Published in GrabNGoInfo

Amy @GrabNGoInfo Follow
Mar 30, 2022 · 7 min read · ✦ · ▶ Listen

Save

Databricks Mount To AWS S3 And Import Data

Mount AWS S3 to Databricks using access key and secret key, read from and write to S3 buckets

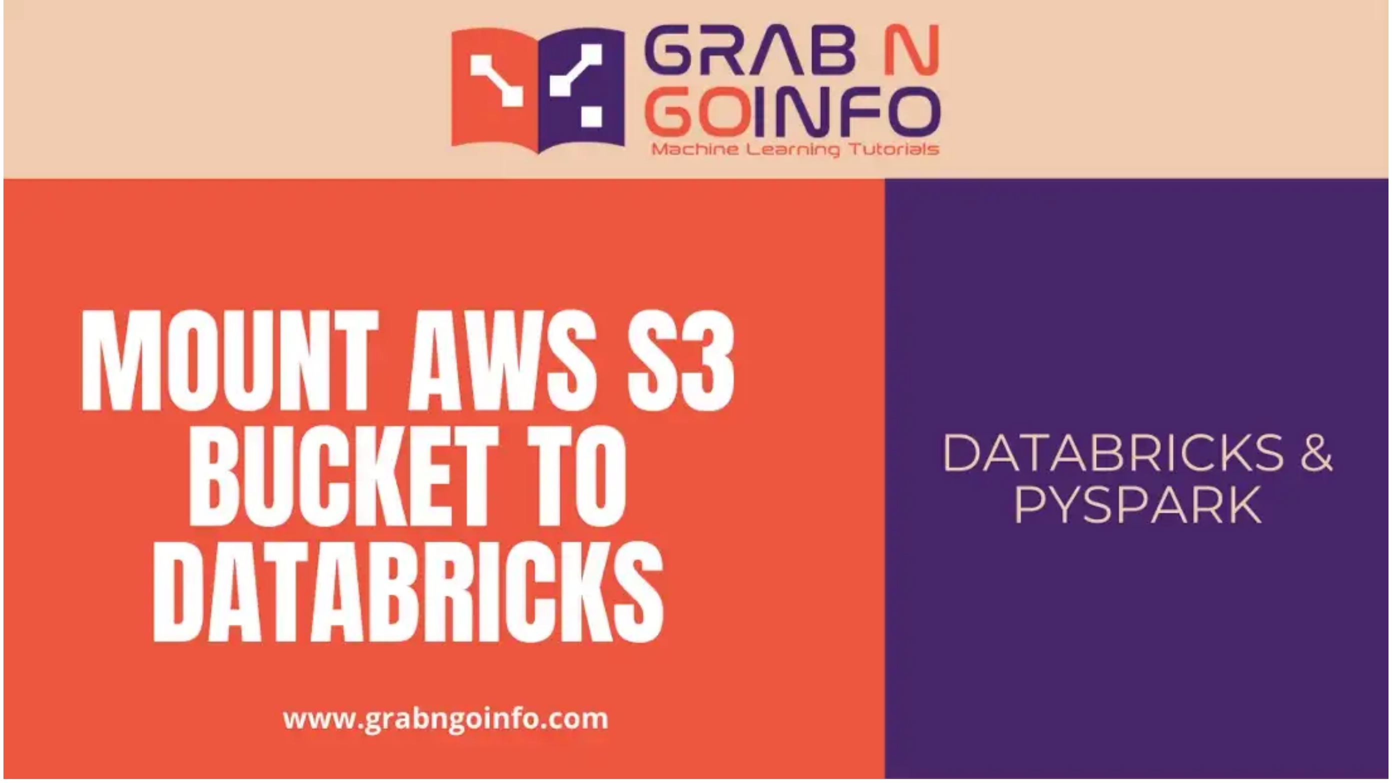


Image Owned by GrabNGoInfo.com

Databricks is a company founded by the creators of Apache Spark. The same name also refers to the data analytics platform that the company created.

To create a Databricks account, go to https://databricks.com/try-databricks . You can choose between the free community version and the paid version.

In this tutorial, I will talk about

- How to create an access key and secret key for Databricks in AWS?
- How to mount Databricks to AWS S3 bucket?
- How to read CSV files from the mounted AWS S3 bucket?
- How to write data from Databricks to AWS S3 bucket?

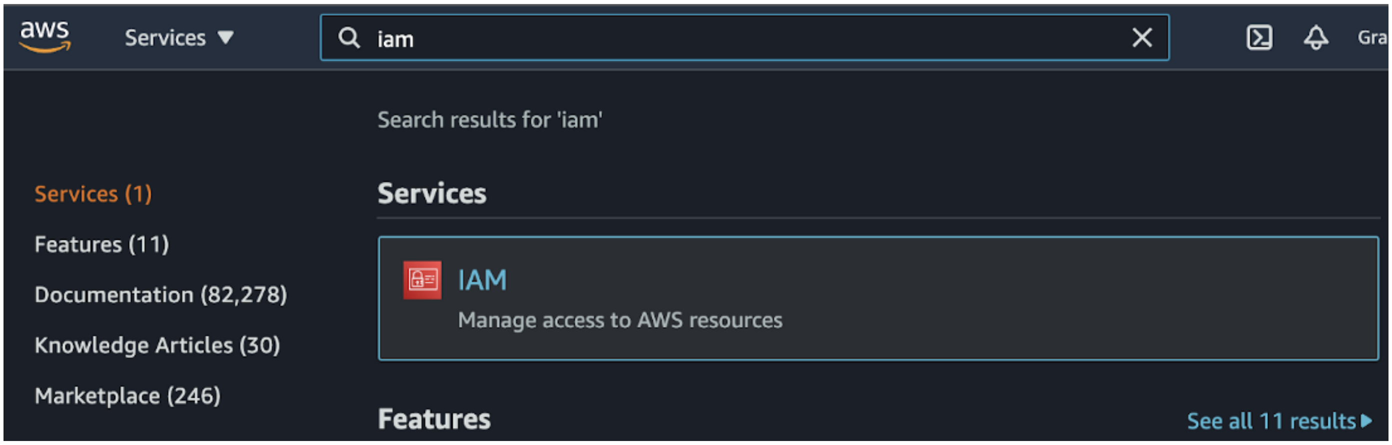
Resources for this post:

- Video tutorial on YouTube
- Click here for Databricks notebook
- More video tutorials on Databricks
- More blog posts on Databricks

