

nextwork.org

Multi-Cloud Data Transfer with AWS and GCP

RD

rdanu.inbox@gmail.com

nextwork-data-transfer-destination-gcp-yourname

Location	Storage class	Public access	Protection
us-west1 (Oregon)	Standard	Not public	None

OBJECTS CONFIGURATION PERMISSIONS PROTECTION LIFECYCLE OBSERVABILITY NEW INVENTORY REPORTS OPERATIONS

Folder browser Buckets > nextwork-data-transfer-destination-gcp-yourname

CREATE FOLDER UPLOAD TRANSFER DATA OTHER SERVICES

Filter by name prefix only Filter objects and folders Show Live objects

Name	Size	Type	Created	Storage class
Automate Your Browser with AI.pdf	18.2 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Build a Three-Tier Web App.pdf	17.4 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Building an AI Workflow.pdf	17.2 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Create S3 Buckets with Terraform.pdf	17.3 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Deploy Backend with Kubernetes.pdf	16 MB	application/pdf	Mar 19, 2025, 12:36:44 AM	Standard
Fetch Data with AWS Lambda.pdf	16.7 MB	application/pdf	Mar 19, 2025, 12:36:42 AM	Standard
How to Use DeekSeek.pdf	6.5 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Prompt Engineering.pdf	17.2 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Threat Detection with GuardDuty.pdf	4.1 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Transcribe Audio Files with AI.pdf	14.3 MB	application/pdf	Mar 19, 2025, 12:36:49 AM	Standard

Introducing Today's Project!

In this project, I will demonstrate how to transfer data from Amazon S3 to Google Cloud Storage using Storage Transfer Service. I'm doing this to learn secure multi-cloud data management and cross-cloud integration.

Tools and concepts

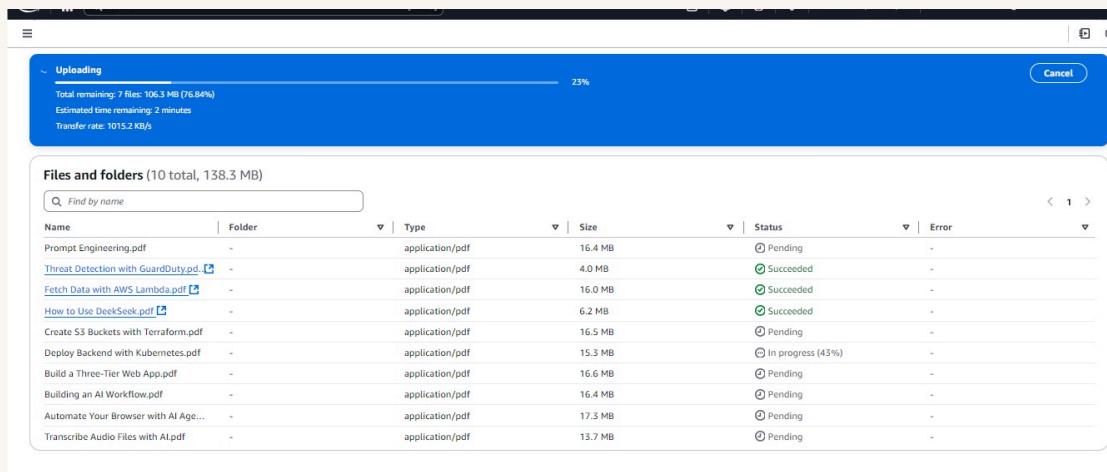
Services I used were Amazon S3, GCP Cloud Storage, Storage Transfer Service, and IAM roles. Key concepts I learnt include multi-cloud data transfer, identity federation, and storage class optimization.

Project reflection

This project took me approximately a 60 minutes to complete. The most challenging part was configuring custom IAM roles and trust policies for cross-cloud access. It was most rewarding to successfully transfer the data from AWS to GCP.

