Automated File Processing with S3 Event Notifications and Lambda function

You can turn on S3 event notifications to send notifications on S3-related events, such as object uploads or deletions. These notifications can be configured to target AWS services like Lambda functions, SQS queues, or SNS topics

Objectives

Imagine you're a solutions architect at a financial company. Your job is to provide the audit team with the transaction records they need for their checks. But there's a catch due to privacy rules: they can't see full credit card numbers. So, your challenge is to make sure they only get to see the last four digits of each card number. This way, they have just enough information to do their job without compromising customer data.

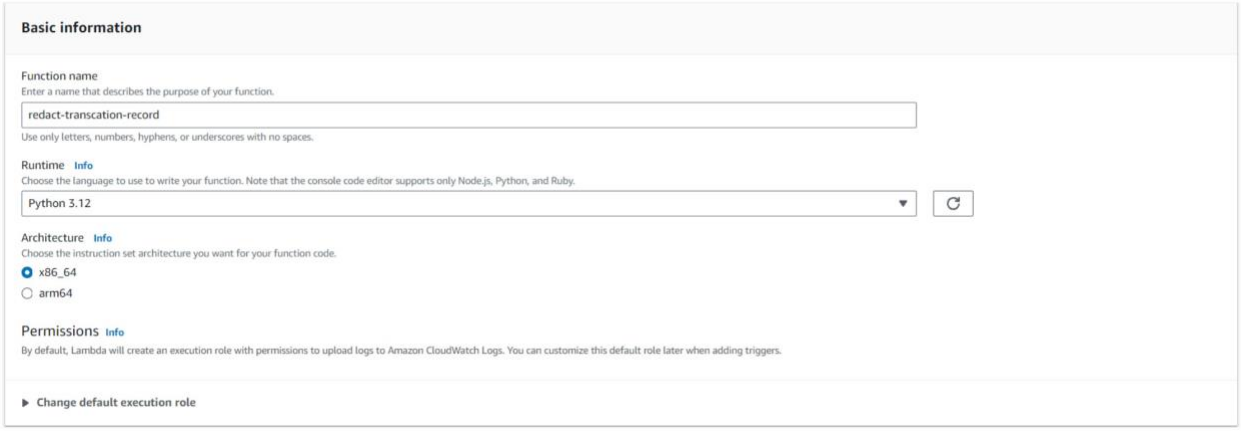
In this lab, you'll set up this system. You'll create an S3 bucket, configure its event notifications to trigger a Lambda function, and write the function logic to process and store a redacted version of the uploaded file in a designated folder within the same bucket.

In this lab, you will:

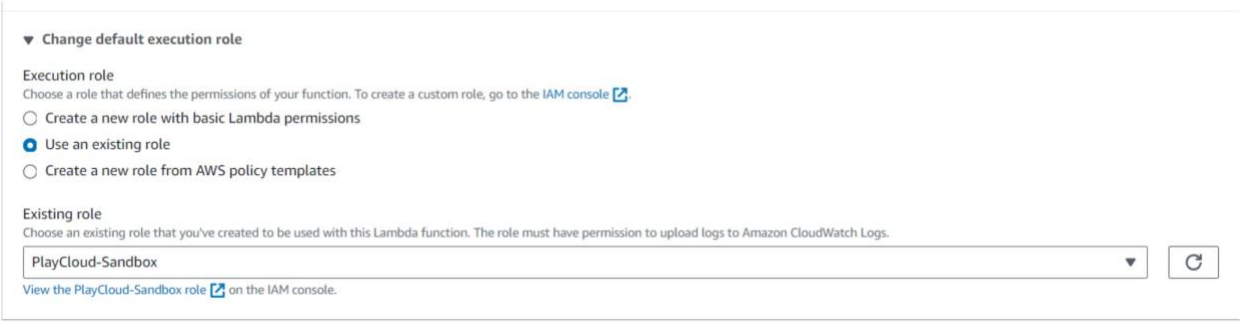
- Learn how to enable S3 event notifications to invoke a Lambda function
- Learn how to read from and upload files to an S3 bucket using the AWS SDK for Python (Boto3)

