Oracle® FCCM Studio Cloud Service

Using Studio

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Oracle FCCM Studio Cloud Service Using Studio, Release 25.05.01

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Contents

Preface

Using Studio Guide provides information about configuring and publishing workspace for the application.

Audience

This document is intended for users who are responsible for provisioning and activating Oracle FCCM Studio Cloud Service or for adding other users who would manage the services, or for users who want to develop Oracle Cloud applications.

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The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Overview

Studio Cloud Service is a modeling platform that allows users to develop, deploy, and manage enterprise grade models to solve problems in Financial Crime and Compliance.

Studio Cloud Service enables financial institutions to develop and deploy models while adhering to the specific regulatory and compliance needs of financial institutions. It allows the creation of authorized workspaces for modelers and analysts with approved software packages and tools, the provision of slices of production data required for specific modeling tasks, a notebook environment for the development of models as well as analytical tasks, and an enterprise model repository for cataloging and saving trained models. Further, it supports a canvas where these models can be woven into analytical application flows crafted by mixing data management tasks, model execution, and deterministic business logic.

2
Getting Started

This topic provides step-by-step instructions to log in to the application.

Accessing the Studio

To access the application, follow these steps:

1. Enter URL in the web browser.
2. The **Oracle Cloud** login page is displayed.
3. Enter your **User Name** and **Password**.
4. Click **Sign In**. The Application landing page is displayed.
5. In the **Navigation List**, click **Oracle Financial Services Crime and Compliance Management Anti Money Laundering Cloud Service** module. The menu options are displayed.
6. Click **Compliance Studio** and then click **Model Management and Governance**.

   The Workspace Summary of the Compliance Studio landing page is displayed.

3
Using Workspaces

Workspaces are provisioned with the data required for modeling by the Administrators, who configure workspaces with subsets of the production data.

After logging in to the application, the Workspace Summary page displayed the following:

- Number of Sandbox Workspaces
- Number of Production Workspaces
- Add Workspace
- Home Page
- User Profile

3.1 Accessing the Workspace Summary

The Workspace Summary page gives access to the various workspace functions such as create, edit, view, populate, delete and download.

After login to the application, the Workspace Summary page is displayed. The page displays workspace records in a Grid or Card View. You can launch a workspace using the Launch option or clicking on it.

The following provides descriptions for the fields and icons on the Workspace Summary page.

Table 3-1 Workspace Summary

Field or Icon	Description
Search	The field to search for Workspace. Enter specific terms in the field for which you want to search, and press Enter on the keyboard to display the results. The search is available for all the fields.
Card and Grid View	Click the Card View or Grid View on the top-right corner of this pane to view the workspace as a block or a table, respectively.
Delete	Select the Workspaces and click Delete to delete the Workspace.
Workspace Code	Displays code of the Workspace. **Note**: This displays only when you are viewing the workspace in the Grid View.
Description	Displays description of the Workspace. **Note**: This displays only when you are viewing the workspace in the Grid View.
Owner	Displays the Owner of the Workspace. **Note**: This displays only when you are viewing the workspace in the Grid View.
Creation Date	Displays the date on which the Workspace was created. **Note**: This displays only when you are viewing the workspace in the Grid View.
Type	Displays the type of Workspace. The types are Sandbox and Production.

Table 3-1 (Cont.) Workspace Summary

Field or Icon	Description
Add Workspace	Click Add Workspace to create a new Workspace.
Launch	Click Launch next to corresponding workspace to display the Workspace Dashboard with application configuration and model creation.
Action	Click Action next to corresponding Workspace and select the options. The available options are: • View • Populate • Edit • Delete • Download

3.1.1 Customer and Account Modeling Sandbox Workspace

The Cust Acct Sandbox is a pre-configured sandbox workspace for creating Customer and Account models. It includes a batch that populates data from the Production workspace into the Sandbox workspace. Users can utilize these datasets in pre-seeded templates to build models or scenarios.

The Cust Acct Sandbox workspace is configured with a pre-seeded batch that populates data into the **FCC_ACCT_SMRY_MONTH** and **FCC_CUST_SMRY_MONTH** tables from the schema of the Production workspace.

Manage Batch

To manage batches in the Cust Acct sandbox workspace, follow these steps:

1. On the **Workspace Summary**, click **Cust Acct Sandbox Workspace**.
2. From the **Orchestration** menu, select **Schedule Batch**. The Schedule Batch page is displayed.
3. From the drop-down list, select the **CustAcctSandboxPopulation** batch.
4. Click **Edit Parameters** to modify the dynamic parameters. The Edit Dynamic Params pane is displayed.
5. Click **CustAcctSandboxPopulation** batch to view the Batch Parameters.
6. Set the **$BatchDate$** to define the batch execution date as follows:
   - Set the batch date to **SYSDATE** (system date). By default, the batch execution date is SYSDATE.
   - Toggle and select **MISDATE** from the **Select Date** picker to specify a particular batch execution date.
7. Click **Execute** to run the batch.
   You can click **Preview Jobs** at any time to view the process sequence used to execute the selected batch.

> **Note:**
>
> For more information about Schedule Batch, see the Managing Batch/Batch Group Executions section.

8. From the **Orchestration** menu, select **Monitor Batch**. The Monitor page is displayed.
9. Click **Start Monitor** to track and monitor batch process executions.

> **Note:**
>
> For more information about the Monitor Batch, see the Monitor Batch/Batch Group section.

Accessing the Supervised Training Notebook

The Cust Acct Sandbox workspace contains the Supervised Training notebook; a sample notebook that demonstrates the full workflow required to build a Supervised Machine Learning (ML) model. The Notebook starts with the selection of the dataset, performs necessary preprocessing and transformation on the raw data and trains an ML model based on this data.

This trained model is persisted into the database for the scoring in Production to refer. During scoring, the model is retrieved and SAR scores are predicted for each entity in the production data and the scores are persisted in an Output table.

To access the Supervised Training Notebook, follow these steps:

1. On the **Workspace Summary**, click **Cust Acct Sandbox Workspace**.
2. From the **Modeling** menu, select **Pipelines**. The Model Pipelines page is displayed.
3. Click the **Supervised Learning** folder, then click **Supervised Learning Example** objective. The Pipeline tab is displayed.
4. Click the **Notebook** tab.
5. At the top of the notebook, click **Run Paragraphs** to execute all paragraphs.
6. Navigate to the **Read and Sample Data** paragraph and view the account and customer summary month data, which can be used to build account-focused or customer-focused models for Transaction Monitoring.

3.2 Creating a New Workspace

> **Note:**
>
> To create a new Sandbox workspace, you must use the **Sandbox2** schema, which should be linked to the data store associated with that workspace.

To create a new workspace, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Add Workspace**. The **Create Workspace** page is displayed.

   The window displays a progress indicator at the left that indicates the active window where you are entering details. Click **Previous** to go back a step and click **Next** to go to the next step.

   The following steps show the various phases from workspace creation to deployment:

   a. Basic Details
   b. Workspace Schema

c. Data Sourcing

d. Metadata Sourcing

e. Validate

f. Summary

3.2.1 Configure Basic Details

Use this Basic Details pane for creating the workspace.

To configure the basic details for the workspace, follow these steps:

1. Enter the required details in the **Basic Details** pane as described in the following table.

Table 3-2 Details for Basic Details Pane

Field	Description
Workspace Code	Enter the code of the workspace. **Note**: Use up to 20 characters consisting of alphanumeric and space characters only. Do not use "ALL" as a workspace code.
Purpose	Enter the purpose of the creation of the Workspace.
User-group	Click on this field to display a list of User-group values. Select the required value. For Example: Modeling Approver, Modeling Reviewer, and Modeling User.
Type	Select the type of Workspace as Modeling. **Note**: The Simulation type is not supported for this release. Select the subtype of Workspace as Sandbox or Production. By default, the Sandbox Workspace is selected. In the Production Workspace, move the toggle switch to the right to enable this option. Enabling it attaches the production schema, which selects the Workspace being created for automatic model promotion. Based on the selection of the Source Workspace, the model is promoted to the environment.
Import archive file	Click on the box to open the file selector dialog and select the required configuration file or drag the file from its directory and drop it in the box. Use this only if you are having archive file on your local machine. **Note**: • This field is optional. • If you are using this feature, the other fields described in the preceding rows are auto populated.

2. Click **Next** to go to the next step.

3.2.2 Configure Workspace Schema

Use this Workspace Schema pane for selecting the data schema or creating the new data store.

To configure the Workspace Schema, follow these steps:

1. Select the required schema from the **Data Schema** drop-down list. This is the actual data used for model building. You can use multiple Data Schemas for one Meta Source. You can select an existing schema or add a new schema by clicking **Create Data Store** icon.

> **Note:**
>
> For details on adding a new data store, see Data Store section.

2. Click **Next** to go to the next step.

3.2.3 Configure Data Sourcing

Use this Data Sourcing pane for selecting/creating the data store with applicable target data schema.

