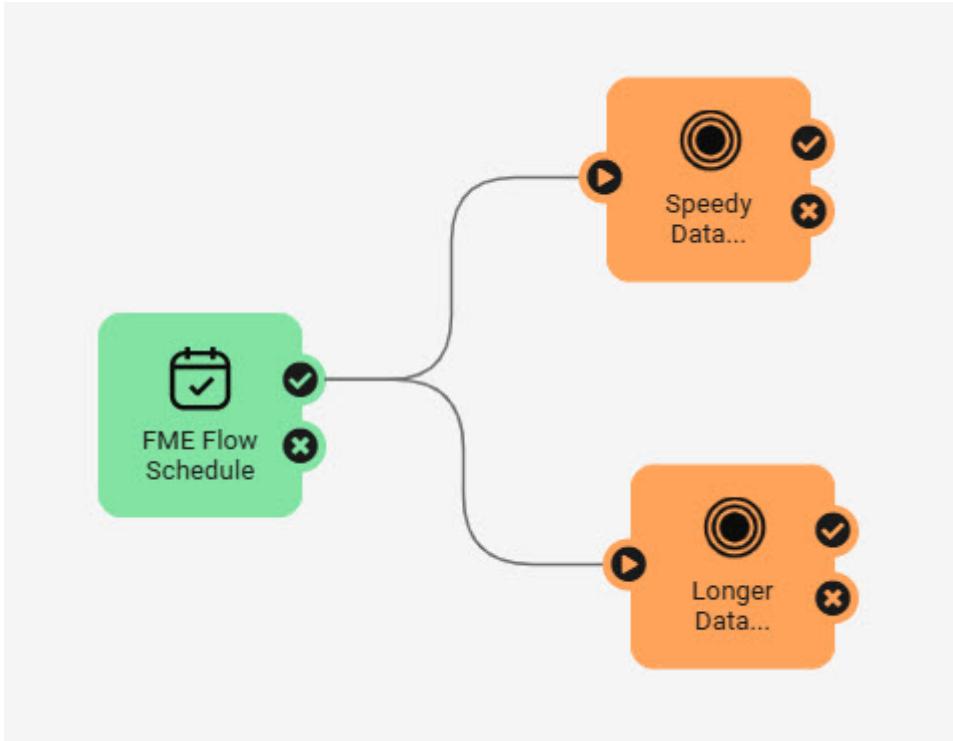


Since no other parameters need to be set for these workspaces, click Apply to close the details.

2. Add a Second Run Workspace Action

Add another Run a Workspace action.

- Repository: Routine Data Update
- Workspace: LongerDataUpdate.fmw

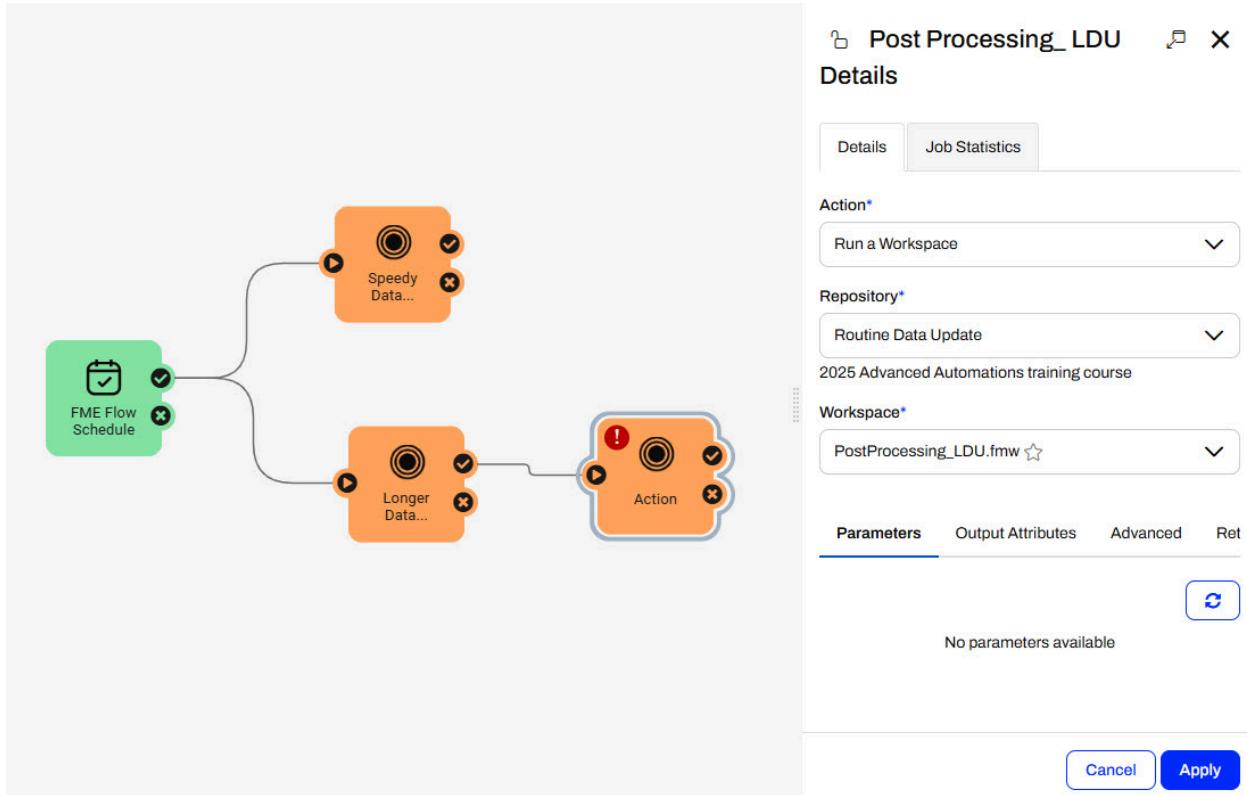


Connect this LongerDataUpdate action to the success port of the Schedule trigger, too.

3. Add a Third Run Workspace Action

The Longer Data Update workspace requires some post-processing to occur after the workspace completes. Add another Run a Workspace action connected to its success port.

- Repository: Routine Data Update
- Workspace: PostProcessing_LDU.fmw



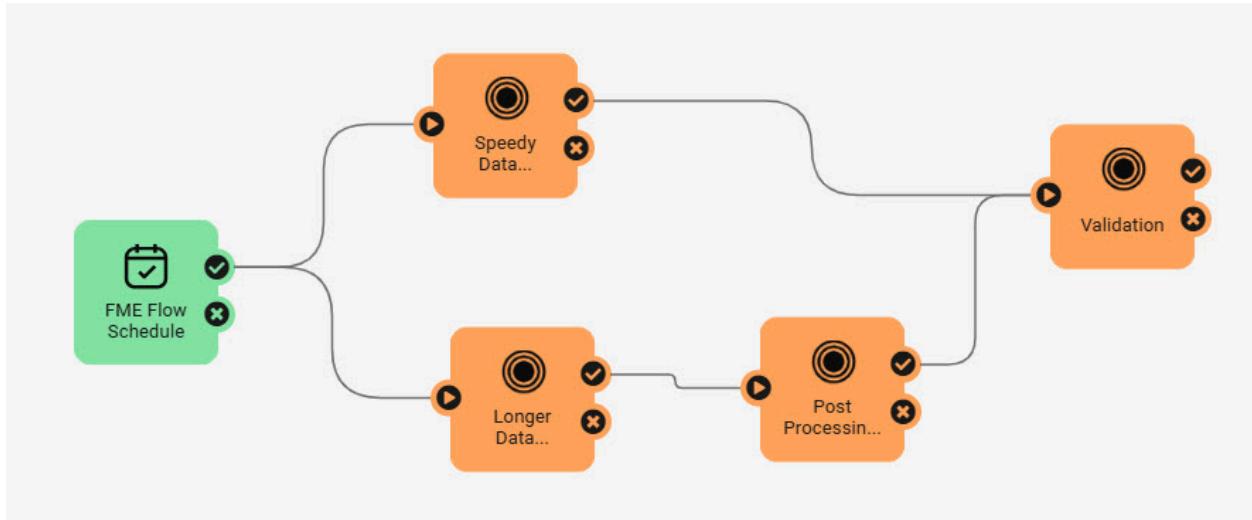
4. Add a Fourth Run Workspace Action

After both the data updates and post-processing are complete, you have a workspace to perform some data validation. Add another Run a Workspace action.

- Repository: Routine Data Update
- Workspace: Validation

5. Connect Validation Run Workspace Action

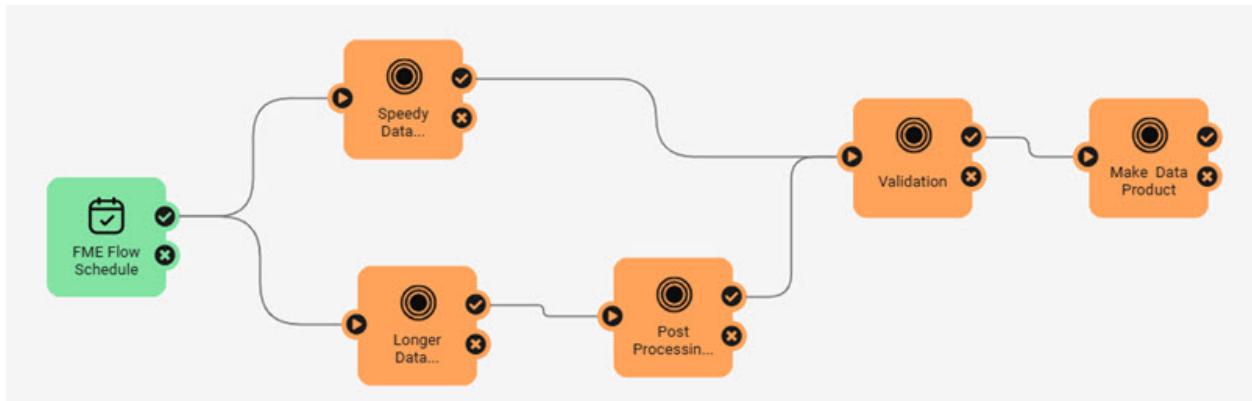
Connect the Validation workspace to the Success output ports of the SpeedyDataUpdate action and the PostProcessing_LDU action.



6. Add a Fifth Run Workspace Action

The last workspace to run is the Make Data Product workspace. Add it to the canvas and connect it to the Success output port of the Validation action.

