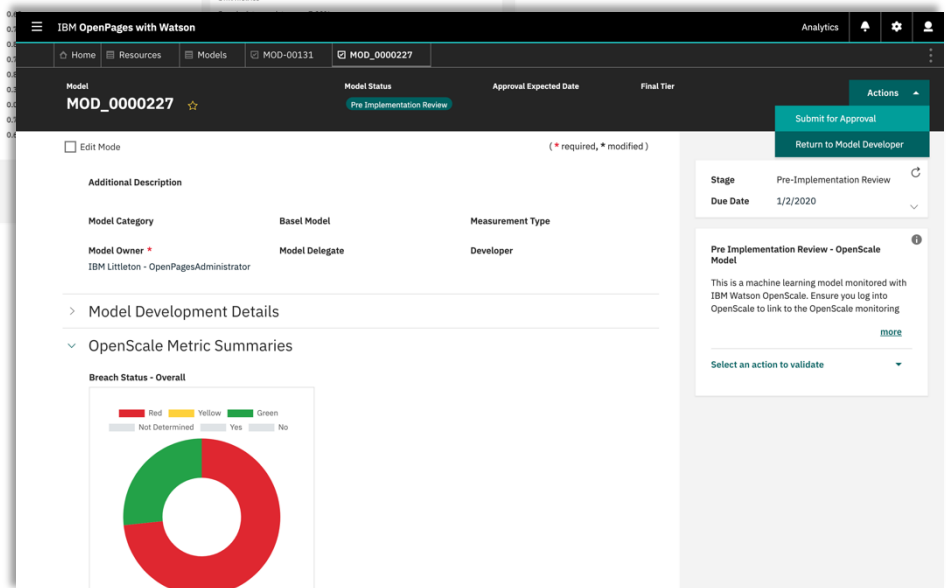
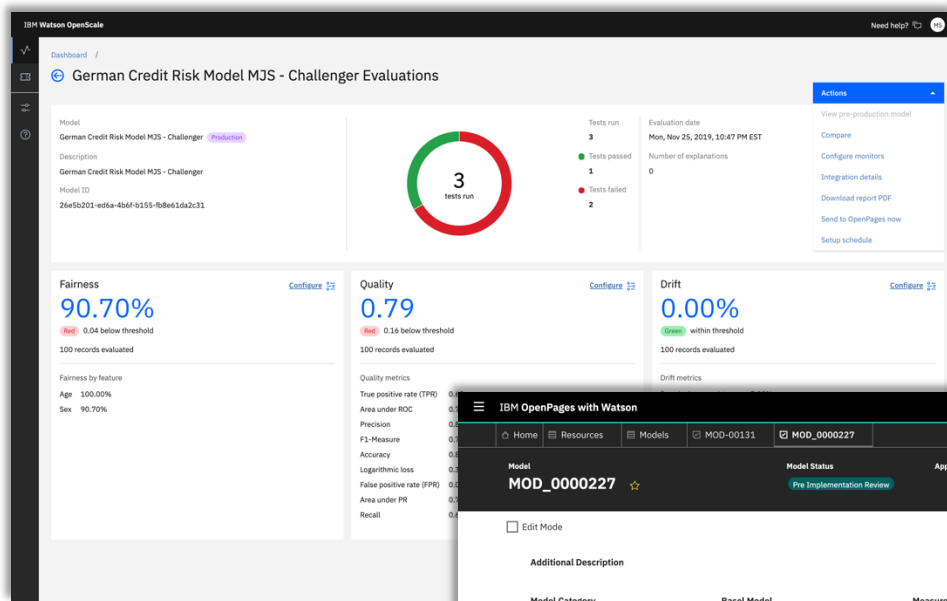


Model Risk Management with IBM Watson OpenScale and IBM OpenPages MRG Beta User Guide



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Model Risk Management with IBM Watson OpenScale for IBM Cloud Pak for Data & IBM OpenPages MRG

WELCOME to the Model Risk Management closed beta for IBM Watson OpenScale for IBM Cloud Pak for Data and IBM OpenPages Model Risk Governance (MRG). In addition to giving some background information about models, model risk, and how to manage it, this guide takes you through the steps of creating pre-production and production models.

Financial institutions manage many complex and integrated areas of risk. Management of model risk is critical to meet regulatory requirements and to protect institutions from operational and reputational risk. It is precisely this scenario that the closed beta is meant to demonstrate.

What is a Model?

The Federal Reserve and Office of the Comptroller of the Currency guidance SR Letter 11-7 defines a Model as “...a quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates.”

These types of models, either deterministic or probabilistic, raise different model risk management challenges.

What is Model Risk?

Model risk is a type of risk that occurs when a mathematical model is used in financial institutions to predict and measure quantitative information, and the model performs inadequately. This can lead to adverse outcomes for the firm and operational losses in millions.

Model Development Cycle

There are many challenges with machine learning and deep learning models. For example, you need to face the lack of knowledge of methods used by model developers or vendors, along with inconsistent documentation and increased volume of model change.

Tests to be run on machine learning and deep learning models differ from straightforward application testing:

- **Drift:** Any change in input data, also known as drift, can cause the model to make inaccurate decisions, impacting business KPIs.
- **Bias:** Although training data may be cleaned to be free from bias, but runtime data may induce biased behavior of model.
- **Explainability:** Traditional statistical models are simpler to interpret and explain, but machine and deep learning models can be complex.
- **Missing Validation/Test Data:** Model training data sets may not capture the range of data or combinations that could be encountered in runtime.

To govern and manage risk, validation and monitoring of AI models are a necessary addition.

OpenScale & OpenPages MRG Integration

IBM offers an end-to-end model risk management solution for financial services with IBM Watson OpenScale and IBM OpenPages with Watson. OpenPages MRG offers model risk governance that enables you to store and manage a comprehensive model inventory. IBM Watson OpenScale monitors and measures outcomes from AI Models across their lifecycle and performs model validations. What is IBM OpenPages Model Risk Governance (MRG)? For more information, see the [IBM OpenPages with Watson product page](#) and the [IBM OpenPages online help](#).