The schema type selected in the previous step requires the definition of database objects to be used for model creation. Data Sourcing step of workspace provisioning allows to select tables from the data store from which data has to be pulled into the Sandbox Schemas.

To configure Data Sourcing, follow these steps:

1. Select Data Store from the **Data Source Name** drop-down list.
2. Select the **Target Data Schema**. You can select multiple Data Sources for a Target Data Schema.
3. Select the type of objects from the **Object Type** drop-down list. The Object Type drop-down list will be enabled after selecting the Data Store from Data Store Name drop-down list.

> **Note:**
>
> In this release, **Table** and **View** Object Types are supported.

4. Click **Next** to go to the next step or Click **Skip** to skip the step.

3.2.4 Configure Metadata Sourcing

> **Note:**
>
> The Metadata Sourcing functionality is not supported in this release.

3.2.5 Validate Workspace

Use the Validate phase for verifying the workspace details such as Basic Details, Workspace Schema, Data Sourcing, and Metadata Sourcing.

To validate the workspace and deploy, follow these steps:

1. Review the details in the **Validate** pane.
2. Click **Finish** to create a workspace using **Physicalize Workspace** or **Download Configurable Archive**.
   - When you click **Download Configurable Archive**, it exports the metadata information of the workspace in `.zip` format which can be used later using the Import option.
   - When you click **Physicalize Workspace**, it creates the actual workspace.

3.2.6 Display Summary

The Summary pane displays the status of the workspace creation.

To view the summary of the workspace creation, follow these steps:

1. You can view the different stages for creating the workspace.
2. You can download the Deployment Report after successful creation of the workspace using **Download** button.

3.3 Managing Workspace

Users can manage workspace using Launch and Action icons on the Workspace Summary page.

3.3.1 Launch the Workspace

Launch workspace allows you to view models of the launched workspace.

Click **Launch**  next to corresponding Workspace. The Workspace Dashboard is displayed with following details:

- Mega Menu
- Recently Used
- Most Used Tags
- Models Status
- Job Status
- Models Timeline

3.3.2 View a Workspace

Use this View option to view all the details for the created workspace.

To view a workspace, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Action**  next to corresponding workspace and select **View** to view the workspace. By default, it is displayed Basic Details tab.
3. Navigate to the Workspace Schema, Data Sourcing, and Metadata Sourcing tab to view the respective details of the workspace.

3.3.3 Populate a Workspace

Populate Workspace allows to populate data from the Production workspace.

To populate the workspace, follow these steps:

1. Navigate to the **Workspace Summary** page.
2. Click **Action**  next to corresponding workspace and select **Populate** to populate data from the Production workspace in the **Populate Workspace** window.

   The following table provides descriptions for the fields in the Populate Workspace window.

Table 3-3 Populate Workspace

Field	Description
Workspace Code	Displays code for the workspace.
Purpose	Displays description for the workspace.
Creation Date	The date and time on which the workspace was created.
Data Store Type	The type of the source data.
Write Mode	You can either overwrite the existing data (truncate and insert) or append to the existing data. • **Overwrite**: In this mode, the underlying tables will be populated in truncate and followed by insert operation. • **Append**: In this mode, the underlying tables will be populated in the append mode. The Data Load option is enabled only if Append is selected on the Write Mode. The options are: – **Selective**: In this mode, only the tables filtered (selected in the Table level Data Filters) will be populated. – **ALL**: In this mode, all the underlying tables mapped to the workspace will be populated along with the filters mentioned below for specific tables.
Data Filter- Global Level	Enter the data filter that needs to be applied on all the tables selected for data sourcing. For example: If MISDATE is equal to Today, then it is applied to all tables (wherever it is available) for selected Data Sources during population. If this field is not found (MISDATE) in the tables, it is not updated. OR Click **Use Template** to select a library. On selecting the template, any pre-filled values will be overridden with the template provided values.
Data Filter- Table level	You can provide the data filters individually on the tables here. Select the table and enter the SQL filter. Note: You can provide multiple table names for the same SQL filter. For example, there are two tables called Student and Employee in the target data source, and below filters are applied: • MISDATE as Today for Student and Employee tables • ID as 1 for Student table Then, Student table will be populated with MISDATE and ID filters and Employee table will be populated with only MISDATE filter. Global filters are not applicable for those tables on which filters have been applied individually. If the same table name is provided in more than one rows here, then filter condition is generated as a conjunction of all the provided filters.
Fetch Size	Enter the Fetch size of JDBC properties for data upload.
Batch Commit Size	Enter the Batch Commit size of JDBC properties for data upload.

Table 3-3 (Cont.) Populate Workspace

Field	Description
Rejection Threshold	The available options are : • **Unlimited**: Here, all the errors will be ignored during the data population. • **Custom Rejection Threshold**: Enter the maximum of number of inserts that may fail for any of the selected tables. You can provide the maximum number of inserts that can fail while loading data to a given table from all the sources. In case of threshold breach, all the inserts into the particular target schema will be rolled back. However, it will continue with populating the next target schema.

You can also pass runtime values in workspace population for the user-defined parameters in **Data Filter – Global/Table**.
Example: Table Filter /Global Filter

```
[{"id":1,"filter":"CUSTOMER_ID =$CUSTID and INCOME =$income and CUSTOMER_NAME
=$customerName","tables":["CUSTOMERS"]}]
```

Additional Parameters:

```
{"fetch_size" :10, "batch_commit_size" :1000,
"rejection_threshold" :"UNLIMITED", "write_mode" :"APPEND",
"dynamic_parameters": [\{"key":"$CUSTID","value":"125"} ,
{"key":"$income$","value":"30000"},{"key":"$customerName","value":"Cust125"}]}
```

The Runtime parameters can be passed as part of additional parameters json .Key = "dynamic_parameters". It will replace all the $ values in Table filter /Global Filters.

3. Click **Populate Workspace** to start the process.

   Here, you can create the batch using **Create Batch** or create and execute batch using **Create and Execute Batch** option. On selecting either of these options, a workspace population task gets added to the batch.

   - When you select **Create and Execute Batch** option, it allows you to create batch and triggers the batch as well.
   - When you select **Create Batch** option, it allows you to prepare the batch and then execute or schedule the batch at a later time through Scheduler Service window. The Workspace population task execution can be tracked in the Monitor Batch window in the Scheduler Service.

3.3.4 Edit a Workspace

Users can edit the workspace details using the Edit option.

To edit a workspace, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Action**  next to corresponding workspace and select **Edit** to edit the workspace.
3. Edit the required fields.

> **Note:**
>
> - You cannot edit the Workspace Code and Import Archive File.
> - You can modify the Workspace Type from Sandbox to Production or vice versa.

4. Click **Save** to save the updated changes.

3.3.5 Delete a Workspace

Users can delete the workspace using the delete option.

To delete a workspace, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Action**  next to corresponding workspace and select **Delete** to delete the workspace. The Delete Workspace dialog box is displayed.
3. Click **Delete** on the confirmation dialog box to confirm or click **Cancel** to cancel.

3.3.6 Download a Workspace

Downloading a workspace allows you to export the workspace metadata definition (without underlying objects such as Models, Pipeline, and so on) in a zip format and further, the same can be used to re-create the workspace.

To download a workspace, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Action**  next to corresponding workspace and select **Download** to download the workspace. The file is downloaded in `.cfg` format.

3.4 Managing Data Stores

This feature allows you to manage the Data Schemas registered with the application. These Data schemas can be used either for workspace or for sourcing the data.

To view the data store, click **User Profile** and select **Data Stores**. The Data Store Summary page is displayed.

The Data Store Summary consist of two sections as follows:

- **Used Data Store**: This shows the list of Data Stores registered with any workspace. Here, you can only view the Data Store details. The count of Used Data Stores also displayed at the top of Data Store Summary page.
- **Unused Data Store**: This shows the list of Data Stores those are not registered with any workspace. Here, you can view, edit, or delete the Data Store details. The count of Unused Data Stores also displayed at the top of Data Store Summary page.

3.4.1 Adding a Data Store

Users can create a data store which will be used for the workspace creation.

To add a Data Store, follow these steps:

1. On the Workspace Summary page, click **User Profile** and select **Data Stores**. The **Data Store Summary** page is displayed.
2. Click **Add Store**. The Add Data Store pane is displayed.
3. Enter connection URL to the database for the data schema in the **Data Store Name**.
4. Enter **Description** about the database connection.

   You cannot select the type for the database connection. By default, it is Oracle database.
5. Enter the **Wallet Alias**. The value should be same as configure using Oracle Wallet.
6. Enter the Oracle Database schema name in the **Table Owner**.

> **Note:**
>
> This field is optional.

7. Click **Create**. The Data Store is created and listed in the Data Store Summary page.

> **Note:**
>
> Click **Test Connection** to check the connection. A success message is displayed.

3.4.2 Viewing the Data Store

To view the Data Store details, follow these steps:

1. On the Workspace Summary page, click **User Profile** and select **Data Stores**. The Data Store Summary page is displayed.
2. Click the **Data Store Name**. The View Data Store pane is displayed to view the details for the data store.

