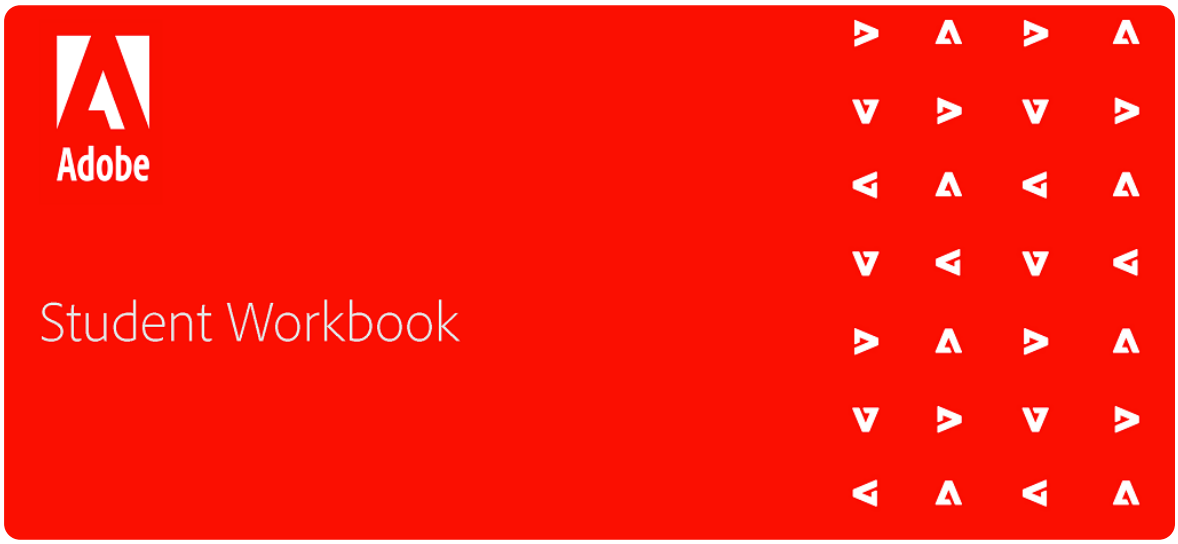
DevOps for AEM as a Cloud Service

Manage Workflows



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DevOps for AEM as a Cloud Service

10-14-2020

Introduction

Organizations might need to collaborate with team members or other stakeholders to ensure all processes and standards of an application are met. The workflows functionality automates several activities and represent a large amount of the processing that occurs in Adobe Experience Manager (AEM) activities. You can use the default workflows or create custom processes to address the business requirements.

Objectives

After completing this module, you will be able to:

- Explain how to start and execute workflows
- Administer a workflow
- Explain workflow terminologies and Workflow console
- Explain the workflow models and stages
- Explain workflow steps
- Observe a workflow model
- Examine and sync the workflow with your Maven project

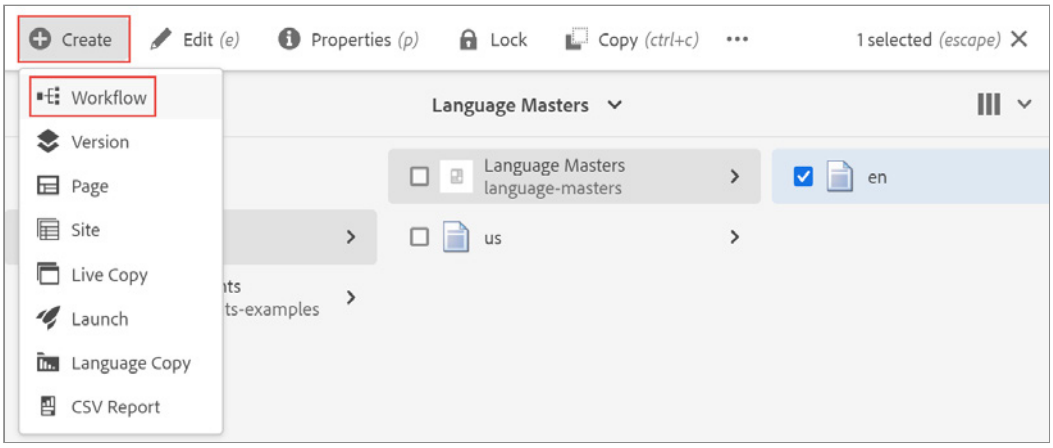
AEM Workflows[1]

The workflow function in AEM enables you to automate and coordinate processes necessary to create, manage, and publish content. Workflow helps formalize and support content management processes. It consists of sequential steps and helps increase efficiency through step automation and coordination resources.

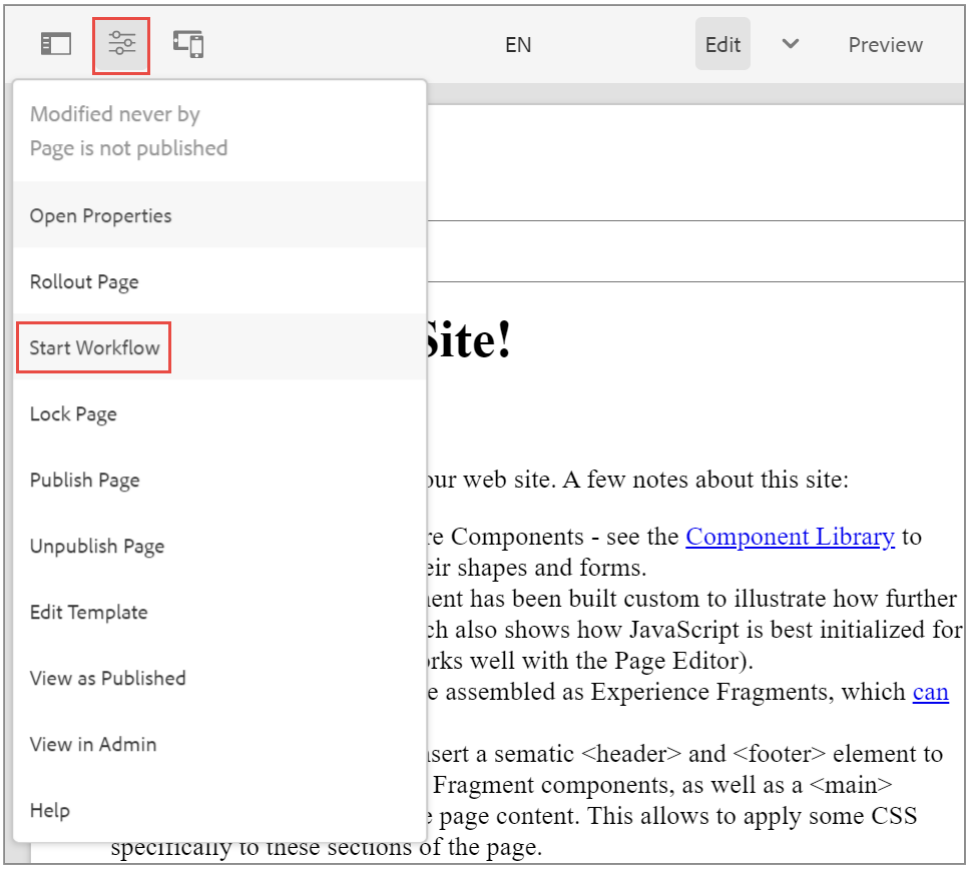
Starting Workflows

In AEM, authors, librarians, and general users can start workflows and must be apart of the *workflow-users* group. They can start the workflow:

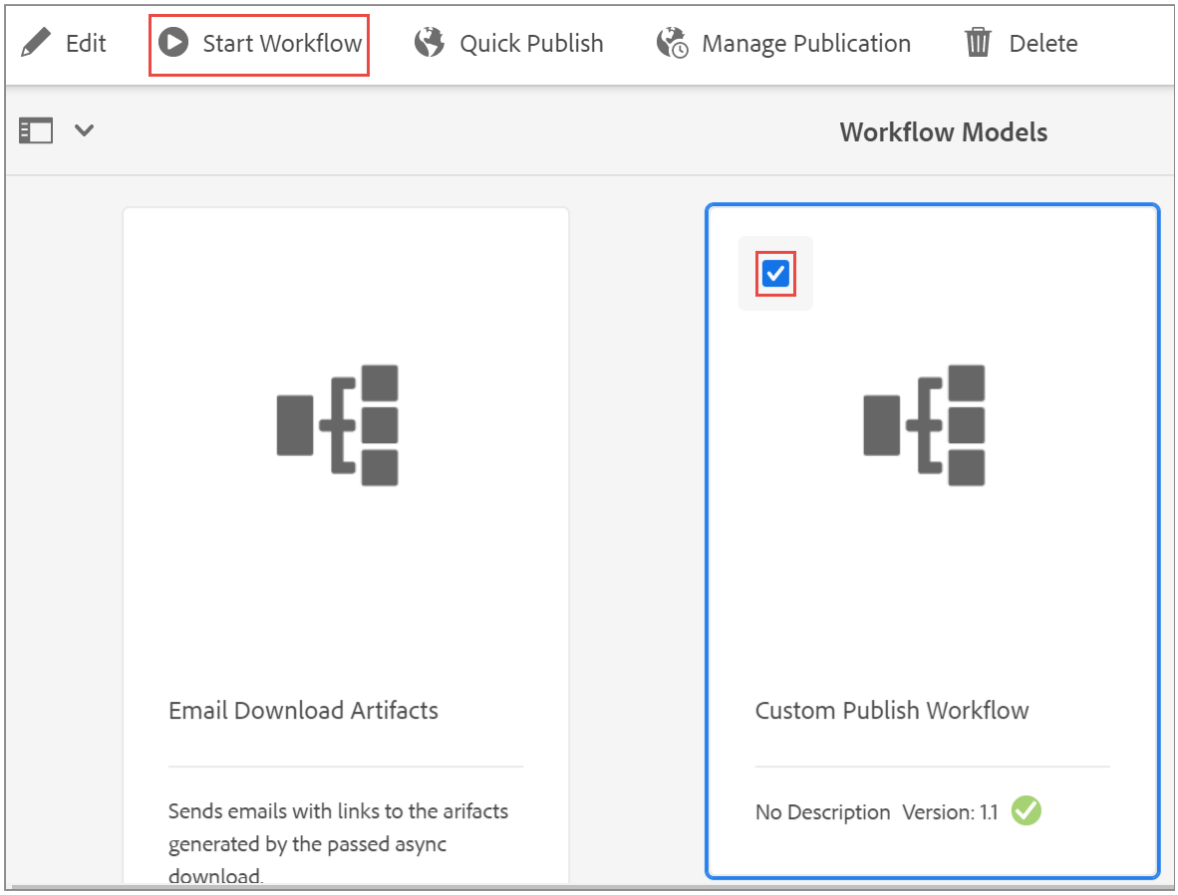
- From the **Sites** console. Select a page for which you want to apply the workflow, click **Create** on the actions bar and select **Workflow** from the drop-down menu, as shown:



- From the **Sites** console, open the page for which you want to apply the workflow. Click the **Page Information** icon on the toolbar and select **Start Workflow** menu, as shown:



You can start a workflow for platform activities from the **Workflow** console. Select the workflow model and click **Start Workflow** on the actions bar, as shown:



The above method is not recommended for normal authoring workflow activities and it is useful for:

- Manual execution of activities
- Content clean up
- Adhoc workflows
- General background processes

Executing Workflows 2

After you start the workflow, a notification is sent to the user to whom the workflow is assigned. The user can view the notification from **Inbox**. Inbox helps view all steps, work items, and notifications assigned to a user. The Inbox displays items that are assigned to the current user and to the groups the user is a member.