Set up your beta environment

Let's get started! Before you begin using the model risk management features, you'll need to set up the following services on IBM Cloud Pak for Data:

- Watson OpenScale, which provides MRM features and metrics
- Watson Machine Learning (2 separate analytic deployment spaces will be created when you run the beta sample notebook, one for pre-production and one for production).
- A database, such as Db2 Warehouse or another Data source available on Cloud Pak for Data
-
- Watson Studio Local, which provides the ability to run notebooks and secure assets, is already deployed on Cloud Pak for Data. You can gain access to this service through the Project area. (The current tutorial demonstrates how to use Watson Studio Local to create the provided sample models, but you can also use any other IDE to build models.)

Integration system credentials (IBM OpenPages MRG)

For your instance of IBM OpenPages, you are provided access to a Docker image that you must download and provision. For information, refer to the [OpenPages Beta Installation Guide](#). After you install OpenPages, you use it to manage models and view the metrics that are generated by Watson OpenScale. Write the information that you need to connect to IBM OpenPages in the following spaces:

URL	
Username	
Password	

Required file

In addition to the previously mentioned services, you must also have the following sample file:

- IBM_CP4DOP_MRM.ipynb

The file can be downloaded from the following Box folder:
<https://ibm.box.com/v/modelriskmanagement>

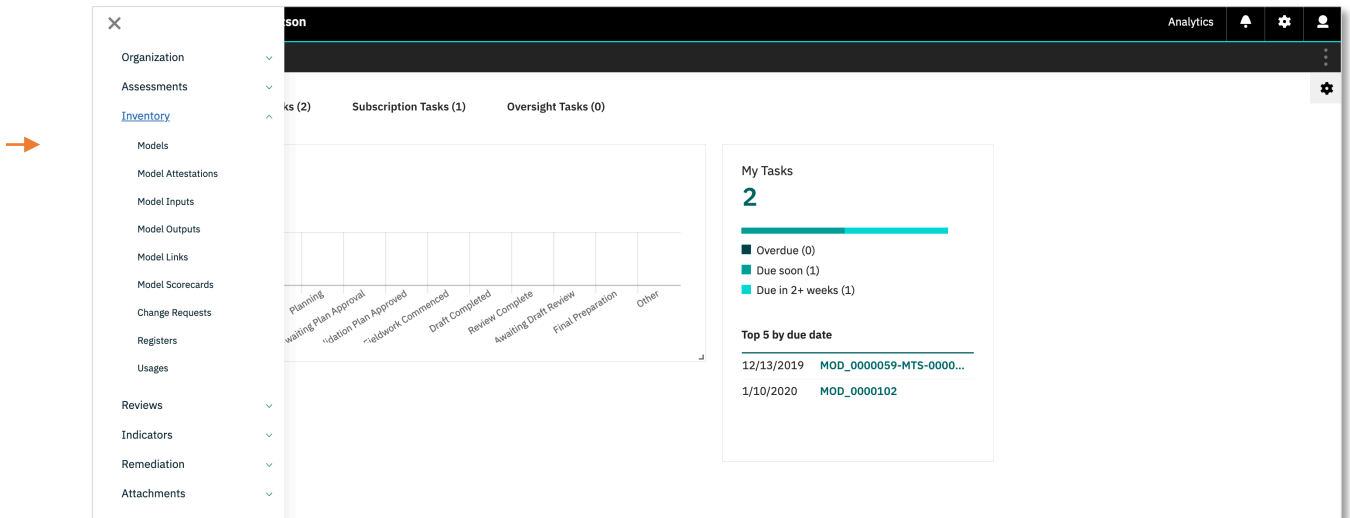


Work in IBM OpenPages

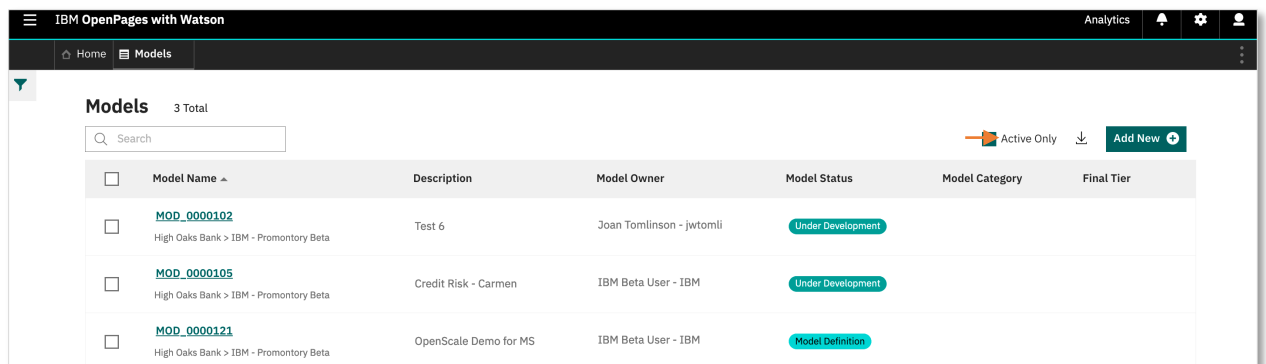
Use this guide to create a new model in OpenPages, take the model through the candidate and development workflows in OpenPages, link the model to an example model OpenScale, explore the OpenScale features, export OpenScale metrics for the model to OpenPages as part of the pre-implementation validation process, and explore the ways to view and interpret these metrics.