Creating the Lambda function

1. Create a Lambda function called **redact-transaction-record** and choose **Python** as the runtime.



2. For the execution role, click the **Use an existing role** option, then choose **PlayCloud-Sandbox**.



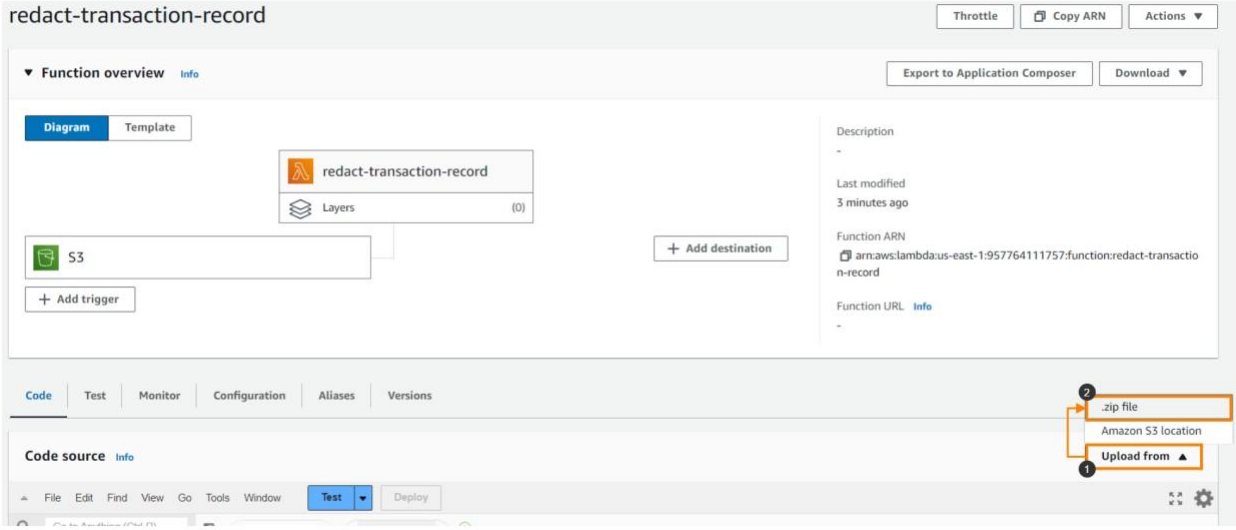
3. Click the **Create function**.

Deploying the Lambda function code

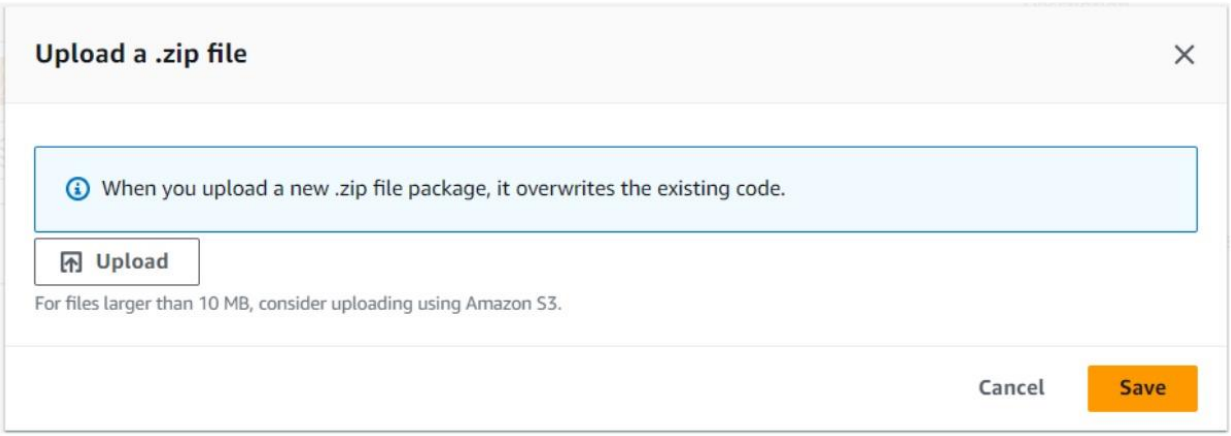
1. Download the following ZIP file on your local machine.

