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Multi-Cloud Data Transfer with AWS and GCP



Leon Williams

The screenshot shows the Google Cloud Storage interface. The top navigation bar includes a trial status message, a search bar, and an 'Activate' button. The main navigation menu on the left lists 'Cloud Storage', 'Overview', 'Buckets' (which is selected), 'Monitoring', 'Storage Insights', and 'Settings'. The 'Buckets' section displays a single bucket named 'bucket-data-transfer-destination-gcp-lw'. Below the bucket details, the 'Objects' tab is active, showing a list of files. One file, 'LeonWilliamsResume.pdf', is listed with a size of 330.7 KB and a type of application/pdf. The interface also features tabs for 'Configuration', 'Permissions', 'Protection', 'Lifecycle', 'Observability', 'Inventory Reports', and 'Operations'.



Leon Williams
NextWork Student

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Introducing Today's Project!

Today I'm learning how to transfer data between AWS S3 and Google Cloud Storage. This project teaches me how to work across multiple cloud platforms, a valuable skill for cloud and DevOps roles where flexibility and reliability matter.

Tools and concepts

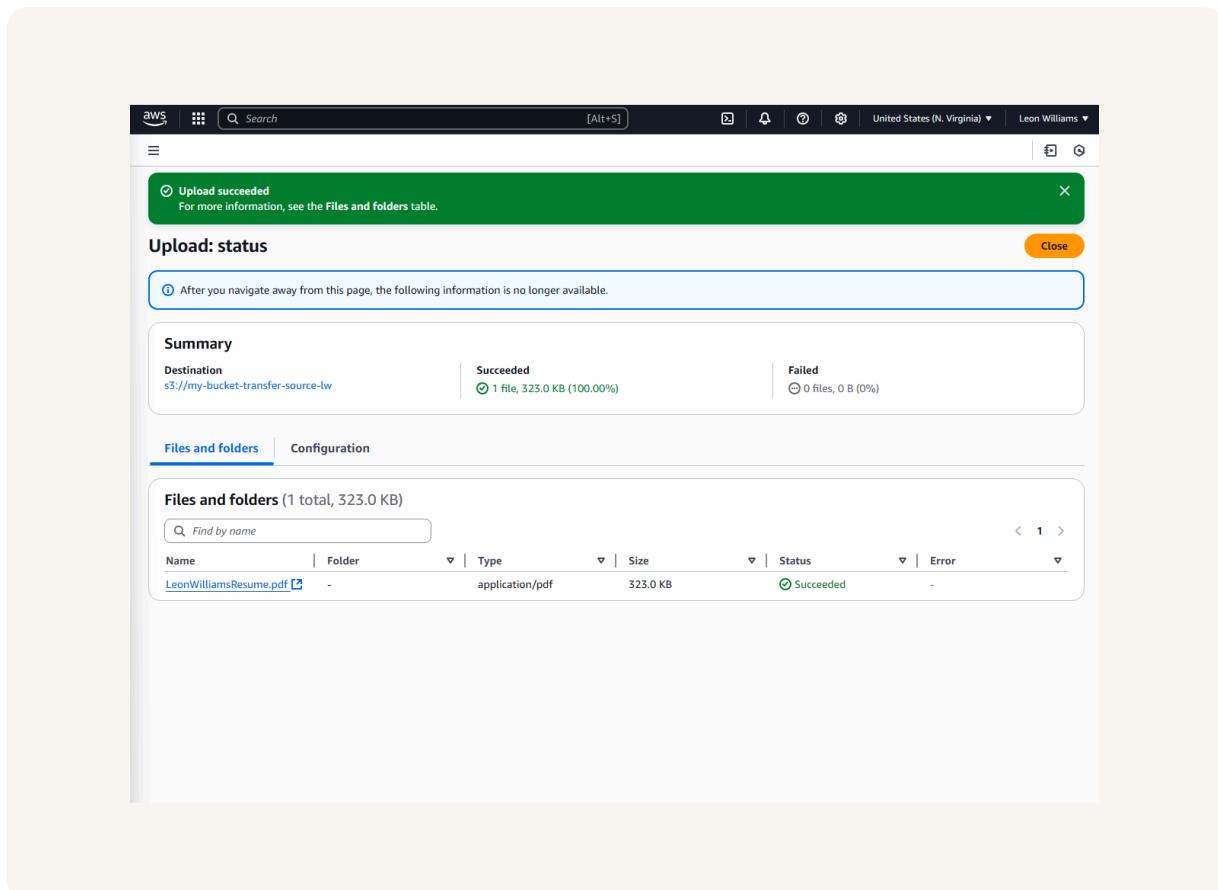
I learned GCP Storage Transfer Service for migrating data from AWS S3 to GCP, IAM roles for secure access, storage classes for cost efficiency, and access control settings to ensure data protection and smooth cloud migration.