Step 1: Set up a New Model in OpenPages

1. Go to menu in the upper left of the screen and select Models under Inventory



2. Click on Add New in the upper right of the screen



3. Complete the following fields:

- Description
- Model Status to "Proposed"
- Model Owner to your account name
- Model Non Model to "Model"
- Machine Learning Model to "Yes"
- Monitored with OpenScale to "Yes"
 - This fields appear once Machine Learning Model is set to "Yes"
- For Parent Entity select the Business Entity with your organization's name

4. Click Save

IBM OpenPages with Watson

Analytics

Home Models *New Model

Model
New Model

Cancel Save

(* required, * modified)

Model Name *
MOD_0000102

*Description *
Test 6

*Model Status
Proposed

*Model Owner *
Joan Tomlinson - jwtml
Search users

*Model Non Model
Model

*Machine Learning Model
Yes

*Monitored with Watson OpenScale
Yes

All Key Items (3)

- Description *
- Model Owner *
- Parent Entities *

Step 2: Move the Model through the Candidate Workflow

For the closed beta, the typical workflow rules are relaxed to enable the same user to move the model through the workflows. Typically, different stages of the workflow would require users assigned to certain roles such as owner, developer, and head of model review.

1. In the model created in Step 1, enter a Candidate Comment and click Save. This field lets the model owner describe why the proposed model is a model and not a non-model.
2. Select the Action “Submit Candidate for Confirmation.” In a live workflow, this step sends the candidate model to a reviewer for approval.

IBM OpenPages with Watson

Analytics

Home Models MOD_0000102

Model MOD_0000102

Candidate Status Model Candidate

Model Non Model Model

Action Submit Candidate for Confirmation

Edit Mode (* required, * modified)

General

Model Name * MOD_0000102

Description * Test 6

Machine Learning Model Yes

Model Non Model * Model

Candidate Comment This is the comment on this candidate model.

Supporting files and artifacts

Search

Add/Update

File Name

No results

Stage Propose Candidate

Due Date 12/14/2019

Propose Candidate

Please submit your assessed Model Candidate to the Model Management group for confirmation.

Select an action to validate

All Key Items (2)

- Model Non Model *
- Candidate Comment

3. Select the Action “Confirm Assessment”. In a live workflow, a reviewer confirms that the model candidate is a model and the candidate workflow is complete.

IBM OpenPages with Watson

Analytics

Home Models MOD_0000102

Model MOD_0000102

Candidate Status Candidate - Awaiting Confirmation

Model Non Model Model

Actions Confirm Assessment Return for Update Override - Non Model

Edit Mode (* required, * modified)

General

Model Name * MOD_0000102

Description * Test 6

Machine Learning Model Yes

Model Non Model * Model

Candidate Comment This is the comment on this candidate model.

Supporting files and artifacts

Search

Add/Update

File Name

No results

Stage App

Due Date 12/14/2019

Candidate Confirmation

Please review the submitted Model Candidate and either:
a) Return to the Model Owner for more information]
b) Confirm the candidate assessment [more](#)

Select an action to validate

All Key Items (2)

- Model Non Model *
- Candidate Comment

Step 3: Move the Model through the Model Development Workflow to the Pre-Implementation Review Stage

1. From the **Action** drop-down menu, click **Start Model Development**.

The screenshot displays the IBM OpenPages with Watson interface. The top navigation bar includes a hamburger menu, the text "IBM OpenPages with Watson", and icons for Analytics, a bell, a gear, and a user profile. Below this is a breadcrumb trail: Home > Models > MOD_0000102 > *New Review. The main header area shows the model name "MOD_0000102" with a star icon, the "Model Status" as "Proposed", and buttons for "Approval Expected Date", "Final Tier", and "Action". The "Action" button is expanded, showing "Start Model Development".

The main content area is divided into two panels. The left panel, titled "Edit Mode" (with a red asterisk indicating required fields), contains a form for the model details. The right panel, titled "Pre Implementation Review", contains instructions and a list of actions.

Model		
Model Name *	Description	Model Status
MOD_0000102	Test 6	Proposed

Version	Model Category	Basel Model	Measurement Type
1			

Additional Description	Model Owner *	Model Delegate	Developer
	Joan Tomlinson - jwtomli		

Model Development Details

OpenScale Metrics

OpenScale Metrics

Pre Implementation Review

Please undertake Model Pre Implementation Review.

Before marking this development stage complete and submitting the Model for Deployment approval, the Review workflow **must** be complete.

Adding a Model Review

- Click on **Add Model Pre Implementation Review**.
- When created, the Review object will enter the Pre Implementation Review workflow.
- Once the Review workflow is complete **submit** the Model for Approval

[less](#)

2. Complete the required fields in the Model object that are related to the development – they are listed on the right side panel – and save.
3. For purposes of this testing, you can enter your user account as the developer.

IBM OpenPages with Watson

Analytics

Home Models MOD_0000102 New Review

Model MOD_0000102

Model Owner Joan Tomlinson - jwtml

Model Status Model Definition

Cancel Save

☐ Edit Mode (* required, * modified)

> Last Updated Model Scorecard

> Model Development

▼ Model Development Planning

Proposed dates

For tracking purposes Proposed dates will be stored as original dates upon completion of this workflow task

*Proposal Expected Date *	*Definition Expected Date *	*Development Expected Date *	*Approval Expected Date *
12/10/2019	12/12/2019	12/14/2019	12/16/2019

> Associations

> Issues and Documents

▼ Administration

Due Date 12/21/2019

Definition and Planning

Choose to assign the Model to a Developer, or choose to put planning on hold for this Model.

Select an action to validate

All Key Items (6)

- Model Owner *
- Proposal Expected Date *
- Definition Expected Date *
- Development Expected Date *
- Approval Expected Date *
- Developer

4. Select Action “Assign to Developer”

IBM OpenPages with Watson

Analytics

Home Models MOD_0000102 New Review

Model MOD_0000102

Model Owner Joan Tomlinson - jwtml

Model Status Model Definition

Cancel Save

☐ Edit Mode (* required, * modified)

Model Name * MOD_0000102

Description Test 6

Additional Description

Model Status Model Definition

Candidate Status Confirmed

Model Non Model Model

Model Category

Basel Model

Measurement Type

Model Owner * Joan Tomlinson - jwtml

Model Delegate

Model Type

Machine Learning Model Yes

Monitored with Watson OpenScale Yes

▼ Last Updated Model Scorecard

Overall Materiality Weighted Score Overall Operational Weighted Score Overall Complexity Weighted Score Overall Regulatory Weighted Score

Due Date 12/21/2019

Definition and Planning

Choose to assign the Model to a Developer, or choose to put planning on hold for this Model.