Setting up Data in S3

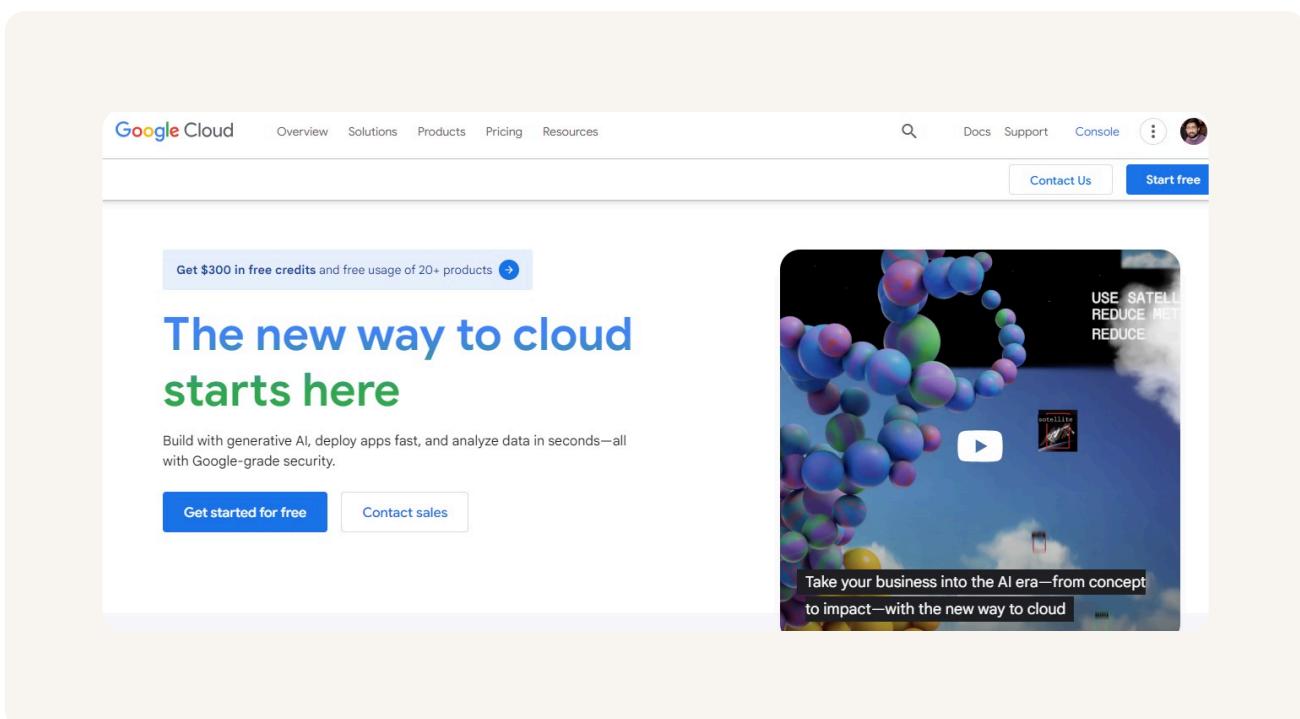
I started this project by setting up a new Amazon S3 bucket to store the source data. I uploaded a few sample files into the bucket to simulate real-world data. This S3 bucket will be used as the source location for the transfer to GCP.



Setting up GCP

Google Cloud Platform (GCP) is Google's cloud service for storage, computing, and more. I set up a GCP account to create a Cloud Storage bucket. This bucket will store the data transferred from my Amazon S3 bucket.

GCP's free tier includes free usage of products like Cloud Storage, Compute Engine, and BigQuery each month. I also get \$300 in free credit to spend on any GCP services. This credit is valid across the first 90 days of my account.