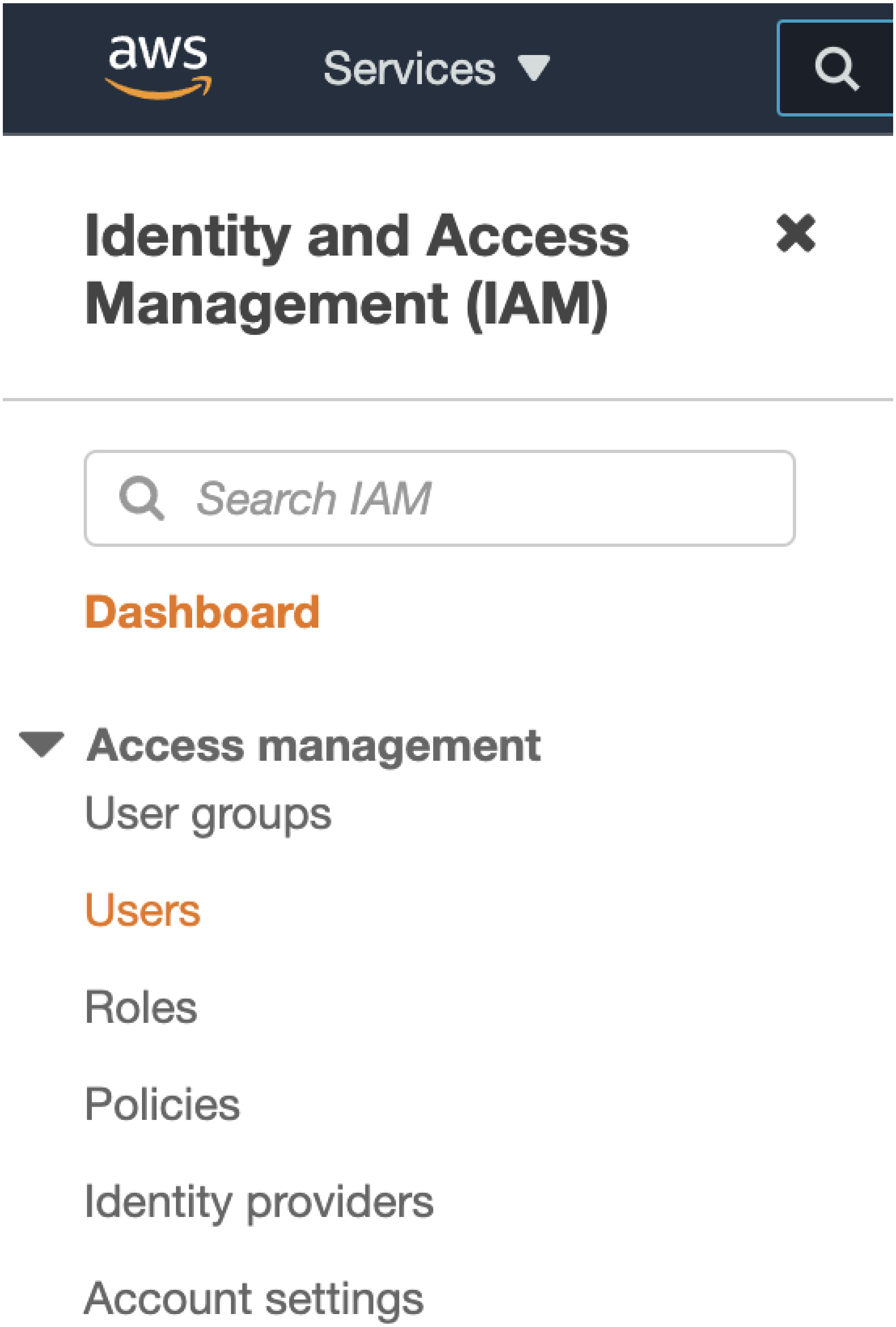
Let's get started!

Step 1: Create AWS Access Key And Secret Key For Databricks

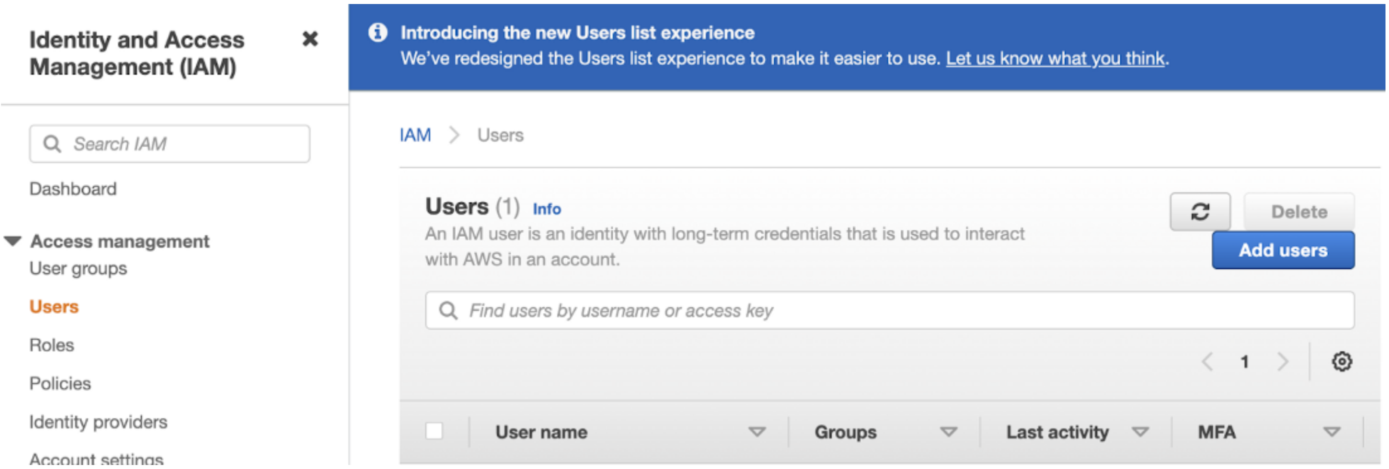
Step 1.1: After uploading the data to an S3 bucket, search IAM in the AWS search bar and click IAM from the search results.



Step 1.2: Click **Users** under **Access management** on the left-hand side of the page.



Step 1.3: Click the blue **Add users** button.

