Importing NRD2 Data Feed to GCP

Posted on October 18, 2023

The intention of this document is to show you the basics of how to download the WhoisXML API's NRD2 data feed provided by WhoisXML API to a GCP Cloud Storage bucket by leveraging a serverless Cloud Functions. GCP Cloud Functions acts as a serverless compute service that allows you to write and execute code without provisioning or managing servers. GCP Cloud Storage is an object storage service for storing and retrieving files. This document will guide you through the process of configuring both GCP Cloud Functions and a GCP Cloud Storage bucket.

Out of scope:

- Scheduling a function for Cloud Functions
- ETL pipelining
- Importing the Python requests module
- Advanced Security
- Clean-up, life cycle file management

Prerequisites

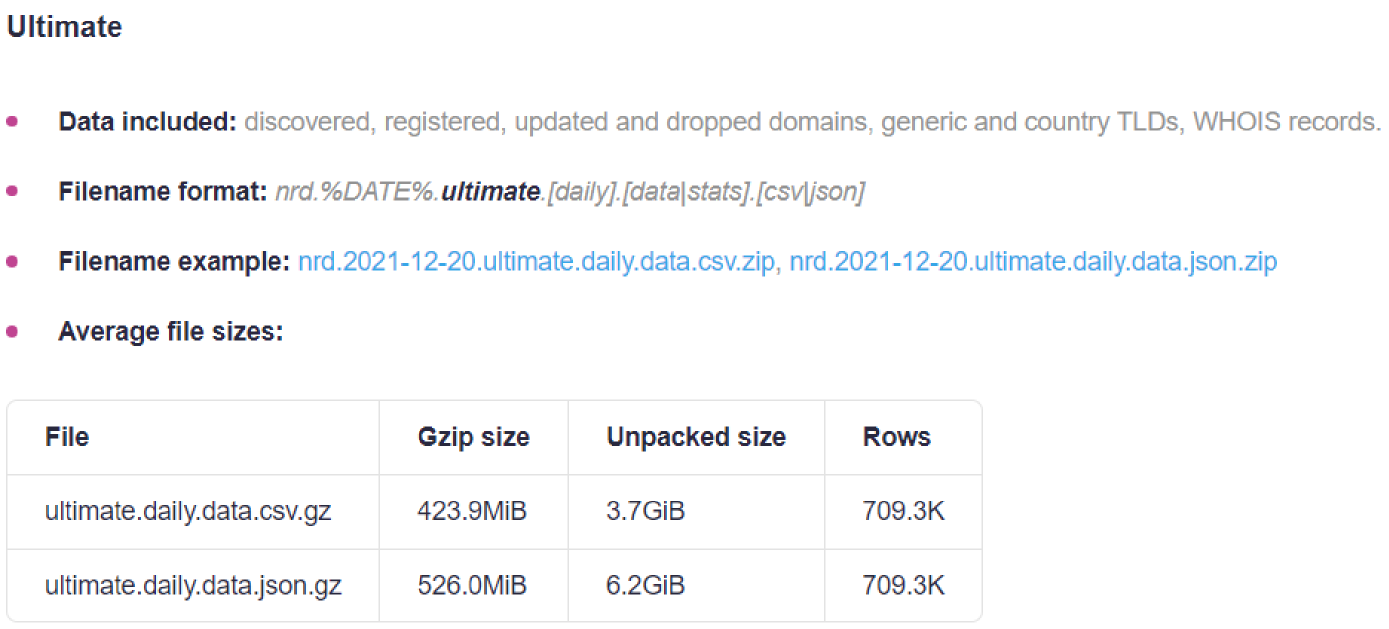
Please ensure you have the following setup:

- GCP Account

- Basic to Intermediate knowledge of GCP services, specifically GCP Cloud Functions and Cloud Storage

- Some familiarity with Python which will be used in Cloud Functions

- Access to the WHOIS NRD2 data feed. In this example, we will be using the NRD2 Ultimate: Simple files. You will need an API key with access to the data feed. Please contact us for more information. For more information on the NRD2 specifications, please visit here.



Ultimate

- **Data included:** discovered, registered, updated and dropped domains, generic and country TLDs, WHOIS records.
- **Filename format:** *nrd.%DATE%.**ultimate**.[daily].[data|stats].[csv|json]*
- **Filename example:** nrd.2021-12-20.ultimate.daily.data.csv.zip, nrd.2021-12-20.ultimate.daily.data.json.zip
- **Average file sizes:**

File	Gzip size	Unpacked size	Rows
ultimate.daily.data.csv.gz	423.9MiB	3.7GiB	709.3K
ultimate.daily.data.json.gz	526.0MiB	6.2GiB	709.3K