- Repository: Routine Data Update
- Workspace: MakeDataProduct.fmw



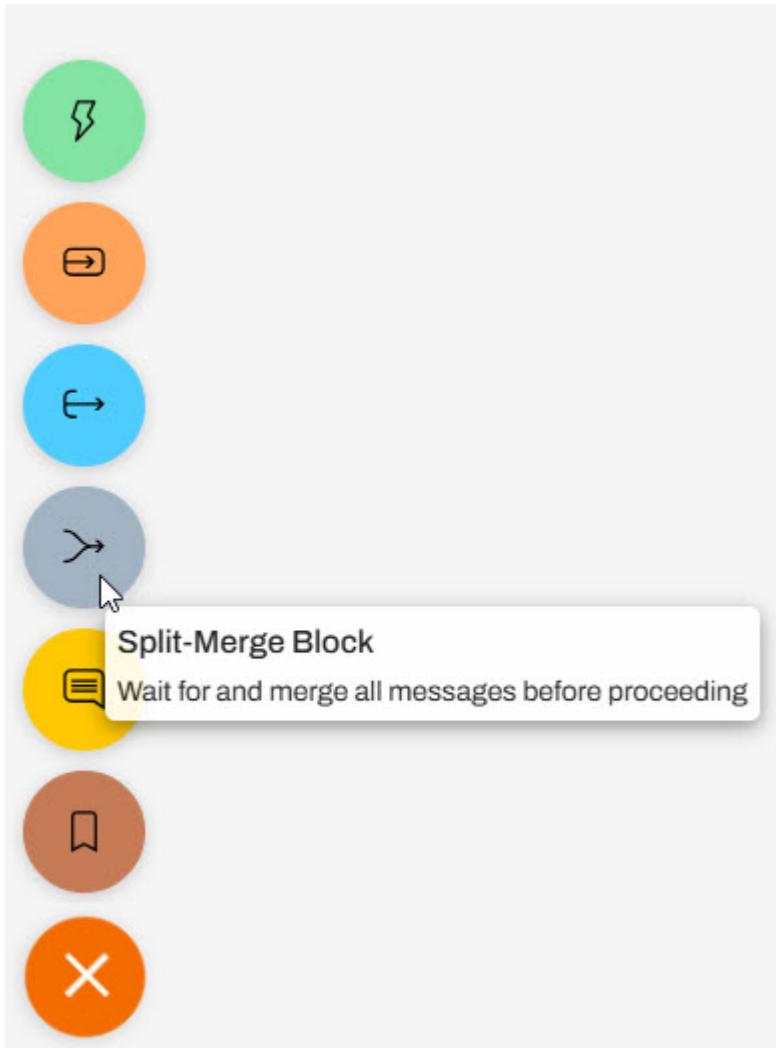
Add Split-Merge Block

Currently, our automation processes the Speedy and Longer Data Updates simultaneously on 2 engines. Once the Speedy update is complete, the Validation and Make Data Product workspaces trigger to run. However, these begin before the Longer Data Update and Post Processing for the Longer Data Update are complete. To keep the validation workspace from running before the Longer

Data Update is completed, you will use a Merge action or a Split-Merge Block to merge the outgoing messages from the Longer and Speedy Data Updates.

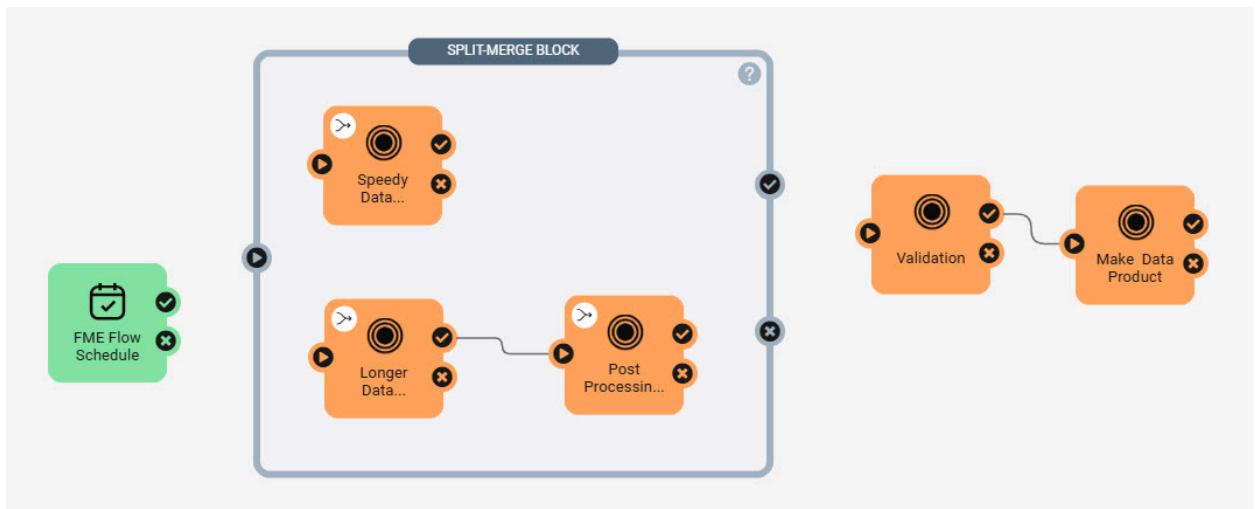
1. Add a Split-Merge Block

Add a Split-Merge Block to the canvas.



2. Configure the Split-Merge Block

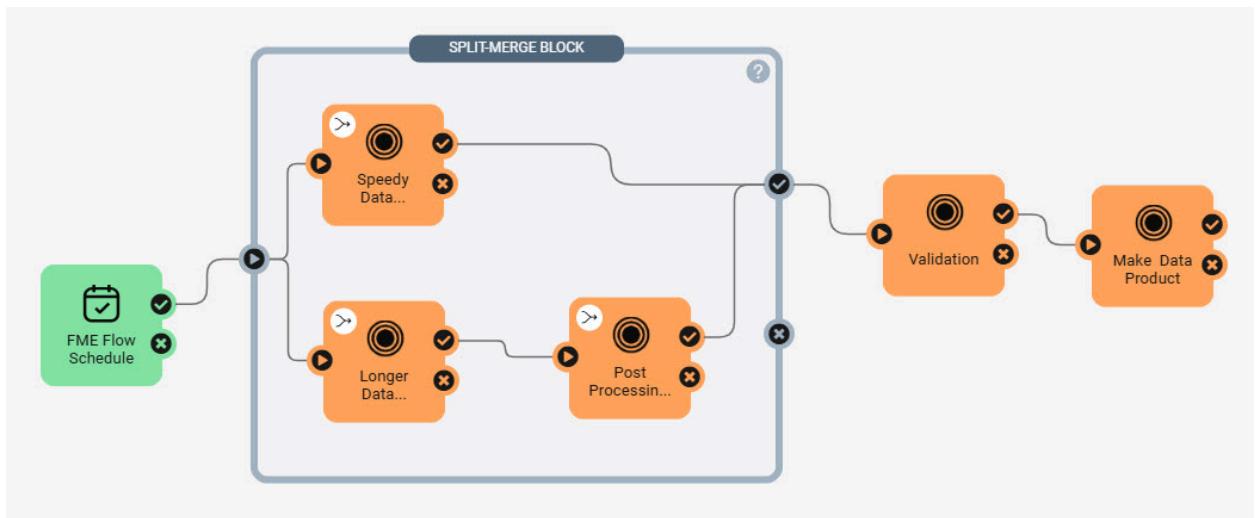
Move the split-merge block so that the SpeedyDataUpdate, LongerDataUpdate, and PostProcessing_LDU actions are inside it. Disconnect the Schedule trigger and Validation workspace from the actions within the split-merge block.



Connect the Schedule trigger success port to the input port of the split-merge block.

Connect the Success output ports of the PostProcessing_LDU and SpeedyDataUpdate actions to the Success output port of the split-merge block.

Lastly, reconnect the Validation workspace input to the split-merge Success output port.



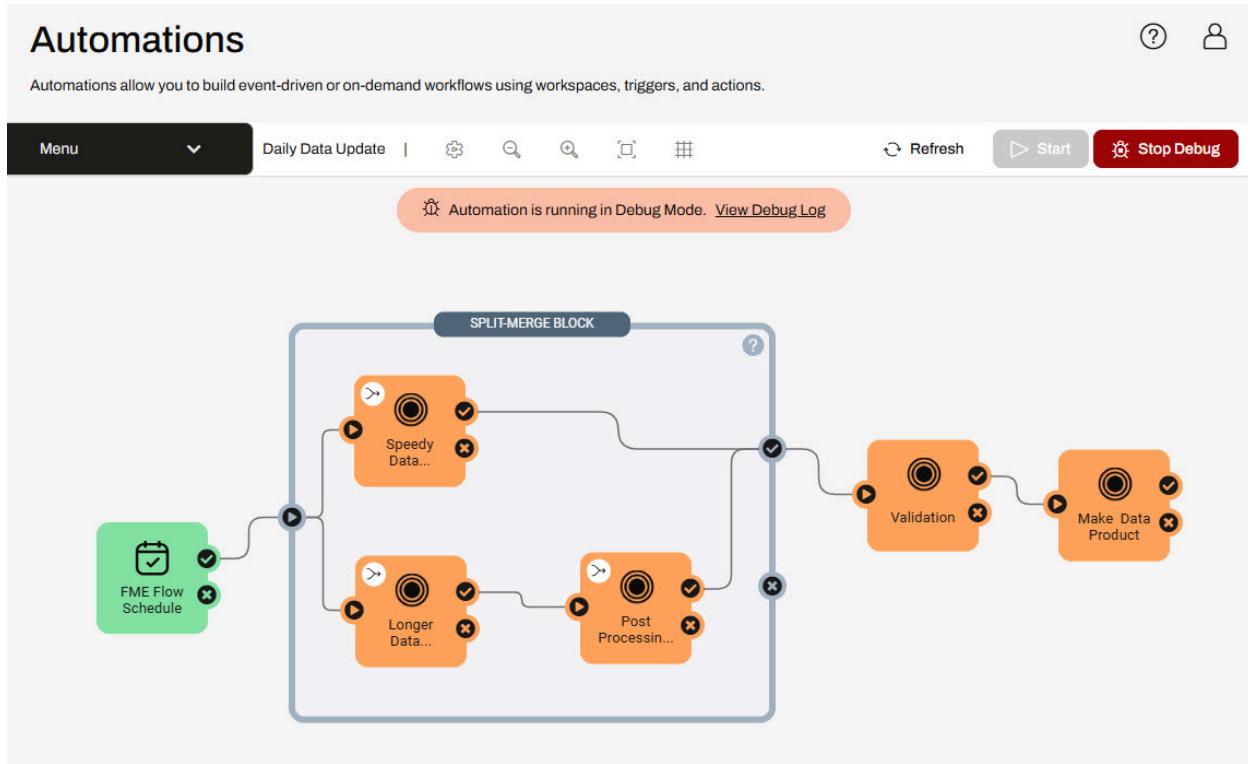
Save and Start the Automation

1. Save the Automation

Save the automation and name it *Daily Data Update*.