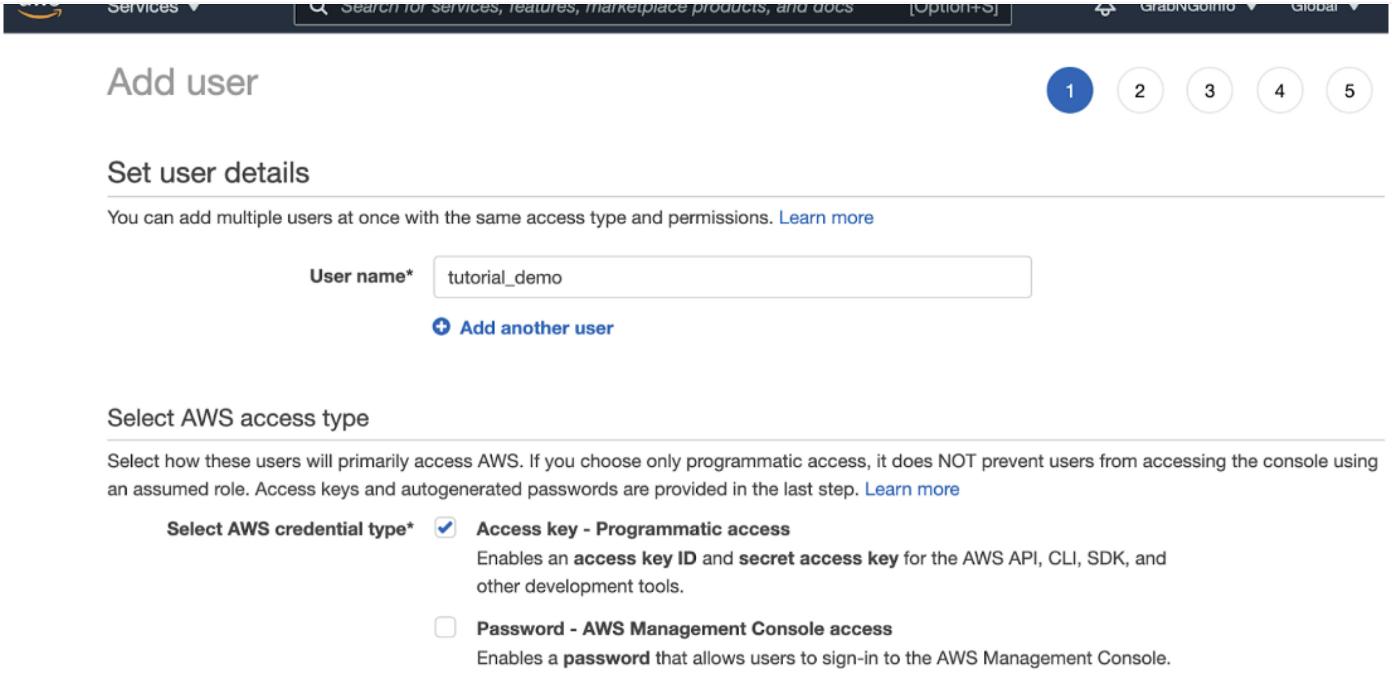


Introducing the new Users list experience
We've redesigned the Users list experience to make it easier to use. Let us know what you think.

Users (1)

An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

Find users by username or access key


Services
Search for services, features, marketplace products, and docs
[Option+S]
GrabNGoInfo
Global
1
2
3
4
5
Add another user

Add user

Set user details

You can add multiple users at once with the same access type and permissions. Learn more

User name* tutorial_demo

Select AWS access type

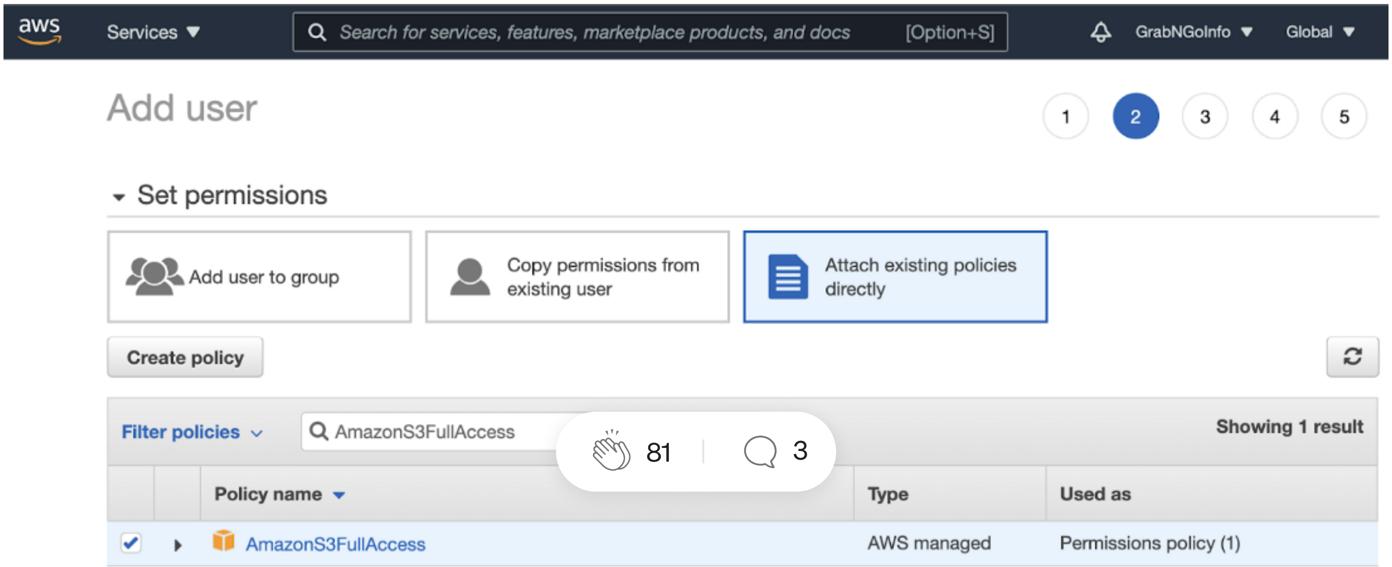
Select how these users will primarily access AWS. If you choose only programmatic access, it does NOT prevent users from accessing the console using an assumed role. Access keys and autogenerated passwords are provided in the last step. Learn more

Select AWS credential type*

☑ **Access key - Programmatic access**
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

□ **Password - AWS Management Console access**
Enables a **password** that allows users to sign-in to the AWS Management Console.

Step 1.5: Go to the permissions section and select **Attach existing policies directly**. Then in the search bar type **AmazonS3FullAccess** and check the box in the search result.


aws
Services ▼
Search for services, features, marketplace products, and docs
[Option+S]
GrabNGoInfo ▼
Global ▼
1
2
3
4
5
Add user to group
Copy permissions from existing user
Attach existing policies directly
Create policy
Filter policies
81
3