https://media.tutorialsdojo.com/public/redact-transaction-record.zip

2. On the AWS Lambda console, click the **Upload from** dropdown box, then click **.zip file**.



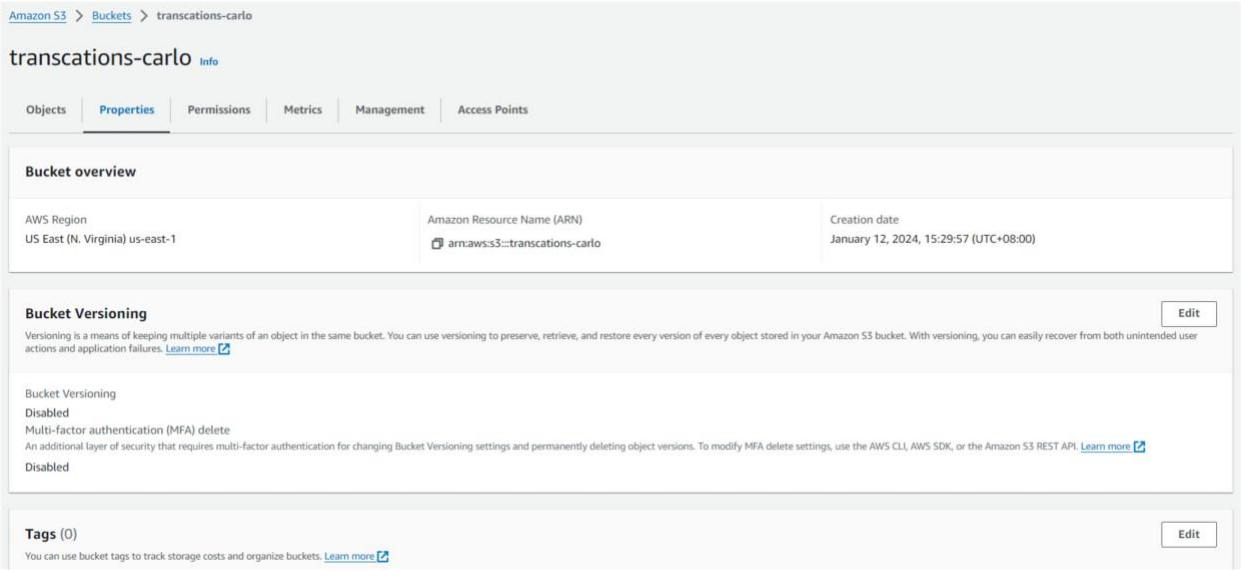
3. A dialog box will appear. Upload the ZIP file you downloaded and click on **Save**.



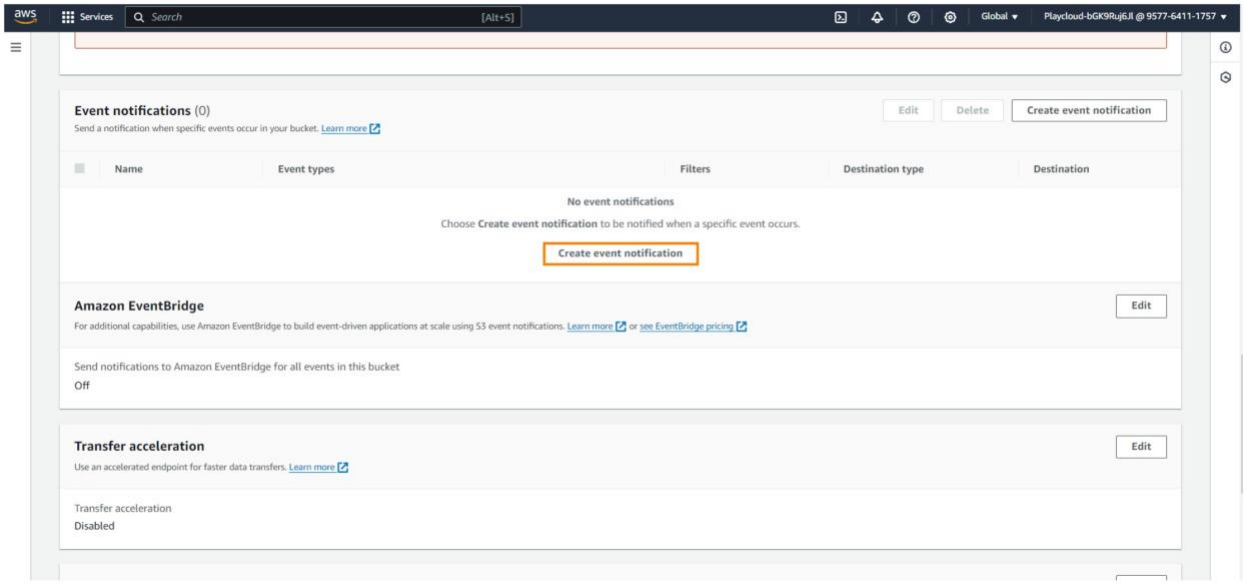
Configuring S3 Event notification

1. Create an S3 bucket with the name **transactions-<your-name>** (for example, **transactions-carlo**) in the **N. Virginia** region. S3 bucket names need to be globally unique. Include your name or any arbitrary characters to ensure that your bucket name won't conflict with existing ones.