The below table describes the actions that you can perform on a step:

Action	Description
Complete	Mark the step as finished
Step Back	Sends step back to the previous participant
Delegate	Assigns step to another user in the group
Open	Displays the workitem and workflow info, and comments on the workflow
Payload	Helps view the source on which the workflow acts upon

Exercise 1: Administer a workflow

Scenario: As an administrator, you need to create a workflow model based on the requirements from the business. Later, test the workflow to ensure the desired functionality is met. You will perform the following tasks:

1. Install a workflow model
2. Execute the workflow and observe the results

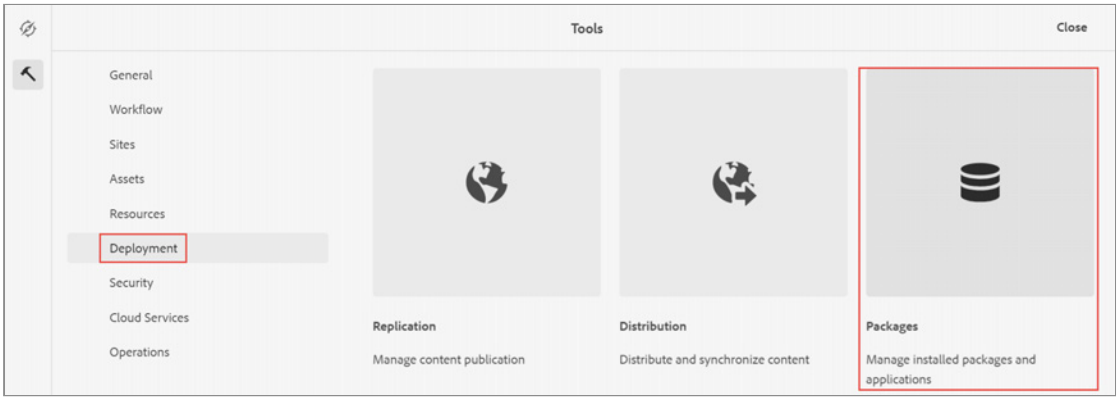
Prerequisites:

- A running AEM author service

Task 1: Install a workflow model

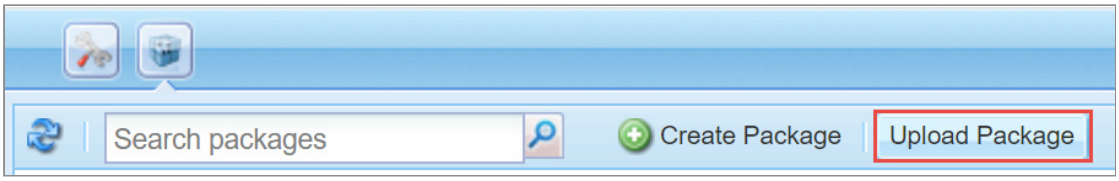
In this task, you will install a custom workflow model. This is a convenience for you to examine a completed model.

1. Click **Adobe Experience Manager** on the header bar. The **Navigation** panel opens.
2. Click the **Tools** icon on the side panel. The **Tools** console opens.
3. Click **Deployment** > **Packages**, as shown:



The **Package Manager** page opens.

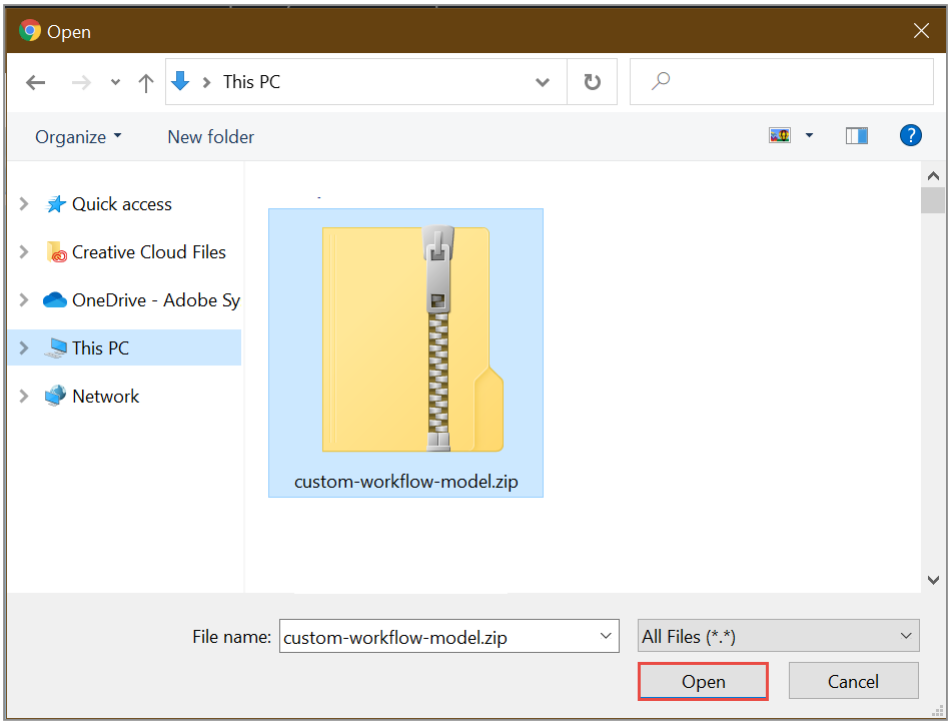
4. Click **Upload Package**, as shown:



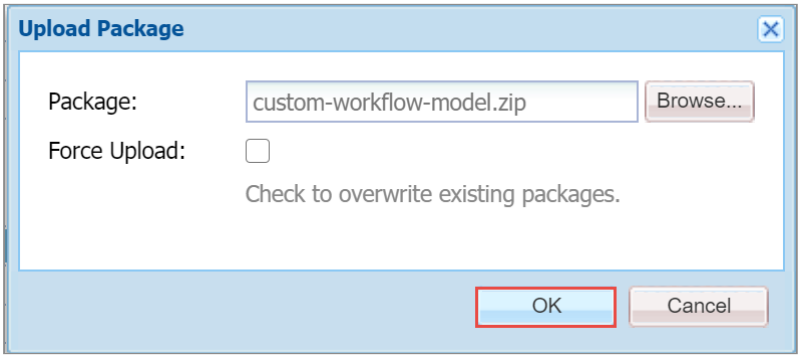
The **Upload Package** dialog box opens.

5. Click **Browse**.

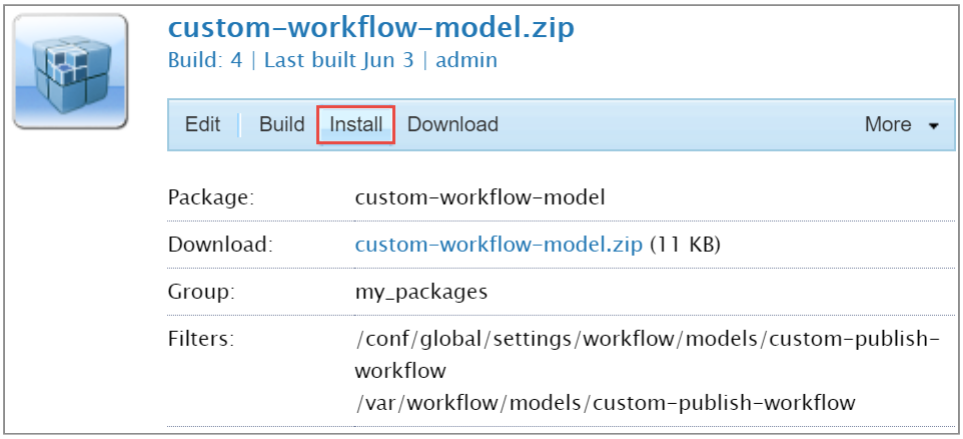
6. On your file system, navigate to the **Exercise_Files\devops-training\training-files\Workflows** folder, select the **custom-workflow-model.zip**, and click **Open**, as shown:



7. Click **OK** to upload this package, as shown:

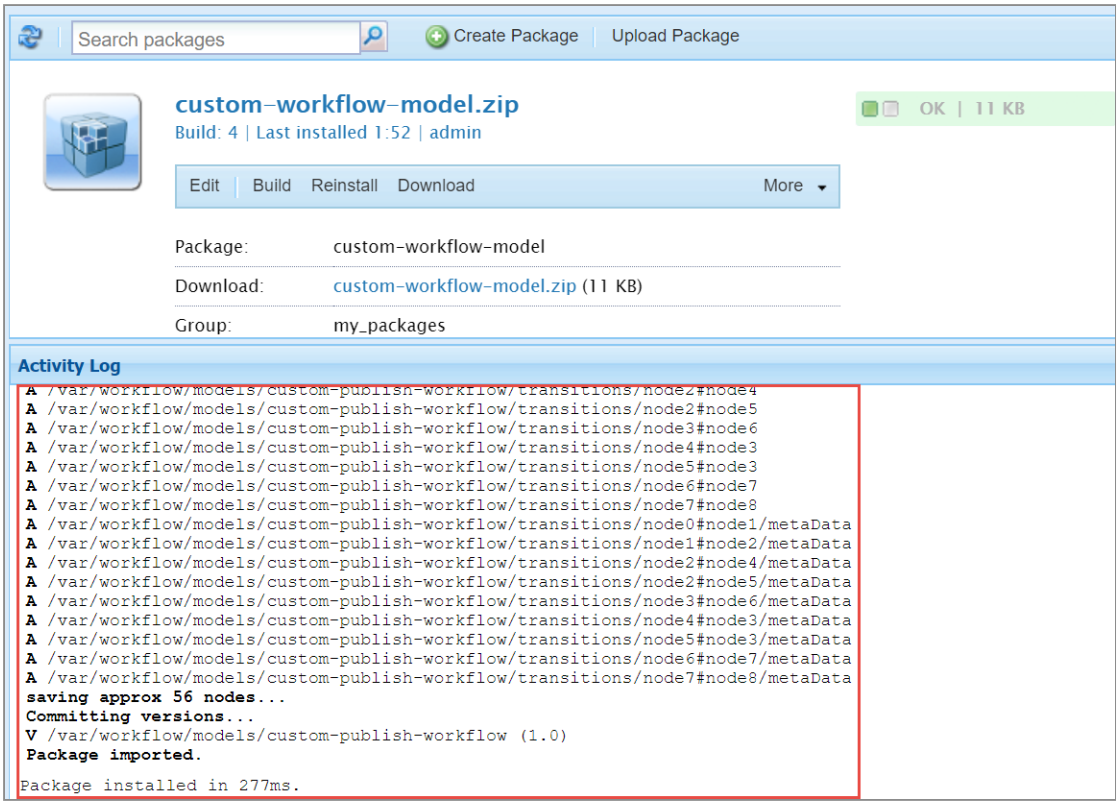


8. Click **Install**, as shown:



The **Install Package** dialog box opens.

9. Click **Install**. The workflow model is installed in AEM successfully and can be confirmed from the **Activity Log** tab, as shown:

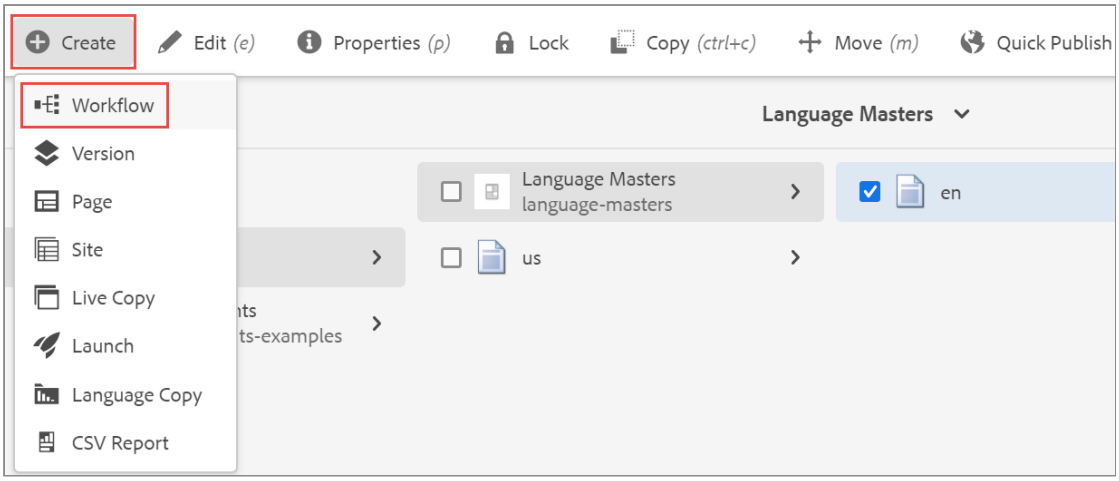


Task 2: Execute a workflow and observe the results

In this task, you will participate in the workflow as an author who wants to publish a page. You will select the page, start the workflow, and then complete each step to ensure the workflow is working as expected.

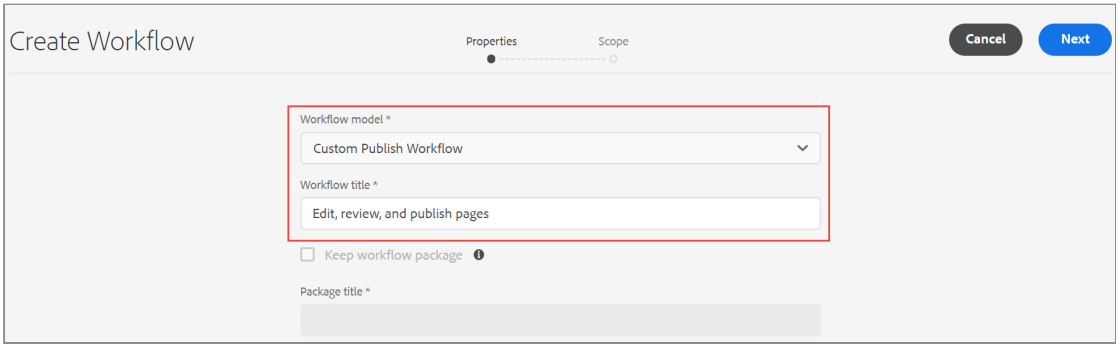
1. Click **Adobe Experience Manager** on the header bar. The **Tools** console opens.
2. Click the **Navigation** icon to open the **Navigation** pane.
3. Click **Sites** to open the console.
4. Navigate through **DevOps Project** > **us** and select the **en** page.

5. Click **Create** on the actions bar and select **Workflow** from the drop-down menu, as shown:



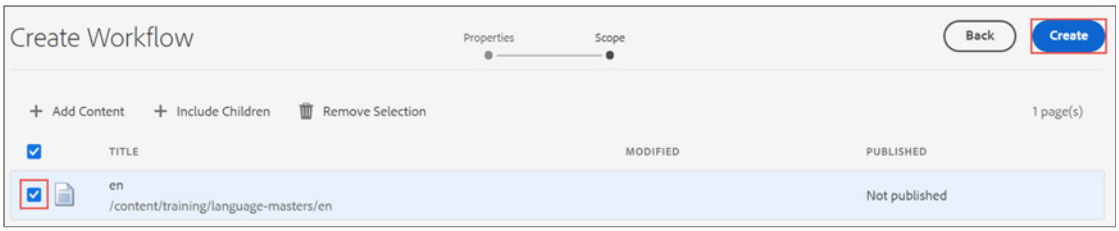
The **Create Workflow** wizard opens.

6. In the **Properties** section, select **Custom Publish Workflow** from the **Workflow model** drop-down menu, type **Edit, review, and publish pages** in the **Workflow title** box, as shown:



7. Click **Next** to open the **Scope** section.

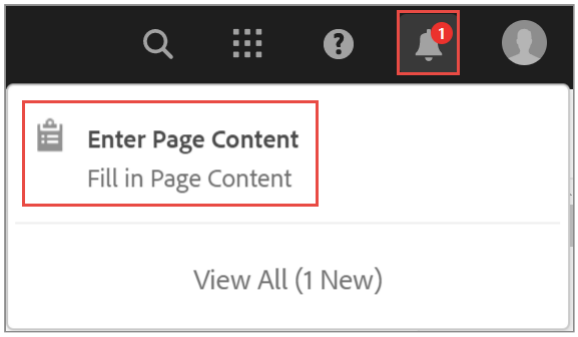
8. Click **Create**, as shown:



The **Workflows have been created for selected resources** message appears at the bottom of the **Sites** console.

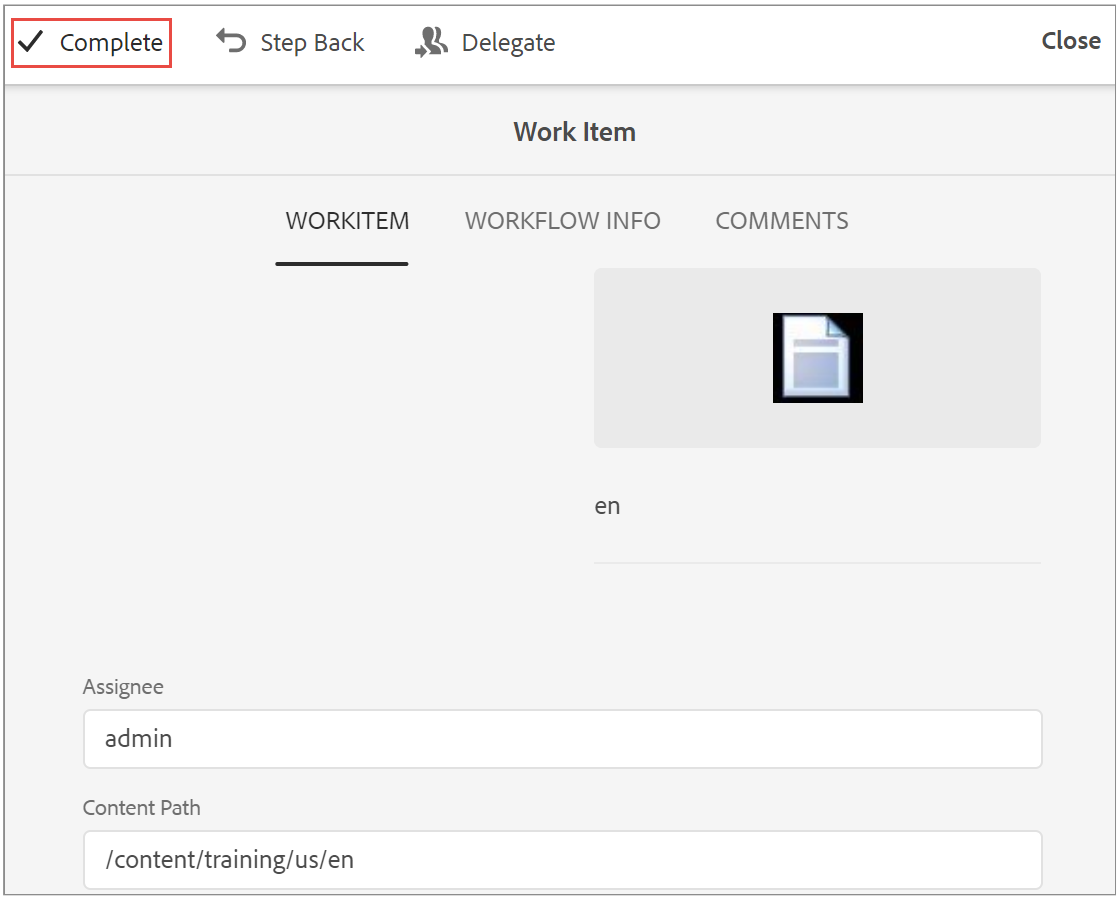
9. Click the **Inbox** icon on the header bar. A drop-down menu with notifications open. Notice how the list contains the first step of the Custom Publish Workfow - Enter Page Content. The Enter Page Content step created this notification after you started the workflow.