Add user

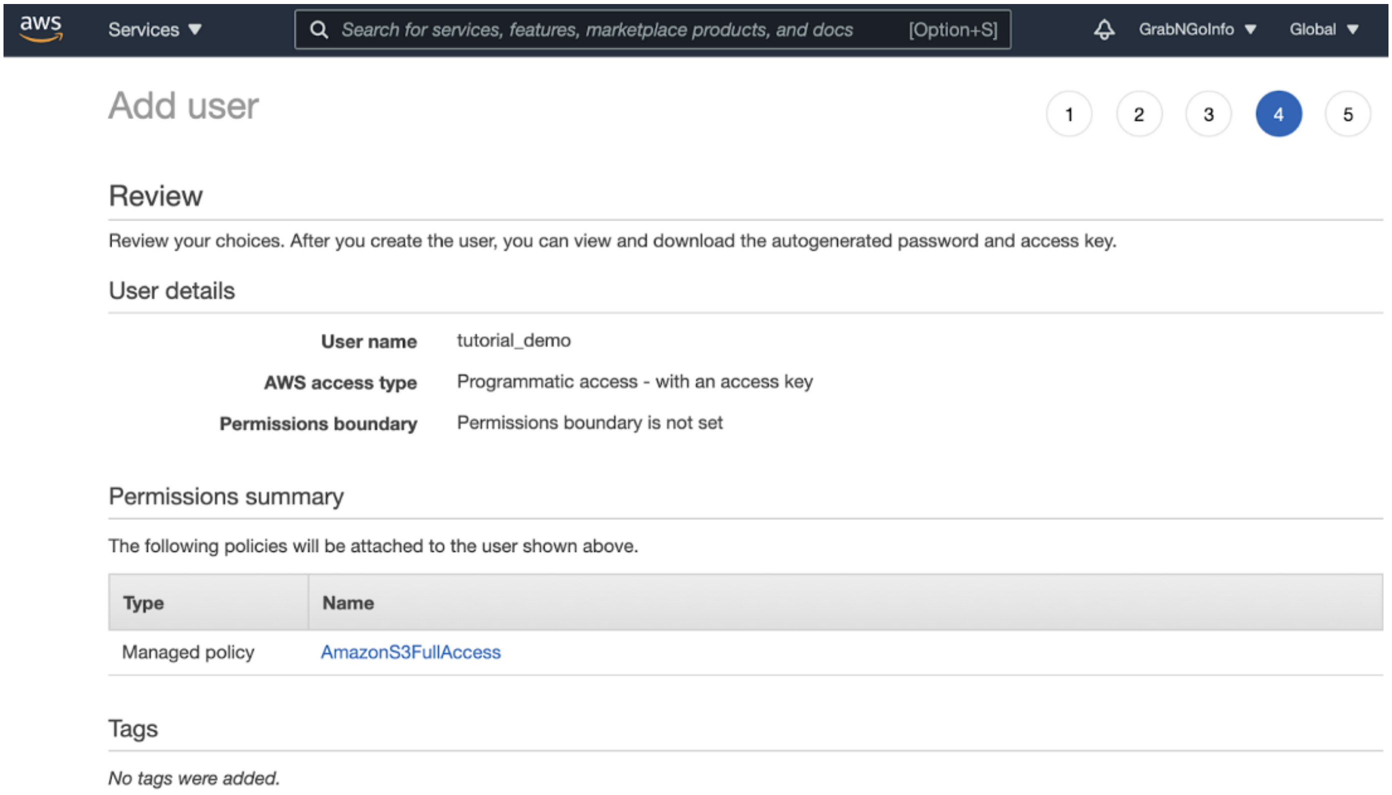
Set permissions

AmazonS3FullAccess

Showing 1 result

		Policy name	Type	Used as
☑	▸	AmazonS3FullAccess	AWS managed	Permissions policy (1)

Step 1.6: We can skip the Tag section and go to the review page.


aws
Services ▼
Search for services, features, marketplace products, and docs
[Option+S]
GrabNGoInfo ▼
Global ▼
1
2
3
4
5

Add user

Review

Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name	tutorial_demo
AWS access type	Programmatic access - with an access key
Permissions boundary	Permissions boundary is not set

Permissions summary

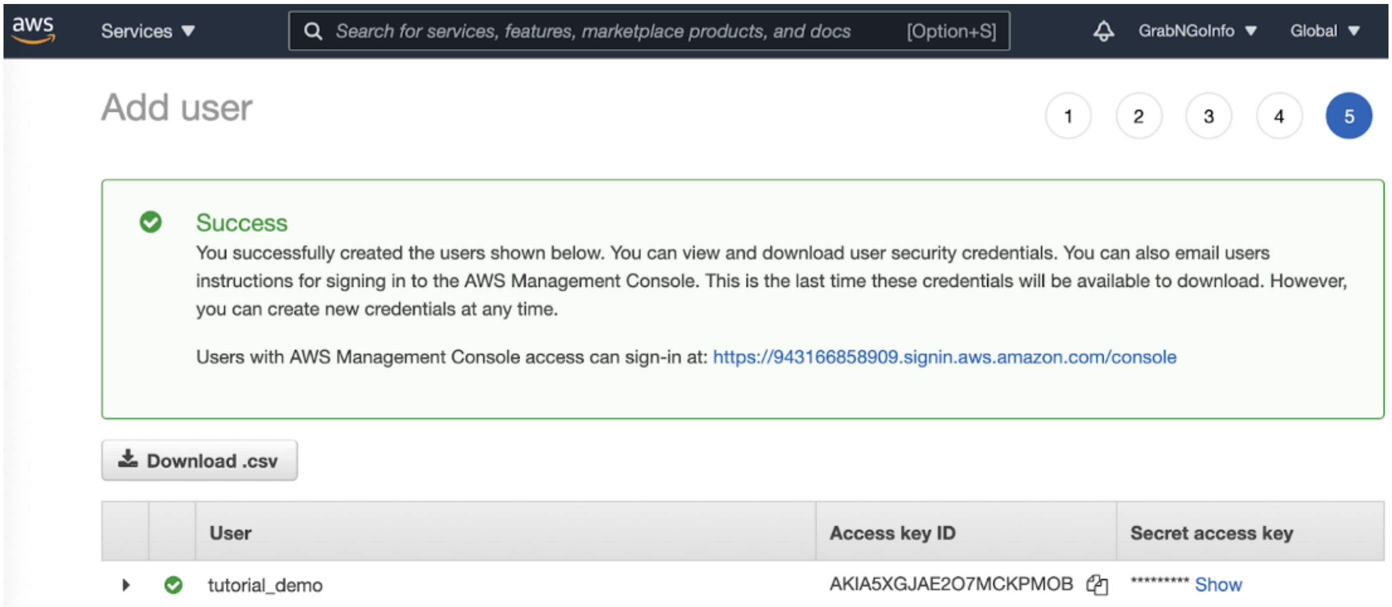
The following policies will be attached to the user shown above.

Type	Name
Managed policy	AmazonS3FullAccess

Tags

No tags were added.

Step 1.7: Click the blue Create user button and you will see this page. Click the **Download.csv** button to download the credential information.



Add user

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

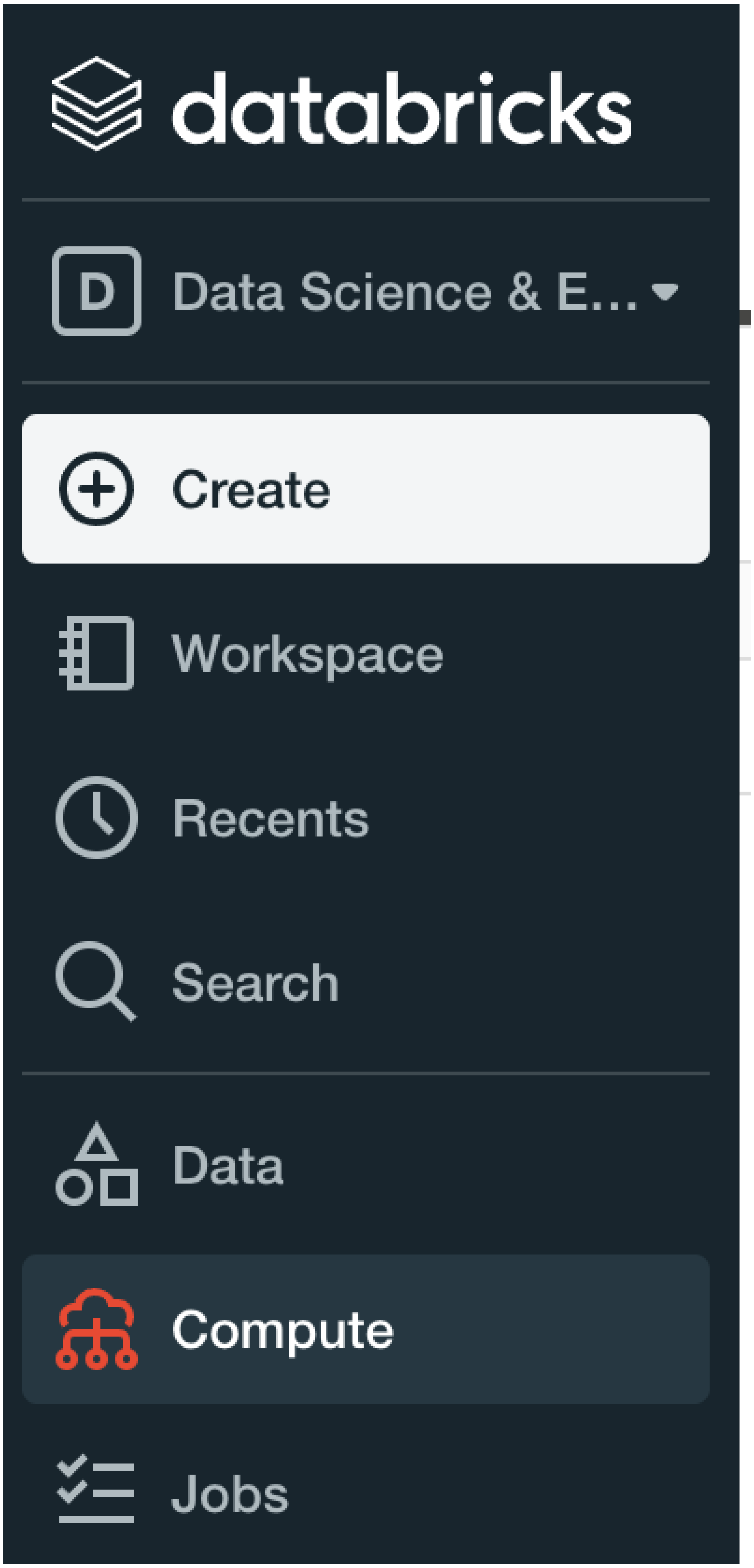
Users with AWS Management Console access can sign-in at: https://943166858909.signin.aws.amazon.com/console

