

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Configure AutoAI experiment

Network Intrusion Detection

Autosaved: 9:42:24 PM

Add data source

Add files such as tabular data (CSV).

Browse Select from project

Test_data.csv
Size: 2.3 MB | Columns: 41

Configure details

Create a time series analysis:

Enable this option to predict future activity over a specified date/time range. Data must be structured and sequential. [Learn more](#)

Yes No

What do you want to predict?

Prediction column [i](#)

protocol_type

PREDICTION TYPE Multiclass Classification

OPTIMIZED FOR Accuracy & run time

CUH remaining: 11.4 CUH

Experiment settings

Run experiment

https://eu-gb.dataplatform.cloud.ibm.com/ml/auto-ml/6262974c-e0e3-4a3a-8464-2d043c945042/configure?projectid=b5521da5-8a11-47df-9702-cf628300a9d3&context=cpdaas

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

https://eu-gb.dataplatform.cloud.ibm.com/ml/auto-ml/6262974c-e0e3-4a3a-8464-2d043c945042/train?projectid=b5521da5-8a11-47df-9702-cf628300a9d3&context=cpdaas

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Progress map ⓘ Prediction column: protocol_type

Relationship map Swap view ↗

Running TEST_DATA.CSV
Starting the AutoAI experiment
Time elapsed: 73 seconds

View log Save code

Pipeline leaderboard ⚡

Rank ↑	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
--------	------	-----------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Progress map ⓘ
Prediction column: protocol_type

Read dataset, Split holdout data, Read training data, Preprocessing, Model selection, Selected algorithm 1, Hyperparameter optimization, Feature engineering, Hyperparameter optimization, Ensemble creation, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, Selected algorithm 3, Hyperparameter optimization, Feature engineering, Hyperparameter optimization, Ensemble creation.

Relationship map
Swap view ↗

Pipeline generation
SELECTED ALGORITHM 1
Composing pipeline P1
Time elapsed: 2 minutes

View log Save code

Pipeline leaderboard ⚡

Rank	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
------	------	-----------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

https://eu-gb.dataplatform.cloud.ibm.com/ml/auto-ml/6262974c-e0e3-4a3a-8464-2d043c945042/train?projectid=b5521da5-8a11-47df-9702-cf628300a9d3&context=cpdaas

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Relationship map ⓘ Prediction column: protocol_type

FEATURE TRANSFORMERS

PIPLINES

TOP ALGORITHMS

100% of training data Test_data.csv

Progress map Swap view ↗

Pipeline generation

SELECTED ALGORITHM 1

Composing pipeline P1

Time elapsed: 2 minutes

View log Save code

Pipeline leaderboard ⚡

Rank	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
------	------	-----------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Progress map ⓘ Prediction column: protocol_type

The progress map illustrates the workflow stages and their parallel execution across multiple pipelines:

- Stages:** Read dataset, Split holdout data, Read training data, Preprocessing, Model selection, Decision Tree Classifier, Selected algorithm 2, Hyperparameter optimization, Feature engineering, Hyperparameter optimization, Ensemble creation.
- Pipelines:** P1, P2, P3, P4, P5, P6, P7, P8, P9.
- Annotations:** A callout for "Selected algorithm 2" points to a step between Model selection and Hyperparameter optimization.

Relationship map

Swap view ↗

Feature engineering

DECISION TREE CLASSIFIER

Started feature engineering for pipeline P3

Time elapsed: 3 minutes

View log Save code

Pipeline leaderboard ▾

Rank ↑	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
--------	------	-----------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison

★ Rank by: Accuracy (Optimized) | Cross validation score

Selected algorithm 2

Hyperparameter optimization

Feature engineering

Hyperparameter optimization

Ensemble creation

Started feature engineering for pipeline P3

Time elapsed: 3 minutes

View log Save code

Pipeline leaderboard

Rank	Name	Algorithm	Accuracy (Optimized) Cross Validation	Enhancements	Build time
1	Pipeline 2	Decision Tree Classifier	0.997	HPO-1	00:00:10
2	Pipeline 1	Decision Tree Classifier	0.997	None	00:00:05

Hot days ahead
86°F

Search

9:49 PM 8/10/2025

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Progress map ⓘ
Prediction column: protocol_type

The progress map illustrates the workflow from dataset to ensemble creation. It starts with 'Read dataset' and 'Split holdout data'. Following these, the process moves through 'Read training data', 'Preprocessing', and 'Model selection'. From 'Model selection', the path splits into two main parallel paths. The first path leads to 'Decision Tree Classifier' (marked with a purple circle), which then branches into 'Hyperparameter optimization' (P1) and 'Feature engineering' (P2). The second path leads to 'Snap Random Forest Classifier' (marked with a blue circle), which then branches into 'Hyperparameter optimization' (P5), 'Feature engineering' (P6), 'Hyperparameter optimization' (P7), and finally 'Ensemble creation' (P8). A final step, 'P9', is shown at the end of the ensemble creation path.