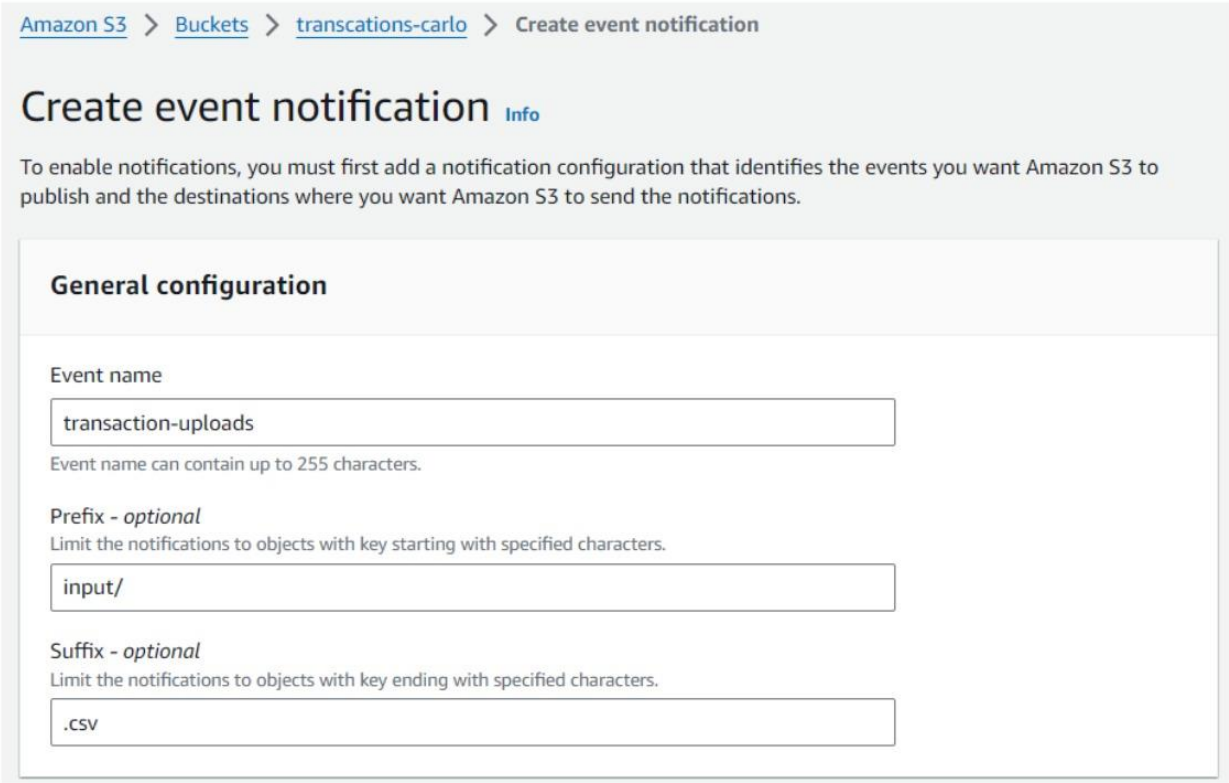
2. Once created, click the **Properties** section of your bucket.