		User	Access key ID	Secret access key
▸	✓	tutorial_demo	AKIA5XGJAE2O7MCKPMOB	********* Show

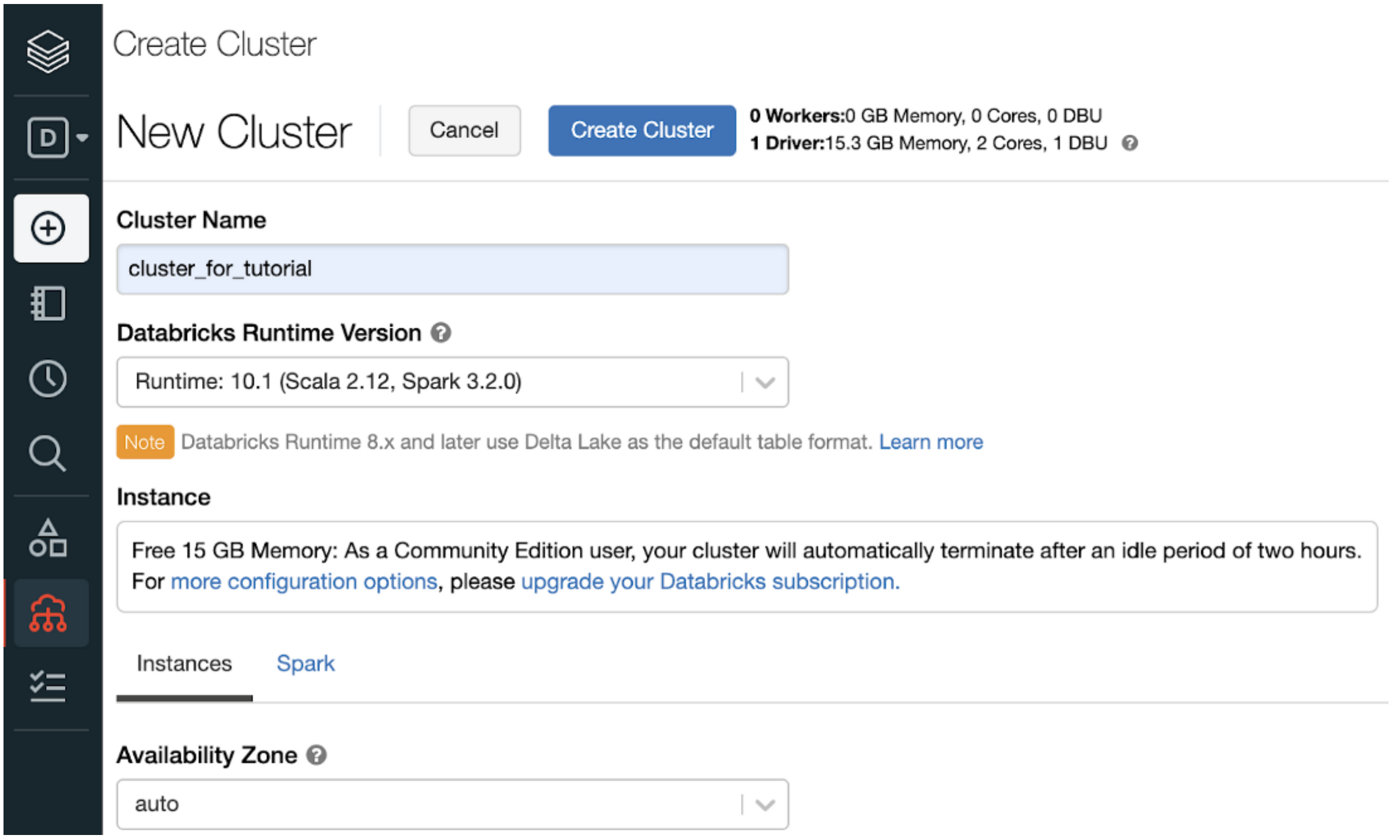
Step 2: Upload AWS Credential File To Databricks

After downloading the CSV file with the AWS access key and secret access key, in step 2, we will upload this file to Databricks.

Step 2.1: In the Databricks UI, click the **Compute** icon.



Step 2.2: Click the blue **Create Cluster** icon and give the new cluster a name under **Cluster Name.** Choose a **Databricks Runtime Version** and click **Create Cluster**. I am using the free Databricks community edition. The paid version has more options.



Create Cluster

New Cluster

0 Workers:0 GB Memory, 0 Cores, 0 DBU
1 Driver:15.3 GB Memory, 2 Cores, 1 DBU

Cluster Name

cluster_for_tutorial

Databricks Runtime Version

Runtime: 10.1 (Scala 2.12, Spark 3.2.0)

Note Databricks Runtime 8.x and later use Delta Lake as the default table format. Learn more