Relationship map Swap view ↗

The relationship map displays correlations between different stages of the pipeline. Nodes represent stages like 'Hyperparameter optimization', 'Feature engineering', and 'Ensemble creation', each with a unique color (purple, blue, grey, and white). The size of the nodes indicates their importance or correlation strength. A large central node is labeled 'Hyperparameter optimization' and 'SNAP RANDOM FOREST CLASSIFIER'. Below it, text indicates 'Starting hyperparameter optimization for pipeline P6' and 'Time elapsed: 4 minutes'. At the bottom right of the map area are 'View log' and 'Save code' buttons.

Hyperparameter optimization
SNAP RANDOM FOREST CLASSIFIER
Starting hyperparameter optimization for pipeline P6
Time elapsed: 4 minutes

View log Save code

Pipeline leaderboard ⚡

Rank ↑	Name	Algorithm	Specialization	Accuracy (Optimized)	Enhancements	Build time
--------	------	-----------	----------------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Relationship map ⓘ Prediction column: protocol_type

FEATURE TRANSFORMERS

PIPLINES

TOP ALGORITHMS

100% of training data Test_data.csv

Progress map Swap view

Hyperparameter optimization

SNAP RANDOM FOREST CLASSIFIER

Starting hyperparameter optimization for pipeline P8

Time elapsed: 4 minutes

View log Save code

Pipeline leaderboard ▾

Rank ↑	Name	Algorithm	Specialization	Accuracy (Optimized) Cross Validation	Enhancements	Build time
--------	------	-----------	----------------	--	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Progress map ⓘ Prediction column: protocol_type

Relationship map

Swap view ↗

Experiment completed ✓

9 PIPELINES GENERATED

9 pipelines generated from algorithms. See pipeline leaderboard below for more detail.

Time elapsed: 5 minutes

View log Save code

Pipeline leaderboard ▾

Rank ↑	Name	Algorithm	Specialization	Accuracy (Optimized)	Enhancements	Build time
--------	------	-----------	----------------	----------------------	--------------	------------

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison ★ Rank by: Accuracy (Optimized) | Cross validation score

Snap Random Forest Classifier Hyperparameter optimization Feature engineering Hyperparameter optimization Ensemble creation pipeline leaderboard below for more detail.

Time elapsed: 5 minutes

View log Save code

Pipeline leaderboard

Rank ↑	Name	Algorithm	Specialization	Accuracy (Optimized) Cross Validation	Enhancements	Build time
1	Pipeline 4	Decision Tree Classifier		0.999	HPO-1 FE HPO-2	00:00:54
2	Pipeline 3	Decision Tree Classifier		0.999	HPO-1 FE	00:00:48
3	Pipeline 9	Batched Tree Ensemble Classifier (Snap Random Forest Classifier)	INCR	0.999	HPO-1 FE HPO-2 BATCH	00:01:03
4	Pipeline 8	Snap Random Forest Classifier		0.999	HPO-1 FE HPO-2	00:00:58

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Projects / Network Intrusion Detection / Network Intrusion Detection

Experiment summary Pipeline comparison

★ Rank by: Accuracy (Optimized) | Cross validation score

Relationship map ⓘ
Prediction column: protocol_type

FEATURE TRANSFORMERS

PIPLINES

TOP ALGORITHMS

Test_data.csv

Progress map
Swap view ↗

Experiment completed ✓
9 PIPELINES GENERATED
9 pipelines generated from algorithms. See pipeline leaderboard below for more detail.
Time elapsed: 5 minutes

View log Save code

Pipeline leaderboard ▾

Rank	Name	Algorithm	Specialization	Accuracy (Optimized)	Enhancements	Build time
1	Pipeline 1	Random Forest	General	95.0%	High	10 minutes
2	Pipeline 2	SVM	Text	94.0%	Medium	8 minutes
3	Pipeline 3	Decision Tree	General	93.0%	Low	12 minutes
4	Pipeline 4	Naive Bayes	Text	92.0%	Medium	9 minutes
5	Pipeline 5	Logistic Regression	General	91.0%	Low	11 minutes
6	Pipeline 6	KNN	Text	90.0%	Medium	10 minutes
7	Pipeline 7	Ensemble	General	89.0%	High	12 minutes
8	Pipeline 8	Neural Network	Image	88.0%	Medium	11 minutes
9	Pipeline 9	Support Vector Machine	Text	87.0%	Low	10 minutes

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Save as

Select asset type

Model

Create a watsonx.ai Runtime model asset that you can test with new data, deploy to generate predictions, and trace lineage activity.