Select an action to validate

All Key Items (6)

- Model Owner *
- Proposal Expected Date *
- Definition Expected Date *
- Development Expected Date *
- Approval Expected Date *
- Developer

Actions

- Assign to Developer
- Place Planning on Hold

5. Select Action “Submit for Pre Implementation Review”

The screenshot shows the IBM OpenPages with Watson interface. The top navigation bar includes 'Home', 'Models', 'Workflows', 'Model Development', and 'Analytics'. The main content area displays details for model 'MOD_0000102'. The 'Model Status' is 'Under Development'. The 'Development Expected Date' is '12/14/2019'. The 'Final Tier' is 'Final Tier'. The 'Model Name' is 'MOD_0000102'. The 'Description' is 'Test 6'. The 'Model Status' is 'Under Development'. The 'Candidate Status' is 'Confirmed'. The 'Machine Learning Model' is 'Yes'. The 'Monitored with Watson OpenScale' is 'Yes'. The 'Model Category' is 'Basel Model'. The 'Measurement Type' is 'Developer'. The 'Model Owner' is 'Joan Tomlinson - jwtml'. The 'Model Delegate' is 'Joan Tomlinson - jwtml'. The 'Developer' is 'Joan Tomlinson - jwtml'. The 'Last Updated Model Scorecard' is shown at the bottom. On the right, there is a 'Stage' section with 'Due Date' '1/10/2020'. Below that, there is a 'Model Development and Documentation' section with a 'Please undertake Model Development as agreed with the Model Owner. Ensure that the Model Documentation and the Inventory is up to date before submitting for Pre-Implementation Review/Validation.' message. A 'Select an action to validate' dropdown is shown with a red progress bar indicating '1 item requires attention.' Below this, there is a 'All Key Items (2)' section with 'Model Owner' and 'Risk Tier Assessments' listed.



Work in Watson Studio Local

In IBM Watson Studio Local, you will create a project and run a notebook to perform most of the set-up tasks, including the following steps:

- create 2 machine models
- connect Watson OpenScale to IBM OpenPages
- create model deployments and configure monitors in Watson OpenScale

Step 1: Create the pre-prod project in Watson Studio

When you first start Watson Studio you have the option of taking a tour. Your first task is to create a project to which you associate the Watson Machine Learning instance that you created for your pre-production work.

1. Click the **Navigation Menu** (☰) icon.
2. Click **Projects**.
3. Click **New Project** and then click the **Create an empty project** tile.
4. Give the project a name and description: In the **Name** field, type **MRM – Pre-prod**. You'll use this project for all your pre-production models.
5. Click the **Create** button.

⊕ New project

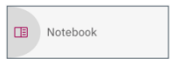
Step 2: Associate your new project with one of the analytic spaces

Now you need to associate your pre-prod project to an analytic space that you designate for pre-production work. A space is really a category that you can use to control access to your pre-production and production environments. Models are assigned into different spaces, with separate authentication access.

1. From the **MRM – Pre-prod** project window, on the **Overview** tab, click **Associate a new or existing deployment space**.
2. In the **Connect to a deployment space** window, click the **New** tab.
3. Type a name, such as **MRM – pre-prod**, and a description and click the **Associate** button.

Step 3: Add the sample beta notebook to the project

As part of your closed beta information package, you were given access to a Watson Studio notebook. You'll use it to set up your connection between Watson OpenScale and IBM OpenPages, to create and deploy pre-prod models, and configure the model deployments in Watson OpenScale.



1. From the project page, click the **Add to project** button.
2. Click the **Notebook** tile.
3. Click the **From file** tab, click the **Choose file** button and then, select the **IBM_CP4DOP_MRM.ipynb** notebook file that you can download from <https://ibm.box.com/v/modelriskmanagement/>
4. Add a name and description and click the **Create notebook** button.

Step 4: Run the sample beta notebook

The newly created notebook is opened in Watson Studio in the integrated notebook editor. You need to update some of the credentials and then run the notebook to create your pre-prod model.

1. In the **Credentials for IBM Cloud Pak for Data** code boxes, paste the following required credentials:
 - a. Watson OpenScale credentials (**WOS_CREDENTIALS**) and GUID (**WOS_GUID**)
 - b. Watson Machine Learning credentials (**WML_CREDENTIALS**)
 - c. Your Db2 credentials (**DATABASE_CREDENTIALS**)
2. In the **Integration system credentials (IBM OpenPages MRG)** code box, paste the credentials that you received from IBM and copied in the preceding **Integration system credentials (IBM OpenPages MRG)** section of this Beta Guide.
3. To restart the notebook and clear the output, from the **Kernel** menu, click **Restart & Clear Output**.
4. Run the notebook each cell at a time by using the Run **Run** option. Ensure that a cell completes before running the next cell. Be sure to read directions for steps that must be taken during the intervening cells. For example, at one point, you are directed to move your model into production before continuing running the notebook.

Congratulations! You have used a notebook to create a pre-prod model. You can check inside Watson Studio, where you will now see the model listed as one of the assets. You have also already deployed this model, which means that you can go to IBM Watson OpenScale to add the model there.



Work in IBM Watson OpenScale

You'll use IBM Watson OpenScale to validate and monitor your models and to process metrics. First, you need to do some set up.

Step 1: Activate model risk management features

As part of the closed beta cohort, you can activate the model risk management beta features on IBM Watson OpenScale. The following sections detail how to activate the beta features on the IBM Cloud Pak for Data environments:

On Cloud Pak for Data

To activate IBM Watson OpenScale in the IBM Cloud Pak for Data environment, you must already have installed IBM Cloud Pak for Data and provisioned your Watson OpenScale instance. Update the environmental variable in the dashboard app by completing the following steps:

1. Open the OpenShift Cluster Console for the **namespace1** namespace: <https://console.apps.<hostname>-lb-1.fyre.ibm.com/k8s/cluster/namespaces/namespace1>
2. Open the **Deployments** page by clicking **Workloads -> Deployment**
3. Click **aiopenscale-ibm-aos-dashboard**
4. Click the **Environment** tab and complete the following steps:
 - a. Add an environment variable **MRM_ENABLED** by clicking **Add Value** link. (Only for IBM internal builds it is added automatically.)
 - b. Change the value of the environment variable **MRM_ENABLED** to **true** (default value is false). When you don't need it, you can delete it by clicking its (-) icon.
5. Click the **Save Changes** button to apply the changes in the pod.