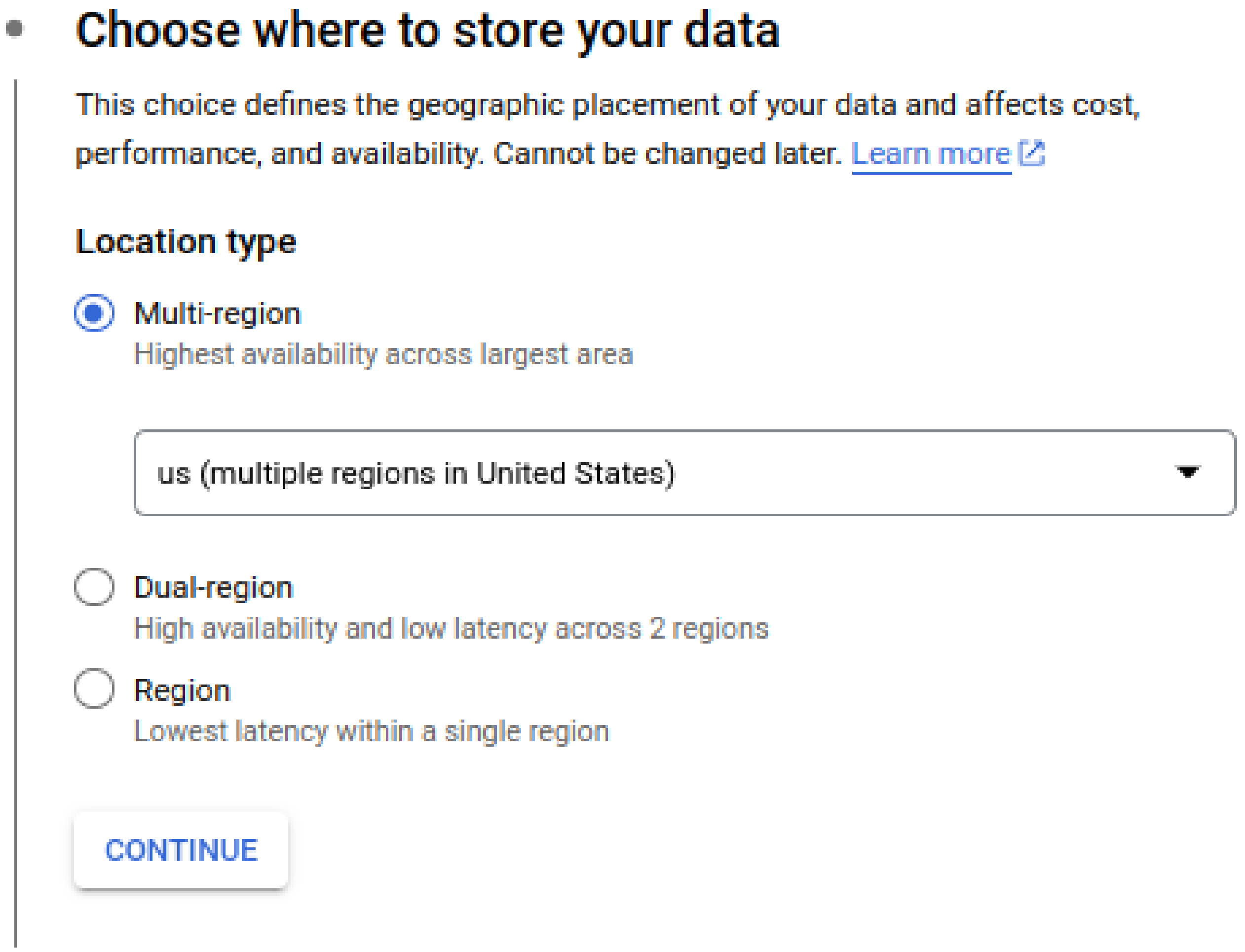
Step 1: Create a GCP Cloud Storage Bucket

The first step is to create a Cloud Storage bucket to write the NRD2 file.

- In the GCP Console, navigate to the Cloud Storage service.

- Click on “Create”.

- Give the bucket a unique name and select the appropriate region and a storage class for your data.



Choose where to store your data

This choice defines the geographic placement of your data and affects cost, performance, and availability. Cannot be changed later. Learn more