10. Click the **Enter Page Content** step from the drop-down menu, as shown:



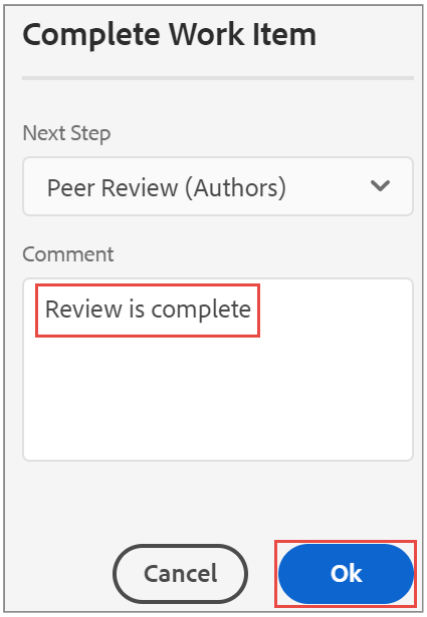
The **Work Item** page opens.

11. Click **Complete** on the actions bar, as shown:



The **Complete Work Item** dialog box opens.

12. Ensure **Peer Review (Authors)** is selected from the **Next Step** drop-down menu, type a comment in the **Comment** box and click **Ok**, as shown:

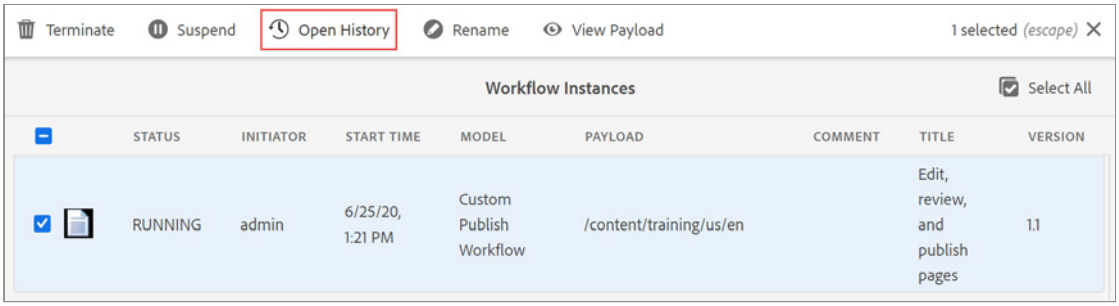


To view the workflow instance and history:

13. Click **Adobe Experience Manager** on the header bar.

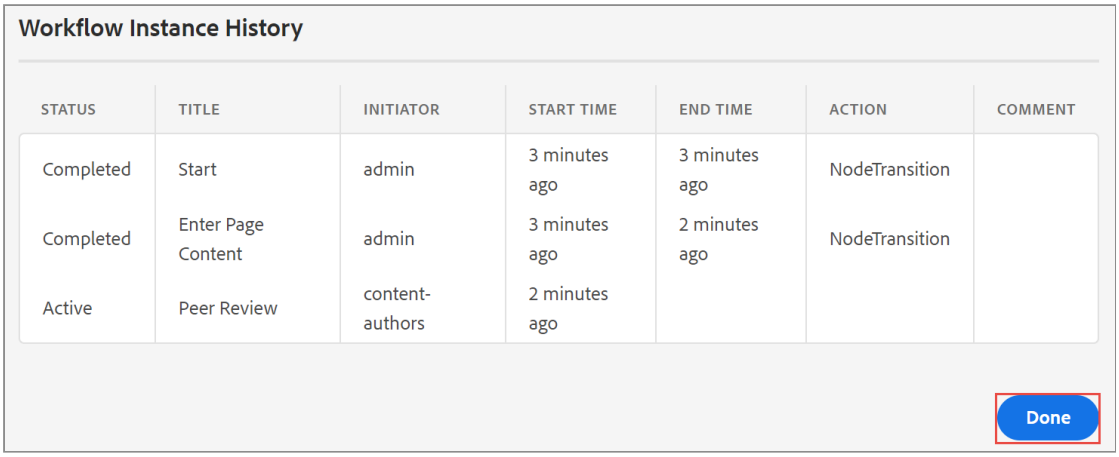
14. Navigate to **Tools** > **Workflow** > **Instances**. The **Workflow Instances** console opens.

15. Select the icon at the start of the line for the instance **RUNNING** and click **Open History** on the actions bar, as shown:



The **Workflow Instance History** dialog box opens.

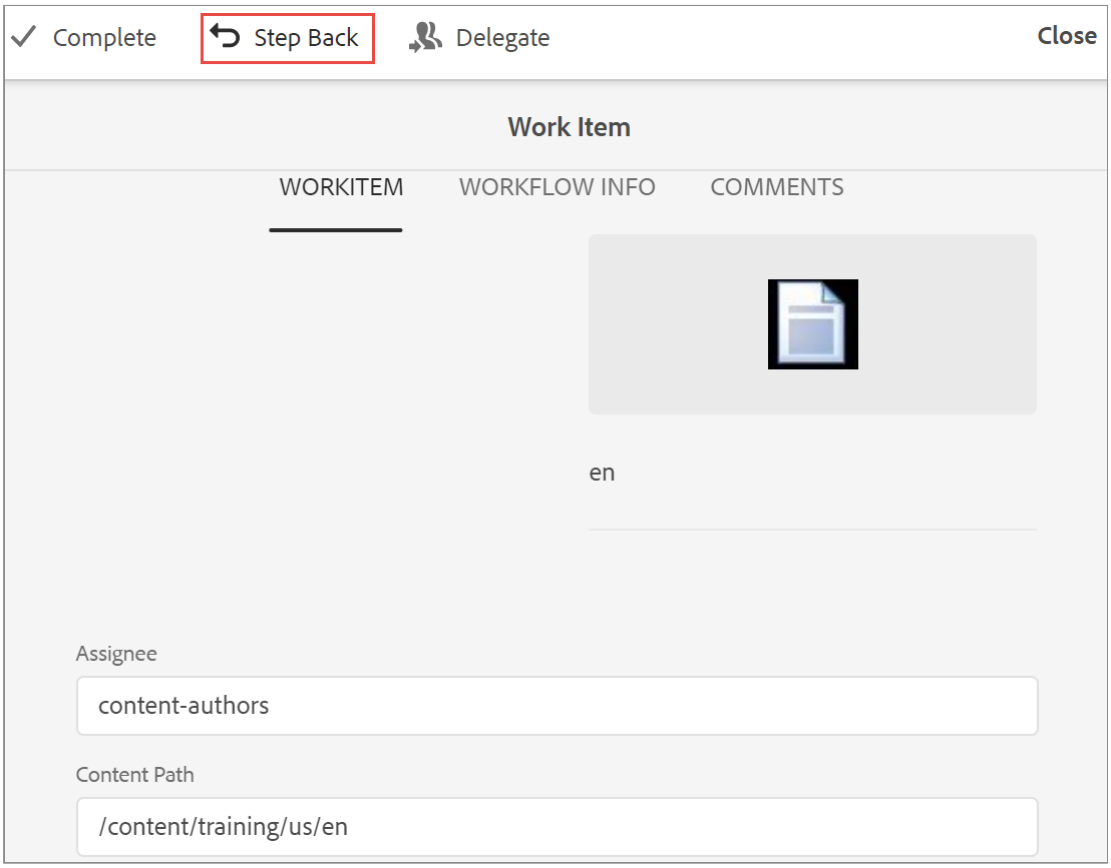
16. Notice the complete history (or audit trail) of the workflow is displayed in the dialog box. The latest status of the workflow should display the **Peer Review** step and click **Done** to close the dialog box, as shown:



To complete other steps of the workflow:

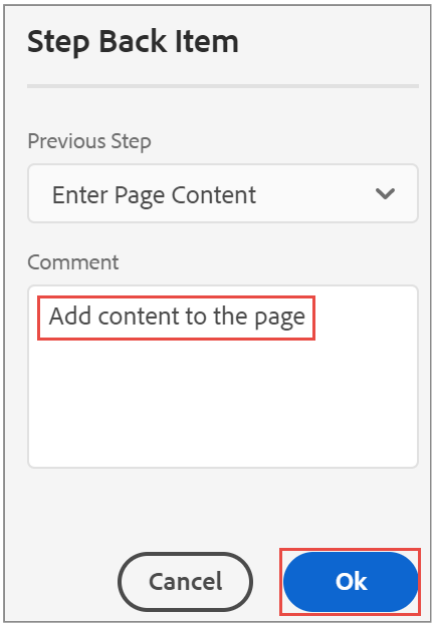
17. Open the browser tab where the **Inbox** is open. Notice that the **Enter Page Content** notification
has disappeared from the list, as you completed the work item in the previous step. A new notification, **Peer Review** has appeared.

18. Select the **Peer Review** step and click **Step Back** on the actions bar, as shown:



The **Step Back Item** dialog box opens.

19. Ensure **Enter Page Content** is selected from the **Next Step** drop-down menu, type a comment in the **Comment** box,and click **Ok**, as shown:



The **Inbox** with **Enter Page Content** step opens.

20. Select the **Enter Page Content** step and click **Complete** on the actions bar. The **Complete Work Item** dialog box opens.

21. Ensure **Peer Review (Authors)** is selected from the **Next Step** drop-down menu, type a comment in the **Comment** box and click **Ok** to complete the step. The **Inbox** with **Peer Review** step opens.

22. Select the **Peer Review** step and click **Complete** on the actions bar. The **Complete Work Item** dialog box opens.

23. Ensure **Legal Review (Contributors)** is selected from the **Next Step** drop-down menu, type a comment in the **Comment** box and click **Ok** to complete the step. The **Inbox** with **Legal Review** step opens.