Notebook

Create a notebook if you want to view the code that created this model pipeline or interact with the model programmatically.

Define details

Name

P4 - Decision Tree Classifier: Network Intrusion Detection

Description (optional)

Model description

Tags

Add tags to make assets easier to find.

Add a tag

Cancel

Create

The screenshot shows a web browser window for the IBM Watsonx.ai Studio. The URL in the address bar is <https://eu-gb.dataplatform.cloud.ibm.com/ml/auto-ml/6262974c-e0e3-4a3a-8464-2d043c945042/train?projectid=b5521da5-8a11-47df-9702-cf628300a9d3&context=cpdaas>. The page title is "Save as". On the left, there are tabs for "New tab", "ibm cloud - Se", "CropRecommen", "IBM watsonx.ai", "Service Details", "Network Intrus", "Network Intrus", "Anomaly Detect", "IBM SkillsBuild", and a "+" sign. The main content area has a search bar "Search in your workspaces" and a navigation bar with "Projects / Network Intrusion Detection / Network Intrusion Detection". Below this, there are sections for "Experi", "Pipe", and a star icon. The "Select asset type" section contains two options: "Model" (selected) and "Notebook". The "Model" section has a description: "Create a watsonx.ai Runtime model asset that you can test with new data, deploy to generate predictions, and trace lineage activity.". The "Notebook" section has a description: "Create a notebook if you want to view the code that created this model pipeline or interact with the model programmatically.". The "Define details" section includes fields for "Name" (set to "P4 - Decision Tree Classifier: Network Intrusion Detection"), "Description (optional)" (set to "Model description"), and "Tags" (with a placeholder "Add tags to make assets easier to find."). At the bottom, there are "Cancel" and "Create" buttons, with "Create" being highlighted in blue.

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

https://eu-gb.dataplatform.cloud.ibm.com/ml-runtime/models/84070177-a85d-41cd-bd56-1e1fa4580375?project_id=b5521da5-8a11-47df-9702-cf628300a9d3&context=cp...

Projects / Network Intrusion Detection / P4 - Decision Tree Classifier: Network Intrusion Detection

About this asset

Name: P4 - Decision Tree Classifier: Network Intrusion Detection

Description: No description provided.

Asset Details: Type: wml-hybrid_0.1, Model ID: 84070177-a85d-41...
Software specification: hybrid_0.1, Hybrid pipeline software specifications: autoai-kb_rt24.1-py3.11

Tags: Add tags to make assets easier to find.

Last modified: 9 seconds ago by Vikas Yadav

Created on: Aug 10, 2025 by Vikas Yadav

Input (1)

Column	Type
count	double
diff_srv_rate	double
dst_bytes	double
dst_host_count	double
dst_host_diff_srv_rate	double
dst_host_rerror_rate	double
dst_host_same_src_port_rate	double
dst_host_same_srv_rate	double

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Promote to space

Promote the asset to a deployment space to deploy the asset or to support a deployment

Create a deployment space

Use a space to collect assets in one place to create, run, and manage deployments

Why + New Local file

Define details

The space " Network Intrusion Detection Deploy" is being created.

Step 1 of 1. Creating deployment space.

Deployment stage

Cancel

Creating...

This screenshot shows the 'Promote to space' dialog in IBM WatsonX AI Studio. The dialog is titled 'Create a deployment space' and explains its purpose: 'Use a space to collect assets in one place to create, run, and manage deployments'. It includes a 'Why' section with a checkbox and a '+ New' button, and a 'Local file' option. A central panel titled 'Define details' displays the message 'The space " Network Intrusion Detection Deploy" is being created.' Below this, a progress bar shows 'Step 1 of 1. Creating deployment space.' and 'Deployment stage'. At the bottom, there are 'Cancel' and 'Creating...' buttons. The background shows the project navigation bar and some workspace cards.