   OR

   Click **Action** icon and select **View** to view the details for the data store.

4

Using Modeling

Modeling allows you to create a pipeline which enables you to create and publish models based on the workspace.

Modeling contains pipeline that allows to design, deploy and govern end-to-end machine learning pipelines for seamless model development.

4.1 Managing Model Pipelines

Model Pipeline enables you to create and publish models based on the workspaces.

The published models are then deployed in production to be consumed by other services and applications. After building and evaluating, multiple models, the best model or champion model can be selected. The champion model can then be deployed for scoring. In this document the champion model can also be referred to as the scoring model.

4.1.1 Accessing Model Pipelines

Using the Model Pipelines, users can create and publish models.

To access the Model Pipelines, follow these steps:

1. Navigate to **Workspace Summary** page.
2. Click **Launch** next to corresponding workspace to launch the workspace.
3. In the Mega menu, click **Modeling** and select **Pipelines**. The Model Pipelines page is displayed.

   The window displays objectives that contain drafts and models. When you hover on the count that are next to the ID column, it displays the count of sub objectives, Drafts, Models, and Champion if available.

   The window displays objectives that contain drafts and models. When you hover on the count that are next to the ID column, it displays the count of sub objectives, Drafts, Models, and Champion if available.

   You can switch the Model Pipelines page view from Flat List to Hierarchical and vice-versa. Flat list is the default view in the Production workspace while Hierarchical is the default in Sandbox workspace.

   - **Hierarchical**: The Model Pipeline page shows the hierarchical list of the Objectives using the **Hierarchical** option. In the Hierarchy view, you can see the following details of the Objectives such as Objective Name, and ID.
   - **Flat List**: The Model Pipeline page shows the flat list of all the models (published and drafts) using the **Flat List** option. Flat list is not objective-specific. It shows the models across all the objectives. You can search the models using the Filter by Version, Filter by Status, and All champions. You can also sort the drafts and models by Default or Latest first using Sort by option.

   The following table provides descriptions for the fields and icons in the Model Pipelines page.

Table 4-1 Model Pipelines - Field and Icon Description

Field or Icon	Description
Breadcrumbs	Indicates the position of the current page in the Model Pipelines hierarchy. Use breadcrumbs locator links to navigate back to higher levels in the hierarchy after you have drilled down through levels of functions.
Add	Click Add and select the following options to Create Objectives and Models: • Draft • Objective To create Models, select Draft. To create Objectives, select Objective. See the Create Objective (Folders) and Create Draft Models sections for more information.
Requester	Displays that the logged-in user has the Requester privileges when the status is green. You can create a model. However, to approve and publish, the model must be reviewed by a user with reviewer privileges and approved by a user with approver privileges.
Reviewer	Displays that the logged-in user has the Reviewer privileges when the status is green. You can review models. However, to approve and publish, the model must be approved by a user with approver privileges.
Approver	Displays that the logged-in user has the Approver privileges when the status is green. You can approve models that are created and reviewed.
Search	The field to search for a model pipeline. Enter specific terms in the field for which you want to search, and press Enter on the keyboard to display the results.
Show empty objectives	Enable this check box to view the empty objectives.
Refresh	Click Refresh to view the updated objectives.
Objective Name	Displays the name and description of the Objective
ID	Displays the ID of the objective.
Owner	Displays the owner who created the Drafts. This information is not displayed for an Objective.
Tags	Displays the tags associated with the Models or Drafts.
Delete Objective	Click Delete Objective to delete the Objective.
Edit Objective	Click Edit Objective to edit the Objective. **Note**: You cannot edit the Objective Name.

4.1.2 Managing Model

A Model has to go through an approval workflow before it can be deployed to production. The following types of users in the system have privileges that restrict the activities, they can do in the model creation and deployment workflow.

The following table describes types of users and their activity for model creation and deployment.

Table 4-2 Model Creation and Deployment

User Icon	Description
Requester	You can create a model. However, to approve and publish, the model must be reviewed by a user with reviewer privileges and approved by a user with approver privileges.
Reviewer	You can review models. However, to approve and publish, the model must be approved by a user with approver privileges.
Approver	You can approve models that are created and reviewed. You can then promote to production and make the model the champion in the production.

The following sections in this topic provide details for the cycle of creation of a model, review, approval, and deployment:

- Create Objective (Folders)
- Create Draft Models
- Pipeline Designer
- Publish Model
- View Model Details
- Understand Model Governance
- Request Model Acceptance
- Review Models and Move to Approve or Reject
- Approve Models and Promote to Production
- Deploy Models in Production and Make it a Global Champion

4.1.2.1 Create Objective (Folders)

Create folders in the Model Pipelines called as Objectives within that you can create models.

> **Note:**
>
> An Admin user only can create the objective.

To create an Objective, follow these steps:

1. On the Model Pipelines page, click **Add** and select **Objective** from the list to display the **Add Objective** dialog box.
2. Enter the **Objective Name**, **Description**, and **Tags** for the objective.

> **Note:**
>
> The Description and Tags fields are optional.

3. Click **Save**. The objective will be created and listed in the Model Pipelines page.

4.1.2.2 Create Draft Models

Use this Draft option to create model draft or notebook for starting the model development.

> **Note:**
>
> An Admin user only can create the draft model.

To create a draft model, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Click **Add** and select **Draft** from the list to display the **Add Draft** dialog box.
3. Enter the **Draft Name**, **Description**, and **Tags** for the draft model.

   > **Note:**
   >
   > The Description and Tags fields are optional.

4. Click **Create**. The draft model will be created and listed inside the objective.

   OR

   Enable the **Import Dump** option. Import Dump lets you drag and drop an existing file with model data and modify it. To import a model data dump from another model, see the Import a Workspace Model Data into a New Model section.

4.1.3 Pipeline Designer

After creating the models in the workspace, users can create and execute the paragraphs using the Pipeline Designer.

Clicking on the model navigates you to the Pipeline Designer page. The following tabs are available on the Pipeline Designer page:

- Pipeline
- Dashboard
- Notebook
- Simulations
- Execution History
- Compare

> **Note:**
>
> 1. Models in the Production workspace have the **Dashboard** as the default tab.
> 2. Drafts or Models in the Sandbox workspace have the **Pipeline** as the default tab.

4.1.3.1 Create Paragraph using Pipeline Designer

Pipeline Designer enables you to design the paragraph using widgets (graphical representation) instead of using python codes.

After creating the models in the workspace, create a paragraphs using the Pipeline Designer.

This helps the Financial Institution and Banks in the following ways:

- Visualization of the data (for example, based on data tasks)
- View the dependency
- Modify the flow of execution or execution order
- Easy for Auditing purpose

You can execute the flow based on requirement. For example, if you have created one flow and want to execute a flow of training paragraphs out of that and other flow as experimental way, then you can modify using the Training and Experimentation link types. One flow can be break into 2-3 flows for execution purpose.

After opening a Model in the Pipeline Designer, following options are displayed:

- Download
- Delete
- Publish
- Script Template list

4.1.3.1.1 Pipeline

Users can create paragraphs for creating, executing, and publishing the pipeline.

You can perform following activities on Pipeline tab:

- Creating a Pipeline
- Creating Script Template
- Viewing a Pipeline
- Using Link Connector Nodes
- Execution of Pipeline
- Publishing a Pipeline

4.1.3.1.1.1 Create a Pipeline

To create a paragraph using pipeline, follow these steps:

1. Navigate to the **Pipeline Designer** page.

   By default, the Start widget is displayed in the canvas screen.

2. Hover over on **Start** widget and click **Add** in the Pipeline Canvas.

   This will open a menu which contains all the widgets sectioned into different categories. The spectra diagram builder is based on row and column positioning.

> **Note:**
>
> Click on each menu to select widgets of the required types. Currently the supported menus are:
>
> - **Paragraph**
> - **Flow Actions**
> - **Container**

You cannot edit or delete this widget. Whenever a new draft is created (not by importing dump files), the default paragraph created is converted into a start widget.

Title of the node is called **Start** widget. Publish /download and import /promote to production of model with start widget will keep this widget. Publish from canvas will keep the start widget in the published model. When you publish model from model summary, you can explicitly select the start widget paragraph from the list of paragraphs. After this only, start widget will appear in the published model.

3. Click on the **Node** to add the basic details. The Basic Details pane is displayed.
4. Enter/Select the details as described in the following table.

Table 4-3 Basic Details Pane

Field	Description
Activity Name	Enter the Activity Name.
Description	Enter the description of Activity.
Task Type	Select the task type. For example, Model Training, Data Analysis and so on.
Track Output	If this option is enabled for any paragraph, then during the model comparison the output details are displayed. Keep the Track Output is ON in case you want to execute the paragraph and view the result from the Dashboard tab.
Execution Path	Select the execution path. The available options are Scoring, Training, and Experimentation.

5. Click **Script** tab to update the script.

4.1.3.1.1.2 Create Script Template

Navigate to Script tab to manage scripts. These scripts can be called for paragraph.

To create a script template, follow these steps:

1. In the **Script** tab, click **Save Script as Template** link. The new window is displayed.
2. Enter/Select the details as described in the following table.