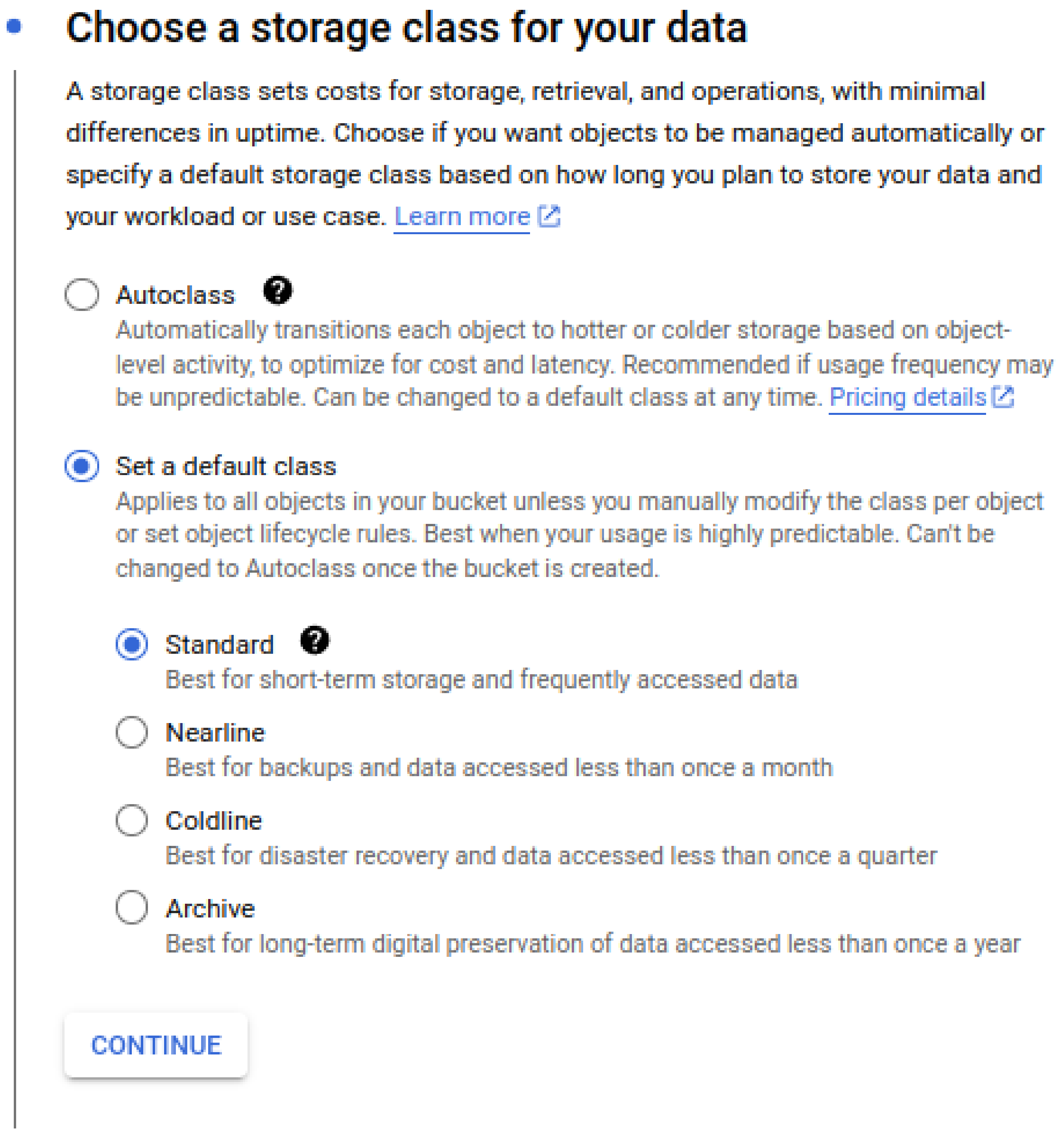
Location type

● Multi-region
Highest availability across largest area

us (multiple regions in United States) ▼

○ Dual-region
High availability and low latency across 2 regions

○ Region
Lowest latency within a single region



Choose a storage class for your data

A storage class sets costs for storage, retrieval, and operations, with minimal differences in uptime. Choose if you want objects to be managed automatically or specify a default storage class based on how long you plan to store your data and your workload or use case. Learn more

○ Autoclass

Automatically transitions each object to hotter or colder storage based on object-level activity, to optimize for cost and latency. Recommended if usage frequency may be unpredictable. Can be changed to a default class at any time. Pricing details

● Set a default class

Applies to all objects in your bucket unless you manually modify the class per object or set object lifecycle rules. Best when your usage is highly predictable. Can't be changed to Autoclass once the bucket is created.