The **aiopenscale-ibm-aos-dashboard** pod is restarted, and the change is applied in the pod.

Note: Ensure that whenever you work inside IBM OpenPages that your profile indicates that you are integrating your work with OpenScale. Also, be sure to select the option **Monitored with Watson OpenScale** when creating your model record.

Step 2: Perform analysis in Watson OpenScale

After you run the set-up notebook and activate the MRM beta features, you can both see and compare the sample evaluations in Watson OpenScale. There is a downloadable report, the Model Summary Report, that includes all the quality measures, fairness measures, and drift magnitude.

1. From the **Insights** dashboard, click the model deployment tile
2. From the **Actions** drop-down box, click one of the following analysis options:
 - a. **Past evaluations:** Lists all the previous versions of the evaluation.
 - b. **Compare:** Compare any of the models, but especially versions of the same model, for best performance.
 - c. **Download report PDF:** Generates the model summary report, which gives you all of the metrics and the explanation for why they were scored the way they were.
 - d. **Send to OpenPages now:** Sends all the metrics to the OpenPages model record that you associated to the OpenScale model deployment. In OpenPages, the metrics are listed in the graphical flow diagram and are clickable so that you can drill down into each metric.

Review results in IBM OpenPages

After you send all the metrics to IBM OpenPages, you are able to review the metrics in OpenPages as part of the Pre-Implementation Review.

1. Find the model in IBM OpenPages by using the model name, such as MOD_0000206.
2. Review the metrics from Watson OpenScale by expanding the OpenScale Metrics twisty:

IBM OpenPages with Watson

Analytics

HomeModelsMOD_0000206

Model

MOD_0000206

Model Status

Approved for Deployment

Approval Expected Date

Final Tier

Action

OpenScale Metrics

OpenScale Metrics

Q

Search

Metric Name	OpenScale Description	OpenScale Category	Breach Status
MET_0432 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale drift metric for 'data_drift_magnitude'	Drift	Green
MET_0433 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale drift metric for 'drift_magnitude'	Drift	Green
MET_0434 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale drift metric for 'predicted_accuracy'	Drift	Green
MET_0435 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale drift metric for 'base_accuracy'	Drift	Green
MET_0436 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale fairness metric for 'Sex'	Fairness	Red
MET_0437 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale fairness metric for 'Age'	Fairness	Red
MET_0438 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale quality metric for 'true_positive_rate'	Quality	Green
MET_0439 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale quality metric for 'area_under_roc'	Quality	Green
MET_0440 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale quality metric for 'precision'	Quality	Green
MET_0441 The GFS Company - Legal Entities > Abrucca Limited	Watson OpenScale quality metric for 'f1_measure'	Quality	Green