24. Select the **Legal Review** step and click **Complete** on the actions bar. The **Complete Work Item** dialog box opens.

25. Ensure **Activate Page** is selected from the **Next Step** drop-down menu, type a comment in the **Comment** box and click **Ok** to complete the step. The **Inbox** has no work items because all steps of the workflow are complete.

To view if the workflow has published the page:

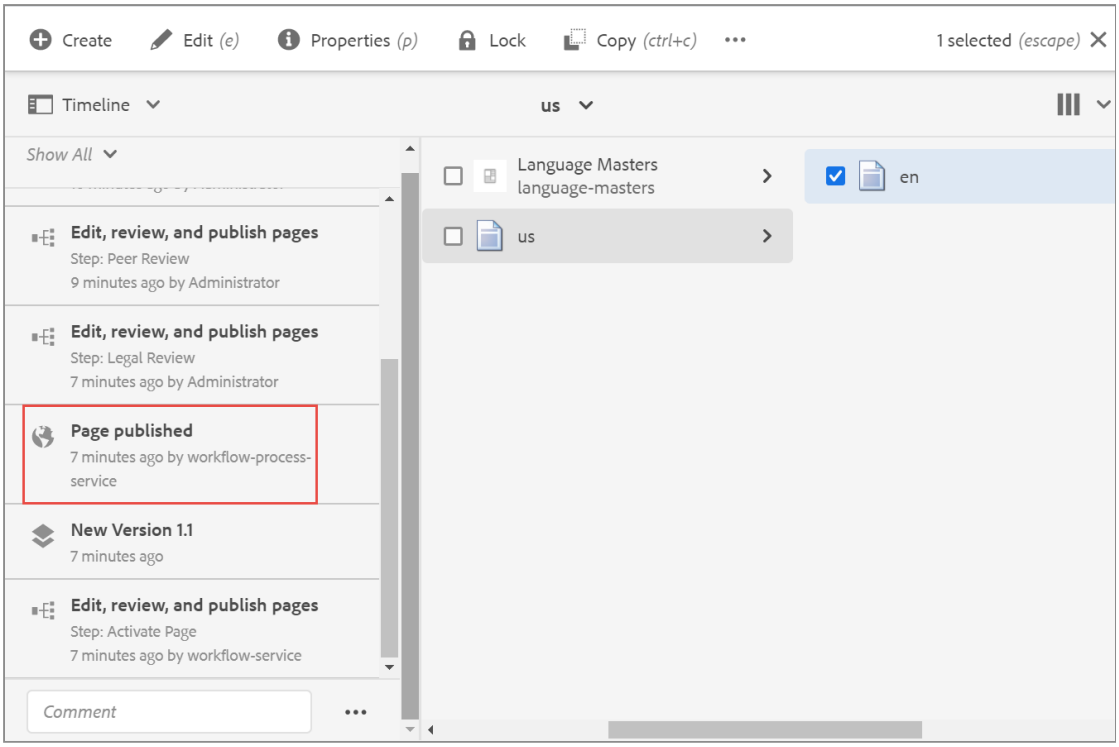
26. Click **Adobe Experience Manager** on the header bar.

27. From the **Navigation** panel, click **Sites** to open the console.

28. Navigate to **DevOps Project** > **us** and select the **en** page.

29. Click the rail selector icon and select **Timeline** from the menu. The **Timeline** panel opens.

30. Notice that the panel displays the page as published, as shown:



31. Click **1 selected x** to clear the selected page.

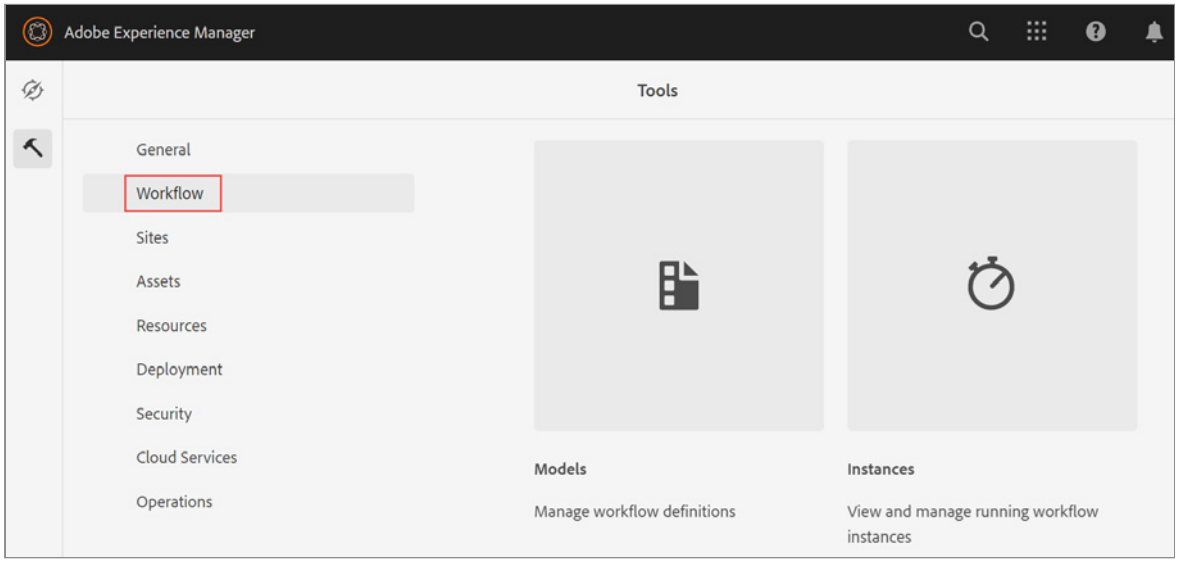
Workflow Terminologies

The following table describes the terminologies associated with a workflow:

Terminology	Description
Models	Provide the structure of steps configured in a workflow
Steps	Are building blocks for manual or automated actions
Payload	Represents the content attached to the workflow
Inbox	Displays the workitems and steps assigned to a user
Work item	Represents a generic step assigned to a user
Task	Is a special step specific for AEM Projects and is assigned to a user
Instance	Displays an actively running workflow model

Workflow Console

You can access and administer workflows from the **Tools** console, as shown:

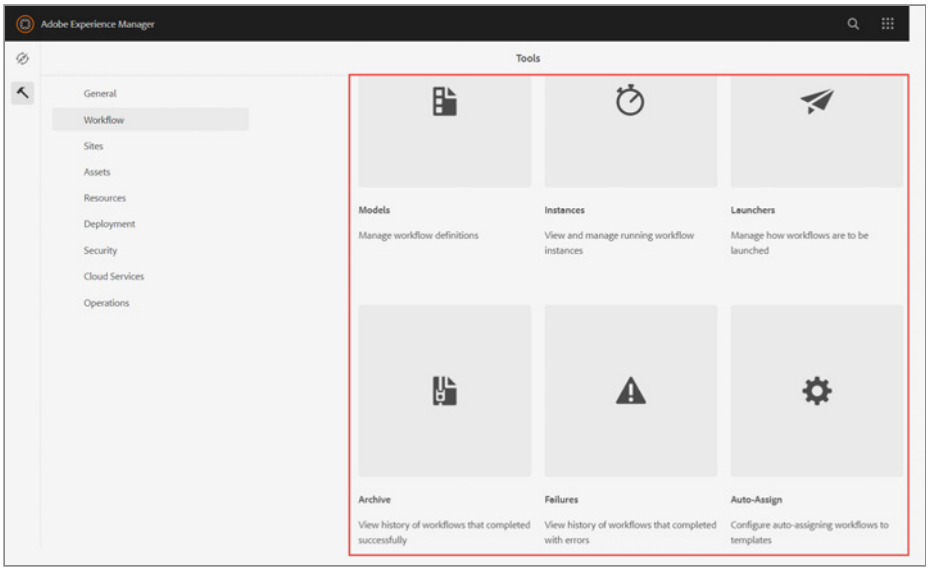


From the **Workflow** console, you can:

- Define a model and implement it by using an editor
- Monitor and manage the current and past workflow instances
- Define triggers to start a workflow automatically

  The **Workflow** console contains the following tools, as shown:
- Process modeling:
  - **Models**: Helps create, edit, and delete workflow models
  - **Launchers**: Helps start workflows automatically

- Process monitoring:
    - **Instances**: Helps view and manage instances of running processes
    - **Archive**: Helps view the completed workflow instances
    - **Failures**: View failed workflow instances



Workflow Models[3] and Stages[4]

The table below describes the AEM permission groups for workflows and the associated actions:

Permission groups	Actions
workflow-users	Start and participate in workflows
workflow-editors	Create or update workflows
workflow-administrators	Have complete control on all Workflow consoles

The **Models** tool of **Workflow** console contains workflow editor that:

- Has a What You See Is What You Get (WYSIWYG) editor
- Syncs with runtime processes
- Has out-of-the-box (OOTB) workflow steps
- Has workflow variables and stages

The workflow editor:

- Defines the order and function of every step in the process
- Creates a workflow model
- Contains individual action items, which are called steps
- Contains automatic steps and user steps

Workflow Stages

Workflow Stages help visualize the progress of a workflow when handling steps. They can be used to provide an overview of how far the workflow is through processing for example, when the workflow is run,. The user can view the progress described by **Stage** as opposed to individual step.

As the individual step names can be specific and technical, the stage names can be defined to provide a conceptual view of the workflow progress.

You can configure Workflow Stages that show the workflow progress and then assign the appropriate stage to each step in your workflow:

- Multiple stage names can be created.
- Then an individual stage name is assigned to each step (a stage name can be assigned to one or more steps).

When the workflow is run, the user can view the progress according to the Stage names (instead of the step names). The workflow progress will be displayed in the [WORKFLOW INFO tab of the step details window of the workitem listed in the Inbox.

Creating and Editing a Workflow

Based on your business requirements, you can modify an existing workflow or create a new one. You can use the Workflow console to manage workflow models and launchers.

To create a workflow:

1. Open the **Workflow** console and create a new model.
2. Double-click the newly created model, and modify the steps dragging the required workflow steps from the **Steps** panel to the workflow.
3. Edit the properties of the steps.
4. Save the workflow.