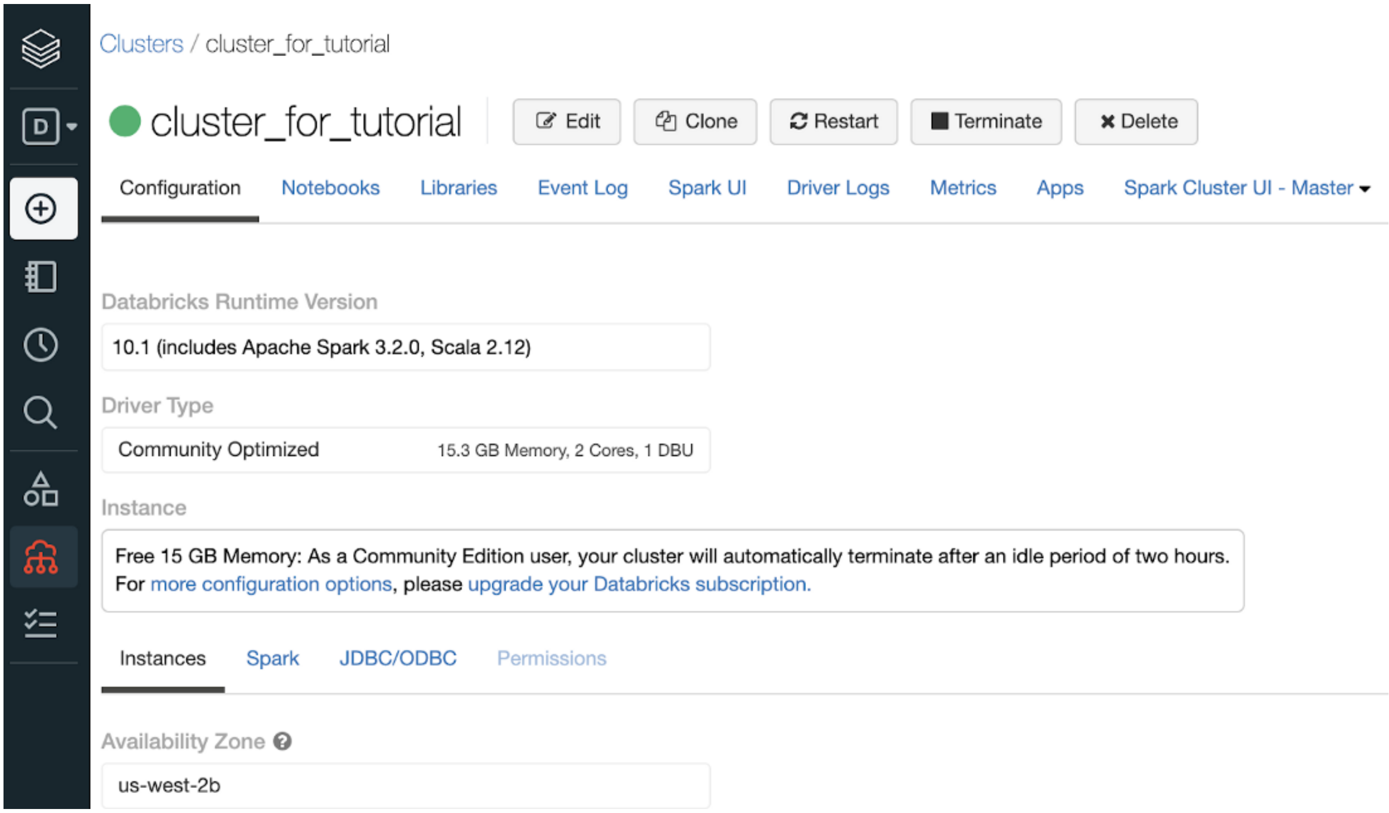
Instance

Free 15 GB Memory: As a Community Edition user, your cluster will automatically terminate after an idle period of two hours. For more configuration options, please upgrade your Databricks subscription.

Availability Zone

auto

Step 2.3: It takes a few minutes to spin up the cluster. The cluster is ready when there is a green circle in front of the cluster name.



Clusters / cluster_for_tutorial

● cluster_for_tutorial

Databricks Runtime Version

10.1 (includes Apache Spark 3.2.0, Scala 2.12)

Driver Type

Community Optimized 15.3 GB Memory, 2 Cores, 1 DBU

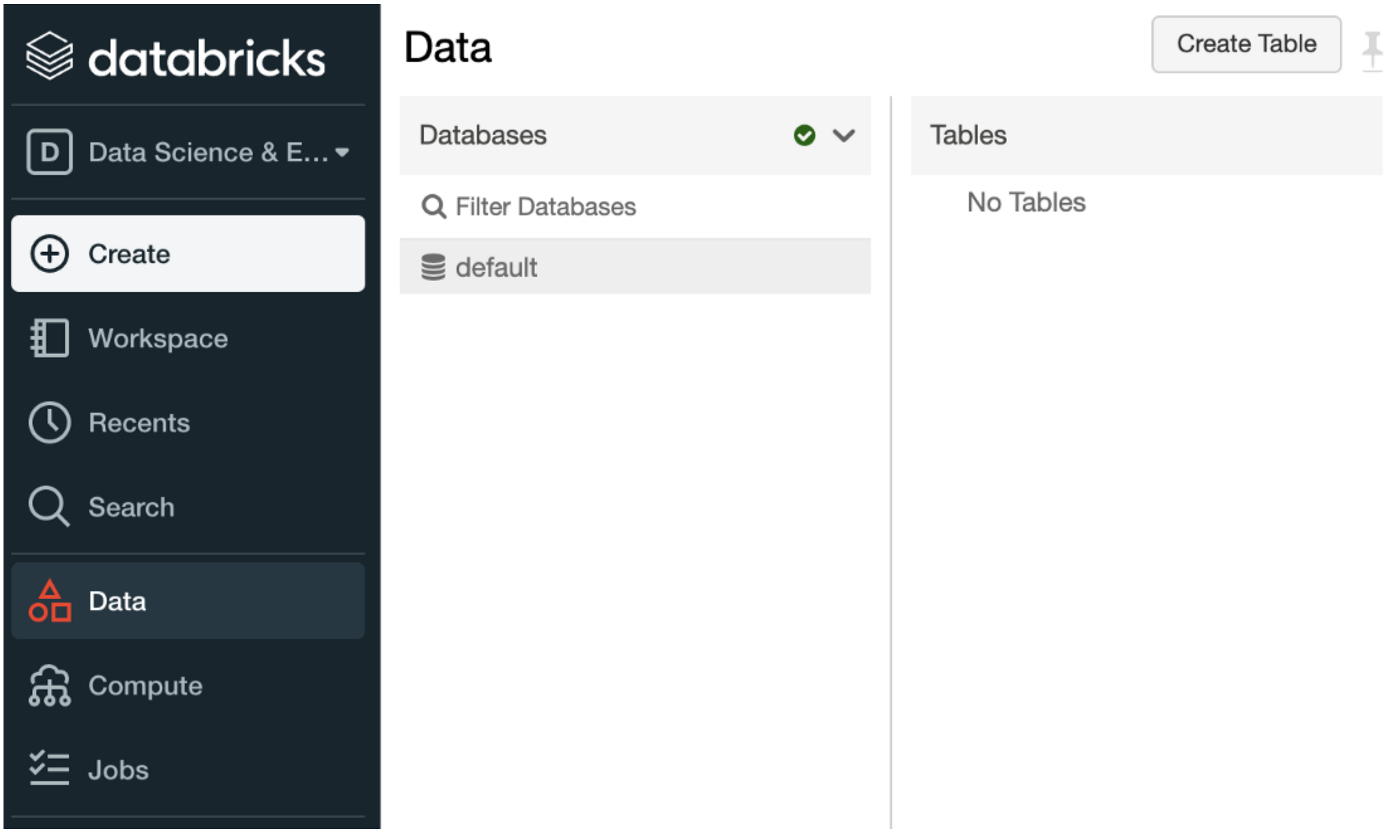
Instance

Free 15 GB Memory: As a Community Edition user, your cluster will automatically terminate after an idle period of two hours. For more configuration options, please upgrade your Databricks subscription.