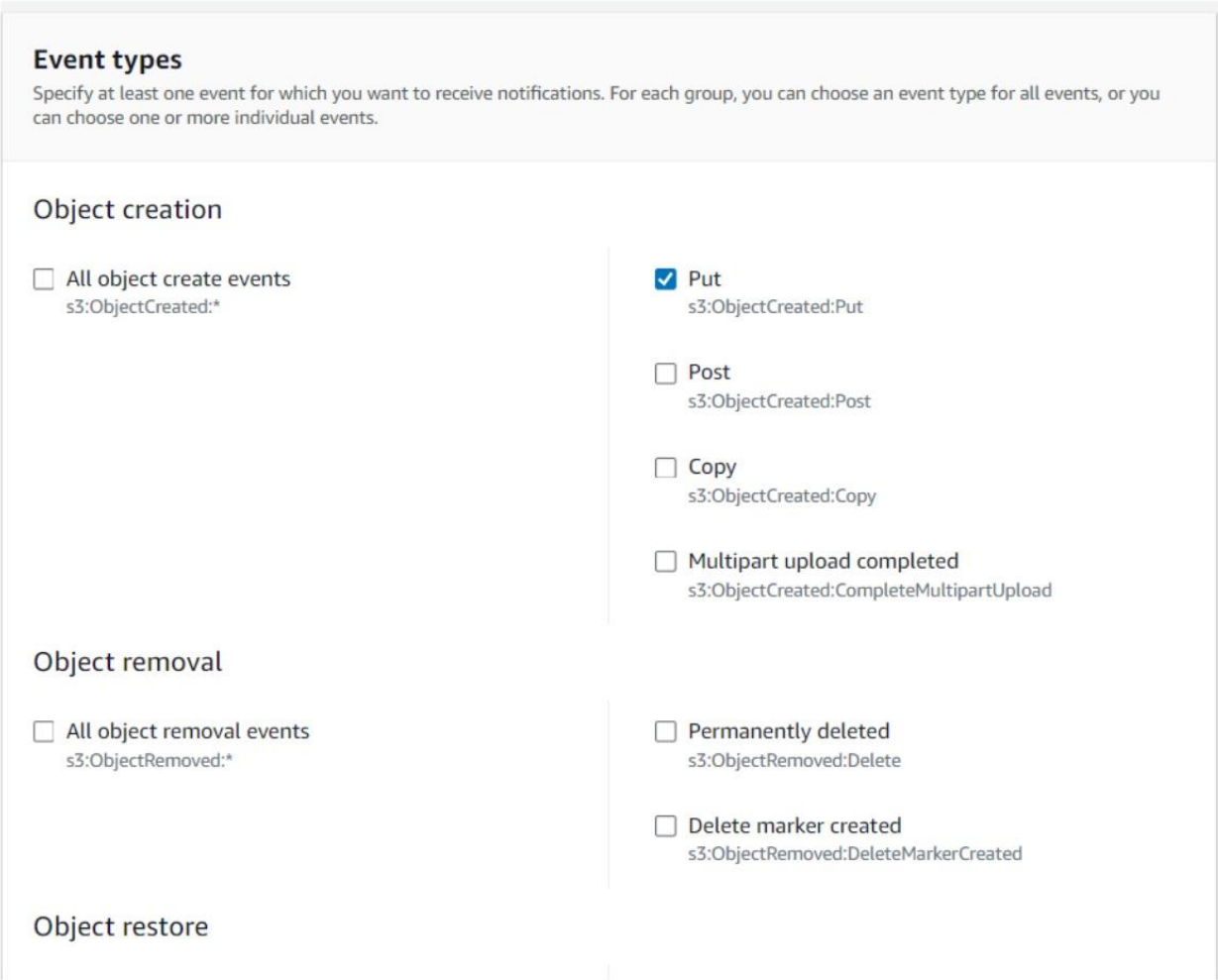
3. Scroll down the **Event notifications** setting and click **Create event notification**.