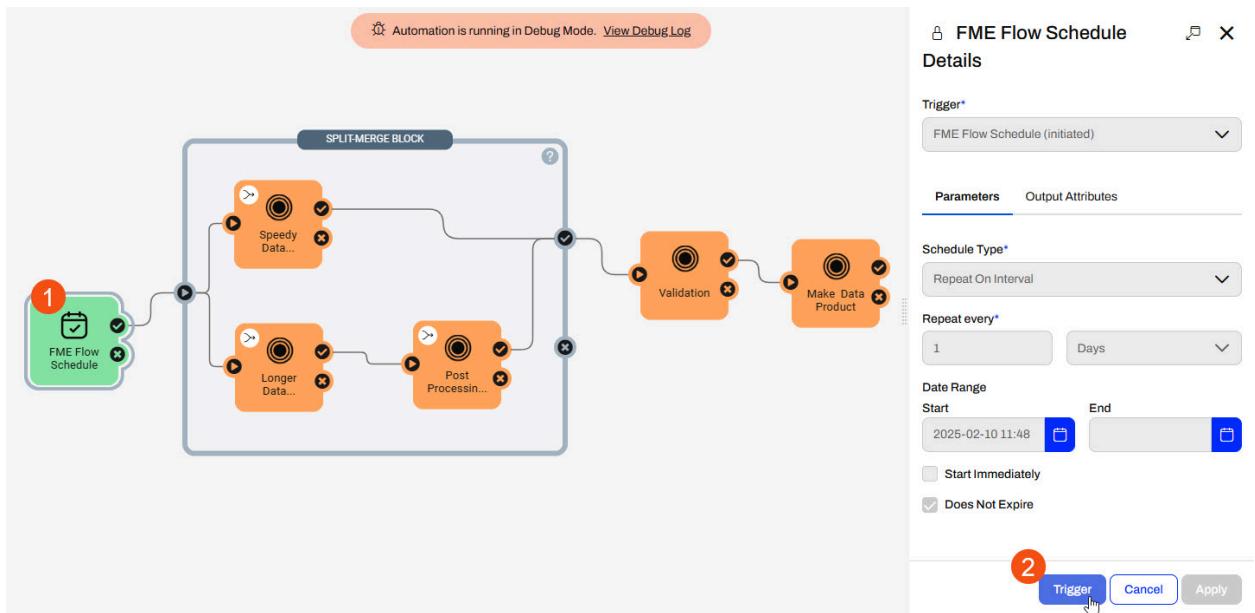
2. Start in Debug Mode

Start the automation in Debug mode. This way, we can easily view the Debug log to troubleshoot the automation.



3. Trigger Automation

Open the FME Flow Schedule trigger details and click the Trigger button. This triggers the automation to run ahead of schedule, which is set to run tomorrow morning.



4. Open Jobs

Immediately after triggering the Automation, go to Jobs > Running and see which workspaces are currently being processed by the FME Flow Engines. Notice that the SpeedyDataUpdate and LongerDataUpdate are being processed simultaneously on two engines.

Jobs								
	Completed	Queued	Running					
Filters								
ID	WORKSPACE	REPOSITORY	USERNAME	RAN BY	STATUS	STARTED	SOURCE NAME	SOURCE TYPE
23	SpeedyDataUpdate.fmw	Routine Data Update	admin	admin		Today at 16:10:38	Daily Data Update	Automations
25	LongerDataUpdate.fmw	Routine Data Update	admin	admin		Today at 16:10:38	Daily Data Update	Automations

Swap between the Completed and Running jobs tabs to see which workspaces from the automation are processed.

Jobs

Jobs Overview												
		Completed		Queued		Running						
		Completed		Queued		Running						
<input type="checkbox"/>		ID	WORKSPACE	REPOSITORY	USERNAME	RAN BY	STATUS	LOGS	STARTED	FINISHED	SOURCE NAME	SOURCE TYPE
<input type="checkbox"/>		22	MakeDataProduct.fmw	Routine Data Update	admin	admin	✓		Today at 16:11:02	Today at 16:11:04	Daily Data Update	Automations
<input type="checkbox"/>		21	Validation.fmw	Routine Data Update	admin	admin	✓		Today at 16:11:00	Today at 16:11:02	Daily Data Update	Automations
<input type="checkbox"/>		20	PostProcessing_LDU.fmw	Routine Data Update	admin	admin	✓		Today at 16:10:53	Today at 16:11:00	Daily Data Update	Automations
<input type="checkbox"/>		18	LongerDataUpdate.fmw	Routine Data Update	admin	admin	✓		Today at 16:10:38	Today at 16:10:53	Daily Data Update	Automations
<input type="checkbox"/>		19	SpeedyDataUpdate.fmw	Routine Data Update	admin	admin	✓		Today at 16:10:38	Today at 16:10:39	Daily Data Update	Automations

Although an engine is available to process the Validation workspace once the SpeedyDataUpdate is completed, the Validation workspace does not begin until the PostProcessing_LDU job is completed successfully. This is a result of the split-merge block within the automation.

If necessary, you can trigger the Daily Data Update automation multiple times to see how the engines and jobs behave on FME Flow.

Conclusion

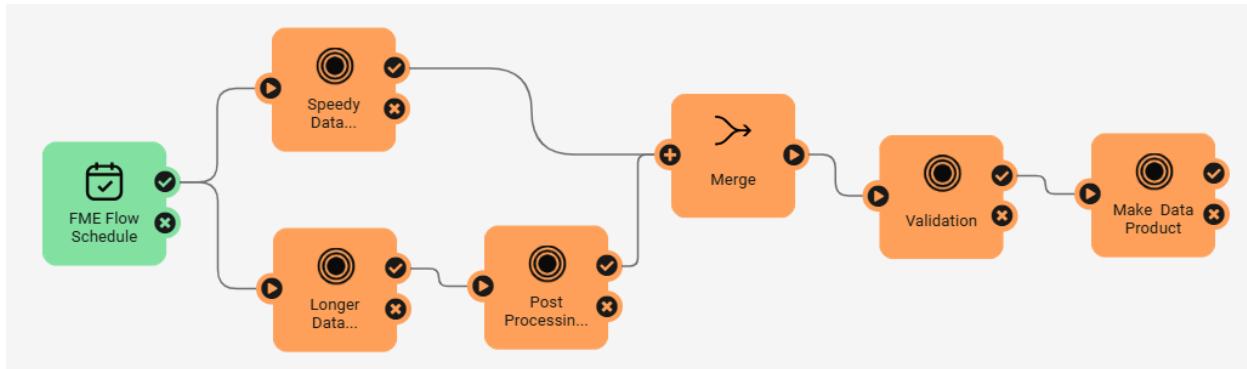
In this tutorial, you learned how to use a Split-Merge Block in an FME Flow Automation and efficiently manage engine resources with parallel and sequential processing. Configuring an Automation to run multiple workspaces simultaneously maximizes engine usage and streamlines the data update process. The addition of the Split-Merge Block ensured that downstream actions, such as validation and final product generation, only occurred after all necessary upstream processes had been completed successfully.

Additional Resources

- [Getting Started with the Split-Merge Block](#)
- [Understanding the Split-Merge Block | Troubleshooting & FAQs](#)
- [Combining Messages from Multiple Workspace Actions](#)

Optional

If you've finished early, remove the Split-Merge Block and replace it with a Merge Messages Action. Connect the Speedy Data Update and Post Processing actions to the input port of the Merge Action and connect the Validation action to the output port.



You may also add more workspace actions and investigate different [Trigger](#) and [External Action](#) options that may elevate this scenario.

Introduction

The FME Flow Automations writer enhances the functionality of Automations workflows by passing information from a workspace event to downstream actions or splitting a workflow into multiple tasks. The Automation writer allows you to pass custom information stored in attributes from inside a workspace to downstream actions as output attributes via separate ports from the Run a Workspace action in Automations.

The FME Flow Automations writer allows FME Flow users to:

- Implement enterprise integration patterns
- Send data from within a workspace to other Automations actions
- Build workspaces to run data-driven parallel processing
- Merge data from other systems

Content Overview

- Starting Resources
- Step-by-step Instructions
 - Create an Automations Writer
 - Create the Automation
 - Save and Start the Automation
- Conclusion
- Additional Resources

Starting Resources

These are just for reference; the instructions guide you through accessing the data and workspaces.

- Starting FME Flow Project
 - Contact School workspace
- FME Data
 - Starting workspace [TrafficWorkOrders-SchoolZones.fmw](#) |
C:\FMEData\Resources\FMEUC25\Advanced Automations in FME
Flow\Workspaces\TrafficWorkOrders-SchoolZones.fmw
 - [Traffic_Signal_Work_Orders_Schools.csv](#) |
C:\FMEData\Resources\FMEUC25\Advanced Automations in FME
Flow\Data\Traffic_Signal_Work_Orders_Schools.csv

Step-by-step Instructions

This tutorial's scenario is that you frequently receive work order requests to fix school traffic lights across the City of Austin. Schools must be notified so a traffic guard can be put on duty until city

maintenance crews resolve the issue. Instead of manually sending the notices, you want to automate this process with FME Flow.

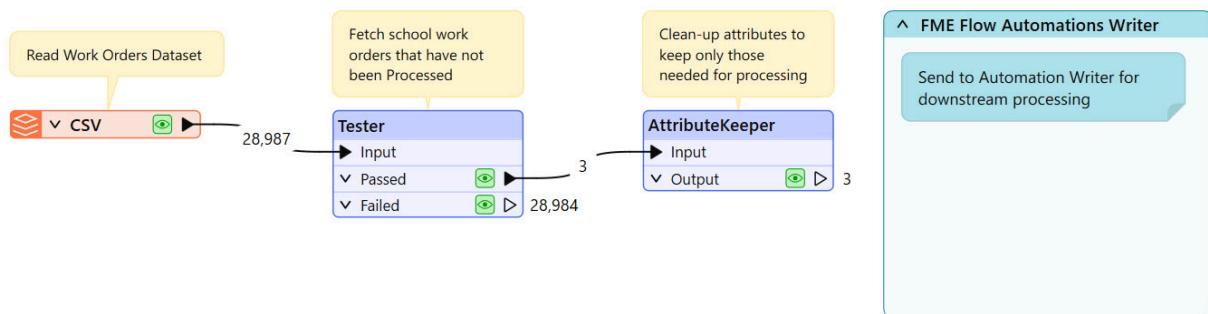
We must create a workspace that reads the full list of work orders and checks which requests must be processed. For each asset, another workspace locates the school it belongs to and prepares its contact information for use in an Automation email action.