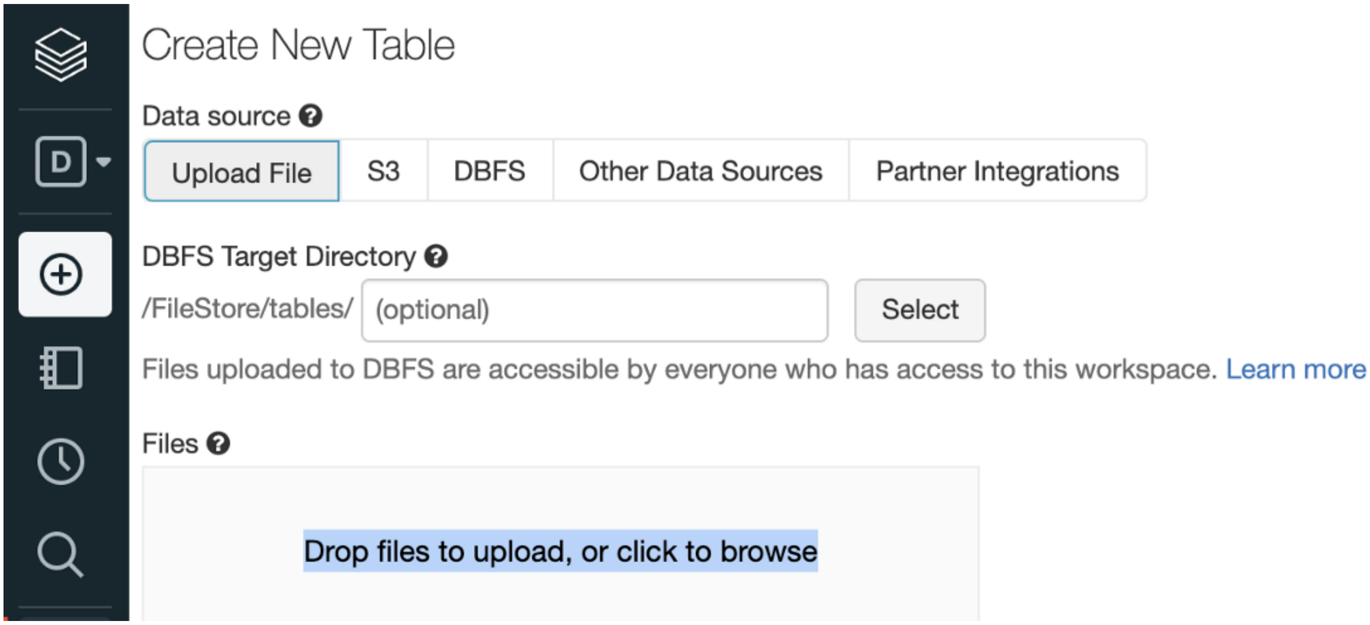
Availability Zone

us-west-2b

Step 2.4: Click the **Data** icon and then click the **Create Table** button. Keep in mind that you need to have a cluster running before creating a table.

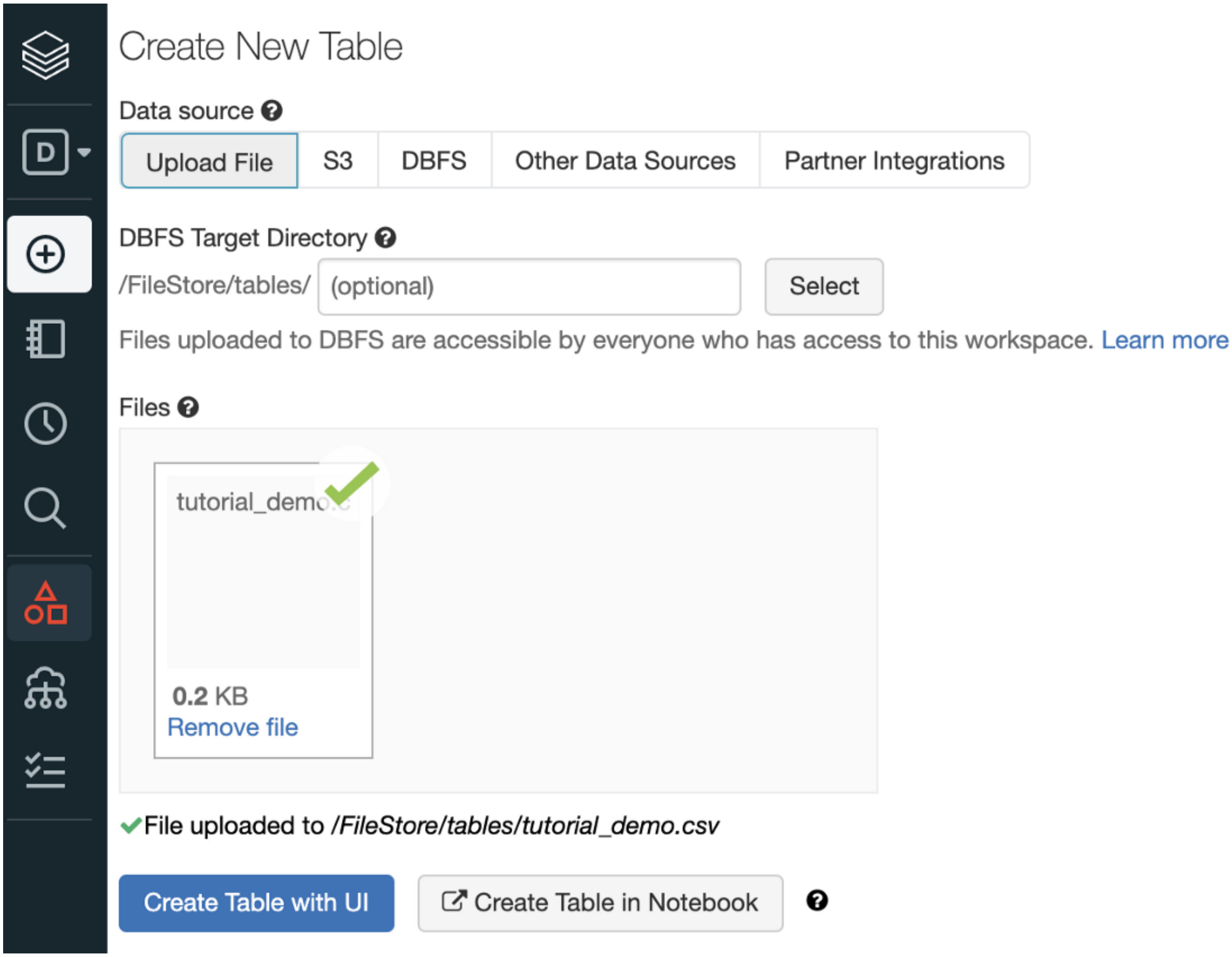


Step 2.5: Click **Drop files to upload, or click to browse** and upload the csv file downloaded from AWS in step 1.



Files uploaded to DBFS are accessible by everyone who has access to this workspace. Learn more

After the file is successfully uploaded, you will see a green checkmark next to the file name.