● Standard

Best for short-term storage and frequently accessed data

○ Nearline

Best for backups and data accessed less than once a month

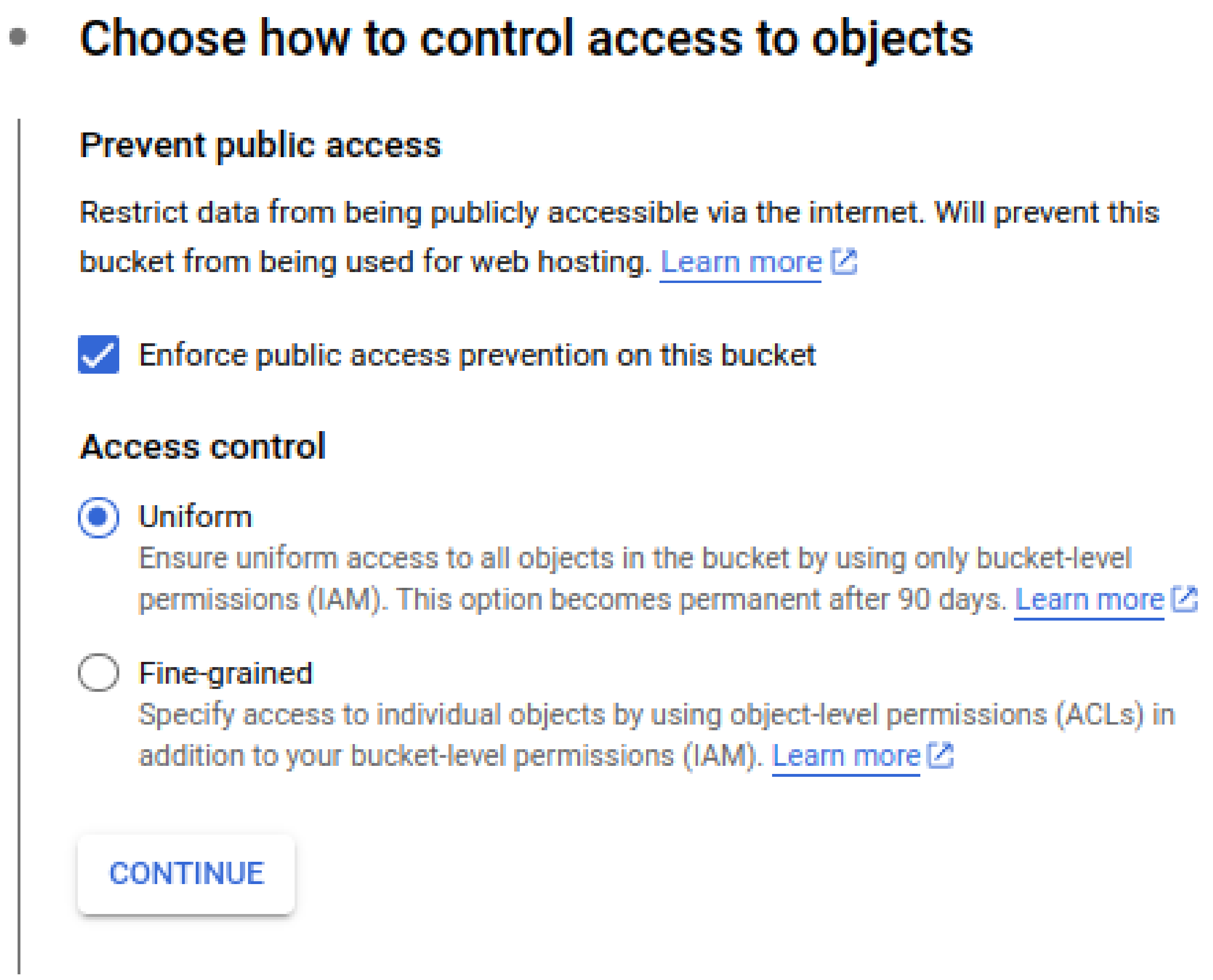
○ Coldline

Best for disaster recovery and data accessed less than once a quarter

○ Archive

Best for long-term digital preservation of data accessed less than once a year

- Then, choose how you would like to manage access to objects. By default, it prevents public access and has a uniform policy at the bucket level.



● Choose how to control access to objects

Prevent public access

Restrict data from being publicly accessible via the internet. Will prevent this bucket from being used for web hosting. Learn more

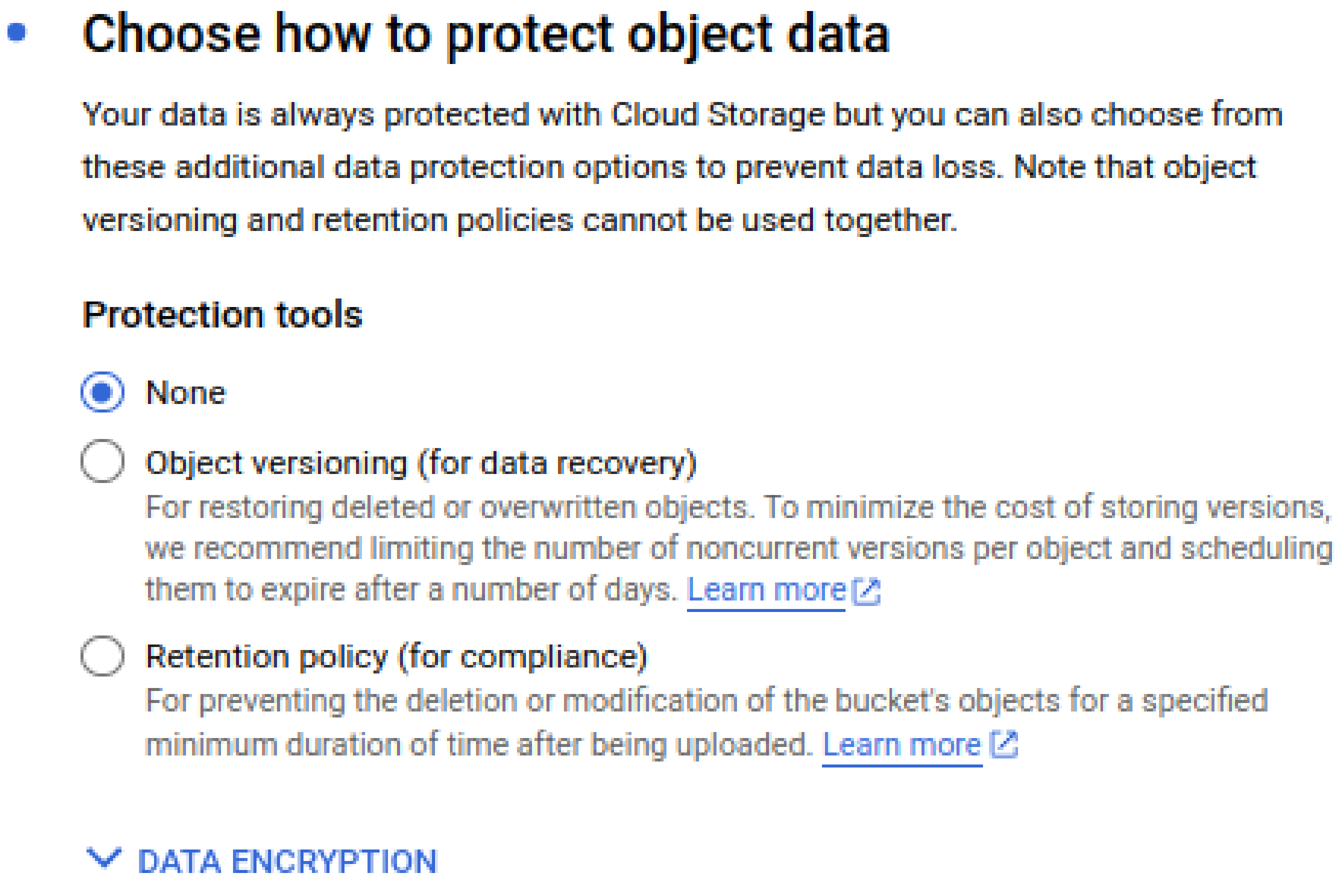
☑ Enforce public access prevention on this bucket