Create an Automations Writer

1. Open the starting workspace, TrafficWorkOrders-SchoolZones.fmw.

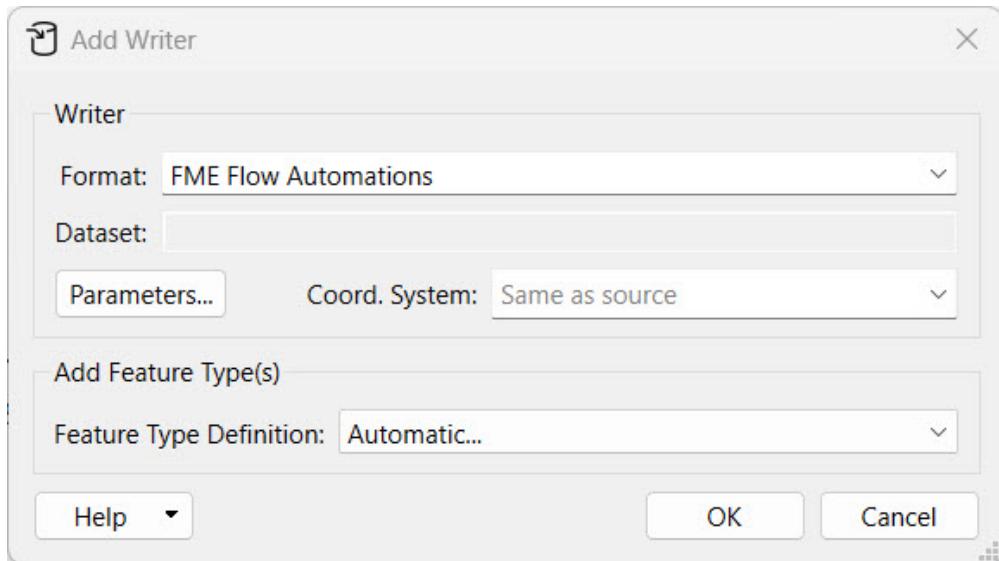
This workspace reads in a dataset of Work Orders, filters the Work Orders to get ones that have not been processed, and cleans up attributes to keep only the ones needed for further processing.

There's a bookmark for an FME Flow Automations Writer, which will be used to pass data from the Work Orders to the next workspace in an Automation. Before creating the writer, run the workspace as it is and inspect the cached data to gain familiarity.

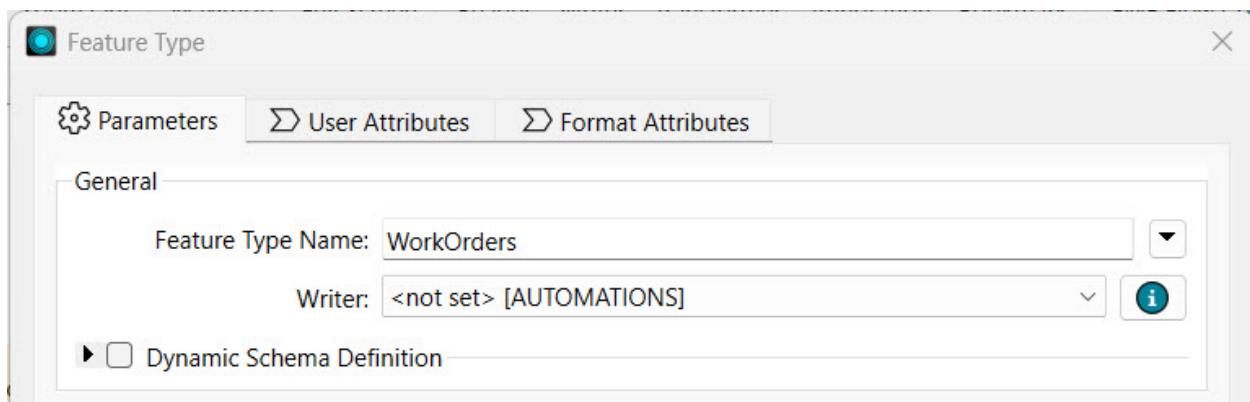


2. Add an FME Flow Automations Writer

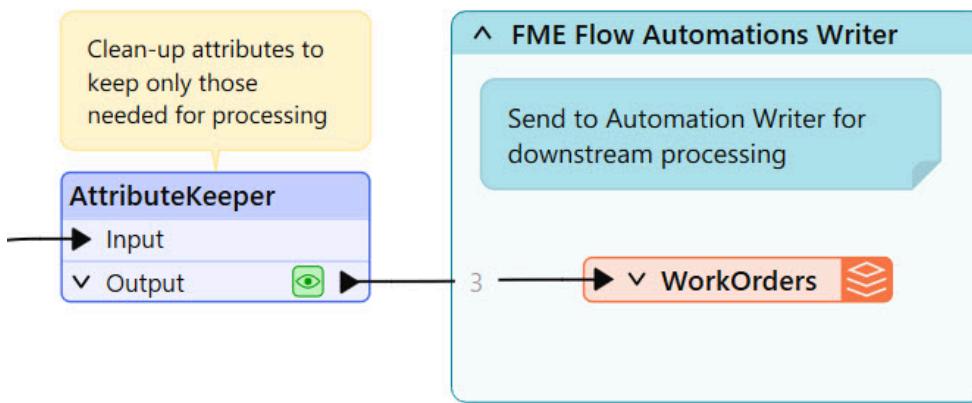
Add a new writer and select the "FME Flow Automations" format. You don't need to change any of the FME Flow Automations writer parameters. Make sure the Feature Type Definition is "Automatic" and click OK.



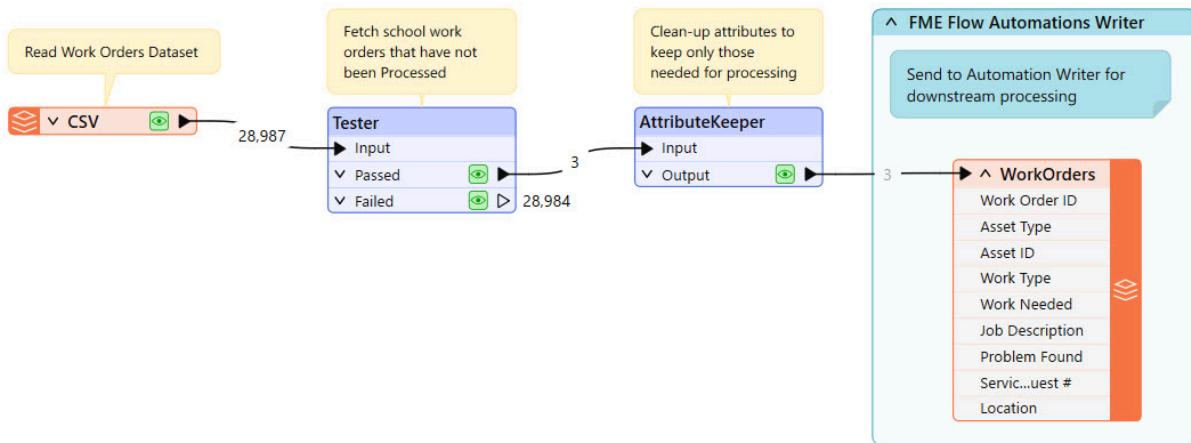
In the Feature Type dialog, set the Feature Type Name to “WorkOrders”. The name of the Automations writer feature type will be the name of the output port in the automation. Click OK when done.



Place your newly created WorkOrders writer in the bookmark and connect it to the AttributeKeeper output port.



If you expand the drop-down schema on the Automations writer, you can see all of the attributes that will be routed to downstream actions in the Automation.



3. Publish Workspace

Your workspace is now complete, and you need to publish it to FME Flow to automate the process. Save the workspace as TrafficWorkOrders-SchoolZones.fmw.

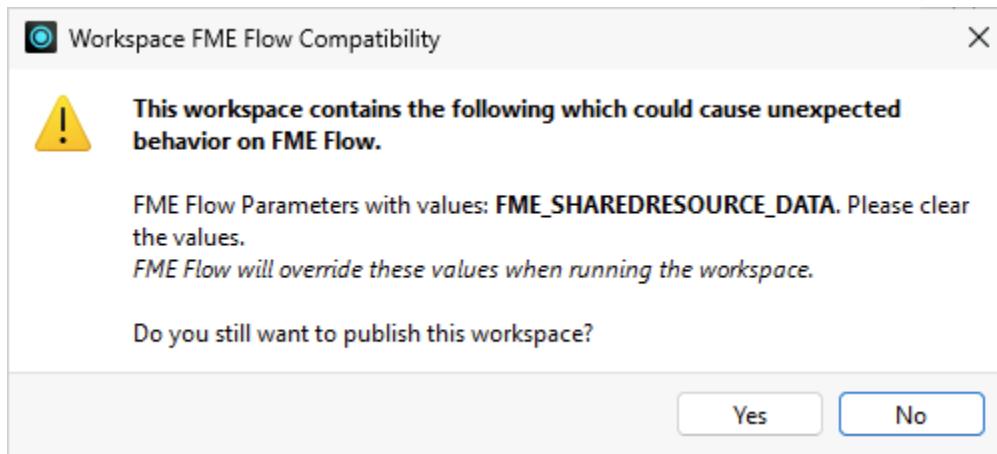
To publish a workspace to FME Flow, a web connection between FME Form and FME Flow is required to transfer the workspace and all related information. Your web connection to FME Flow should already be created on the training machines as Training FME Flow. The credentials are:

- Host URL: <http://localhost>
- Username: admin
- Password: FMElearnings

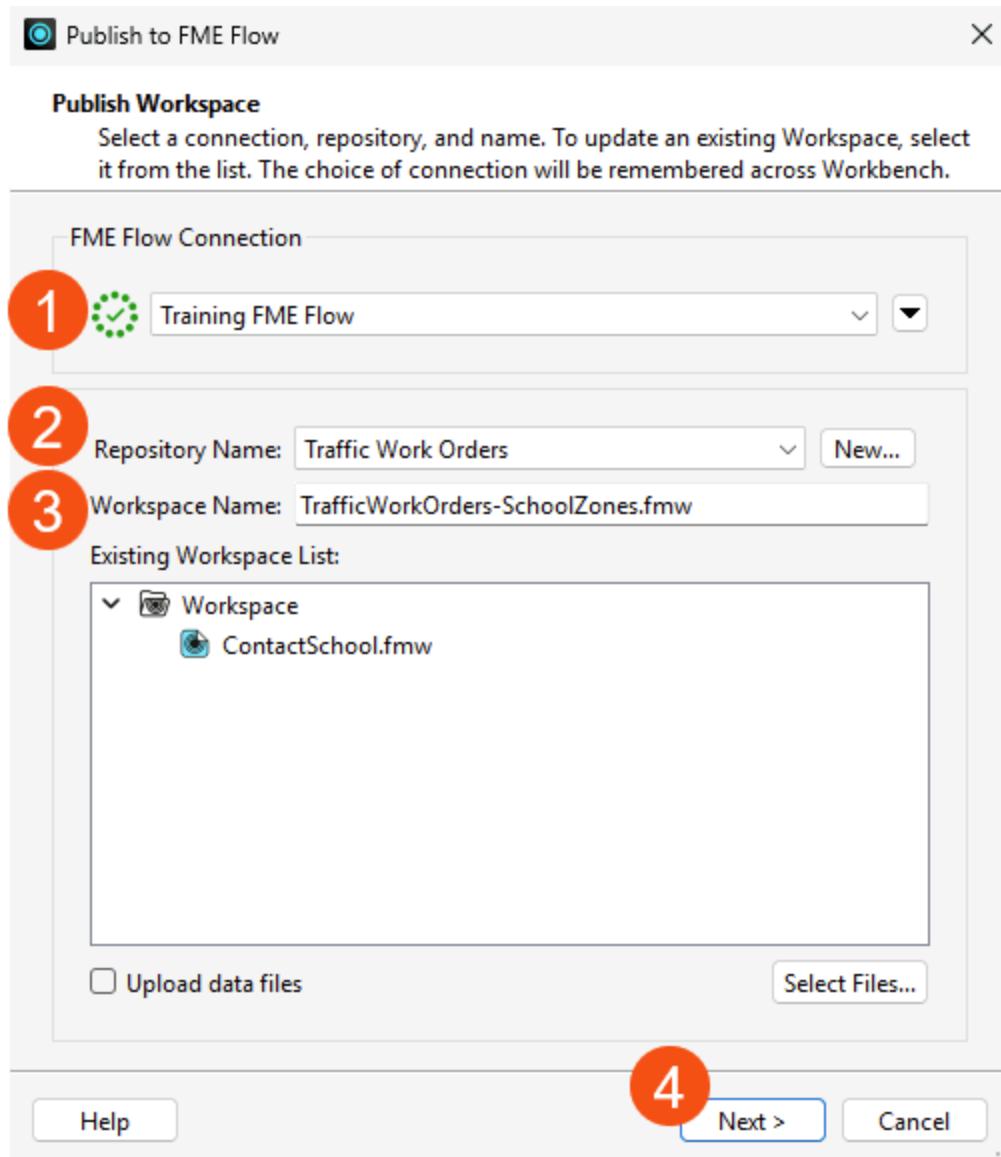
Click Publish in the top toolbar and make sure your FME Flow connection is selected.



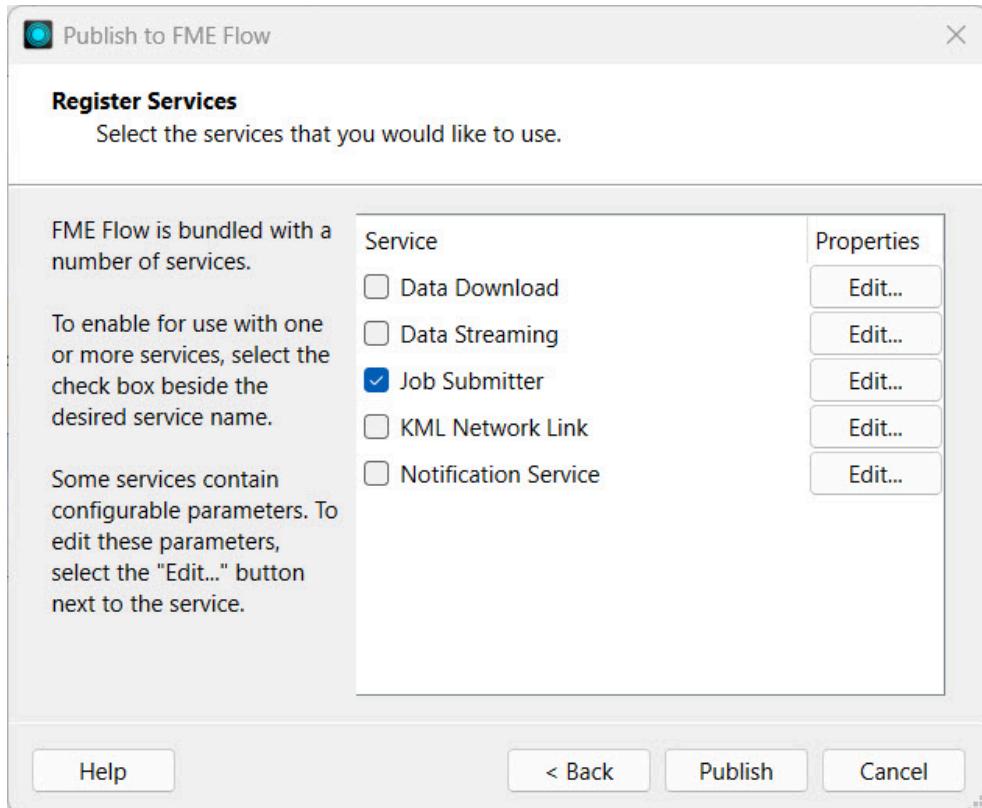
You may experience a warning regarding the FME_SHAREDRESOURCE_DATA parameter. Click Yes to continue publishing.



Select the Traffic Work Orders repository. You can leave the workspace name as TrafficWorkOrders-SchoolZones.fmw.



Click Next and select the Job Submitter service. Lastly, click Publish.

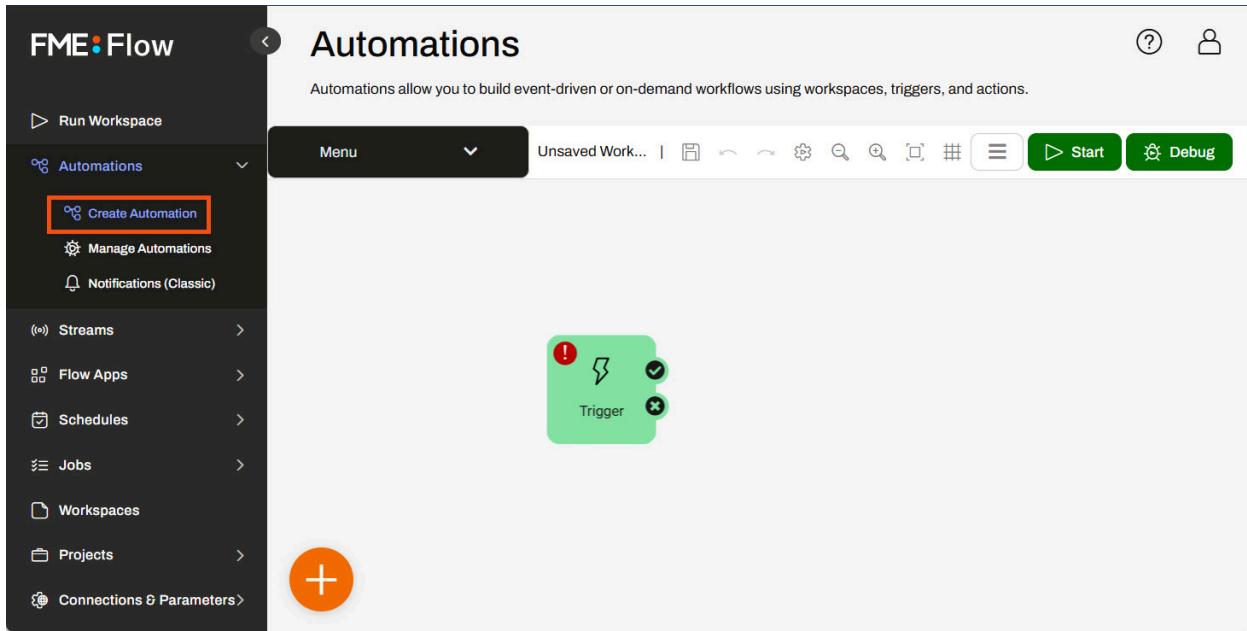


You should see in the Translation Log that the workspace has successfully been published to FME Flow.

	Transformer	Message
97		Successfully uploaded resource(s).
98		Successfully published to FME Flow as 'TrafficWorkOrders-SchoolZones.fmw'.
99		-----
100		Publish Summary
101		-----
102		FME Flow URL : https://[REDACTED].com
103		Username : admin
104		Repository : Traffic Work Orders
105		Name : TrafficWorkOrders-SchoolZones.fmw
106		Direct Link : https://[REDACTED].com/fmeserver/#/workspaces/run/Traffic%20Work%20Orders/TrafficWorkOrders-SchoolZones.fmw
107		Uploaded Resources : C:\Users\[REDACTED]\Downloads\AutomationsWriterTutorial\AutomationsWriterTutorial\AutomationsWriterTutorial\Traffic_Signal_Work_Orders_Schools.csv
108		Registered Services : Job Submitter
109		Time : Wed Feb 19 12:18:20 2025
110		-----

Create the Automation

1. Navigate to FME Flow and create a new Automation.



2. Configure the trigger on the canvas and set the following parameters:

- Trigger: FME Flow Schedule (initiated)
- Schedule Type: Basic
- Recurrence: Daily
- Start: any date in the future, and set the time for 08:00

FME Flow Schedule Details

Trigger*

FME Flow Schedule (initiated)

Parameters

Output Attributes

Schedule Type*

Basic

Recurrence*

Daily

at 8:00

Date Range

Schedules must be configured according to the time zone of the FME Flow that runs the task.