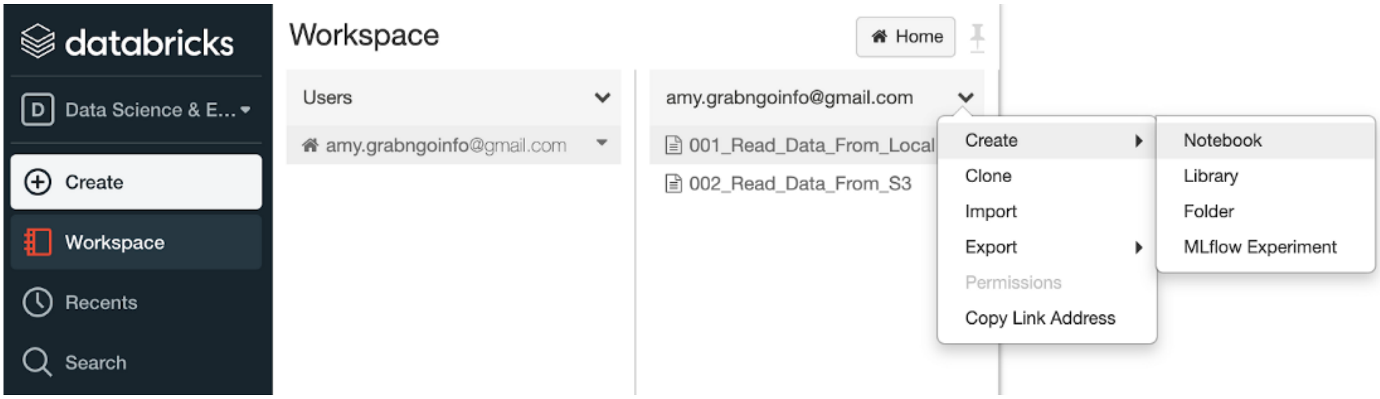


Files uploaded to DBFS are accessible by everyone who has access to this workspace. Learn more

✓File uploaded to */FileStore/tables/tutorial_demo.csv*

Step 3: Mount S3 Bucket To Databricks

Step 3.1: Create a new notebook.



Step 3.2: Check the contents in FileStore by running the code below in the notebook.

```
# Check the contents in tables
folderdbutils.fs.ls(“/FileStore/tables”)
```

You will see that the CSV file downloaded from AWS is in the FileStore tables folder.

Step 3.3: Mount S3 bucket.

We first need to import libraries. `Pyspark.sql.functions` has the functions for pyspark. `Urllib` is the package for handling urls.

```
# pyspark functions
from pyspark.sql.functions import *

# URL processing
import urllib
```

Next, let’s read the csv file with AWS keys to Databricks. We specify the file type to be csv, indicate that the file has the first row as the header and the comma as the delimiter. Then the path of the csv file was passed in to load the file.

```
# Define file type
file_type = “csv”

# Whether the file has a header
first_row_is_header = “true”

# Delimiter used in the file
delimiter = “,”

# Read the CSV file to spark dataframe
aws_keys_df = spark.read.format(file_type)\
.option(“header”, first_row_is_header)\
.option(“sep”, delimiter)\
.load(“/FileStore/tables/tutorial_demo.csv”)
```

After that, we get the access key and secret key from the spark dataframe. The secret key was encoded using `urllib.parse.quote` for security purposes. `safe=""` means every character in the secret key is encoded.

```
# Get the AWS access key and secret key from the spark dataframe
ACCESS_KEY = aws_keys_df.where(col(‘User
name’)==’tutorial_demo’).select(‘Access key ID’).collect()[0][‘Access
key ID’]

SECRET_KEY = aws_keys_df.where(col(‘User
name’)==’tutorial_demo’).select(‘Secret access key’).collect()[0]
[‘Secret access key’]

# Encode the secrete key
ENCODED_SECRET_KEY = urllib.parse.quote(string=SECRET_KEY, safe=””)
```

After getting the access key and secret key, it’s time to mount the S3 bucket! We can mount the bucket by passing in the S3 url and the desired mount name to `dbutils.fs.mount()`. It returns `Ture` if the bucket is mounted successfully.

```
# AWS S3 bucket name
AWS_S3_BUCKET = “crypto-price-prediction”

# Mount name for the bucket
MOUNT_NAME = “/mnt/crypto-price-prediction”

# Source url
SOURCE_URL = “s3n://{0}:{1}@{2}”.format(ACCESS_KEY,
ENCODED_SECRET_KEY, AWS_S3_BUCKET)

# Mount the drive
dbutils.fs.mount(SOURCE_URL, MOUNT_NAME)
```

Step 4: Read Data From The Mounted S3 Bucket

Step 4.1: Check the contents in the mounted S3 bucket using `dbutils.fs.ls`

```
# Check if the AWS S3 bucket was mounted successfully
display(dbutils.fs.ls(“/mnt/crypto-price-prediction/g-research-crypto-
forecasting/”))
```

Step 4.2: Read a dataset in CSV format from S3 to Databricks. We set the delimiter to be a comma, indicate that the first row is the header, and ask spark to infer the schema.

```
# File location and type
file_location = “/mnt/crypto-price-prediction/g-research-crypto-
forecasting/crypto_100k_records.csv”

file_type = “csv”

# CSV options
infer_schema = “true”
first_row_is_header = “true”
delimiter = “,”

# The applied options are for CSV files. For other file types, these
will be ignored.
df = spark.read.format(file_type) \
.option(“inferSchema”, infer_schema) \
.option(“header”, first_row_is_header) \
.option(“sep”, delimiter) \
.load(file_location)

display(df)
```

Step 4.3 (optional): We can save data as a table in Parquet format on Databricks for future access. If the table was saved before and we want to overwrite it, the `allowCreatingManagedTableUsingNonemptyLocation` needs to be set to `true` .

```
# Allow creating table using non-emply location
spark.conf.set(“spark.sql.legacy.allowCreatingManagedTableUsingNonempt
yLocation”,”true”)

# Save table
df.write.format(“parquet”).saveAsTable(‘crypto_train’)
```

Step 5: Save Spark Dataframe To S3 Bucket

We can use `df.write.save` to save the spark dataframe directly to the mounted S3 bucket. CSV format is used as an example here, but it can be other formats. If the file was saved before, we can remove it before saving the new version.

```
# Remove the file if it was saved before
dbutils.fs.rm(‘/mnt/crypto-price-prediction/g-research-crypto-
forecasting/demo_example’, True)

# Save to the mounted S3 bucket
df.write.save(f’/mnt/crypto-price-prediction/g-research-crypto-
forecasting/demo_example’, format=’csv’)

# Check if the file was saved
successfulydisplay(dbutils.fs.ls(“/mnt/crypto-price-prediction/g-
research-crypto-forecasting/demo_example”))
```

Step 6: Unmount S3 Bucket (Optional)

To unmount the S3 bucket, use the code below.

```
# Unmount S3 bucket
dbutils.fs.unmount(“/mnt/crypto-price-prediction”)
```

Recommended tutorials

- GrabNGoInfo Machine Learning Tutorials Inventory
- One-Class SVM For Anomaly Detection
- 3 Ways for Multiple Time Series Forecasting Using Prophet in Python
- Four Oversampling And Under-Sampling Methods For Imbalanced Classification Using Python
- Multivariate Time Series Forecasting with Seasonality and Holiday Effect Using Prophet in Python
- How to detect outliers | Data Science Interview Questions and Answers
- Time Series Anomaly Detection Using Prophet in Python
- How to Use R with Google Colab Notebook