Access control

● Uniform
Ensure uniform access to all objects in the bucket by using only bucket-level permissions (IAM). This option becomes permanent after 90 days. Learn more

○ Fine-grained
Specify access to individual objects by using object-level permissions (ACLs) in addition to your bucket-level permissions (IAM). Learn more

- Finally, choose how to protect object data. You have the option to do object versioning or use a retention policy.



- Choose how to protect object data

Your data is always protected with Cloud Storage but you can also choose from these additional data protection options to prevent data loss. Note that object versioning and retention policies cannot be used together.

Protection tools

● None

○ Object versioning (for data recovery)
For restoring deleted or overwritten objects. To minimize the cost of storing versions, we recommend limiting the number of noncurrent versions per object and scheduling them to expire after a number of days. Learn more

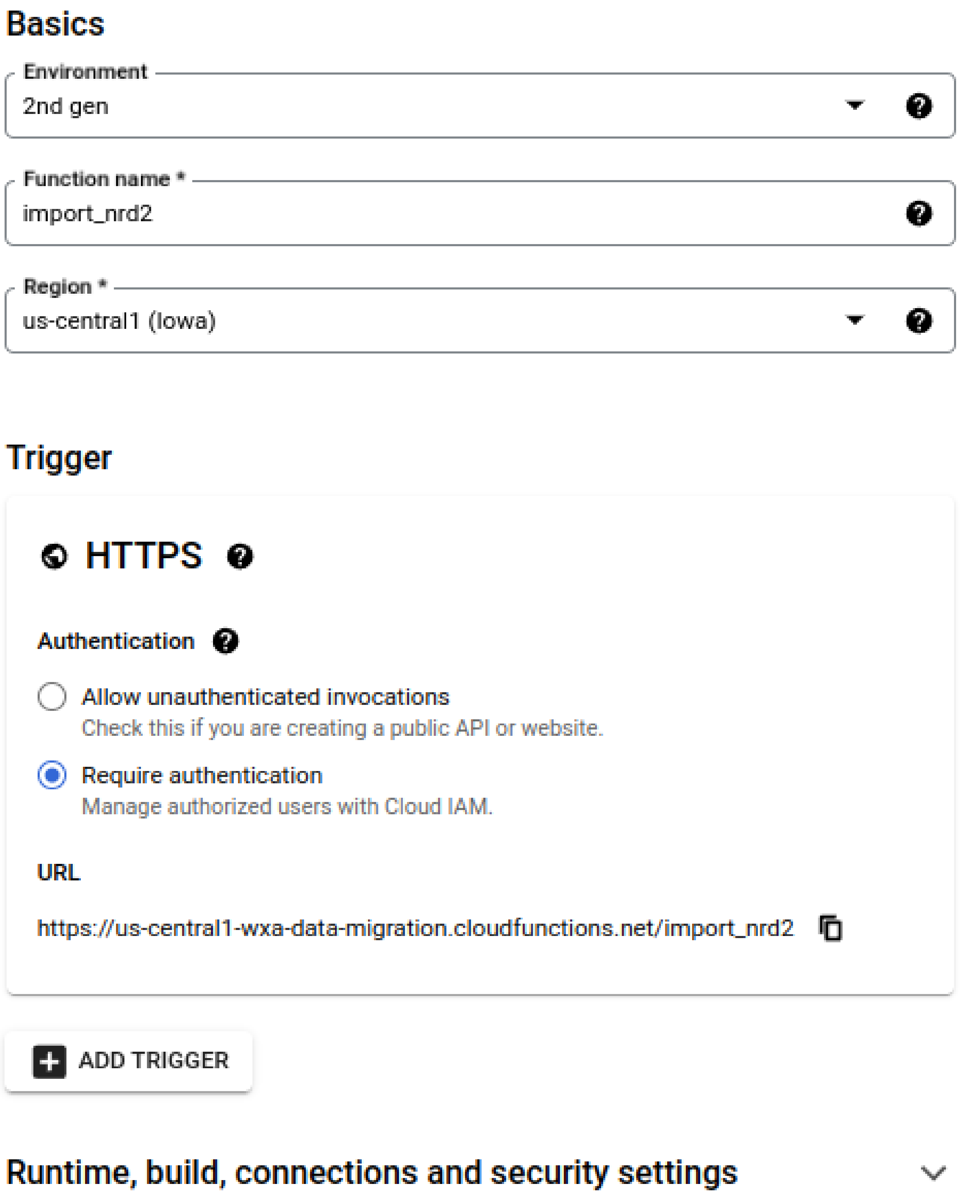
○ Retention policy (for compliance)
For preventing the deletion or modification of the bucket's objects for a specified minimum duration of time after being uploaded. Learn more