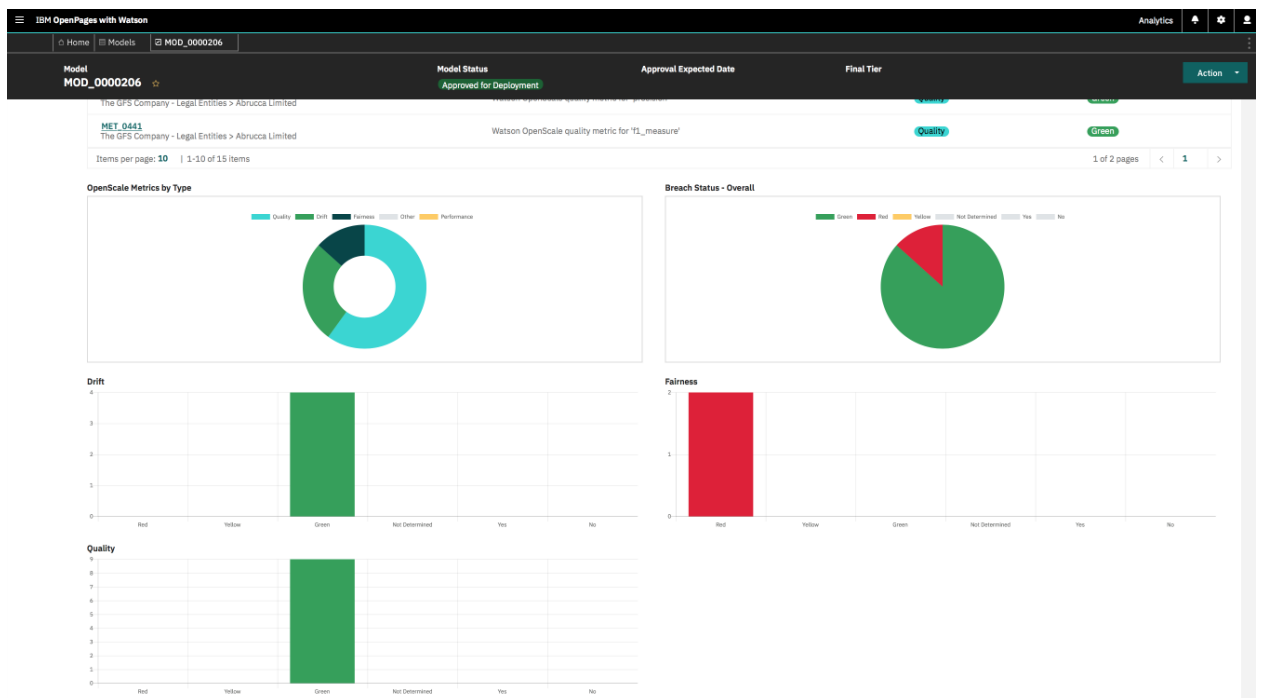
Items per page: 10

1-10 of 15 items

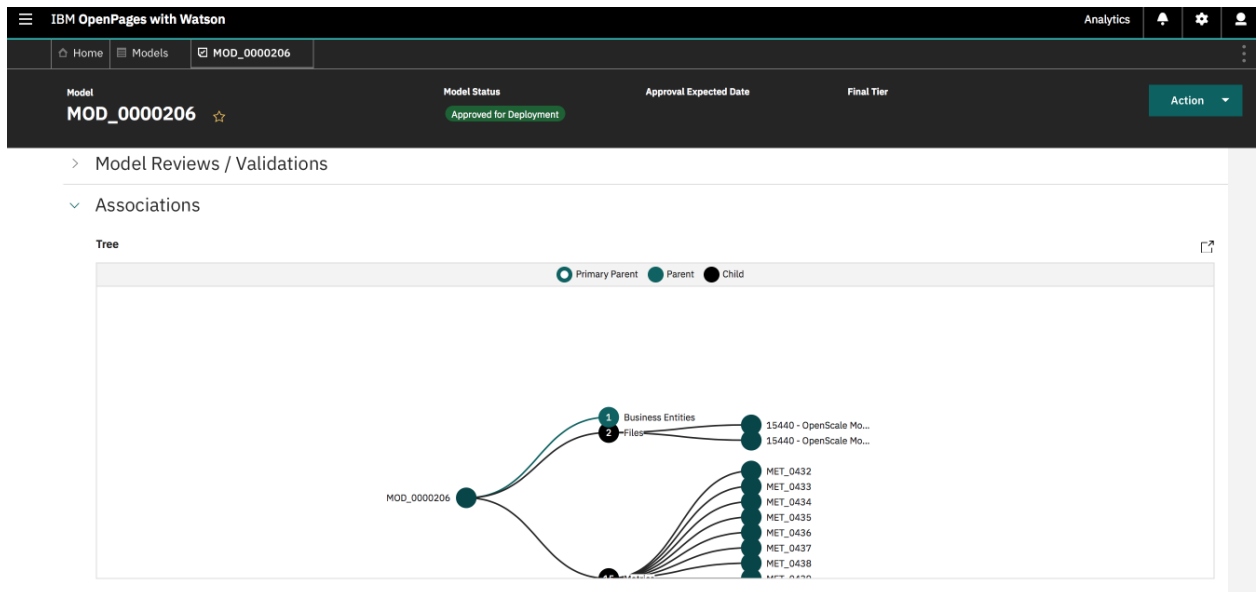
1 of 2 pages

<1>

3. In addition to a list of metrics, you can view metrics by type in a graphical format by expanding the OpenScale Metrics Summary twisty:



4. The Associations view provides relationships in the form of a tree:




5. The **Supporting files and artifacts** pane gives you access to all the Watson OpenScale model risk management reports that are run:


The screenshot shows the IBM OpenPages with Watson interface. The top navigation bar includes 'Home', 'Models', and 'MOD_0000206'. The main header displays 'Model MOD_0000206' with a star icon, 'Model Status: Approved for Deployment', 'Approval Expected Date', and 'Final Tier'. An 'Action' dropdown menu is visible. Below the header, the 'Supporting files and artifacts' section is expanded, showing a search bar and a table of supporting files and artifacts. The table has columns for 'File Name' and 'Priority'. Two files are listed: '15440 - OpenScale Monitoring Report 22 Nov 2019 10-32.pdf' and '15440 - OpenScale Monitoring Report 22 Nov 2019 10-38.pdf', both associated with 'The GFS Company - Legal Entities > Abrucca Limited'. A 'New Issue' button is visible in the top right corner.



Change the model status in IBM OpenPages

As part of the overall model risk governance workflow, the models you create are typically worked on by several different personas or job roles. For example, there might be a data scientist who is the model owner, a model validator, and model reviewer. For the purposes of the beta, you will act in all of these roles to see how the model can progress from one status to the next.

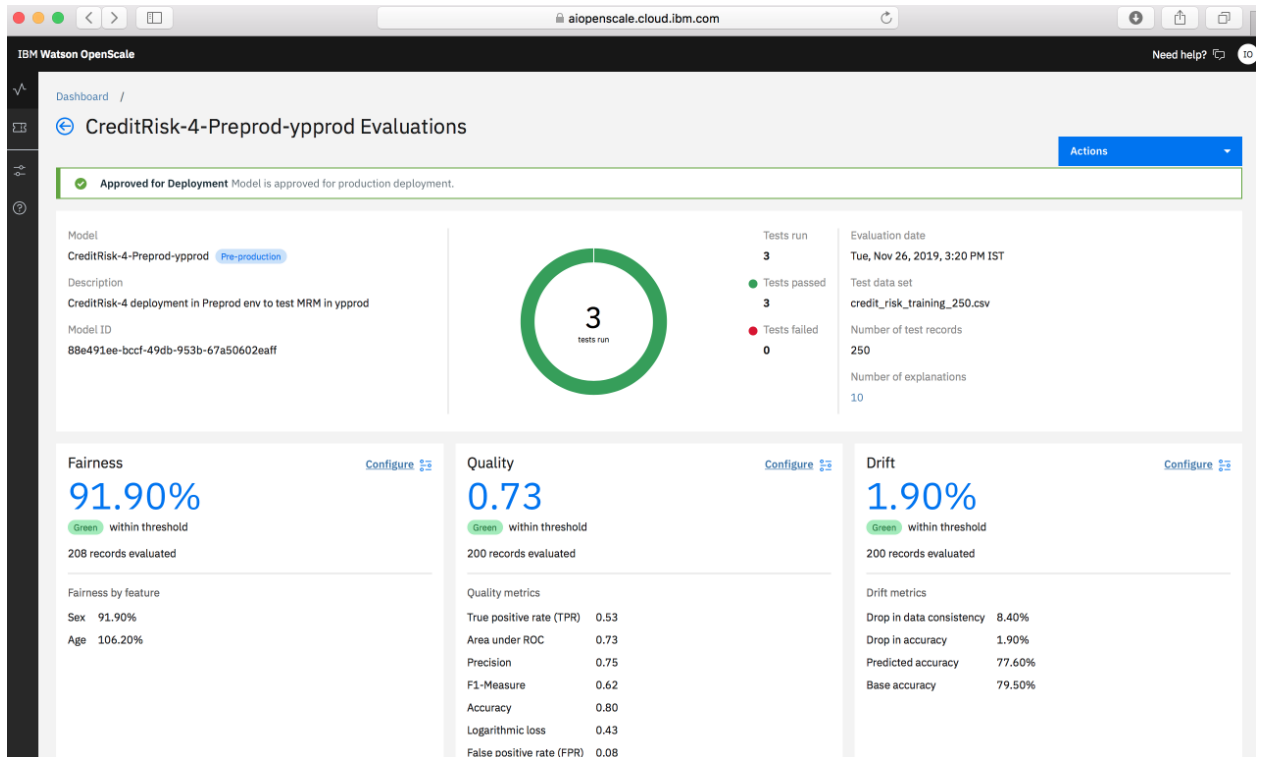
To do this, you must open the model and use the Actions drop-down  box to set the model status. Use the ID, such as OpenPagesAdministrator that was given to you to be the model owner, validator, and final approver. For the next part of the tutorial, you'll want the status to be Approved for Deployment.