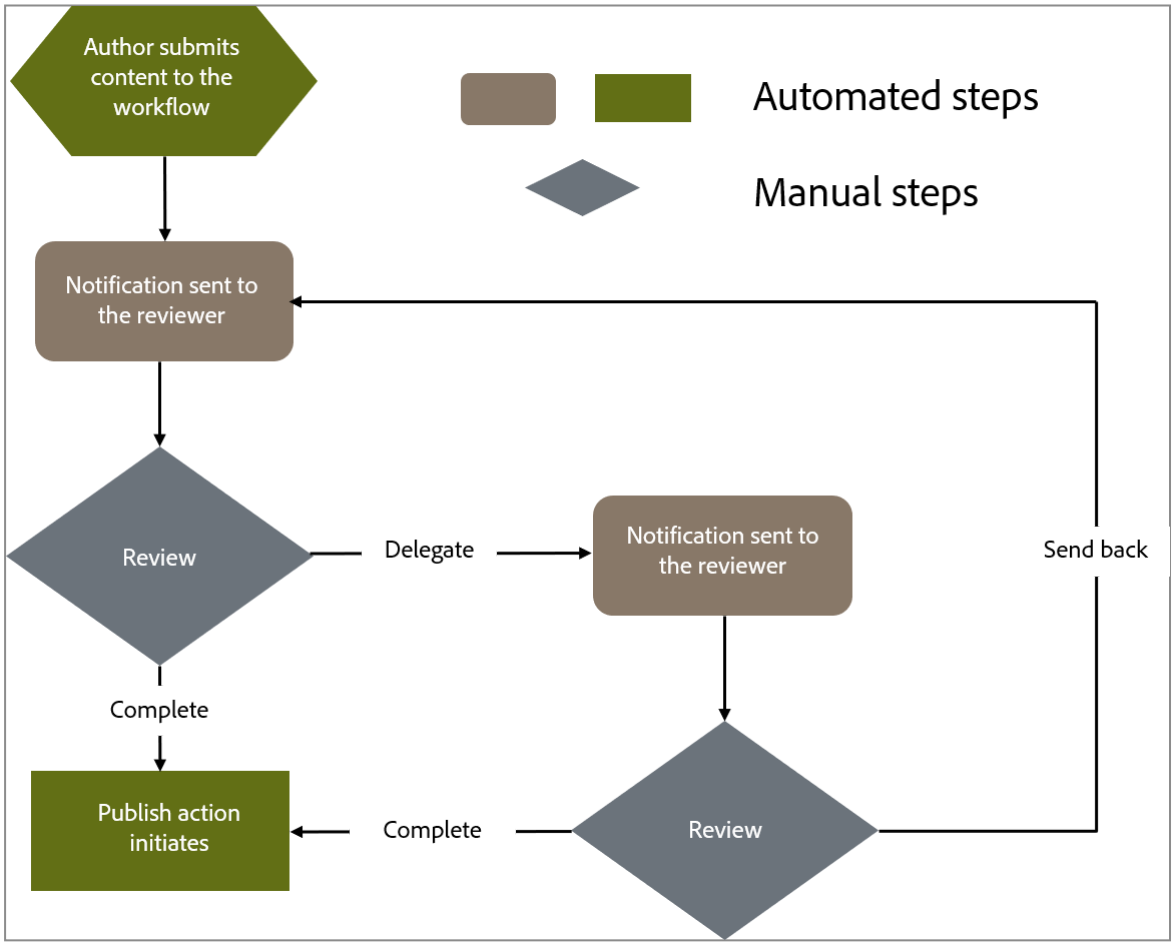
You can edit workflows in the workflow model editor. The editor defines the order and function of every step in the process. A workflow model includes a **Flow Start** and a **Flow End** steps by default. You can add different steps such as automated or manual to the model based on the requirements. The editor has a Sync button that helps you save and synchronize the changes to the model.

Workflow Steps

Workflow processes are modeled as a series of individual steps. A workflow step can be performed either by:

- The AEM server using a built-in user specifically for executing workflow steps automatically, or
- An AEM user such as content editors, template editors, asset management users, and all the other roles performed by users.

AEM workflows consist of automated and manual steps, as shown:



In automated steps, AEM performs the step automatically and triggers the next step of the workflow to be started. In manual steps, the user or group is notified with the new assigned steps and requires a user to take an action.

AEM includes a collection of available workflow steps, which are useful in common content management processes, such as Participant, Process, Create Task, Delete Node, Dialog Participant, Dynamic Participant, and Form Participant. Each step can contain any number of actions and associated conditions. For example, a step in a publish workflow may involve the step approval from an editor. Two of the commonly used workflow steps are Participant and Process.

Participant Step

The Participant step requires manual intervention by a person to advance the workflow. It enables you to assign a step to a user or a group of users. If the workflow is assigned to just one user, that user needs to complete that step before the workflow can proceed to the next step. If the workflow is assigned to a group of users, all those users must complete the corresponding steps.

You can notify participants of their required actions through email. Also, if configured, the participants will receive an email notification when the workflow is completed or if the workflow is terminated. You can configure timeouts and timeout handlers for this step. Timeout is the period after which the step will be timed out. You can select between off and immediate, and if you want to specify specific blocks of time, you can select 1h, 6h, 12h, and 24h. The timeout handler controls the workflow when the step times out.

Every new model includes a sample participant step, which you can either edit or remove. You can add and configure additional steps as required.

Process Step

The Process step automatically executes special processes for AEM. This step:

- Allows for custom OSGi components (Java) to be executed.
- Can use custom processes by extending the WorkflowProcess interface
- Offers the following built-in processes:
    - Workflow control processes: Control the behavior of the workflow and do not perform any action on content
    - Basic processes: Delete the item at a given path or logs a debug message
    - WCM processes: Perform WCM-related tasks, such as activating a page or confirming registration
    - Versioning processes: Perform version-related tasks, such as creating versions of the payload
    - DAM processes: Perform DAM-related tasks, such as creating thumbnails, creating sub assets, and extracting metadata
    - Collaboration processes: Are related to the collaboration features of AEM, such as the collaboration with social communities

Other Common Workflow Steps

Other commonly used steps of workflows are:

- Task step: Is an enhanced participant step that works well for Project workflows. It can execute JavaScript and enables you to set priority, due dates, and decision options.
- Container step: Starts another workflow that executes as a child workflow. It enables you to reuse the workflow models to implement common sequences of steps.
- Splits: Create multiple processing paths in the flow and uses routing expressions to control the process flow.

- Goto Step: Specifies the next step to execute in the workflow model and helps define advanced routing structures in your workflow models based on rule definitions or scripts.

Splits

The commonly used split steps are:

- **AND Split**: Creates a split in the workflow, after which both branches will be active. You can add workflow steps to each branch as required. This step enables you to introduce multiple processing paths into the workflow. For example, yo;u can allow certain review steps to occur in parallel, so saving time.
- **OR Split**: Creates a split in the workflow, after which only one branch will be active. This step enables you to introduce conditional processing paths into your workflow. You add workflow steps to each branch as required.

Exercise 2: Observe a workflow model

Scenario: The workflow you have installed is based on the following business requirement:

- Content update - Authors need to start a workflow, review the page content and publish it.
- Peer review (optional)
- Legal review (mandatory)
- Auto publish after reviews

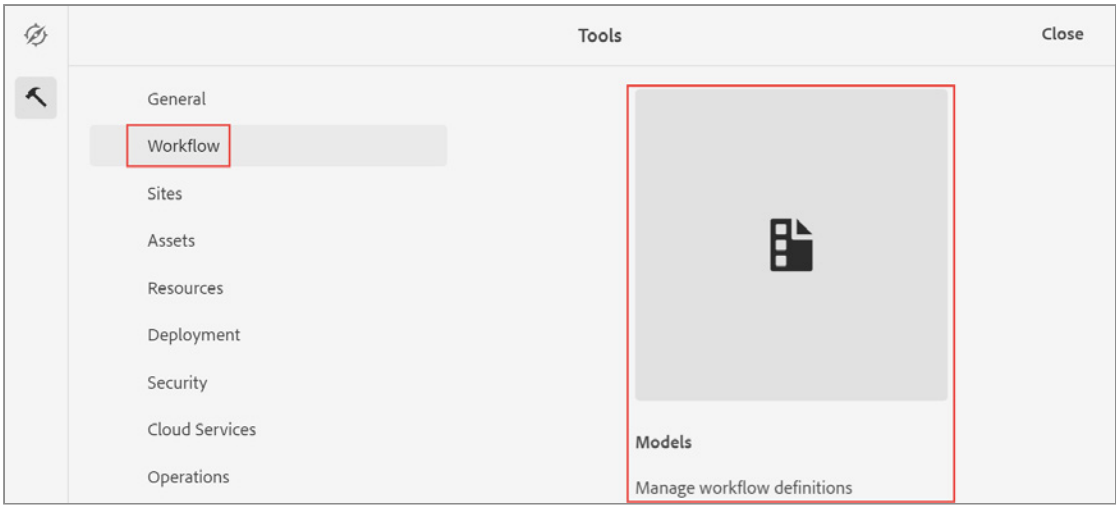
This workflow has three participants with different steps and their responsibilities are as follows:

- The **Page Author**:
    - Starts the workflow
    - Updates the page
    - Selects **Complete** in the Author UI after the page is updated
    - Chooses Peer or Legal for review
- The **Peer Reviewer**:
    - Opens the Inbox and selects the workitem
    - Selects **Payload** to view the edited page
    - Selects **Step Back** in the Author UI to add comments to the **Page Author**
    - Selects **Complete** in the Author UI after the step is completed
- The **Legal Reviewer**:
    - Opens the Inbox and selects the workitem
    - Selects **Payload** to view the edited page
    - Selects **Step Back** in the Author UI to add comments to the **Page Author**
    - Selects **Complete** in the Author UI after the step is completed and the page is automatically published.