DATA ENCRYPTION

Step 2: Creating a Function in Cloud Functions

Now the magic begins.

- Navigate to the Cloud Functions service in the GCP console.
- Click on “Create Function”. Provide your function with a descriptive name. On the configuration page, specify “Require authentication” in the HTTPS trigger section.



Basics

Environment: 2nd gen

Function name *: import_nrd2

Region *: us-central1 (Iowa)

Trigger

HTTPS

Authentication

○ Allow unauthenticated invocations
Check this if you are creating a public API or website.

● Require authentication
Manage authorized users with Cloud IAM.

URL

https://us-central1-wxa-data-migration.cloudfunctions.net/import_nrd2

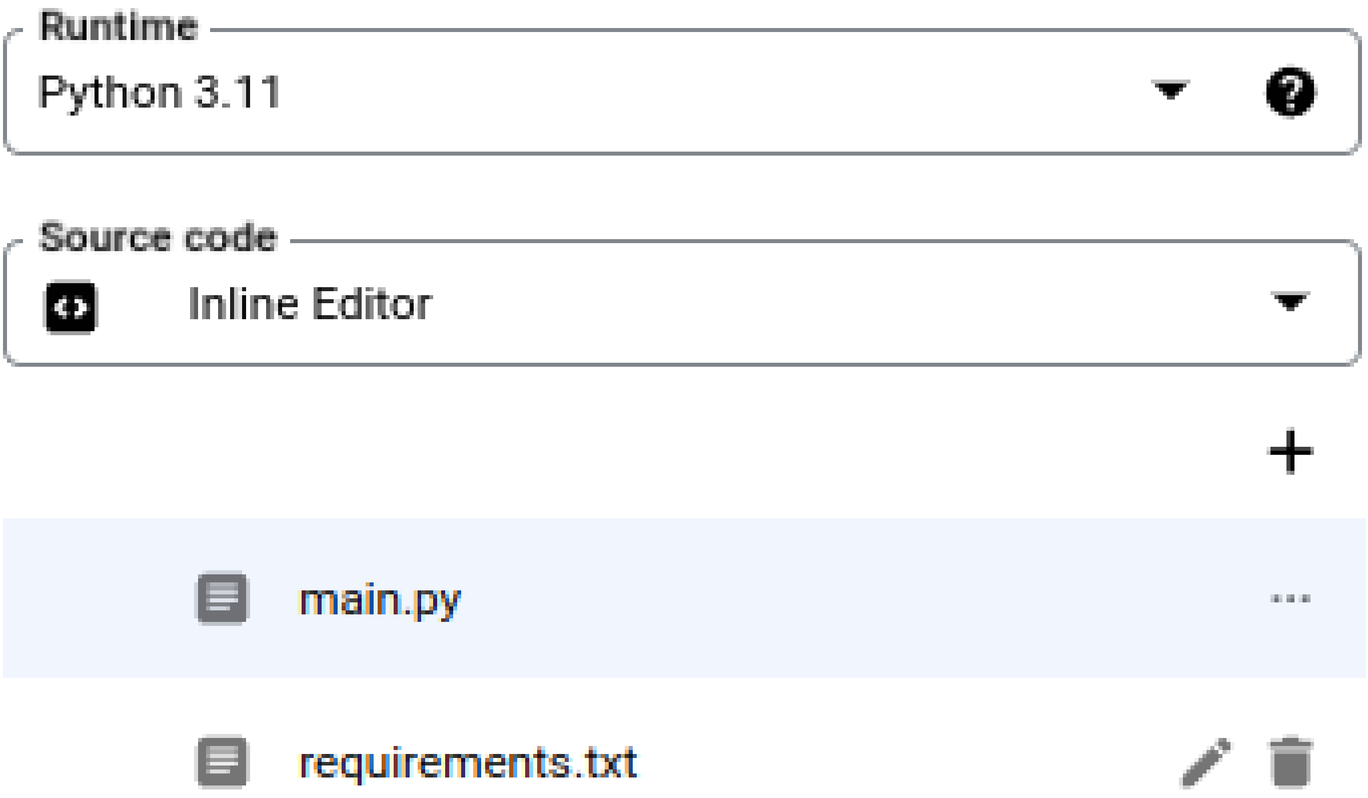
Runtime, build, connections and security settings

- Click on “Next”.

Step 3: Write the function to import the NRD2 .csv file to Cloud Storage

The example code snippet uses the Python requests module, and you may need to import it.

- First, select Python 3.* as your Runtime.