1. In IBM OpenPages, locate the model you want to promote.
2. From the Actions drop-down  box, click Approved.
If for some reason, you don't see the Approved option, you might need to move the model through other steps, such as **Submit for Pre Implementation Review** or **Submit for Approval**.

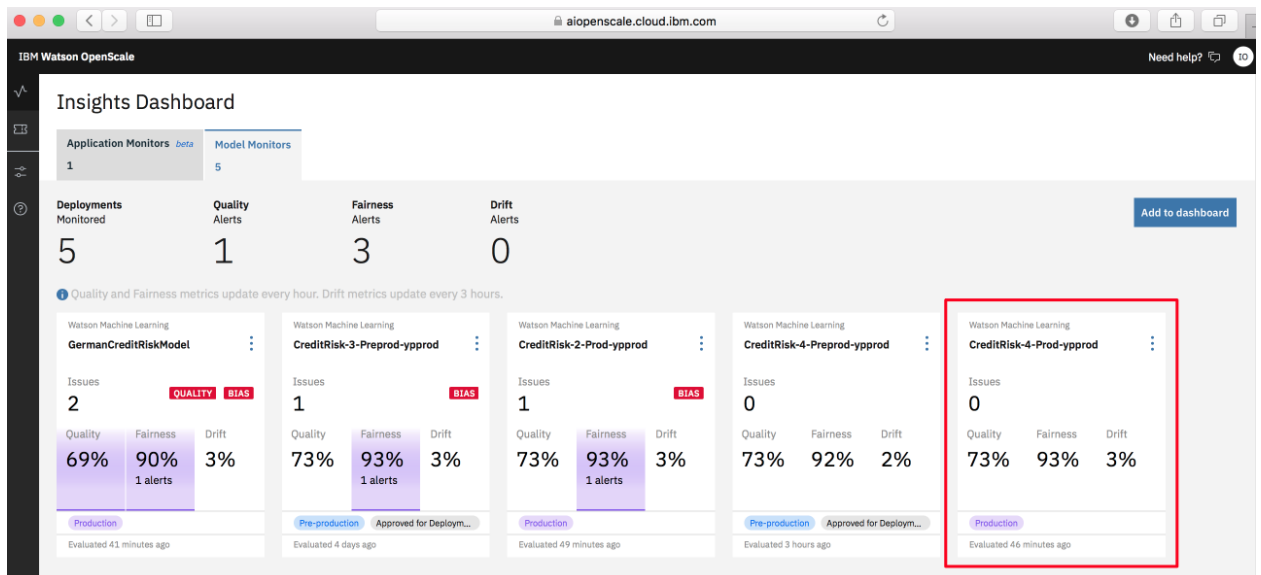
Deploy a new model to production in Watson OpenScale

Push the best model to production. Create a production record by importing from a pre-production model. After the model is approved for deployment in IBM OpenPages, you can send the model to production in Watson OpenScale.