Current Timezone

Wed-19-Feb-2025 11:23:58 AM -0800

Start *

2025-05-07 08:00

End



Does Not Expire

Cancel

Apply

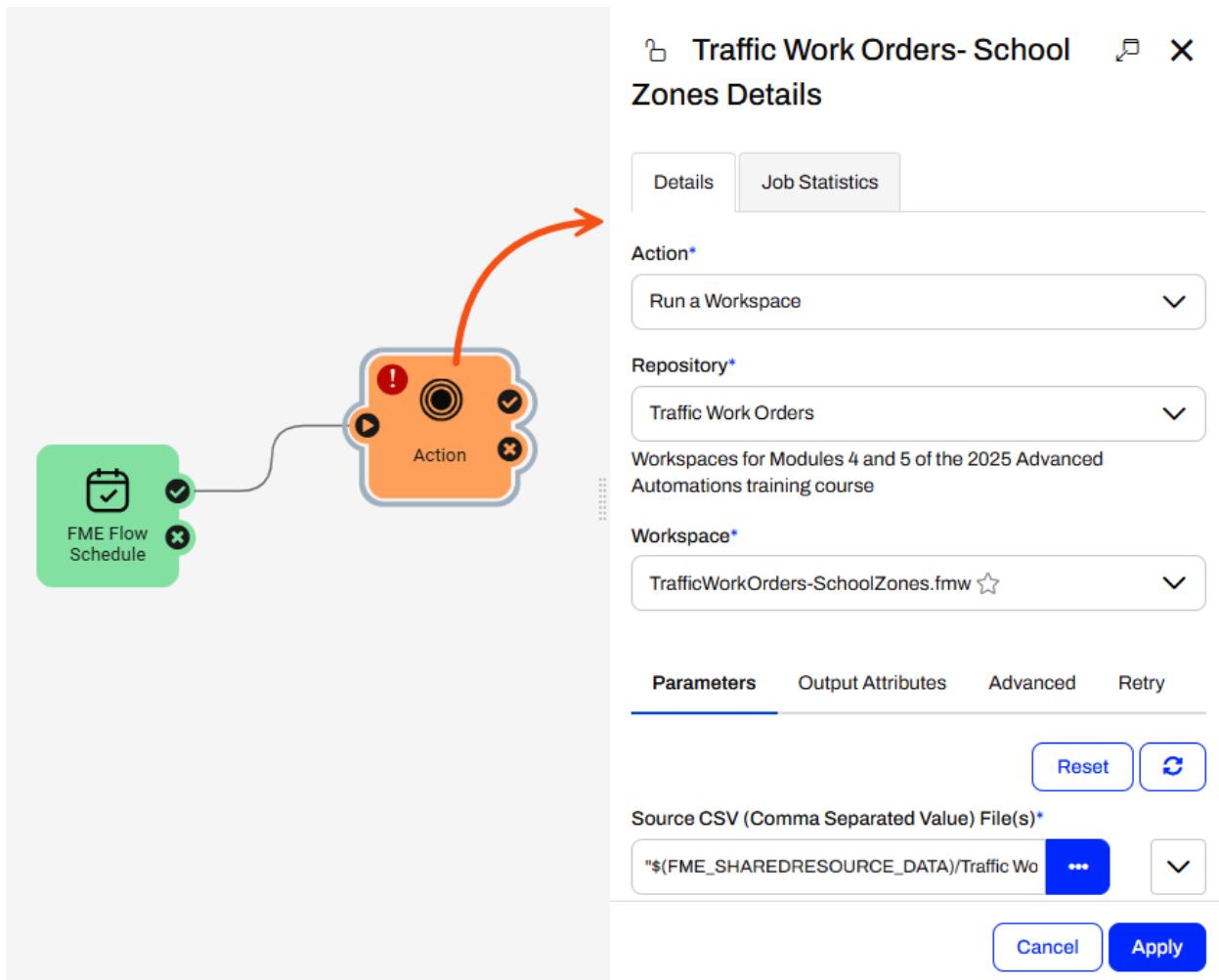
Click Apply to save and close the trigger details.

3. Add an Action to Run the TrafficWorkOrders-SchoolZones.fmw Workspace.

Connect a new Action to the success port of the FME Flow Schedule Trigger and set the following parameters:

- Action: Run a Workspace
- Repository: Traffic Work Orders
- Workspace: TrafficWorkOrders-SchoolZones.fmw

The Source CSV can be left as the default value "\$(FME_SHAREDRESOURCE_DATA)/Traffic Work Orders/Traffic_Signal_Work_Orders_Schools.csv".



Click the Output Attributes tab, expand the WorkOrders section, and expand Event Attributes. You will see all the attributes from the data exposed to the Automation using the Automation Writer you created in the workspace. You will need to reference these in the following Run a Workspace action, so leave them all selected.

⌚ Traffic Work Orders- School

Zones Details

Parameters Output Attributes **Advanced** Retry

> Success

> Failure

▽ WorkOrders

▽ Event Attributes (11)

route.WorkOrders.Work Order ID

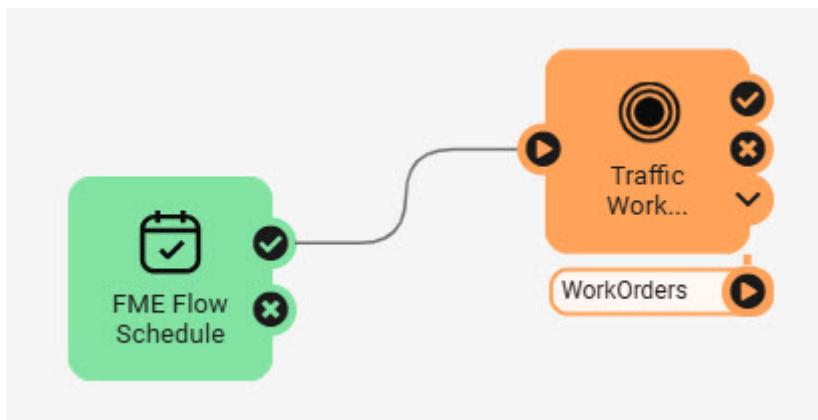
route.WorkOrders.Asset Type

route.WorkOrders.Asset ID

route.WorkOrders.Work Type

route.WorkOrders.Work Needed

Click Apply to close the action details. The WorkOrders Automation Writer Output Port from the workspace should now be visible on the Run a Workspace action.



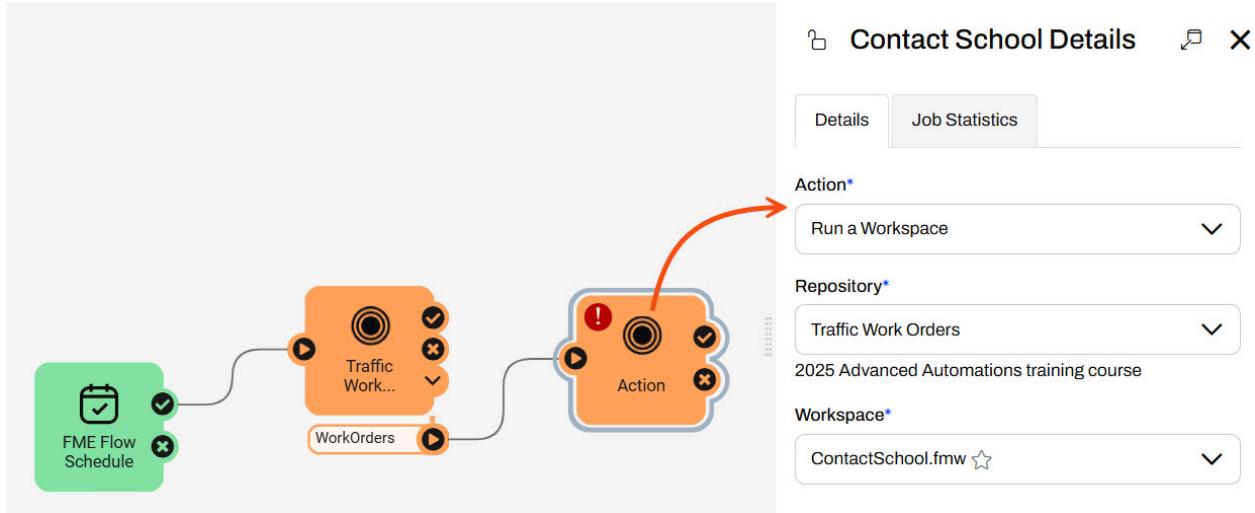
Run a Workspace using Automation Writer Output

1. Add an Action to Run the ContactSchool.fmw Workspace.

This workspace will process each asset's information, find the school that owns it, prepare the contact information, and generate an HTML notice. An Automations Writer has already been created to pass the contact information downstream within the automation.

Connect another Run a Workspace action to the output port of the WorkOrders Automation Writer and set the following parameters:

- Repository: Traffic Work Orders
- Workspace: ContactSchool.fmw



Scroll down to the Parameters and link each Parameter to the Work Orders output attributes from the previous workspace.

- Open the drop-down menu to access available parameters
- Expand the Workspace and WorkOrders sections
- Select the corresponding attribute for that parameter
 - Ex: For the Work Order ID parameter, select the Work Order ID attribute

Contact School Details

Parameters Output Attributes Advanced Retry

Work Order ID*

WRK22-146710

Asset Type*

School Beacon Zone

Asset ID*

7291

Work Needed*

Reset Refresh

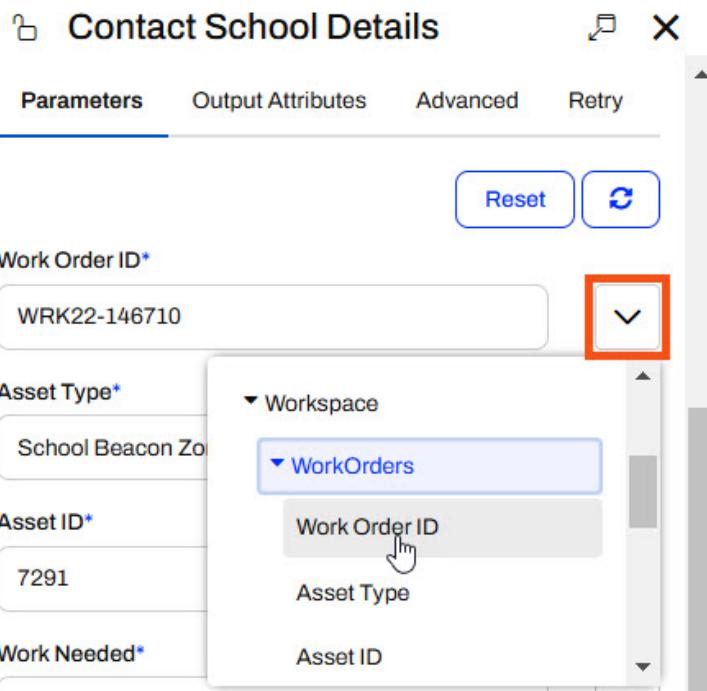
▼ Workspace

▼ WorkOrders

Work Order ID

Asset Type

Asset ID



Repeat for each parameter until they are linked to their corresponding WorkOrders attribute.