Runtime: Python 3.11

Source code: Inline Editor

- Then, copy over requirements.txt.

```
blinker==1.6.3
cachetools==5.3.1
certifi==2023.7.22
charset-normalizer==3.3.0
click==8.1.7
cloudevents==1.10.0
deprecation==2.1.0
Flask==2.3.3
functions-framework==3.4.0
google-api-core==2.12.0
google-auth==2.23.3
google-cloud-core==2.3.3
google-cloud-storage==2.12.0
google-crc32c==1.5.0
google-resumable-media==2.6.0
googleapis-common-protos==1.61.0
gunicorn==20.1.0
idna==3.4
itsdangerous==2.1.2
Jinja2==3.1.2
MarkupSafe==2.1.3
packaging==23.2
protobuf==4.24.4
pyasn1==0.5.0
pyasn1-modules==0.3.0
requests==2.31.0
rsa==4.9
urllib3==2.0.6
watchdog==3.0.0
Werkzeug==3.0.0
```

- The below Python code provides the entry point for the lambda_handler function:

Example code:

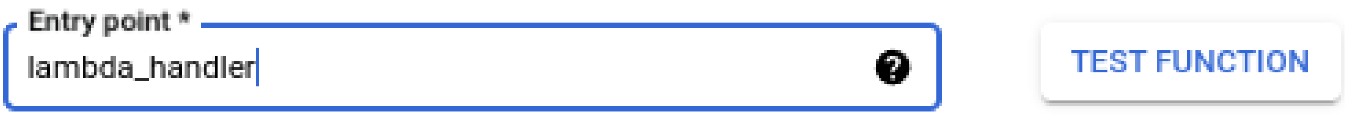
```
import os
from datetime import datetime, timedelta
import requests
from requests.auth import HTTPBasicAuth

import functions_framework
from google.cloud import storage


def download_nrd_file(url, bucket_name, blob_name, authUserPass):
    project_id = "wxa-data-migration"
    storage_client = storage.Client(project=project_id)
    bucket = storage_client.bucket(bucket_name)
    blob = bucket.blob(blob_name)

    CHUNK_SIZE = 1024 * 1024
    try:
        # Download the binary file in chunks
        response = requests.get(
            url, stream=True, auth=HTTPBasicAuth(authUserPass, authUserPass)
        )
        response.raise_for_status()

        # Create a temporary file to store chunks
        temp_file = "/tmp/temp_file"

        with open(temp_file, "wb") as f:
            for chunk in response.iter_content(chunk_size=CHUNK_SIZE):
                f.write(chunk)
        # Upload the binary file to Cloud Storage from the temporary file
        blob.upload_from_filename(temp_file)

        # Clean up the temporary file
        os.remove(temp_file)

        return True
    except Exception as e:
        print(f"Error: {str(e)}")
        return False


@functions_framework.http
def lambda_handler(request):
    # Calculate yesterday's date in YYYY-MM-DD format
    yesterday = (datetime.now() - timedelta(days=1)).strftime("%Y-%m-%d")

    # Define the URL of the CSV file you want to download
    nrd_url = f"https://newly-registered-domains.whoisxmlapi.com/datafeeds/Newly_Registered_Domai

    # Define your API Key here
    apiKey = "<YOUR_API_KEY>"

    # Define the Cloud Storage bucket and object/key where you want to store the file
    bucket_name = "nrd2"
    blob_name = f"nrd2-simple-{yesterday}.csv.gz"

    try:
        # Download the NRD2 file with basic authentication
        success = download_nrd_file(nrd_url, bucket_name, blob_name, apiKey)

        print("Status code returned is ", str(success))
        if success:
            # Upload the NRD file to Cloud Storage
            print(f"Uploading file to ", bucket_name, blob_name)
            return {
                "statusCode": 200,
                "body": "NRD2 file successfully downloaded and stored in GCP",
            }
        else:
            bodyStr = f"Failed to download {nrd_url}"
            return {"statusCode": 500, "body": bodyStr}
    except Exception as e:
        return {"statusCode": 500, "body": str(e)}
```

- Specify “Entry point” to be the entry function of your code. In our case, it’s “lambda_handler”.

Step 4: Testing your new function

The last step is to test the function to ensure it can a) successfully retrieve the NRD2 file, and b) write it to the Cloud Storage bucket:

- Click on “TEST FUNCTION” at the top of the page, and you should see something similar. GCP will fire up a Cloud Shell and set up the testing environment.

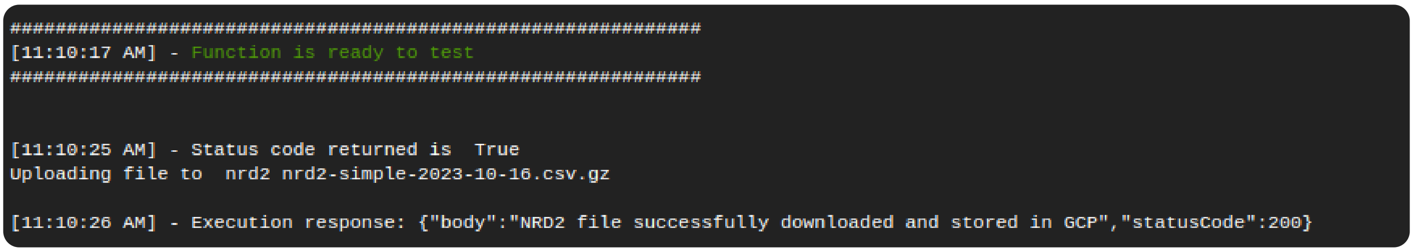


Entry point *
lambda_handler

- Click on “RUN TEST” in the bottom right corner.