Table 4-4 Script Templates - Field Description

Field	Description
Script Name	Enter the unique Script Name.
Description	Enter description of the script.
Script Type	The script types is default and you cannot edit it.

Table 4-4 (Cont.) Script Templates - Field Description

Field	Description
Script Content	Enter the Python script.

OR

Enable **Use Template** and select the script from the **Script Templates** drop-down list. You can also create the Script template list by clicking Action icon on the Pipeline Designer.

3. Click **Save**. A node is created.
4. Click **Execute** to execute the pipeline.

   You can perform the following actions on the Pipeline Designer page:

   - **Edit model description**: Click Edit icon to update the description of the model.
   - **Parameter Sets**: Select the required parameter set. The selected parameter set will be promoted along with the model pipeline at the time of deployment and you can update this dependency based on your requirements.
   - **Version**: Select version from the drop-down list.
   - **Add Tags**: Click Add Tags link to add tag to the model.
   - **Python Runtime Parameters**: Select the required Python Runtime parameter. The selected Python runtime parameter will be used during all the executions and you can update this dependency based on your requirements.
   - **Publish**: Allows publishing the pipeline and this option is displayed for the Drafts.
   - **Deploy**: Allows you to deploy the model and this option is displayed for the published models.
   - **Actions icon**:
     - **Download**: Use Download to download the current working version in opened in canvas
     - **Script Template list**: Allows you to add, edit, view, and delete the script templates.
     - **Delete**: Allows to delete the current working version. If this is first draft of Model, it will delete all the dependent published version in the Sandbox. If the Model is not first version, then it will delete only the current working version.
   - **Clear execution results**: Click this icon to clears the execution details.
   - **Invalidate session**: Click this icon to deletes the previous session details.
   - **Auto-align**: Arrange all the widgets in vertical order. After saving, the reverting option will not work.
   - **Revert-align**: Revert all the widgets if they are Auto-aligned.
   - **Refresh**: Refresh the pipeline.

4.1.3.1.1.3 Executing a Pipeline

Use this Execute option to execute pipeline from the pipeline designer page.

To execute the pipeline, follow these steps:

1. On the Pipeline tab, click the **Execute** icon. The Execute Pipeline pane is displayed.

2. Select the flow, which you want to execute **Scoring**, **Training**, and **Experimentation**. It displays all the keys defined for all the paragraphs in the notebook with a placeholder for providing the values.

   Execution parameters are the parameters defined in the notebook required for execution.

3. In the **Execution Parameters**, enter the **Key** and **Value**.

   The System Parameters also shows the Execution ID, Execution Date, and Execution Batch. These are required for executing all the paragraphs along with other parameters. It also shows from where the parameter comes from as a subscript.

   Save parameters set: These are the set of parameters with a specific value required for an instance of execution. It consists Key and Value. You can save the parameters set that can be used for one execution instance and reuse it for the next execution. It consists of parameters with a specific value to each parameter. Parameters containing no value will not be taken. Each set is identified with a unique code for each objective. While saving the parameter, you have to provide a code for identifying the name and description which is not mandatory. You can save Key Value parameter set using the **Save parameter set** option. To Save Parameter Set, enter the Threshold Value and Description in the Parameter Set pane.

   Open from saved parameter set: These saved Parameter Set can be selected during the execution. It will replace the values of the parameters from the chosen Parameter Set. Click **Open from saved parameter set**. The Threshold Code pane is displayed. Select the Parameter Set from the available list. You can select multiple Parameter Set in the same execution instance. In that case, if there are any common keys, value will be replaced with that from the latest Parameter Set selected.

4. Click **Add new parameters** to add new parameters for execution.

   > **Note:**
   >
   > If the parameter is not defined in the notebook, it will not be used for the execution. In case of multi select, if there are common parameters among the chosen scenarios, it will take the value based on the order of selection. that is first chosen scenario parameter will be taken.

5. To view the only required parameters, click **Show only required link**. Execution will be performed based on the selected links. It filters out all the unused parameters and all the unused parameters for the current execution are displayed with a warning.

   Use **Reset** to reset the entered data and **Delete** to delete the entered Key and Value.

6. Click **Execute** to initialize the execution process.

4.1.3.1.2 Dashboard

This Dashboard tab of the Pipeline Designer allows users to execute the Models and also shows the execution output of Model if the widgets are saved with Track output option enabled.

> **Note:**
>
> - Dashboard is the default tab for Promoted models.
> - There is no Cancel button in Settings tab of reports in the Dashboard tab. You can press Escape key to close the Settings.

4.1.3.1.3 Notebook

Users can navigate to Notebook tab to view the paragraphs. You can add and run paragraph, invalidate session, edit, add, export the notebook, and so on.

> **Note:**
>
> The Username is case sensitive. Ensure you use the correct case for the username when accessing and executing the notebook.

4.1.3.1.3.1 Common Screen Elements in the Notebook

This topic describes common screen elements in the notebook that can be used to perform quick actions when preparing and executing the notebooks.

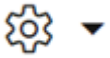
Elements in the Notebook

Icon Name	Action/Description
Modify Notebook 	Modifies the details of a notebook, such as a name, description, and (or) tags.
Hide Code 	Hides or shows the Code Section in all the paragraphs in a notebook.
Hide Result 	Hides or shows the Results Section in all the paragraphs in a notebook.
Re-initialize session 	Re-initialize the paragraph in a notebook. **Note**: By default, the Start Widget gets executed automatically on clicking the Re-initialize icon. All other paragraphs need to be executed manually.

Icon Name	Action/Description
Read-Only 	Sets the notebook to read-only mode. **Note**: The notebook is protected from edit, clear result, delete, share, reset session, and run paragraphs in Read-only mode.
Write 	Set the notebook to write mode.
Run Paragraphs 	Executes all the paragraphs in a notebook in sequential order.
Invalidate Session 	Resets any connection or code executed in a notebook.
Delete Notebook 	To delete the selected notebook.
Clear Result 	Clears results for all the paragraphs in a notebook. **Note**: This action clears all the results. You must rerun the paragraphs to view the results.
Clear Paragraph Dependencies 	Remove all defined paragraph dependencies.
Open as an iframe 	Opens a notebook in an Iframe. This allows a notebook to be embedded inside another webpage.

Icon Name	Action/Description
Share Notebook 	Share the notebook with another user, user group, or role.
Clone Notebook 	Creates a copy of a notebook. All paragraphs in the current notebook are replicated in the new notebook. The cloned notebook is created with the default name, Copy of <Current Notebook Name>.
Export Notebook 	Export the notebook to your computer as a DNSB file.
Print Notebook 	To print a notebook in the PDF format and save it in your local machine.
Default Template 	To apply the overall look and feel of the notebook using the default template.
Layout 	Sets the preferred layout. The available layouts are Zeppelin and Jupyter.
Default Template 	Applies the overall look and feel of the notebook using the default template.
Show Panel 	Shows or hides the Paragraph Settings Bar Commands, Results Toolbar, and Settings Dialog for a selected paragraph in a panel to the notebook's right.

Icon Name	Action/Description
Attach Credentials 	You can use this option to attach credentials (wallet and password) to the notebook to enable secure data access.
Versioning 	You can use this option to create versions for your notebook, which helps you analyze the changes based on the version control.
Run Paragraph 	To execute the code or query in a paragraph.
Enter Dependency Mode 	To add or remove dependent paragraphs. Paragraphs with dependent paragraphs are executed in the dependency order.
Comments 	To add comments to a paragraph.
Expand 	To expand a paragraph and view the paragraph in full-screen mode.
Show/Hide Line Numbers 	To show or hide line numbers in the code in a paragraph. **Note**:This button is applicable only to the code section.
Visibility 	To manage the visibility settings in a paragraph. It controls how a paragraph may be viewed by the author and other users who have access to the notebook.

Icon Name	Action/Description
Settings 	Users can perform the following actions: • Resize the width of a paragraph • Change the order of placement of the paragraphs by moving them up or down • Run the all above or all below paragraph from the selected paragraph. • Clear the paragraph result • Open the notebook in Embedded window • Disable the run action • Clone the paragraph • Delete a paragraph

4.1.3.1.3.2 Programmatic Dynamic Forms and Fixed Dynamic Forms

A dynamic form is a user input field that is generated from the code of a paragraph. Dynamic forms allow users to bind free variables in a paragraph.

The Programmatic Dynamic Forms and Fixed Dynamic Forms scripts are supported.

For Example:

Textbox

The Textbox dynamic form allows users to input any string of characters.

Click **Add Python Paragraph** to add a paragraph in the notebook and fetch the runtime parameters. This is available for all the interpreters. For example, enter the command as follows:

```
%python
ds.textbox('Name', 'Default Value', 'Label')
```

Click **Play** icon to run the script and display the label.

> **Note:**
>
> In the current release, the notebook supports Textbox, Select, Slider, Checkbox, Date Picker, Time Picker and DateTime Picker dynamic forms.