To observe this workflow model:

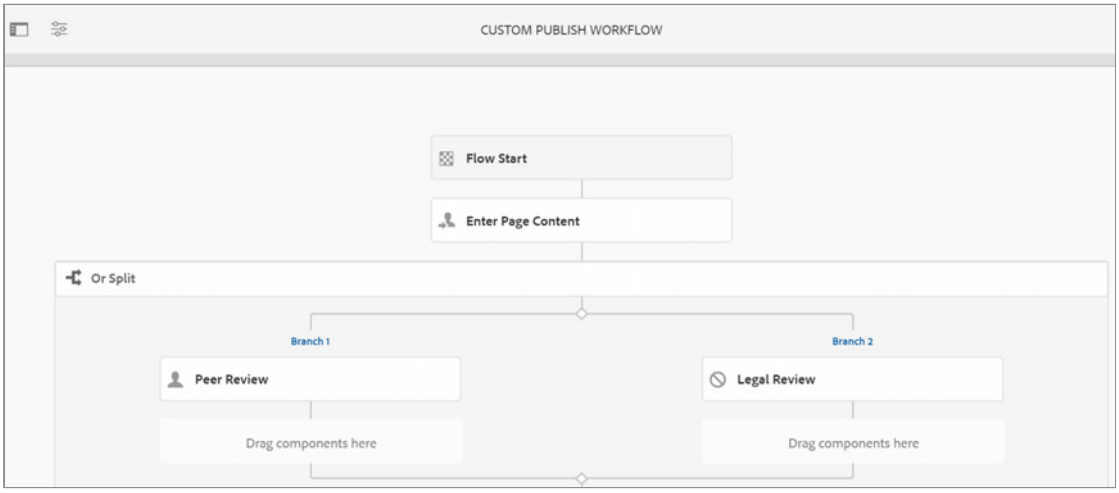
1. Navigate to http://localhost:4502

2. Click **Tools** > **Workflow** > **Models**, as shown:

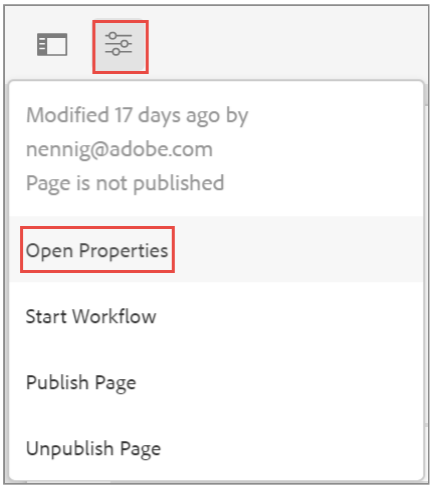


The **Workflow Models** console appears and notice the **Custom Publish Workflow** model is added as a result of the package that you have installed in previous steps.

3. Select the **Custom Publish Workflow** model and click **Edit** on the actions bar. The **CUSTOM PUBLISH WORKFLOW** model opens in the workflow editor, as shown:

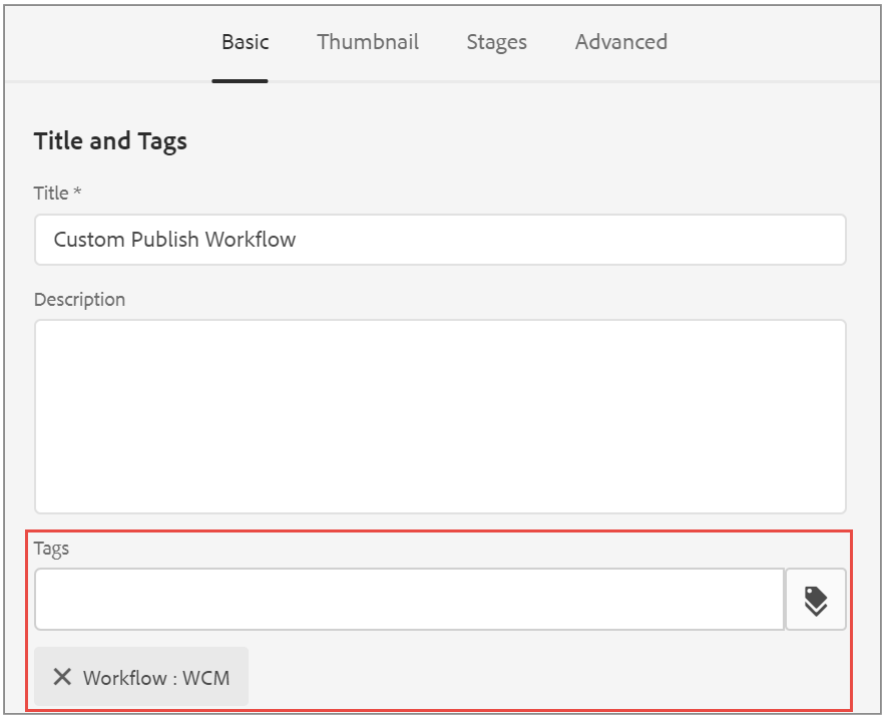


4. At the top left, select **Page Information** > **Open Properties**, as shown:

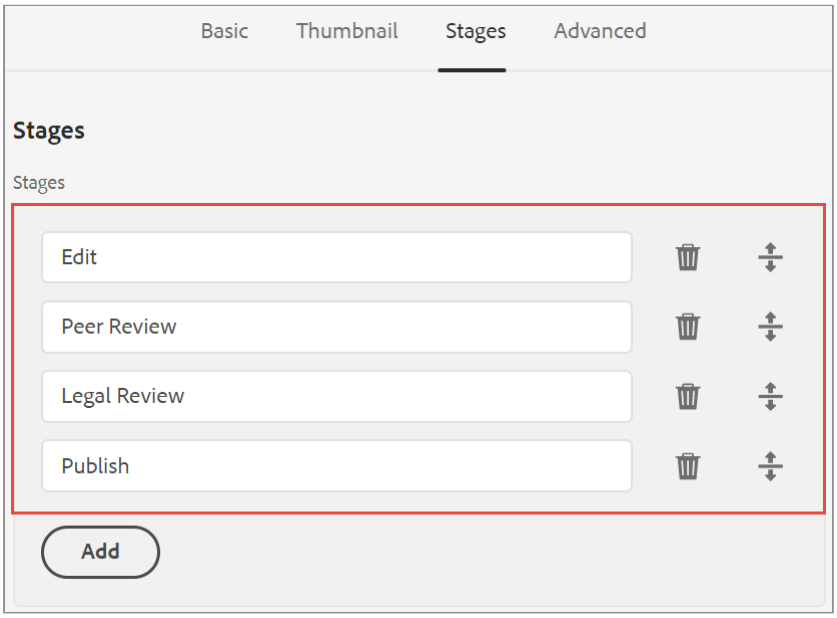


The **Custom Publish Workflow** properties page opens.

5. On the **Basic** tab, notice the WCM tag is added to filter this workflow for only the **Sites** console, as shown:

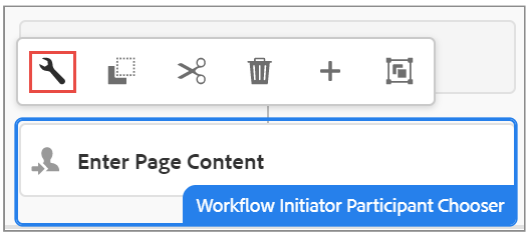


6. Click the **Stages** tab, notice the different stages defined for this workflow, as shown:



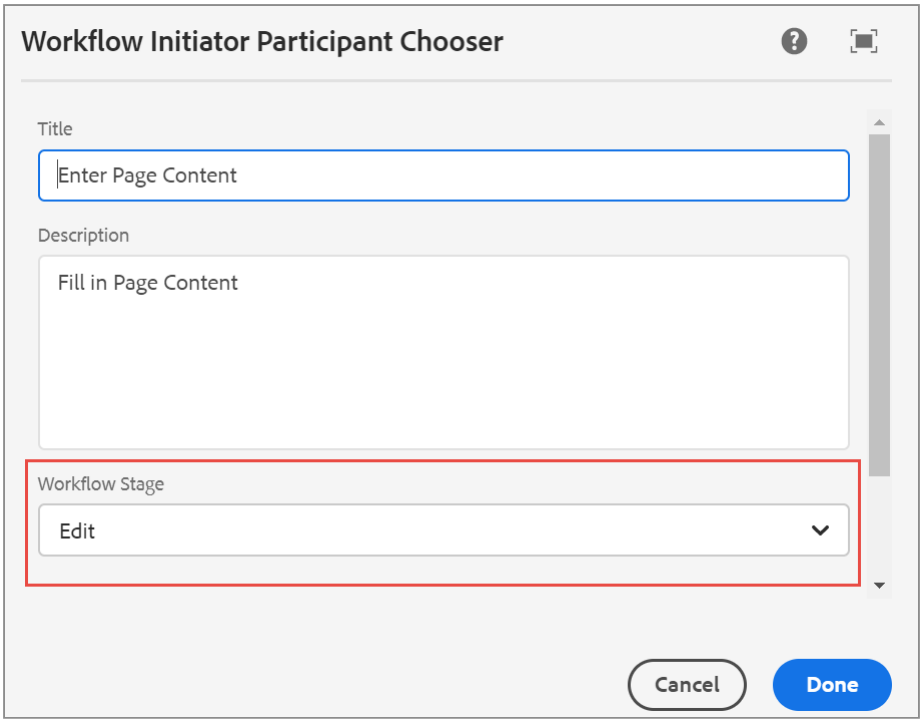
7. Click **Cancel** to close the properties dialog box. The workflow editor opens.

8. Click the **Enter Page Content** step and click the **Configure** (wrench) icon on the toolbar, as shown:



The **Workflow Initiator Participant Chooser** dialog box opens.

9. Notice that the **Workflow Stage** is set **Edit**, as shown:



10. Click **Cancel** to close the dialog and observe the other steps in the workflow.

11. If you want to edit the workflow, click **Sync** at the top right to synchronize the changes with the runtime model.

12. Click the **Workflow Models** tab of the browser and click **1 selected (escape) x** to clear the selected model.

Exercise 3: Examine and sync the workflow with your Maven project

Scenario: You have installed a workflow model content package and examined it within your local AEM service. To use the workflow for your project, you need to synchronize it back to the Maven project. Adding the workflow to your Maven project enables the workflow to be created whenever you install the code.