New tab | ibm cloud - Se... | CropRecomm... | P4 - Decision Ti... | Service Details | SB4Academia_ | Network Intrus... | Anomaly Detect... | IBM SkillsBuild | +

https://eu-gb.dataplatform.cloud.ibm.com/ml-runtime/models/4416e0a6-3b06-43a0-916d-dc54de2bc58e?space_id=194847db-5c63-4b03-b3fa-0ef72602151f&context=cpdaas

IBM watsonx.ai Studio Search in your workspaces Upgrade ? Bell Vikas Yadav's Account London VY

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection

Create a deployment

Associated asset
P4 - Decision Tree Classifier: Network Intrusion Detection

Deployment type

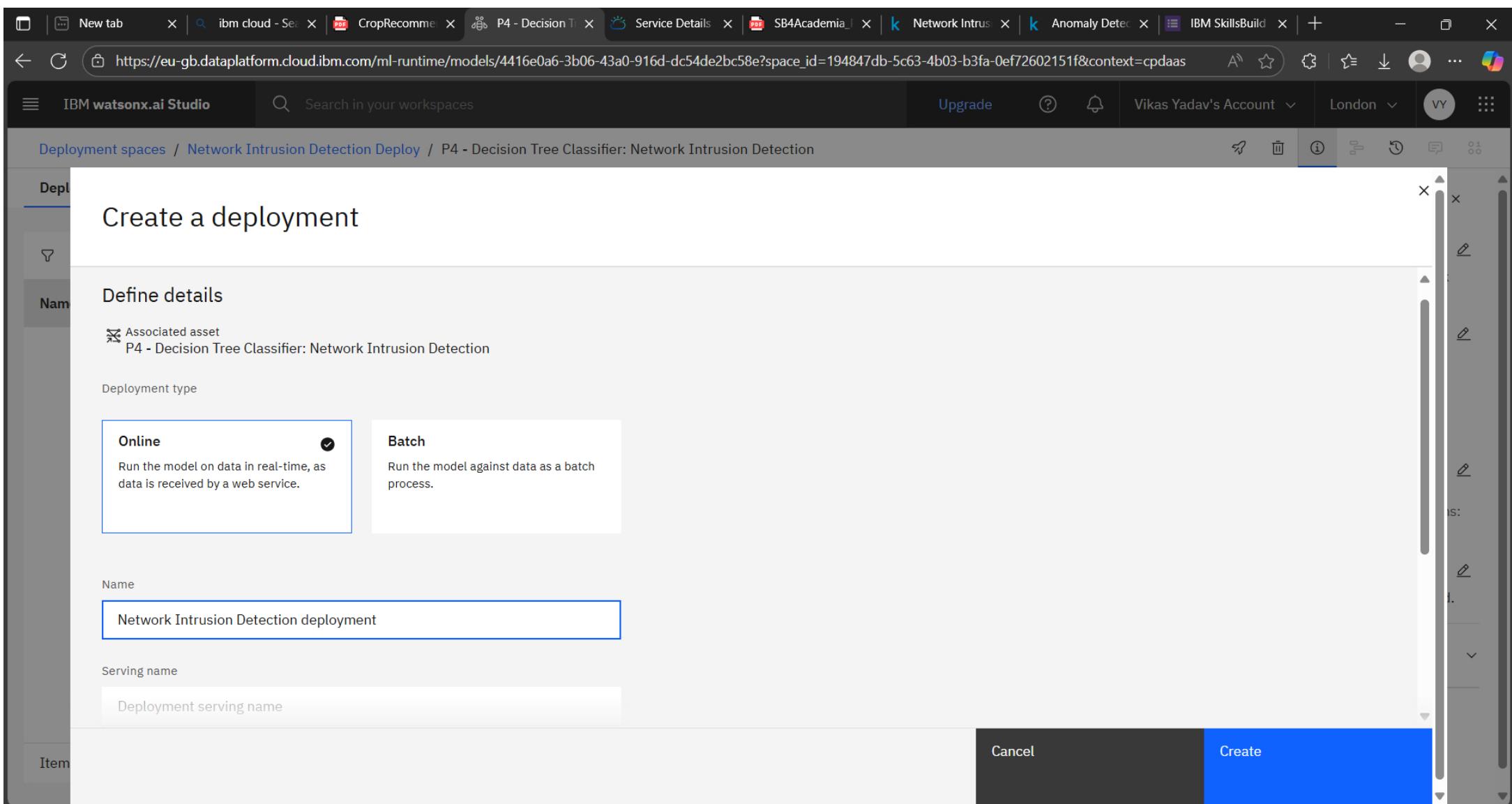
Online
Run the model on data in real-time, as data is received by a web service.