4.1.3.1.4 Simulations

Simulation run is for executing a single notebook in parallel by giving different values for same parameters. The simulation flow allows for iterative execution along that path with input drivers (variables) that are passed through a parameter set.

You can either create a new parameter set or use the existing parameter set and execute it from this tab. In addition, you can select or deselect the link types which you want to execute.

If you want to add different values for the same parameter, click **Add Run**. You can add any number of run based on your requirements and then click **Execute all** to execute at one time. The Batch Run Identifier will be same for all runs and the Task Identifier will be incremented for newly created run.

The Run Stats displays the execution start and end date. The Outputs of the tracked nodes will be shown under the inputs of each run panel.

4.1.3.1.5 Execution History

The Execution History tab of the Pipeline Designer shows the history of the executed pipelines.

You can compare and refresh the executions using **Compare** and **Refresh** icons.

To view the inputs, output, and canvas view, click on the corresponding options in the table.

Click **Output** icon displays the Output Details pane, where you can view **Executed-Only** paragraph outputs. By default, this option is enabled, you can disable this option based on your requirements.

By default, **Tracked** option is selected that displays outputs tracked from the time of the execution. Select **All** option to view all the outputs.

4.1.3.1.6 Compare

This Compare tab allows you to compare the models with Champion model.

Navigate to Pipeline Designer window and click Compare tab. This shows the following comparison details:

- Model Properties
- Model Inputs (Last Execution Details)
- Audit Log
- Model Script
- Model Output (Last Execution Details)

> **Note:**
>
> Enable **Highlight Same Data** option to highlight the same data between the comparison models.

4.1.4 Publish Model

Use this Publish option after creating the draft models and publish the notebooks, which have the model script.

To publish the model, follow these steps:

1. Create a draft model. For more information, see the Create Draft Models section.
2. Click **Action**  icon next to corresponding Draft Model and select **Open in Pipeline Designer** option. The Pipeline page is displayed.
3. Click **Publish**. The Publish Pipeline pane is displayed.
4. Enter the details as described in the following table.

Table 4-5 Publish Pipeline - Field Description

Field	Description
Model Name	Displays name of the model. Modify the name if required using edit option.
Description	Enter description of the model.
Technique	Enter the registered technique to use.
Run Version	Enter the run version.
Attach parameter set	Enable this option if required. If it is enabled: • Selected parameter set will be associated with the published model. • Best performing parameter set or prime reference of the objective is recommended to be associated with the model. • This set is further used for promote to production at the time of deployment. • Users can update this dependency from model details screen.
Associate python runtime	Enable this option if required. If it is enabled: • Selected python runtime will be associated with the published model. • This python run time will be further used for promoting the model to production at the time of deployment. • Users can update this dependency from model details screen.

5. Click **Publish**. The model will be published.

4.1.5 View Model Details

Users can view model information for deployed models, models that require approval, and so on.

To view the model details, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model.
3. Click **Show published models** to view the following icons associated with this model.

   The number one indicates that the model is champion.

   - Deploy
   - Download
   - Open in Pipeline Designer
   - Scope Detail
   - Delete Model

4.1.5.1 Scope Detail

Use this Scope Detail option for viewing details such as model deployment, notebook, and last execution status for both input and output.

To view the scope detail, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model.

3. Click **Action**  icon next to corresponding Draft Model and select **Scope Detail** option. The new page is displayed with details such as Notebook, Inputs (Last execution details), Deployment Details, and Outputs (Last execution outputs).

> **Note:**
>
> This option is available for both Draft and Published models.

4.1.6 Model Governance

The Model Governance has an impact on how the application functions with the various user types and the requests they can place from the Model Deployment pane. You require to understand Model Governance before you request model acceptance, review models, or approve models for production.

There are three types of users available on the Model Pipelines page:

- Requester
- Reviewer
- Approver

The request consists of the following phases in the **Request** drop-down list on the Model Deployment pane:

- Model Acceptance
- Model Acceptance + Promote to Production
- Promote to Production
- Make - Champion - Global
- Make - Champion - Local
- Retire Champions

The values in the drop-down list are active based on the type of user (Requester, Reviewer, or Approver) and the phase that the model is in (accepted, promoted to production, global champion, and so on). Let us look at these with a few examples.

Example 1:

Assume that you are a user with Requester privileges, and you create a model. Now you can request for the model to be accepted on the Model Details window from the Request drop-down list. The values enabled for selection are Model Acceptance and Model Acceptance + Promote to Production. Let us proceed and assume that you select Model Acceptance, then a user with Reviewer privileges forwards your model to a user with Approver privileges. At this stage, the Approver can choose to reject or accept your model acceptance request. A rejection would bring the model back to the initial state with comments on the updates required before it can be requested for acceptance again. However, if the Approver accepts your model, then the Make Champion- Local selection is enabled when you log in. You can create many models and send them for acceptance. After acceptance, any model that is accepted can be made the champion on your local workspace at any time replacing the earlier local champion.

Example 2:

Assume that in the previous example, you selected Model Acceptance + Promote to Production, then a Reviewer forwards it to the Approver. The Approver, at this stage, chooses to promote the model to production by selecting Promote to Production. The model is now available in the production environment and the Approver can choose at any time to select a model from these models in production and select Make Champion- Global. If there exists a Champion model in the production environment, then it will be replaced by the new global champion. However, the earlier champion will still be available in the production environment along with other models and the Approver can choose to make it the global champion again at any time or select any of the other models and make one of them the global champion.

4.1.6.1 Request Model Acceptance

After comparing models, move the selected models to acceptance. Only a user with the Requester role can request for model acceptance.

The model will be moved to review which will be available to Reviewer and Approver role, and then to acceptance is available to users with the Approver role, who can promote to production.

To request the model acceptance, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model and click the Model to open it.
3. Click **Deploy**. The Model Deployment pane is displayed.
4. From the **Reviewer** drop-down list, select the Reviewer group.
5. From the **Approver** drop-down list, select the Approver group.
6. Enter comments in Comments and click **Attach** to attach supporting files for the comments if required.
7. Use the following features on the pane to perform additional actions:
   - View the model status change in the progress indicator. The Progress Indicator displays the various states of progress that the model has been through. Accordingly, you must request, review, or approve models.
8. Click the type of **Request** from the drop-down list:
   - Model Acceptance: To review and accept the model creation.
   - Model Acceptance + Promote to Production: To review and promote the model to production.
   - Promote to Production: To promote a model to production.
   - Make Champion - Global: If the model is not the champion model, select to make it the Global champion.
   - Make Champion - Local: If the model is not the champion model, select to make it the local champion.
   - Retire Champion: To retire a Champion model.

   The model sent for acceptance or for promotion to production is now displayed to a Reviewer to review it and then to Approver when signed in, who must either accept the request or reject it.

4.1.6.2 Review Models and Move to Approve or Reject Status

The Reviewer must provide comments and move the model to approve or reject status.

If comments are related to rejection and if the Approver rejects, then model goes back to the Requester to make changes or to delete it. If comments are related to approval, then model moves further in the workflow and is displayed to an Approver.

To review a model, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model and click **Show published models**.
3. Click **Deploy** icon to display the Model Deployment pane.
4. For **Approve**: Review the details and send it for Approver.

   OR

   For **Reject**: Review the details and send it back to the Requester for modifications.

4.1.6.3 Approve Models and Promote to Production

The models reviewed and set to promote to production by either the Requester or Reviewer is displayed to the Approver when signed in. The Approver has to either reject the model and send it back to the requester with supporting comments or approve it for pushing to production.

To approve or reject models, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model and click **Show published models**.
3. Click **Deploy** icon to display the Model Deployment pane.
4. Click **Approve** or **Reject** with appropriate comments.

4.1.6.4 Deploy Models in Production and Make it a Global Champion

After approving the models, deploy it to the production environment. You must have an Approver function role and privileges to do this activity.

> **Note:**
>
> Sandbox workspace should have the production workspace attached in order to have this option enabled.

To deploy model in the production, follow these steps:

1. On the Model Pipelines page, select the Objective.
2. Select the Draft Model and click **Show published models**.
3. Click **Deploy** icon to display the Model Deployment pane.
4. Select the **Reviewer** and **Approver group**.
5. Enter the comments.
6. From the **Request** drop-down list, select the **Promote to Production**. After approval, it will be deployed into production.

If you want to make the model is champion, then from the **Request** drop-down list and select the **Make Champion - Global/Local**.

4.1.7 Import a Model Data into a New Model

The existing model data in the application is in `.dsnb` format which can be imported during the creation of a new model.

> **Note:**
>
> The import should happen inside an Objective only.

The import of model data lets you reuse and extend on model creation. This topic is part of the procedure of creating Draft Models and after creating a new model using this method, see the Create Draft Models section for instructions on how to proceed further.

To import the model data, follow these steps:

1. On the Model Pipelines page, Select the **Objective**.
2. Select the Draft Model.
3. Click **Action**  icon next to corresponding Draft Model and select **Download** option. The `.zip` folder is downloaded that contains `.cfg` and `.dsnb` files.
4. Click **Add** and select **Draft**. The **Add Draft** pane is displayed.
5. Enable the **Import Dump** option.
6. Click **Import Archive File** to select the `.dsnb` file from the file selector dialog and select a file.
7. Click **Open**.