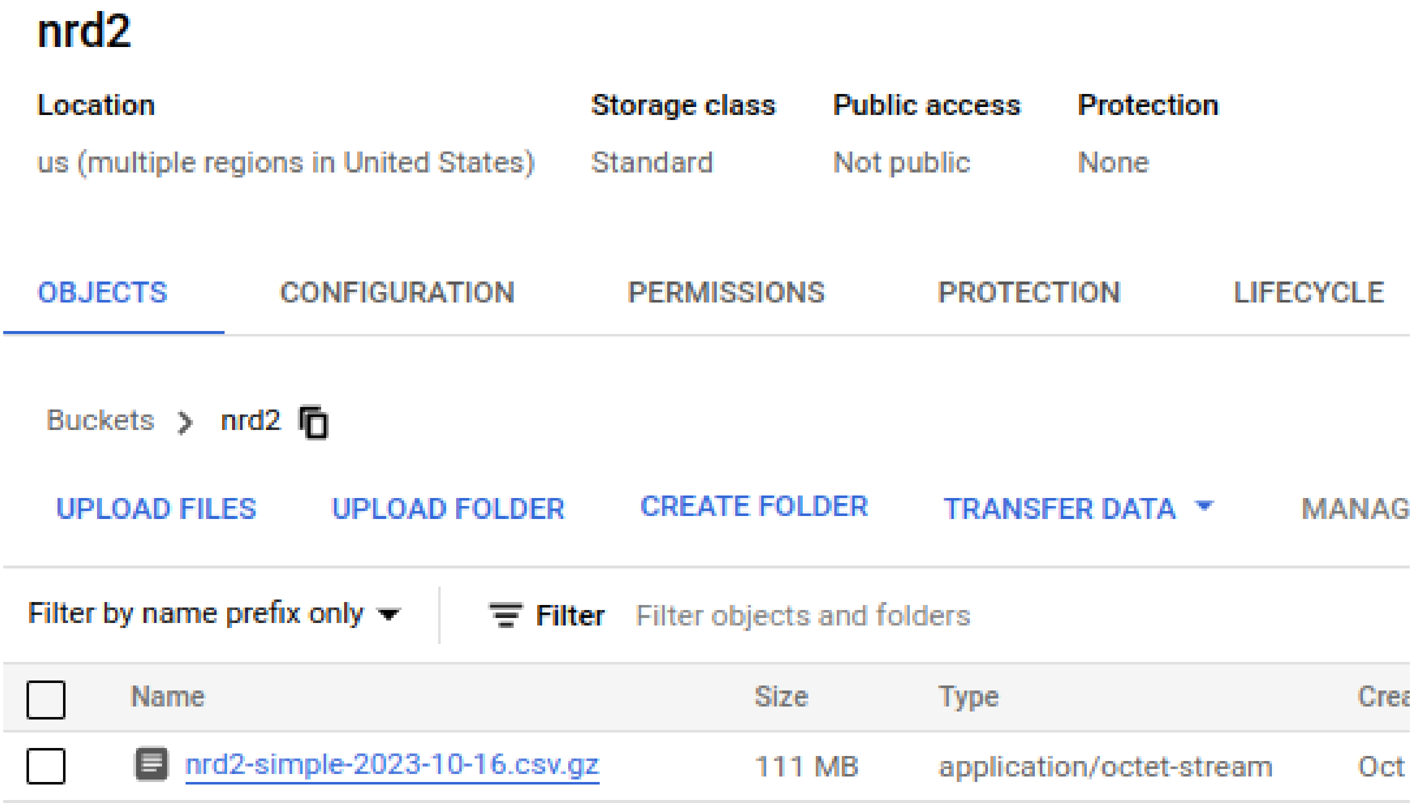
If your function is set up correctly, the function will retrieve the file, and write it to the Cloud Storage bucket. You can navigate to the Cloud Storage bucket to verify it’s there.

The output of the console should resemble this.



```
#############################################################
[11:10:17 AM] - Function is ready to test
#############################################################


[11:10:25 AM] - Status code returned is  True
Uploading file to  nrd2 nrd2-simple-2023-10-16.csv.gz

[11:10:26 AM] - Execution response: {"body":"NRD2 file successfully downloaded and stored in GCP","statusCode":200}
```

Then, in Cloud Storage, you'll have a new object added to the bucket.



nrd2

Location	Storage class	Public access	Protection
us (multiple regions in United States)	Standard	Not public	None

□	Name	Size	Type	Crea
□	nrd2-simple-2023-10-16.csv.gz	111 MB	application/octet-stream	Oct

Conclusion

The steps we took in GCP are similar to the AWS setup. After walking you through the process, the next step is to determine what you want to do with this data, such as import it into BigQuery, or MySQL database.