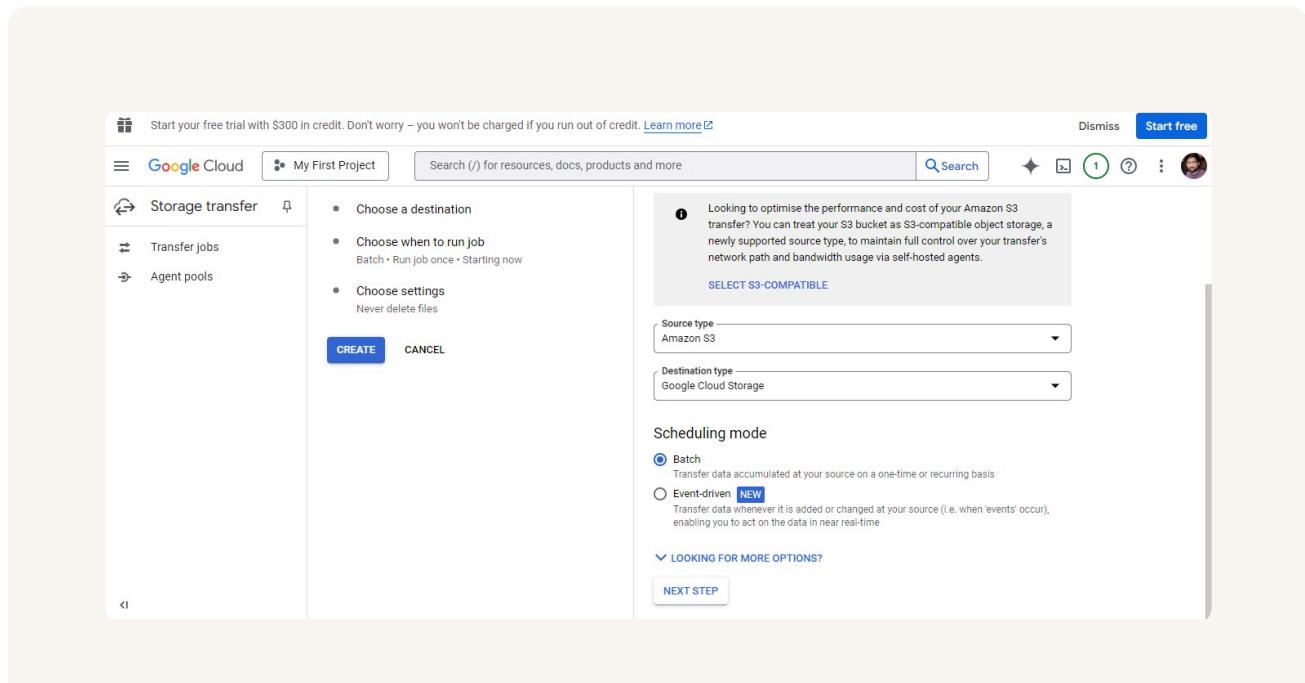


Storage Transfer

Data transfers are important for backups, migrations, and syncing data. Using multiple cloud providers offers flexibility, reliability, and cost savings. We're creating a transfer job to automate and securely move data from S3 to GCP.

The transfer is set up using Storage Transfer Service, a GCP tool for moving data from sources like AWS S3. We need this service because it automates and secures large-scale transfers. It makes cross-cloud data migration simple and efficient.

There are two types of transfers: batch and event-driven. Batch transfers run on a set schedule, while event-driven transfers happen automatically based on specific events. Event-driven transfers are real-time, while batch transfer are periodic.



Granting GCP Access to AWS

To connect AWS and GCP, I'm using identity federation to authenticate in one cloud and access resources in the other without separate credentials. This method is more secure by avoiding multiple credentials and enabling single sign-on (SSO).

I created a custom IAM role for granting GCP access to AWS S3. This was necessary because default roles don't support cross-cloud identity federation. The custom role ensures secure and specific permissions for the data transfer.

Within the IAM role, I wrote a custom trust policy to define which external identity can assume the role. The policy includes a subject ID, which uniquely identifies the GCP service account. This ensures that only authorized GCP identities can access

The screenshot shows the 'Custom trust policy' section of the AWS IAM console. On the left, a code editor displays the JSON policy document:

```
1 Version: "2012-10-17",
2 Statement: [
3   {
4     Effect: "Allow",
5     Principal: {
6       Federated: "accounts.google.com"
7     },
8     Action: "sts:AssumeRoleWithWebIdentity",
9     Condition: {
10       StringEquals: {
11         "accounts.google.com:sub": "109865920221252839341"
12       }
13     }
14   }
15 ]
16 ]
17 }
```

On the right, there are two panels: 'Edit statement' and 'Select a statement'. The 'Edit statement' panel contains a button '+ Add new statement'. The 'Select a statement' panel has a placeholder 'Select an existing statement in the policy or add a new statement.'

Transferring from S3 to GCS!

To set up my destination GCS bucket, I selected a region to define where the data is physically stored. I also chose a storage class based on how often the data will be accessed. These settings help balance cost, availability, and performance.

I verified my data transfer was successful by checking the destination GCS bucket for the files. I also reviewed the Storage Transfer Service logs to confirm there were no errors.

The screenshot shows the Google Cloud Storage console interface. At the top, it displays the bucket name: `nextwork-data-transfer-destination-gcp-yourname`. Below this, it shows basic bucket details: Location (us-west1 (Oregon)), Storage class (Standard), Public access (Not public), and Protection (None). The main area is a 'Folder browser' showing a list of files. The files are all PDFs and were uploaded on March 19, 2025, at 12:36:43 AM. The list includes:

Name	Size	Type	Created	Storage class
Automate Your Browser with AI.pdf	18.2 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Build a Three-Tier Web App.pdf	17.4 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Building an AI Workflow.pdf	17.2 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Create S3 Buckets with Terraform.pdf	17.3 MB	application/pdf	Mar 19, 2025, 12:36:43 AM	Standard
Deploy Backend with Kubernetes.pdf	16 MB	application/pdf	Mar 19, 2025, 12:36:44 AM	Standard
Fetch Data with AWS Lambda.pdf	16.7 MB	application/pdf	Mar 19, 2025, 12:36:42 AM	Standard
How to Use DeekSeek.pdf	6.5 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Prompt Engineering.pdf	17.2 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Threat Detection with GuardDuty.pdf	4.1 MB	application/pdf	Mar 19, 2025, 12:36:41 AM	Standard
Transcribe Audio Files with AI.pdf	14.3 MB	application/pdf	Mar 19, 2025, 12:36:49 AM	Standard

 RD

rdanu.inbox@gmail.com

NextWork Student

NextWork.org

Transfer with a Manifest

I verified my data transfer was successful by checking the destination GCS bucket for the files. I also reviewed the Storage Transfer Service logs to confirm there were no errors.



NextWork.org

Everyone should be in a job they love.

Check out nextwork.org for
more projects