   OR

   Drag and drop the file into the **Import Archive File** field.
8. Enter the following details for the draft:
   - **Draft Name**
   - **Description**
   - **Tags**

   > **Note:**
   >
   > If you want to create a new model under the new objective, then create new objective using **Add in new objective** and provide the required details for both Objective and Draft.
9. Click **Import**. A new model will be created by importing the model data dump from the another model.

5
Using Orchestration

The Orchestration mega menu contains the Scheduler Service which automates behind-the-scenes work that is necessary to sustain various enterprise applications and their operations.

5.1 Scheduler Service

Scheduler Services automates behind-the-scenes work that is necessary to sustain various enterprise applications and their operations. Using Scheduler Services, applications can control unattended background jobs program execution.

> **Note:**
>
> The Scheduler Service shows the job relevant to the given workspace. For the Production workspace, the scheduler also includes jobs from the other Oracle Financial Crime and Compliance Management Cloud Services.

Scheduler Service operations:

- Scheduler Service Dashboard: The Scheduler Service Dashboard gives the complete status of the Executed Runs, Successful Runs, Failed Runs, Ongoing Runs, Interrupted Runs, and the Upcoming Runs.
- Define Batch: A Batch contains a group of background tasks that are executed together, on a specific date and time during which the resources are available for batch processing.
- Define Task: A batch job is a piece of a program meant to meet specific and business-critical functions. The program is a REST API used in a batch.
- Managing Batch/Batch Group Executions: Schedule batch jobs, to automate tasks that are processed on a regular basis but do not need to occur during the day or require human intervention. Jobs that happen on a regular basis are incorporated into batch schedules. You can also edit pre-conditions for batch group execution and pause scheduled executions.
- Monitor Batch/Batch Group: Track and access the real-time feedback on the status of the current encoding job and lists the jobs pending in the batch. You can also Cancel or Restart the service when required.

5.1.1 Scheduler Service Dashboard

View the task executions based on the execution status in the Scheduler Service Dashboard.

To access the Scheduler Service Dashboard, follow these steps:

1. On the Workspace Summary, click **Orchestration** and select **Scheduler Dashboard**. The Scheduler Service Dashboard page is displayed.
2. You can access the following details related to batch/batch group execution from the Dashboard:

- The batches/batch groups are categorized based on their execution status: **Executed Runs**, **Successful Runs**, **Failed Runs**, **Ongoing Runs**, **Interrupted Runs**, and **Upcoming Runs** tabs. Click the respective tab to view the details of the batches/batch groups based on their execution status. For example, click **Ongoing Runs** to view the details of the batches that are currently running.
- The run time, schedule name and the MISDATE associated with each batch/batch group.
- The batch execution summary for all the batches executed in the last 7, 30 and 120 days. The summary is displayed in the form of a color-coded bar graph with legend for the various execution statuses.
- To view the list of all task executions associated with a specific batch/batch group, select the required execution status tab, select Batch/Batch Group and select the required batch/batch group.
- To view the task executions within a specific date range, select the required execution status tab, select Batch/Batch Group and select the required batch/batch group. Specify both the Start Date and End Date.

5.1.2 Define Batch

A Batch contains a group of background tasks that are executed together, on a specific date and time during which the resources are available for batch processing.

You can use batch and batch groups to group a set of background tasks to be executed together.

Batch Groups consist of batches that need to be executed together. Batch groups help to process date and time-based background tasks based on a defined period when resources are available for batch processing.

Click **Define Batch** from the Header panel to access the Define Batch page.

To access the list of existing batches and batch groups click **Batch** or **Batch Group** tab respectively. You can also view following details related to each batch/batch group.

- **Batch ID** : The unique alphanumeric code assigned to a specific batch/batch group.
- **Name**: The unique batch/batch group name.
- **Description**: The brief description of the batch/batch group.
- **Last Modified**: The last modified By user, date and time details.

To search for a specific batch/batch group, enter the keywords in the Search field and click **Search**. You can search based on Name, Code, and Description. You can also sort the batch/batch group list based on Code, Name, Created Date, and Last Modified Date.

Perform one of the following operations, to manage batch/batch group, from the Scheduler Service (Define Batch) page:

- Creating a Batch/Batch Group
- Editing a Batch/Batch Group
- Copying a Batch/Batch Group
- Deleting a Batch/Batch Group

5.1.2.1 Creating a Batch/Batch Group

Create a batch/batch group, to execute a group of background tasks together, on a specific date and time, when the resources are available for batch processing.

To create a batch/batch group from the Scheduler Service (Define Batch), follow these steps:

1. Click **Create**. The Create pane is displayed.
2. Enter the Batch Details as described in the following table.

Table 5-1 Create Batch - Field Description

Field	Description
Code	Enter a unique alphanumeric code for the new batch/batch group. **Note**: The code must start with alphabets, should not contain any spaces, and must not exceed 60 characters. Special characters are not allowed except underscore (_).
Name	Enter a unique name for the new batch/batch group. **Note**: The name should start with alphabets, should not contain any spaces, and must not exceed 60 characters. Special characters are not allowed except underscore (_).
Description	The description/details for the batch/batch group. The description should start with an alphabet and must not exceed 250 characters.
Batch/Batch Group	Select Batch to create a new batch or Batch Group to create a new batch group.
Service URL Name	Select the Service URL name from the drop-down list, if it is available. To add a new service URL, enter a name to identify the new Service URL Name and enter the proper Service URL. You can give partial URL here and the complete URL in the Task Service URL. **Note**: Leave this field as empty.
Service URL	This field will be auto-populated based on the selected Service URL Name. **Note**: Leave this field as empty.
Cleanup URL	Enter the complete Cleanup URL and enable the check box, to activate the cleanup URL, before you initiate a batch/batch group restart.
Notify on mail	From the drop-down list, select the any one of the following options to get an email notification, based on the selected batch execution status. The available options are: • **Every Time**: An e-mail is triggered irrespective of the batch execution status. • **Never**: No e-mail will be triggered. • **On Error only**: An e-mail is triggered only when the batch execution has failed. By default, this option is selected. • **On Interrupt only**: An e-mail is triggered if the batch execution is successfully interrupted. Based on the selected option, an email is sent to the email ID of the logged in user, mentioned in the IAM console.

Table 5-1 (Cont.) Create Batch - Field Description

Field	Description
Batch Parameters	Click **Add** to add a new batch parameter, in the following format: • **Parameter Name**: A valid parameter name for the new Batch parameter. • **Parameter Value**: A valid parameter value required for Batch execution. **Note**: Enclose the Parameter Value for a Run time with **$** symbol. For example, **$paramName$**. By default, **$BATCHDATE$**, **$BATCHRUNID$** and **$RUNSKEY$** are added as batch Parameters. **$RUNSKEY$** parameter is added only if you are creating a new batch or copying from an existing batch. It is not supported for existing batches. To delete a batch parameter, click **Delete** next to that parameter details.

3. Click **Save**. The new batch/batch group is created and displayed in the Scheduler Service (Define Batch) page.

5.1.2.2 Editing a Batch/Batch Group

Edit the batch/batch group details such as Description and also add new Batch Parameters to a batch, along with adding new batches to the batch group.

> **Note:**
>
> You cannot edit the seeded batches.

To modify a batch/batch group, follow these steps:

1. Click **Edit batch/batch group** corresponding to the batch/batch group that you want to modify. The Edit batch pane is displayed.
2. Modify the required details.

> **Note:**
>
> You cannot edit the **Code** for batch/batch group.

3. Click **Save** to save the edited batch/batch group.

   The edited batch/batch group will be updated in the Scheduler Service (Define Batch) page.

5.1.2.3 Copying a Batch/Batch Group

Copy a batch/batch group that you want to clone to create a new batch/batch group.

To copy a batch/batch group, follow these steps:

1. Click **Copy batch/batch group** corresponding to the batch/batch group that you want to copy. The Copy batch/batch group pane is displayed.

2. Modify the required details to create a new batch/batch group.
3. Click **Save** to save the copied batch/batch group.

   The copied batch/batch group will be added in the Scheduler Service (Define Batch) page.

5.1.2.4 Deleting a Batch/Batch Group

Delete a batch/batch group that is no longer required in the system from the Define Batch page.

> **Note:**
>
> You cannot delete the seeded batches.

To delete a batch/batch group, follow these steps:

1. Click **Delete batch/batch group** corresponding to the batch/batch group that you want to delete. The Confirmation dialog box is displayed.
2. Click **Yes** to delete the batch/batch group.

> **Note:**
>
> After confirmation, any active schedules associated with this batch/batch group will also be deleted.

5.1.3 Define Task

The Define Task page lists task associated with a specific Batch Definition. You can create new tasks, and edit or delete existing tasks.

Click **Define Task** from the Header panel to access the Define Task page.