In this exercise, you will perform the following tasks:

1. Examine the workflow in Java Content Repository (JCR)
2. Sync the workflow with your Maven project

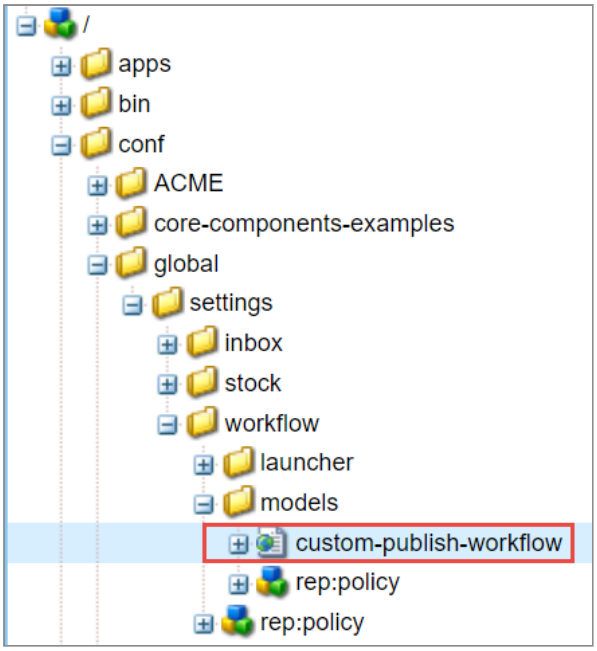
Prerequisites:

- A running AEM author service

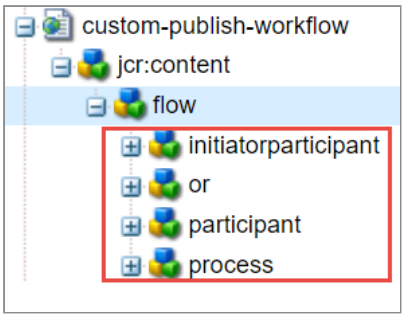
Task 1: Examine the workflow in JCR

The workflow editor stores the workflow models under `/conf/global` in JCR because they are platform workflows.

1. Open CRXDE Lite by using http://localhost:4502/crx/de or from AEM by navigating to **Tools** > **CRXDE Lite**. The **CRXDE Lite** page opens.
2. Navigate to `/conf/global/settings/workflow/models/`.
3. Notice a node named **custom-publish-workflow** is added to the **/models** folder, as shown:



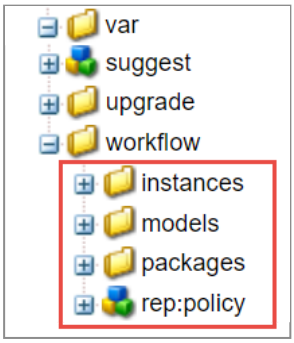
4. Navigate to `custom-publish-workflow/jcr:content/flow`, notice that a node for each step of the workflow is created, as shown:



Note: This node structure is needed to be able to use the workflow editor.

---

5. Navigate to `/var/workflow`, as shown. This server-side cache stores the current running instances and the runtime models:

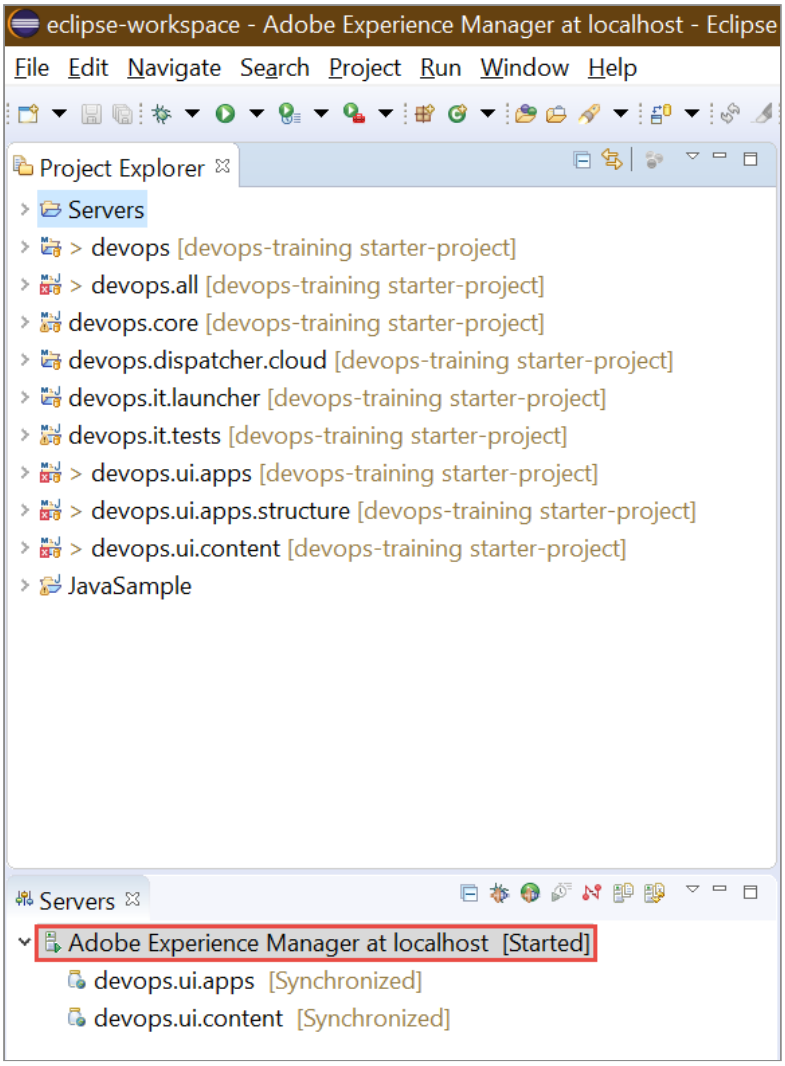


Note: The runtime models are needed to start an instance at any given time, even if the workflow model is actively being edited. The sync button then writes the model to the runtime model.

Task 2: Sync the workflow with your Maven project

1. Open the Eclipse application, on the left-hand side of the workspace (below the **Project Explorer** tab), on the **Servers** tab, check if the **Adobe Experience Manager at localhost** is started.

2. If the server is not started, right click and select **Start**. The status changes to **Adobe Experience Manager at localhost [Started],** which confirms the server is running, as shown:

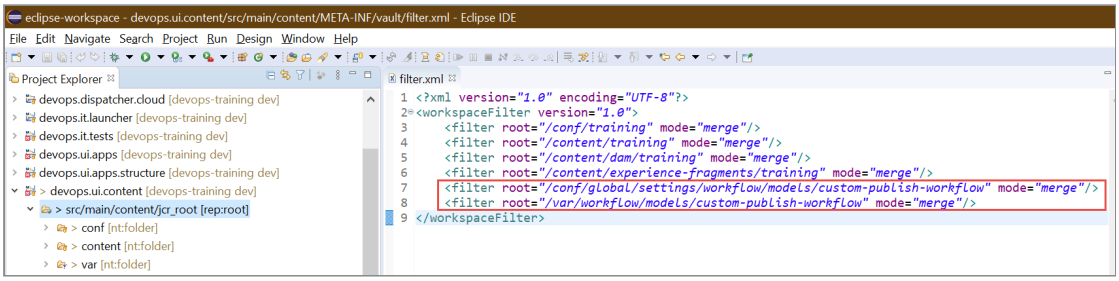


Note: Refer to the Technical Basics module on Eclipse to recreate or troubleshoot the server if you do not have a server present or if it is not started.

Workflows (/conf and /var) are considered as mutable content and, therefore, you should add it to the devops.ui.content maven module.

3. Go to **devops.ui.content/src/main/content/META-INF** and open **filter.xml** and add the below line of code, as shown:

```
<filter root="/conf/global/settings/workflow/models/custom-publish-workflow" mode="merge"/>
<filter root="/var/workflow/models/custom-publish-workflow" mode="merge"/>
```

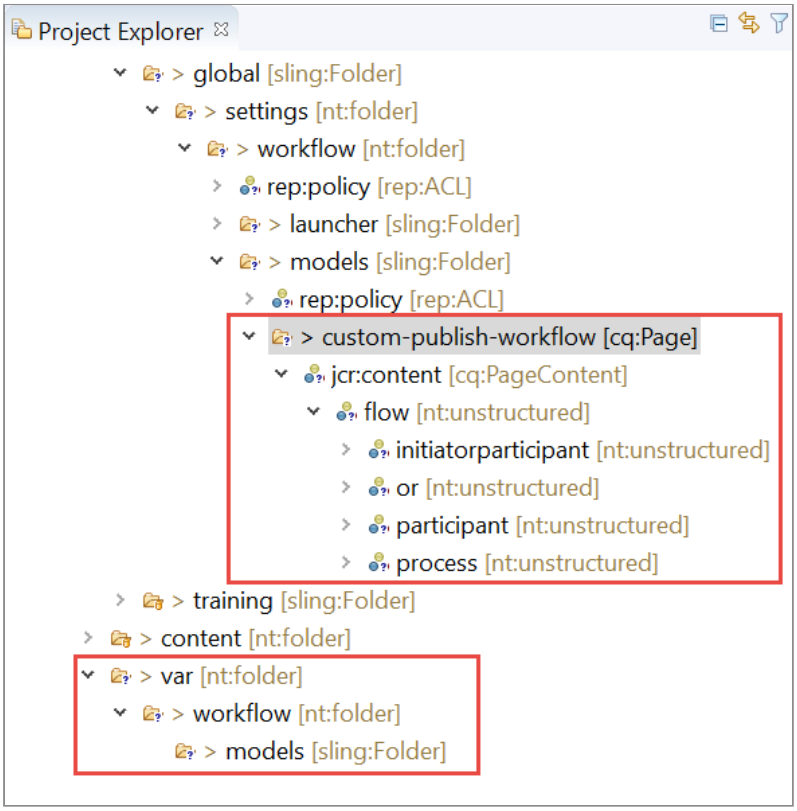


Note: The filter.xml file determines the nodes that you need to import into the project and the nodes that you need to install in AEM.

4. Under **devops.ui.content**, right-click the **src/main/content/jcr_root** and select **Import from server**. The **Repository Import** dialog box opens.

5. Click **Finish**, as shown:

The contents are now in sync with the AEM server, as shown:



Note: Any changes you sync back to your maven project should be committed into the source control through the following command:

```
git commit -a -m “added new files”
```

References

1. Working with Workflows https://docs.adobe.com/content/help/en/experience-manager-cloud-service/sites/authoring/workflows/overview.html ↩

2. Participate in Workflows https://docs.adobe.com/content/help/en/experience-manager-65/authoring/workflows/workflows-participating.html ↩

3. Models https://docs.adobe.com/content/help/en/experience-manager-65/developing/extending-aem/extending-workflows/workflows.html#model ↩

4. Stages https://docs.adobe.com/content/help/en/experience-manager-65/developing/extending-aem/extending-workflows/workflows.html#workflow-stages ↩