1. Review the status of the model deployment:

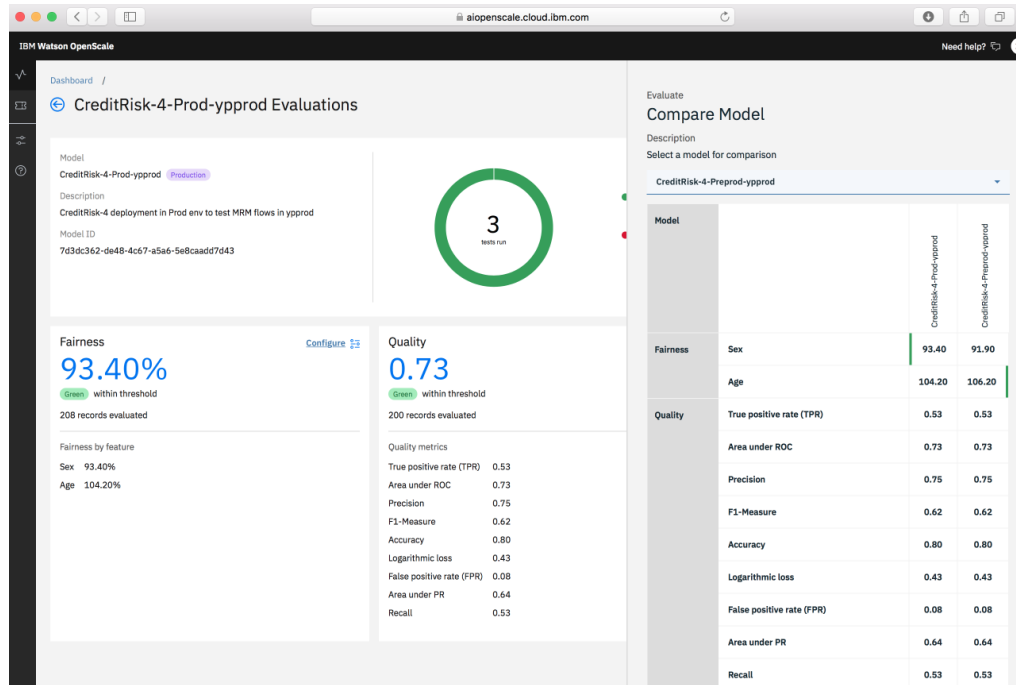


2. Return to the **sample beta notebook** and run the cells to send the model to production.
3. You can now view the production model deployment tile. In a regular production environment, it initially appears empty until enough data is gathered and time has passed for metric calculation to be triggered. For the beta, the notebook adds data and runs the monitors so that you can see the results right away.



Use the analysis of fairness to redefine the model, possibly by using a different algorithm.

Watson OpenScale enables you to compare models by looking at the key metrics in a side-by-side comparison. Use this feature to determine which version of a model is the best one to send to production or which model might need work:



Because of the connection to Watson OpenScale, you can get alerts in IBM OpenPages for items that require attention or missing pieces of information:

The screenshot shows the IBM OpenPages with Watson interface. The main content area displays the configuration for metric **MET_0522**. The **General** section includes fields for Metric Name, Description, Metric Type (Watson OpenScale), Owner, Metric Capturer, and Status (Active). The **Metric Last Value Information** section shows the current value (0.1298) and breach status (Green). The **Metric Values** section displays a table of historical values.

Metric Value Name	Collection Status	Breach Status	Value	Value Date
MET_0522_MV_0008544 The GPS Company - Legal Entities > Abrucca Limited	Collected	Green	0.084	11/26/2019
MET_0522_MV_0008716 The GPS Company - Legal Entities > Abrucca Limited	Collected	Green	0.1298	11/26/2019

A sidebar on the right indicates that 2 items require attention: Description, Owner, Metric Capturer, and Status.

You can set up a regular schedule for sending metrics to IBM OpenPages:

The screenshot shows the IBM Watson OpenScale interface. The main content area displays the 'Set up schedule' dialog box. The dialog box allows users to select metrics to send to OpenPages on a weekly schedule (every Monday at 0:00 PM UTC). The 'drift_buffer_range' metric is highlighted with a red box.

Set up schedule

Select the metrics to send to OpenPages on a weekly schedule (every Monday at 0:00 PM UTC). If the metric is not yet available in OpenPages, a new metric will be created automatically.

Schedule off — ☒ Schedule on

Drift measures	Fairness measures	Quality measures	Report
<input checked="" type="checkbox"/> Drop in data consistency	<input checked="" type="checkbox"/> Sex	<input checked="" type="checkbox"/> True positive rate (TPR)	<input checked="" type="checkbox"/> PDF
<input checked="" type="checkbox"/> Drop in accuracy	<input checked="" type="checkbox"/> Age	<input checked="" type="checkbox"/> Area under ROC	
<input checked="" type="checkbox"/> Predicted accuracy		<input checked="" type="checkbox"/> Precision	
<input checked="" type="checkbox"/> Base accuracy		<input checked="" type="checkbox"/> F1-Measure	
<input checked="" type="checkbox"/> drift_buffer_range		<input checked="" type="checkbox"/> Accuracy	
		<input checked="" type="checkbox"/> Logarithmic loss	
		<input checked="" type="checkbox"/> False positive rate (FPR)	
		<input checked="" type="checkbox"/> Area under PR	
		<input checked="" type="checkbox"/> Recall	

Cancel Save

Note: Ensure that the **drift_buffer_range** metric is **de-selected** before saving your schedule. See **Known issues and limitations for beta** for more information.

Known issues and limitations for beta

Because this is a closed beta, you are working in a non-standard and non-production environment. It is expected that there will be some limitations,

issues, and non-standard ways of working. At the start of the closed beta, the offering management team is aware of the following issues:

Publishing metrics from Watson OpenScale to IBM OpenPages MRG fails on Cloud Pak for Data

If you selected all (or specifically the **drift_buffer_range** metric) metrics while publishing metrics to OpenPages, it fails with the following error:

```
"message_details": "float() argument must be a string or a number, not 'list'"
```

Because publishing metrics to IBM OpenPages happens as a single metric at a time, some metrics are published until the processor encounters the **drift_buffer_range** metric, which causes it to subsequently fail.

Ensure that you de-select the **drift_buffer_range** metric before sending metrics to IBM OpenPages.

Common log per client for IBM OpenPages

Because each client in the closed beta is assigned a single user ID for IBM OpenPages, there will be a single common log that is available to every participant in the closed beta. Clients are responsible for ensuring that no proprietary or personally identifiable information is recorded in the IBM OpenPages log.

Payload logging requires additional submissions for Amazon Web Services binary, Microsoft Azure binary and multiclass, and Native XGBoost binary problem types

If you build your own notebook to try out model risk management features for any of the models that use certain frameworks, you must send the same record for initial scoring a second time. This is needed for the initial setup of payload logging when you configure monitors. The following frameworks and problem types are affected:

- Amazon Web Services binary
- Microsoft Azure binary and multiclass
- Native XGBoost binary

Duplicate deployments appear in the list of deployments when you add a production model to the Insights dashboard

Select a model deployment

Select the deployment you want to monitor.

Machine learning Provider

WML Prod (Production)		
Deployment	Description	Created
German Credit Risk Model - Prod	German Credit Risk Model - Prod	Thu, Dec 5, 2019, 12:59 PM IST
German Credit Risk Model - Prod	German Credit Risk Model - Prod	Thu, Dec 5, 2019, 12:59 PM IST

When you attempt to add a production model to the Insights dashboard, you actually see two listings for the same model.

These are identical and you can choose either item to add to the dashboard.