Batch
Run the model against data as a batch process.

Name

Serving name

Cancel Create



IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection

Deployments Model details

New deployment

Name	Type	Status	Tags	Last modified
Network Intrusion Detection deployment	Online	Deployed		27 seconds ago Vikas Yadav (You)

Items per page: 20 1–1 of 1 items

1 of 1 pages

About this asset

Name: P4 - Decision Tree Classifier: Network Intrusion Detection

Description: No description provided.

Asset Details

Type: wml-hybrid_0.1

Model ID: 4416e0a6-3b06-43...

Software specification: hybrid_0.1

Hybrid pipeline software specifications: autoai-kb_rt24.1-py3.11

Tags

Add tags to make assets easier to find.

Source asset details

Last modified: 1 minute ago by Vikas Yadav

Created on: Aug 10, 2025 by Vikas Yadav

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection /

Network Intrusion Detection deployment

Deployed Online

API reference Test

Endpoints for scoring ⓘ

Private endpoint

https://private.eu-gb.ml.cloud.ibm.com/ml/v4/deployments/13b67500-d3d8-42dd-ab02-211ffe9f1257/predict

Bearer <token> ⓘ

IAM

Public endpoint

https://eu-gb.ml.cloud.ibm.com/ml/v4/deployments/13b67500-d3d8-42dd-ab02-211ffe9f1257/predictions?ve

Learn more about the 2021-05-01 version query parameter

Code snippets

cURL Java JavaScript Python Scala

```
# NOTE: you must set $API_KEY below using information retrieved from your IBM Cloud account (https://eu-gb.dataplatfrom.cloud.ibm.com/docs)
export API_KEY=<your API key>

export IAM_TOKEN=$(curl --insecure -X POST --location "https://iam.cloud.ibm.com/identity/token" \
--header "Content-Type: application/x-www-form-urlencoded" \
```

About this deployment

Name: Network Intrusion Detection deployment

Description: No description provided.

Deployment Details

Deployment ID: 13b67500-d3d8-42...
Serving name: No serving name.
Software specification: hybrid_0.1 ⓘ
Hybrid pipeline software specifications: autoai-kb_rt24.1-py3.11
Copies: 1

Tags

Add tags to make assets easier to find.

Associated asset

P4 - Decision Tree Classifier: Network Intrusion Detection

Last modified

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection /

Network Intrusion Detection deployment

Deployed Online

API reference Test

Enter input data

Text JSON

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

Download CSV template ↴ Browse local files ↗ Search in space ↗ Clear all ×

	duration (double)	service (other)	flag (other)	src_bytes (double)	dst_bytes (double)	land (double)	wrong_fragment (double)	urgent (double)	hot (double)	num_failed_logins (double)
1	Start typing or drag and drop a CSV file...									
2										
3										
4										
5										

0 rows, 40 columns

Predict

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection /

Network Intrusion Detection deployment

Deployed Online

API reference Test

Enter input data

Text JSON

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

Download CSV template ↴ Browse local files ↗ Search in space ↗ Clear all ×

	duration (double)	service (other)	flag (other)	src_bytes (double)	dst_bytes (double)	land (double)	wrong_fragment (double)	urgent (double)	hot (double)	num_failed_suspects (double)
1	0	private	SF	316	299	0	0	0	0	0
2	1	private	REJ	0	0	0	0	0	1	0
3	0	smtp	S3	1005	522	0	0	0	0	1
4	2	telnet	RSTO	220	766	0	0	0	0	0
5										0

4 rows, 40 columns

Predict

IBM watsonx.ai Studio

Search in your workspaces

Upgrade

Vikas Yadav's Account

London

Prediction results

CropRecommender Network Intrusion Detection Service Details SB4Academia Network Intrusion Anomaly Detection IBM SkillsBuild

https://eu-gb.dataplatform.cloud.ibm.com/ml-runtime/deployments/13b67500-d3d8-42dd-ab02-211ffe9f1257/test?space_id=194847db-5c63-4b03-b3fa-0ef72602151f&context=c...

Deployment spaces / Network Intrusion Detection Deploy / P4 - Decision Tree Classifier: Network Intrusion Detection /

Prediction type
Multiclass classification

Prediction percentage

4 records

udp tcp

Confidence level distribution

Display format for prediction results

Table view JSON view

Show input data

	Prediction	Confidence
1	udp	100%
2	tcp	100%
3	tcp	100%
4	tcp	100%
5		
6		
7		
8		
9		
10		
11		

Download JSON file