Parameters Output Attributes Advanced Retry

Reset



Work Order ID*

	Work Order ID		
--	---------------	--	--

Asset Type*

	Asset Type		
--	------------	--	--

Asset ID*

	Asset ID		
--	----------	--	--

Work Needed*

	Work Needed		
--	-------------	--	--

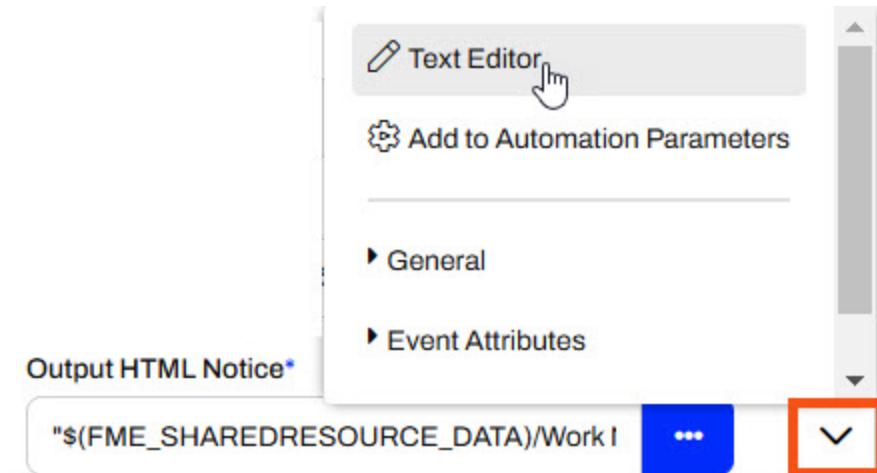
Location*

	Location		
--	----------	--	--

Ensure the Source Schools GML File parameter is set to "\$(FME_SHAREDRESOURCE_DATA)/Austin Schools/austinSchools.gml".

The output location for the Output HTML Notice parameter is set to
"\$(FME_SHAREDRESOURCE_DATA)/Work Notices/".

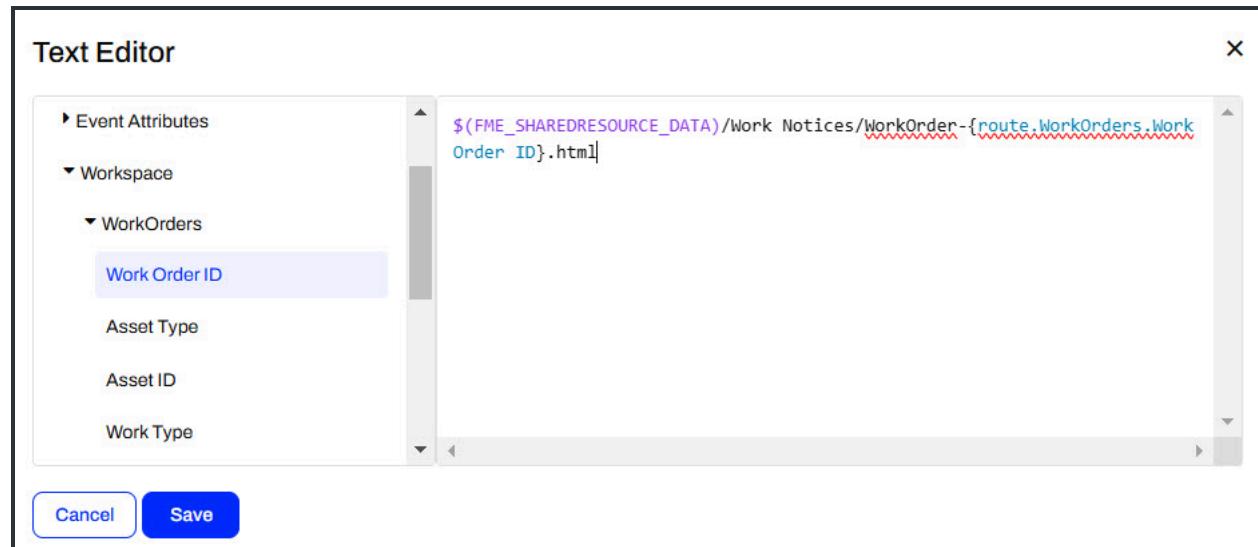
However, to save individual files for each Work Order Notice, you'll want to append the file name to contain the Work Order ID on the end of it. Next to the Output HTML Notice parameter, expand the drop-down menu and click Text Editor.



The Text Editor will open with the file path. On the left pane, expand Workspace and WorkOrders. Here, you can access all the same Output Attributes from the WorkOrders Automation Writer in the previous workspace. Clicking an attribute will add it to the text content.

Append the file path and enter a filename for the HTML report so that it is "WorkOrder-Work Order ID.html." Use the Work Order ID parameter from the parameter menu. The resulting path should be:

```
$(FME_SHAREDRESOURCE_DATA)/Work Notices/WorkOrder-{route.WorkOrders.Work Order ID}.html
```



Click Save to close the Text Editor.

Optionally, go to the Output Attributes tab and expand Contact_Info and Event Attributes to see the attributes exposed to downstream actions by the Automations Writer in this workspace.

Contact School Details



Parameters **Output Attributes** Advanced Retry

> Success

> Failure

∨ Contact_Info

∨ Event Attributes (15)

route.Contact_Info.WorkOrderID

route.Contact_Info.Asset_Type

route.Contact_Info.WorkToDo

route.Contact_Info.address

route.Contact_Info.city

Click Apply to close the details pane.

The Automation canvas now should contain two Run a Workspace actions with Automation Writer output ports.

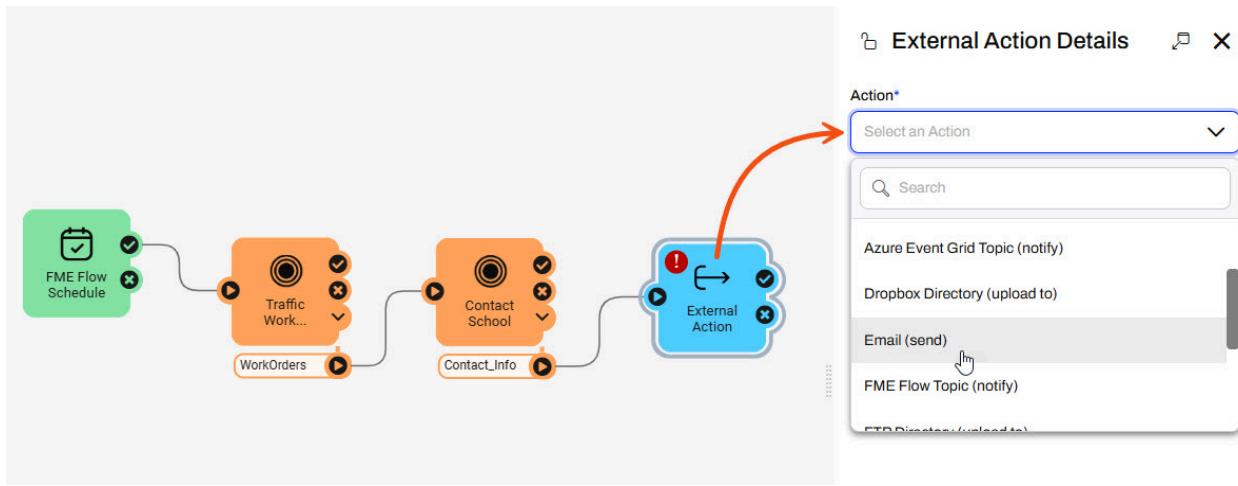


With this setup, ContactSchool.fmw will run for each feature routed from the “WorkOrder” Automations writer. The published parameter values will be dynamically filled based on each feature's attribute values.

Add Email External Action

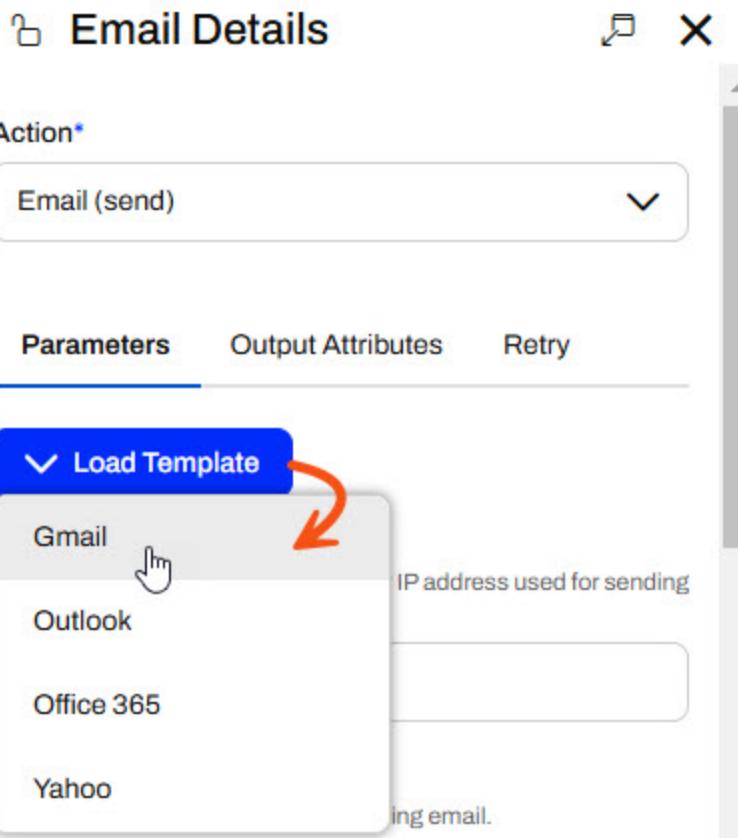
1. Add an External Action to Send Email Notifications to Schools

Lastly, you need to email the notices to each school. Add an external action to the “Contact Info” output port in the automation. Select the “Email (Send)” action.



All emails sent will be via the SMTP protocol through an external account. You can get the SMTP Server parameters from your email provider, or use Load Template to fill in the blanks for some common providers.

Select the Gmail template.



SMTP Account and SMTP Password are required if the email server requires authentication (this is likely). Enter these details for your SMTP account.

- SMTP Account: peakautotraining@gmail.com
- SMTP Password: krebfsuめwvnkbyj

For this Gmail account, set the Connection Security to SSL/TLS.

Email Details

Parameters **Output Attributes** **Retry**

Load Template

SMTP Server*
Mail exchange server domain name or IP address used for sending email.

SMTP Server Port*
Mail exchange TCP port used for sending email.

SMTP Account ?

SMTP Password ?
 

Connection Security*
The encryption mechanism used for the connection, if any.

2. Configure the Email External Action Parameters to Use Automations Writer Output Attributes

You will use the Automations Writer output attributes in several of the email action parameters to transfer data from the workspace to the outgoing email.

In reality, for the Email To parameter, you would select the "email" attribute under Contact Info in the drop-down menu. However, the recipient email addresses in the Schools data are not real. Instead, enter your own email address to receive the notification.

Next, go to the Email From parameter and enter an email address. This does not need to be the same address specified as the SMTP Account - if users reply to the notification message, they will be redirected to this email address.

Fill in the Email Subject. Leave the Email Format as the default, Plain Text.

Email To* ?

Email From* ?

Email Subject*

Email Format*

Next, you should personalize each school's email body content using the Automations Writer output attributes. Click the drop-down next to the Email Body parameter and select Text Editor. Fill out the message using text and output attributes under Workspace and Contact_Info on the left.