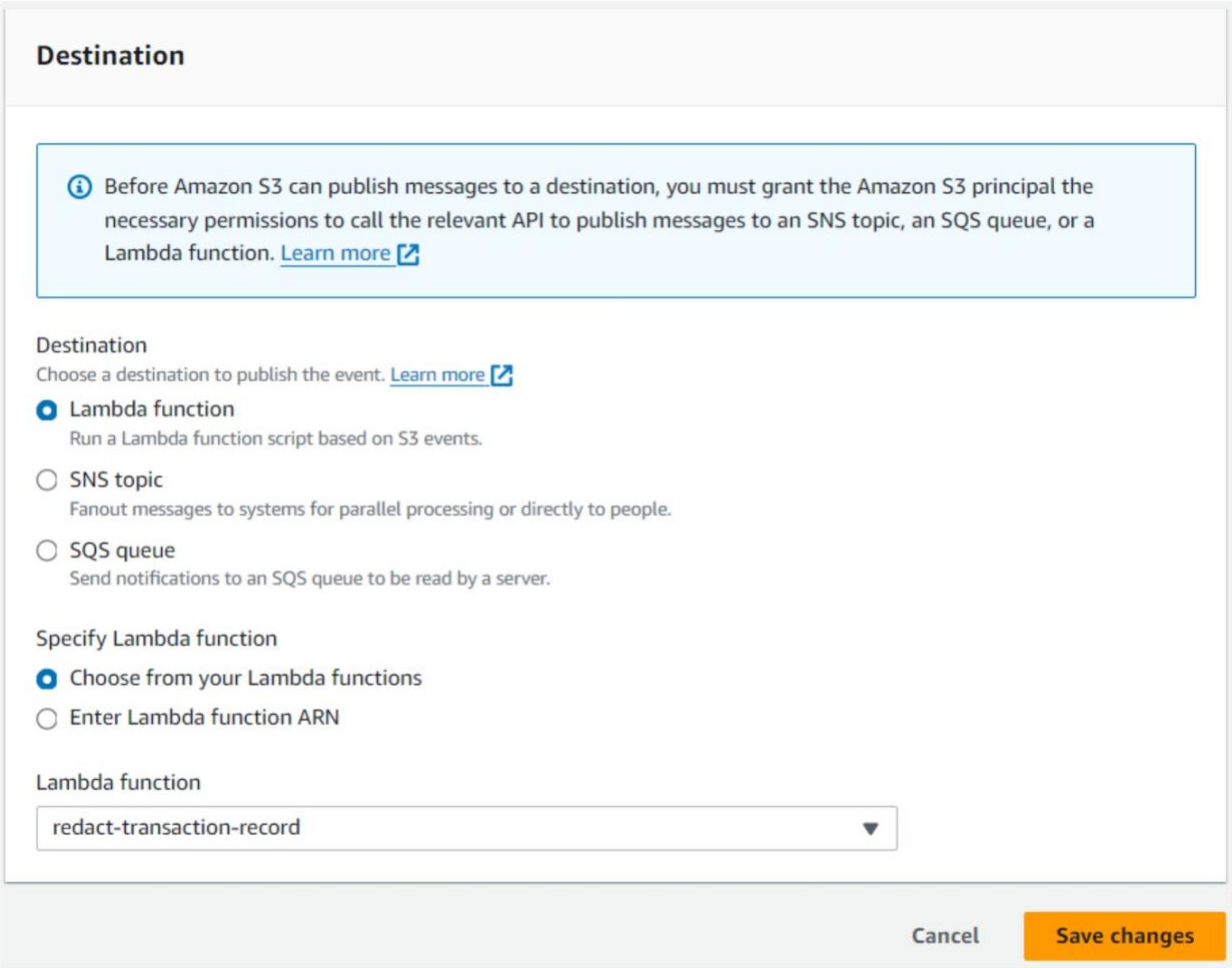
4. In the **General configuration** section, enter the following details:



5. For Event Types, tick the **Put** checkbox.



6. For **Destination**, choose the **redact-transaction-record** Lambda function. Then, click on **Save changes**.



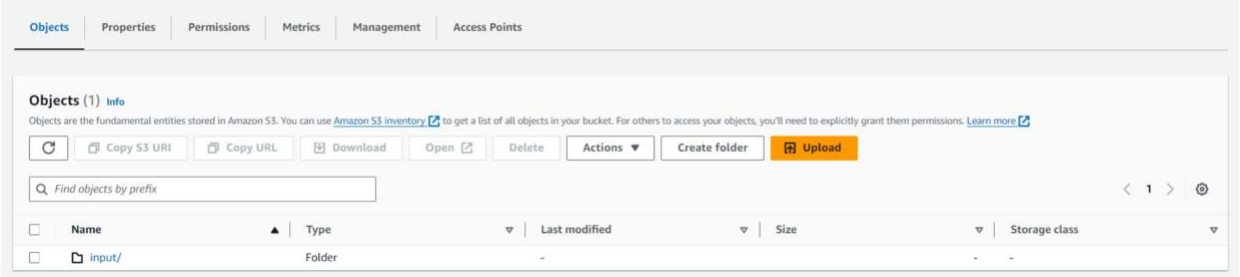
Testing the Configuration

Now that we're done setting up all the required resources, let's do a quick test.

When we created the event notification, note that we have configured both a Prefix and a Suffix. In this setup, 'input/' is used as the Prefix, which means the event will only trigger for files uploaded to the *'input'* folder within the bucket. The Suffix *'.csv'* ensures that the event is triggered only for files with a *'.csv'* extension. We use these filters to prevent unnecessary S3 notifications to our Lambda functions, ensuring they run only in response to relevant files.