Select Batch/Batch Group from the drop-down list and select the particular batch/batch group to access the list of tasks associated with it. You can view the following details related to each task:

- **Task ID**: The unique identifier for the task.
- **Name**: The name of the task.
- **Parent Tasks**: The parent task associated with the task.
- **Component**: The seeded/custom component associated with the task.
- **Created Date**: The task creation date.
- **Last Modified**: The last modification date.

To search for a specific task, enter the keywords in the Search field and click **Search**. You can search based on the **Task Name**, **Code** and **Description**. You can also sort the Task list based on **Code**, **Name**, **Precedence**, **Component**, **Created Date**, and **Last Modified Date**.

Using the **Preview** option, you can view the complete task execution sequence for a specific batch/batch group.

Perform the following operations to manage a task from the Scheduler Service (Define Task) page:

- Adding a Task
- Editing a Task
- Define Task Precedence
- Deleting a Task

5.1.3.1 Adding a Task

Add new tasks to a selected Batch Definition.

To add a new task, follow these steps:

1. In the Scheduler Service (Define Task) page, select the Batch for which you want to add a new task from the drop-down list.
2. Click **Create task**. The Create task pane is displayed.
3. Enter the Task Details and Parameters as described in the following table.

Table 5-2 Create task - Field Description

Field	Description
Task Code	Enter a unique alphanumeric code for the new task. **Note**: The code must begin with letters, should not include spaces, and has a maximum limit of 60 characters. Special characters except underscore (_) are not allowed.
Task Name	Enter a unique name for the new task. **Note**: The name should start with letters, not contain spaces, and have a maximum limit of 60 characters. Special characters except underscore (_) are not allowed.
Task Description	The description/details for the task. The description should start with an alphabet and must not exceed 250 characters. Avoid using phrases like "Select From" or "Delete From" in the description.
Task Type	Select the task type from the drop-down list. The available options are REST and SCRIPT.
Component	Select the component type from the drop-down list. The available options are CUSTOM, MODEL, and POPULATE_WORKSPACE.
Batch Service URL	Select the required Batch Service URL from the drop-down list. Batch Service URL is not required, if you provide the complete Task Service URL.
Task Service URL	This field is auto-populated by API.
Task Parameters	By default, all Batch Level Parameters are added and enabled as task parameters in the Task Parameters pane. Note: You can edit the parameters only for custom components. To disable, deselect the check box corresponding to the task parameter. If you want to add new parameter for task, click **Add Task Parameters** and enter the name and value in the following fields: • Param Name • Param Value To delete a parameter, click on **Delete** next to the respective parameter.

4. Click **Save** to add the new task to task summary in the Define Task page.

5.1.3.1.1 When Component is Model

Users need to provide additional task parameters when Component is selected as Model on the Create task pane.

To add a new task parameter for the model component, follow these steps:

1. In the Scheduler Service (Define Task) page, select the Batch for which you want to add a new task from the drop-down list.
2. Click **Create task**. The Create task pane is displayed.

   For Task Details, see the Adding a Task section.
3. In the Task Parameters, you can update the following details:
   - **Batch Date**: Displays the batch execution date. You can enable or disable this parameter.
   - **Batch Run ID**: Displays the batch execution run ID. You can enable or disable this parameter.
   - **Runskey**: Displays the runskey. You can enable or disable this parameter.
   - **Objective**: Select the Object which you want to use for execution. The Sub Objective is displayed with path. For example, if Test1 is Objective and Test11 is Sub Objective, and you want to use Test11 Objective for execution, then select this field as Test1/Test11.
   - **Model**: Select the Model of selected Objective. It can be any specific model of Objective or All models of Objective.
     - If the ALL_CHAMPION is selected here, then Objectives with no Champion Model is skipped, and the Objectives with Champion Models gets executed.
     - If CHAMPION is selected, and no Champion is present, then Model Execution gets fail.
   - **Link Type**: Select the link type for execution. For example: Training, Scoring, or Training+Scoring.
   - **Synchronous Execution**: You can set this parameter to Yes or No.
     - If Synchronous Execution is set to Yes, then execution will wait for the notebook execution status.
     - If Synchronous Execution is set to No, then execution will not wait for the notebook execution status, it will trigger the notebook and update task status as successful in the batch monitor.
   - **Optional Parameters**: This is used pass the parameters dynamically.
     For example:

     ```
     model_group_name=LOB1,benford_flag=Y,benford_digit=1,from_date=01-Jul-2020,to_date=31-Jul-2021
     ```

     Model_group is the parameter defined in model and value can be passed here.

> **Note:**
>
> Fields marked with * are mandatory fields.

The Create Task window also shows the following Header Parameters:

- **user**: Displays the logged in user name.
- **workspace**: Displays the launched workspace name.
- **locale**: Displays the locale. For example: en_US.

4. Click **Save** to add the new task to task summary in the Define Task page.

5.1.3.1.2 When Component is Populate Workspace

Users need to provide additional task parameters when Component is selected as Populate Workspace on the Create task pane.

To add a new task parameter for the populate workspace component, follow these steps:

1. In the Scheduler Service (Define Task) page, select the Batch for which you want to add a new task from the drop-down list.
2. Click **Create task**. The Create task pane is displayed.

   For Task Details, see the Adding a Task section.
3. In the Task Parameters, you can update the following details:
   - Additional Parameters
   - Data Filters - Global level
   - Data Filters - Table level
     For more information on these fields, see the Populate a Workspace section.

   The Create Task window also shows the following Header Parameters:
   - **user**: Displays the logged in user name.
   - **workspace**: Displays the launched workspace name.
   - **locale**: Displays the locale. For example: en_US.
4. Click **Save** to add the new task to task summary in the Define Task page.

5.1.3.2 Editing a Task

Edit details such as Task Description and Task Type in the existing tasks.

You can also add a new task parameter and enable or disable existing task parameters.
To edit a task, follow these steps:

1. From the **Define Task** page, select the batch/batch group to modify the task details from the drop-down list.
2. Click **Edit task** corresponding to the Task that you want to modify.
3. In the **Edit Task** pane, modify the required Task Details.
4. Click **Save** to update the changes.

5.1.3.3 Define Task Precedence

Task Precedence indicates the execution-flow of a batch. Task Precedence Value helps to determine the order in which the specific tasks of a batch are executed.

For example, consider a Batch consisting of four tasks. The first three tasks lack define precedence and hence will be executed simultaneously during batch execution. However, Task

4 has a precedence value as Task 1, indicating that Task 4 is executed only after the successful completion of Task 1.

You can set Task Precedence between Tasks or define to run a Task after a set of other tasks. While, multiple tasks can be executed simultaneously, cyclical execution is not permitted. Tasks without defined precedence execute immediately upon Batch Execution.

> **Note:**
>
> The Task Precedence option is disabled if a batch has only one associated task.

To define task precedence, follow these steps:

1. From the **Define Task** page, select Batch/Batch Group from the drop-down list.
2. Click **Add or Remove Precedence** corresponding to the task requiring precedence to access the **Precedence Mapping** list.
    a. Select a batch to execute before the current task, from the **Available Tasks** pane and click **Move Selected**. To move all the batches, click **Move All**.
    b. To remove a batch from the task precedence sequence, select the task from the **Selected Tasks** pane and click **Remove**. To remove all the selected batches, click **Remove All**.
3. Click **Save** to update Task Precedence in the batches.
4. Click **Preview** to view the precedence information.

5.1.3.4 Deleting a Task

Remove any tasks that that are no longer required in the system, from a Batch Definition.

To delete a task, follow these steps:

1. From the **Define Task** page, select the Batch/Batch Group from the drop-down list.
2. Click **Delete task** corresponding to the batch/batch group that you want to delete. The Confirmation dialog box is displayed.
3. Click **Yes** to delete the task.

5.1.4 Managing Batch/Batch Group Executions

Schedule Batch enable users to manage batch/batch group executions.

Click **Schedule Batch** from the Header panel to access the Schedule Batch page.

All the batch/batch group schedules are listed. You can sort this list based on code, name, Task Precedence, Components, and dates, to access a specific schedule.

From the Schedule Batch page, you can perform the following operations related to the execution and scheduling of batches/batch groups:

- Execute Batch/Batch Group
- Scheduling and Automating Batch/Batch Group Execution
- Re-start Batch/Batch Group
- Re-run Batch/Batch Group

5.1.4.1 Execute Batch/Batch Group

Use the Execute Batch to run a batch/batch group instantaneously.

To execute a Batch/Batch Group, follow these steps:

1. In the Schedule Batch page, select **Batch/Batch Group** and **Batch Name/Batch Group Name** to execute from the drop-down list.
2. Click **Exclude Tasks** to add/remove tasks from the execution list.
3. Click **Hold Tasks** to pause/release tasks during execution.
4. Click **Edit Parameters** to modify the dynamic parameters.
5. Click **Execute**.

   The Batch is executed, and the associated unique Run ID is displayed in the format: `<BATCH_CODE>_<MIS_DATE>_<ITERATION-COUNT>`.

   You can always click **Preview** to view the process sequence used to execute the selected batch/batch group.