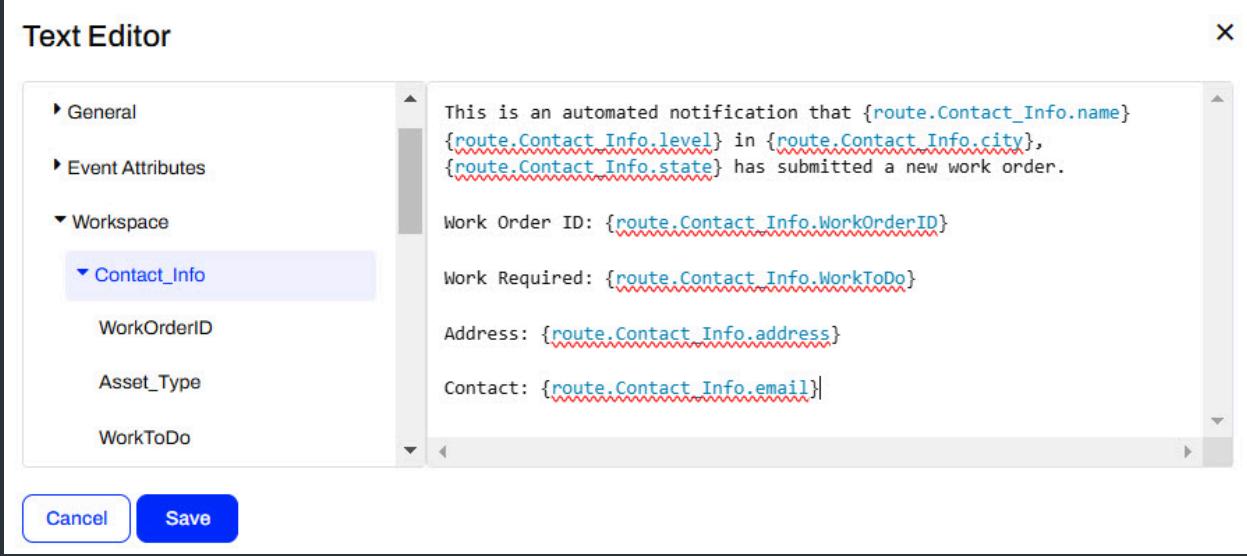
This is an automated notification that {route.Contact_Info.name} {route.Contact_Info.level} in {route.Contact_Info.city}, {route.Contact_Info.state} has submitted a new work order.

Work Order ID: {route.Contact_Info.WorkOrderID}

Work Required: {route.Contact_Info.WorkToDo}

Address: {route.Contact_Info.address}

Contact: {route.Contact_Info.email}



Click Save to close the Text Editor.

To make sure all the Email parameters are accepted, click Validate.

Email Details

Action*
Email (send)

Parameters Output Attributes Retry

Load Template

SMTP Server*
Mail exchange server domain name or IP address used for sending email.
smtp.gmail.com

SMTP Server Port*
Mail exchange TCP port used for sending email.
465

SMTP Account ?
peakautotraining@gmail.com

SMTP Password ?
.....

Validate **Cancel** **Apply**

If everything is good, you will receive a Valid Parameters message at the top of the Details pane. If you receive an error, ask a TA for help. Click Apply to save and close the Email Details.

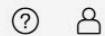
Save and Start the Automation

1. Save and Run the Automation

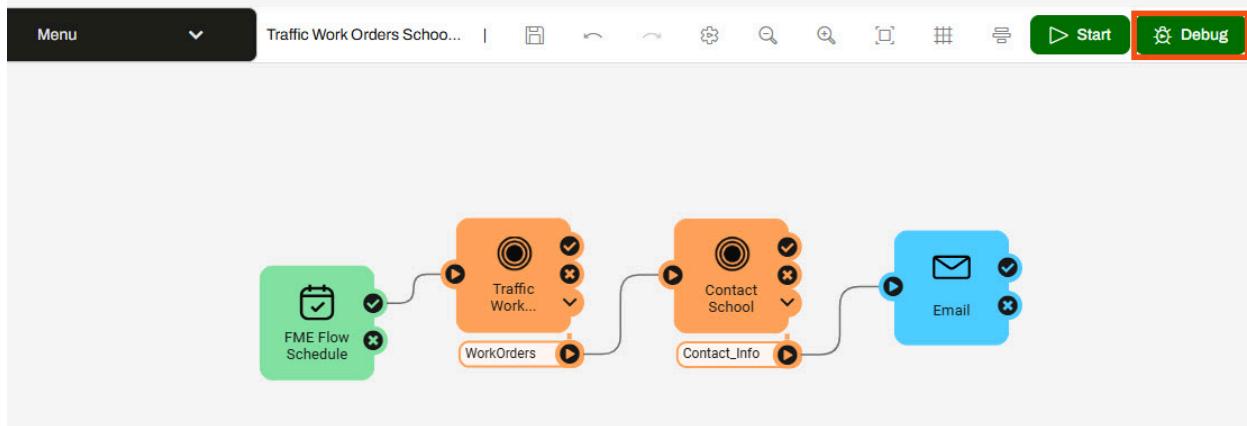
Save your Automation and name it Traffic Work Orders School Notifications.

Now that the automation is complete, start the automation in Debug mode for testing by clicking the "Debug" button on the top right.

Automations



Automations allow you to build event-driven or on-demand workflows using workspaces, triggers, and actions.



Note: Log files generated in Debug mode are not saved after Debug mode is stopped. This is good for testing the automation because it doesn't flood the Production logs with messages only for testing purposes. You can also access Debug logging for the automation individually.

Instead of waiting for the Schedule to trigger by itself, you can manually run the automation by opening the Schedule trigger and clicking the "Trigger" button.

FME Flow Schedule Details

Trigger*: FME Flow Schedule (initiated)

Schedule Type*: Basic

Recurrence*: Daily at 8:00

Date Range: Schedules must be configured according to the time zone of the FME Flow that runs the task

Buttons: Trigger (highlighted with a red circle), Cancel, Apply

Inspect the Debug Log and Triggered Jobs in the Automation menu to see how multiple jobs have been submitted for ContactSchool.fmw. If you've configured the email external action to send emails to an account you can access, you should receive an email for each job with the traffic work order information.

 peakautotraining@gmail.com
to me ...

This is an automated notification that Rodriguez Elementary School in Austin, TX has submitted a new work order.

Work Order ID: WRK22-146710

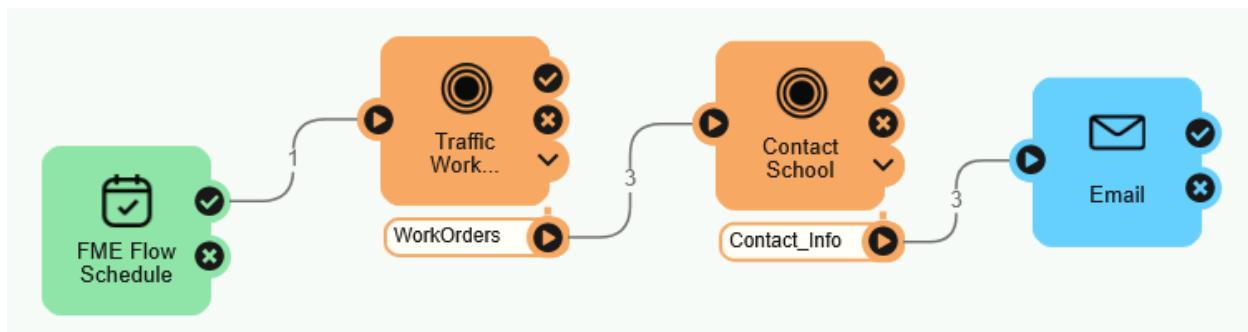
Work Required: Timing Issue

Address: 4400 Franklin Park Dr.

Contact: rodriguez@fakemail.com

Conclusion

You successfully created an automation that uses the Automations writer to split jobs and pass data between actions. Schools will automatically receive work order notices every morning after the FME Flow Schedule trigger runs the automation at 8:00 AM. When the automation is triggered, ContactSchool.fmw will run once per work order, and an email will be sent to each of the corresponding schools.



Why did we process the work orders across multiple jobs instead of doing everything in a single workspace? Depending on the workflow you're performing and the data sources/destinations, following the splitter pattern breaks tasks into smaller pieces. Each task will have its own job and status, follow-up actions can be performed according to the status, and the jobs can be run on multiple FME Flow Engines.

This helps avoid situations where a single feature causes an entire job to fail, forcing you to redo a long-running job. Additionally, it can sometimes be more efficient to distribute work across multiple FME Flow Engines, especially if you're running hundreds or thousands of tasks.

Additional Resources

- [Webinar: Essentials of Automations: Attributes and Parameters](#)
- [Dynamic Workspaces: Data Driven Parallel Processing in FME Flow Automations](#)
- [Dynamic Workspace Chaining in FME Flow Automations](#)

Data Attribution

The data used here originates from data made available by the [Austin Independent School District \(ISD\), Texas](#) and the [Government of Austin, Texas](#). It contains information available to the public domain. Data has been modified for this example.

Optional

If you finish early and would like a challenge, try to work on the tutorial [Dynamic Workspace Chaining in FME Flow Automations](#). It builds on the Traffic Work Orders near Schools scenario and introduces you to [Dynamic Workspaces](#), and combines what you've learned in this course on Automation Attributes and Parameters, the Split-Merge Block, and the FME Flow Automations Writer.

Conclusion

Thank you for attending Advanced Automations in FME Flow today. We hope you've learned valuable skills to improve your FME Flow Automations.

Here's a recap of the topics we covered today:

- Output Attributes and Automation Parameters help customize Automations by extracting JSON key-value pairs between Automation triggers and actions. We used Output Attributes from a Resource or Network Directory trigger to filter event messages and input the uploaded file path to run a workspace.
- The Split-Merge Block combines output messages from multiple Run a Workspace actions into one message before continuing with downstream actions in Automations. We used a Split-Merge Block to combine messages from data updates running in parallel before running a data validation workspace.
- The Automations Writer returns data from workspaces into Automations to control the flow of data or send data to downstream actions. We used Automations Writers to send Traffic Work Order information through emails to schools affected by the upcoming work.

Course material will be added to the Knowledge Base in the upcoming weeks.

Next Steps

- Get your Community Badge for attending training today! Go to the [FME Community](#) and log in. Scroll down to Redeem Reward Code and enter TEJK17 to get your badge.
- FME Flow Authoring live online training next week, May 12-16. Register [here](#).
- Lunch from 12:00 - 1:00 pm
- Plenary at 1:00 pm
- Enjoy the rest of the conference!