To start the test:

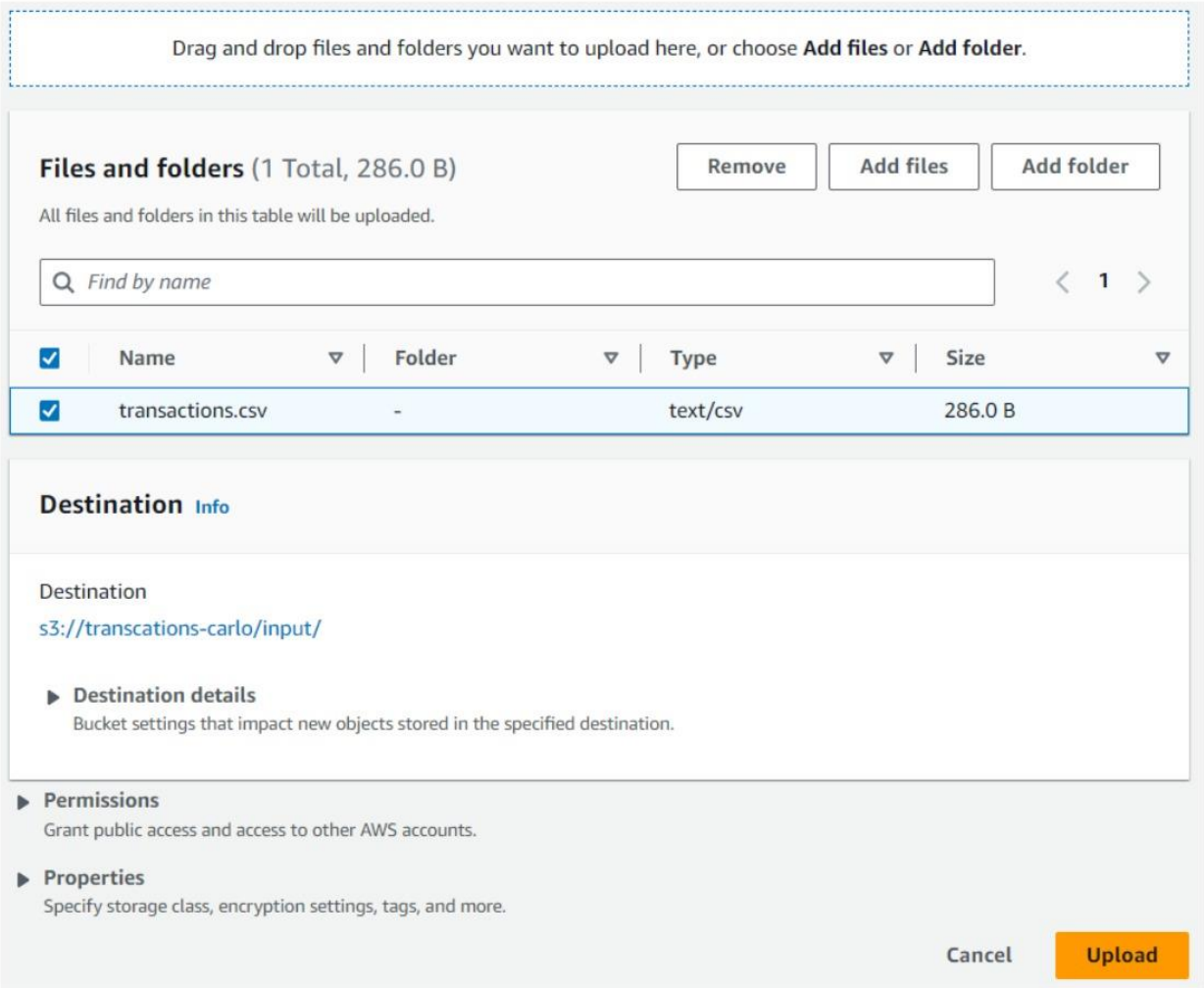
1. Create a folder named **'input'** in the S3 bucket.



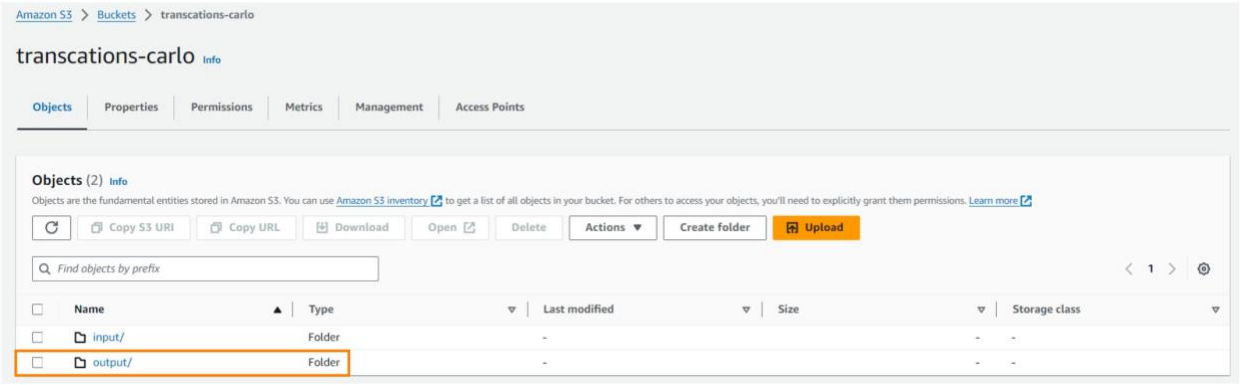
2. Download the [transactions.csv]() file into your computer.