5.1.4.1.1 Adding Pre Conditions For Batch Group Execution

Pre-conditions help to execute batches associated with a batch group, on specific days, based on the set frequency and selected days.

You can set pre-conditions for a batch group, to execute specific batches on selected days based on the set frequency interval. This enables to wisely use the available resources for execution.

To set pre-conditions for batch group execution, follow these steps:

1. In the Schedule Batch page, select **Batch Group** and the **Batch Group Name** from the drop-down list.
2. Click the **Schedule** tab.
3. Click **Pre Conditions** to set the pre-conditions for task execution.
4. Select the **Batch** to set the pre condition.
5. Set the execution frequency to Weekly, Monthly, or specific interval and set one of the following conditions:
   - **Weekly**: Select the weekdays to execute the batch. You can select multiple days.
   - **Monthly**: Select the days of the month to execute the batch. You can select multiple days.
   - **Interval**: Select the recurrence frequency to execute the batch.
6. Click **Add** to add another pre condition.
7. After adding all the required pre-conditions, Click **Save**.

   The pre-conditions are saved and the batch group will be executed based on the set pre-conditions.

> **Note:**
>
> The batch group is always get executed based on the pre condition and any schedule associated with the batch group will not be considered for processing.

5.1.4.1.2 Edit Dynamic Parameters

Modify the dynamic parameters set for a batch/batch group.

You can modify the batch parameters, batch header parameters, task parameters, and the task header parameters associated with a batch/batch group.

To edit the dynamic parameters from the Schedule Batch page, follow these steps:

1. Select **Batch/Batch Group** and then select the specific batch/batch group.
2. Click **Edit Parameters** to access the Edit Dynamic Params pane.

   You can also edit the dynamic parameters while configuring the scheduling options.
3. Click the batch/batch group name to access all the parameters.
4. Set the **$BatchDate$** to set the batch execution date as follows:
   - Set the batch date to **SYSDATE** (system date). The batch execution date is set to SYSDATE by default.
   - Toggle and select **MISDATE** to select a particular batch execution date.
5. Enter **$BATCHRUNID$** to set the batch run ID in the format: `<BATCH_CODE>_<MIS_DATE>_<ITERATION-COUNT>`.
6. Edit the batch header parameters and the task parameters.
7. Click **Save** to update the batch/batch group parameter values.
8. After updating the changes, execute the batch/batch group or configure the scheduling settings.

5.1.4.2 Scheduling and Automating Batch/Batch Group Execution

Using the various scheduling options, you can automate batch/batch group execution to run based on the specified scheduling parameters.

To automate the batch/batch execution, follow these steps:

1. In the Schedule Batch page, click **Schedule** tab.
2. In the Schedule Batch page, select the following options:
   - **Once**: Run only once
   - **Daily**: Run daily
   - **Weekly**: Run weekly on selected days and time.
   - **Monthly**: Run monthly on selected days and time.
   - **Quarterly**: Run every quarter on selected days and time.
   - **Cron Expression**: A Cron Expression is a string comprising of six or seven fields separated by white space. Fields can contain any of the allowed values, along with various combinations of the allowed special characters for that field. To execute a batch/batch group using a Cron expression, enter the Cron Expression for your

schedule. For more information about the Cron Expression, click **Information** next to the Cron Expression field.

3. Enter the following generic information and the parameters:
   - **Batch/Batch Group**: Batch/batch group for execution.
   - **Batch/Batch Group Name**: The specific batch/batch group to be executed.
   - **Schedule Name**: The unique schedule name.
4. Provide the following scheduling parameters based on the selected schedule option.

Table 5-3 Scheduling Options

Details	Once	Daily	Weekly	Monthly	Quarterly
Start Date to begin execution	Yes	Yes	Yes	Yes	Yes
End Date to stop the execution	No	Yes	Yes	Yes	Yes
Run Time to execute the batch/batch group	Yes	Yes	Yes	Yes	Yes
Select Days of the week you want to execute the batch/batch group. You can select multiple days	No	No	Yes	No	No
Select Months of the Year you want to execute the batch/batch group. You can select multiple months	No	No	No	Yes	No
Select Day of the Month to execute batch/batch group	No	No	No	Yes	No
First Months of the Year to calculate the year beginning and each quarter beginning	No	No	No	No	Yes
Select Quarters to execute batch/batch group You can select multiple quarters	No	No	No	No	Yes
Select Days of Quarter: Select the days to execute the batch/batch group. You can select first day, mid day, last day, First N days, or last N days	No	No	No	No	Yes
No. of Days: If you select first N days or last N days, select the number of days to execute the batch/batch group at the beginning or end of the selected quarter	No	No	No	No	Yes

> **Note:**
>
> For Cron Expression based scheduling, enter the required Cron expression.

5. Click **Exclude Tasks** to add/remove tasks from the execution list.
6. Click **Hold Tasks** to pause/release tasks during execution.
7. Click **Edit Parameters** to modify the dynamic parameters.
8. Click **Schedule** to add the new schedule for execution.

   You can set pre conditions to process batch groups. When a batch group has an associated pre condition, the execution schedule will not be considered for processing.
9. To manage schedules associated with a specific batch, follow these steps:

a. In the Select Batch page, select **Batch** and select the **Batch Name** to view the associated schedules

b. Click **View Schedule** to access the list of all the schedules associated with the batch. You can perform the following tasks:

- Click **Edit** to modify the schedule.
- Click **Pause** and enter the **Start Date** and **End Date** to pause the schedule from execution. Click **Add** to apply the pause.
  To remove the pause, click **Delete** next to the specific pause.

5.1.4.3 Re-start Batch/Batch Group

Re-start a batch/batch group that has not executed successfully or has been explicitly interrupted, canceled, or put on hold during the execution process.

Restarting a batch/batch group enables you to continue execution directly from the point of interruption or failure, allowing you to complete executing the remaining tasks.

> **Note:**
>
> Before restarting a batch/batch group, ensure to provide the complete cleanup URL and also to enable invoking the cleanup URL before restarting the execution.

To re-start a batch/batch group, follow these steps:

1. Click **Schedule Batch** from the Header panel.
2. From the Schedule Batch page, select the **Re-start** tab.
3. Select **Batch/Batch Group** and **Batch Name/Batch Group Name** from the drop-down list.
4. Select the Batch **Run ID** from the drop-down list.
5. Click **Re-start**.

5.1.4.4 Re-run Batch/Batch Group

Re-running a batch/batch group facilitates you to run the batch/batch group irrespective of the previous execution state.

When you re-run a batch/batch group that has been previously executed, a new Run ID is generated, and the batch/batch group is executed as if it were a new run.
To re-run a batch/batch group, follow these steps:

1. Click **Schedule Batch** from the Header panel.
2. From the Schedule Batch page, select the **Re-run** tab.
3. Select **Batch/Batch Group** and **Batch Name/Batch Group Name** from the drop-down list.
4. Select the Batch **Run ID** from the drop-down list.
5. Click **Re-run**.

5.1.5 Monitor Batch/Batch Group

Using Monitor Batch/Batch Group, you can view the status of executed batches/batch groups, along with the tasks details.

Monitoring enables users to track and identify issues at regular intervals, ensuring smoother batch execution. Both a visual representation and a tabular view of the status of each task in the batch are available.

To monitor a batch/batch group, follow these steps:

1. Click **Monitor Batch** from the Header panel.
2. Select the **Batch/Batch Group** and the **Batch Name/Batch Group Name** to monitor the execution.
3. **Set Refresh Frequency Time Interval and duration** in seconds.

   By default, the refresh interval is set to **5 seconds** and duration is set to**5 minutes**. This indicates that the monitor progress will be refreshed every 5 seconds for the next 5 minutes.
   The refresh interval ranges between 5 to 60 seconds and the duration ranges between 5 to 180 seconds.
4. Select the **MISDATE** to view the list of Batch Run IDs executed on a specific date.
5. Select the **Batch Run ID** you want to monitor.
6. Click **Start Monitor** to view the results in **Visualization** and **List View** tabs.

   The Visualization tab displays execution status graphically, while the List View tab provides the details in a tabular form, including:

   - **Status**: Task execution status are Not-Started, On-going, Aborted, Successful, Failed, Interrupted, Excluded and Undefined.

     > **Note:**
     >
     > When the task execution status is Aborted, the batch execution will still be On-going. The task status will be set to Ongoing, when it is triggered again.

   - **Start Time**: Task execution start time.
   - **End Time**: Task execution end time.
   - **Task Details**: Mouse-over the task to display its status and details.
7. At any point, click **Stop Monitor** to stop monitoring.

   You can download the task execution summary in PDF or Excel, with or without the task logs, from the **Monitor Task** page.
8. To Re-run, Re-start, or Interrupt execution, click **Actions** and select the required option. You can also reset the search criteria using **Actions**.

   This step is optional.
9. Click **View Execution Parameters** adjacent to a batch/batch group, to access the list of tasks and task parameters such as **Runskey ID**, **Misdate** associated with that batch/batch group.

   This step is optional.