3. Open up the **transactions.csv**. You'll notice that the file contains 5 transactions, with the card numbers fully displayed.

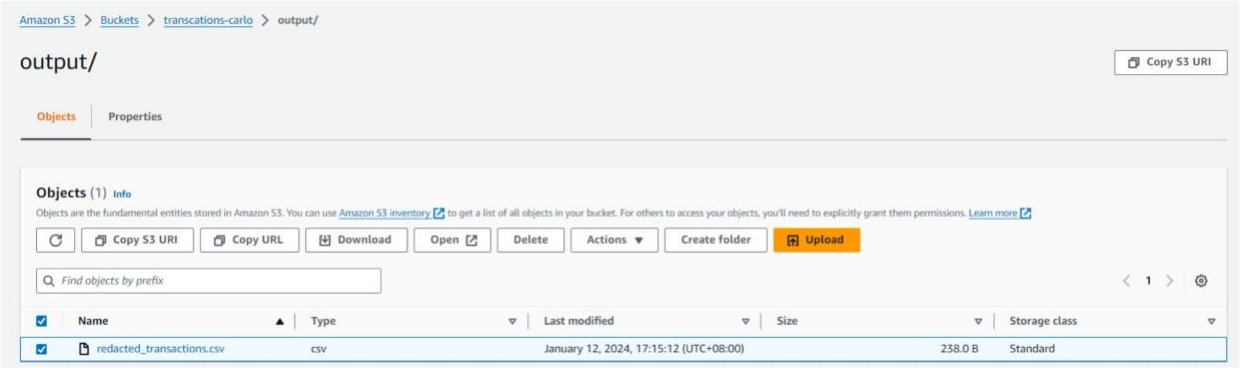
4. Upload the **transactions.csv** to the **input** folder.:



5. Go back to the **Objects** section of your S3 bucket. You'll find a new **output** folder created in the bucket.



6. Click the **output** folder.



7. You should see a new file called **redacted_transactions.csv**. Download it to your local folder and open it. This file contains the same transaction records, but with the first 12 digits of each credit card number redacted

Transactions.csv

Date	Amount	CardNumber	Merchant
2024-01-12	$150.00	1234567890123456	Coffee Shop
2024-01-13	$45.00	6543210987654321	Bookstore
2024-01-14	$78.25	8706543211234677	Electronics Store
2024-01-15	$22.50	3216549870654321	Grocery Store
2024-01-16	$130.00	4561237890654321	Online Marketplace

Lambda_function.py

```
import boto3

import csv

import re

import os


s3_client = boto3.client('s3')



def lambda_handler(event, context):

    # Get bucket name and object key from the event

    bucket_name = event['Records'][0]['s3']['bucket']['name']

    object_key = event['Records'][0]['s3']['object']['key']


    # Download the file to /tmp directory

    download_path = '/tmp/' + os.path.basename(object_key)

    s3_client.download_file(bucket_name, object_key, download_path)


    # Read, process, and redact the CSV file

    redacted_data = read_csv(download_path)


    # Write redacted content to a new CSV file in /tmp

    redacted_file_path = '/tmp/redacted_' + os.path.basename(object_key)

    write_csv(redacted_data, redacted_file_path)
```

```
    # Upload the redacted file to the 'output/' folder
    output_key = 'output/' + 'redacted_' + os.path.basename(object_key)
    s3_client.upload_file(redacted_file_path, bucket_name, output_key)



def redact(row):
    """
    Redacts credit card numbers, leaving the last four digits visible.
    Assumes credit card number is in the third column (index 2).
    """
    row[2] = re.sub(r'\d{12}(\d{4})', r'**\1', row[2])
    return row


def read_csv(file_path):
    redacted_data = []
    with open(file_path, mode='r', newline='') as file:
        reader = csv.reader(file)
        for row in reader:
            redacted_data.append(redact(row))
    return redacted_data


def write_csv(data, file_path):
    with open(file_path, mode='w', newline='') as file:
        writer = csv.writer(file)
        writer.writerows(data)
```