Project reflection

This project took me approximately 1 hour and 20 minutes. The most challenging part was configuring secure IAM roles for cross-cloud access. It was most rewarding to verify a successful, seamless data transfer.

Setting up Data in S3

I set up a new S3 bucket in AWS and uploaded my resume as a test file. This helped me get comfortable with storing and managing objects in the cloud using Amazon S3, a key skill for any cloud engineering workflow.



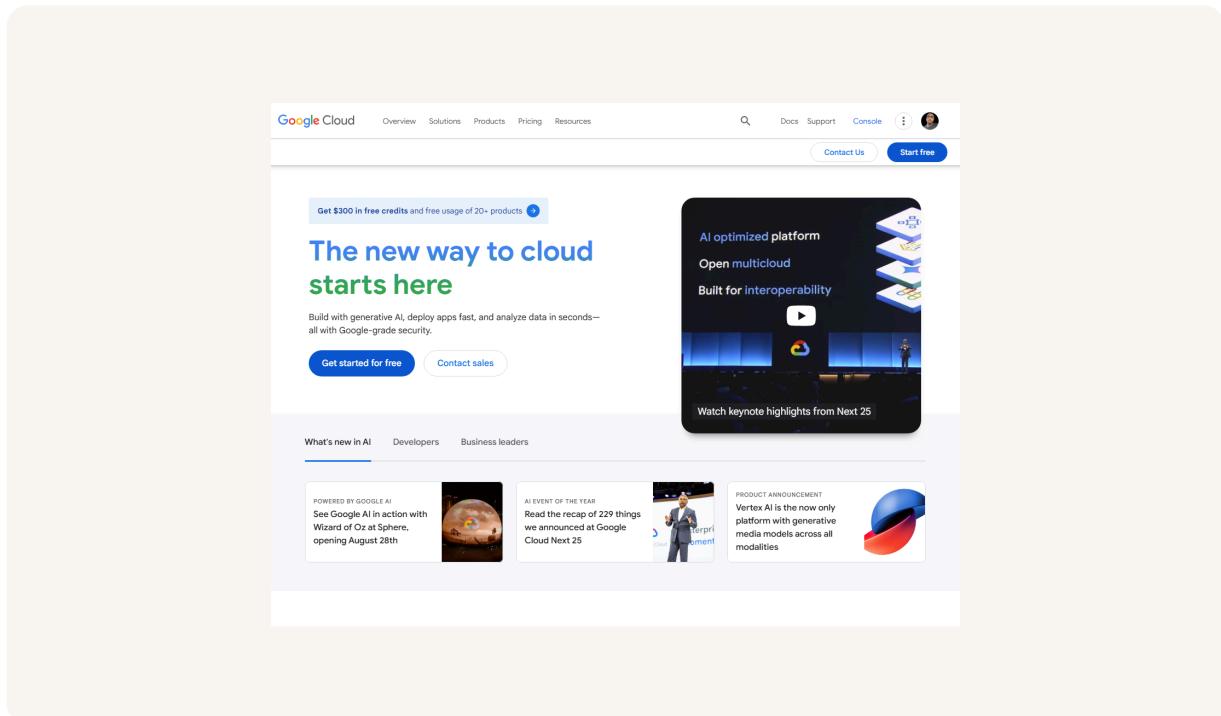
Leon Williams
NextWork Student

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Setting up GCP

GCP, or Google Cloud Platform, is Google's cloud service that offers tools for computing, storage, databases, machine learning, and more. It's similar to AWS and gives developers a powerful platform to build and manage cloud-based solutions.

With GCP's free trial, I received \$300 in credits and access to over 25 free services, including Cloud Storage. It's a great way for me to explore cloud tools, build real projects, and grow my skills without upfront costs.





Leon Williams
NextWork Student

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Storage Transfer

We are creating a transfer job to move files from my S3 bucket in AWS to my storage bucket in GCP.

The purpose of using Storage Transfer Service is to move data from AWS S3 into Google Cloud Storage securely and efficiently. It handles the authentication and error checking for you, so you don't need to build or manage your own transfer process.

There are two types of transfers in Storage Transfer Service. I used batch for a scheduled move. Event-driven transfers trigger automatically. This helped me understand storage workflows in my multicloud project.



Leon Williams
NextWork Student

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The screenshot shows the Google Cloud Storage Transfer interface. At the top, there is a banner with the text "Free trial status: \$300.00 credit and 91 days remaining. Activate your full account to get unlimited access to all of Google Cloud—use any remaining credits, then pay only for what you use." Below the banner, the navigation bar includes "Google Cloud", "My First Project", "Search (/) for resources, docs, products, and more", "Search", and "Activate". The main content area is titled "Create a transfer job" under "Storage Transfer". On the left, there are two sections: "Transfer jobs" and "Agent pools". The "Transfer jobs" section has a sub-section titled "Get started" with the sub-task "Amazon S3 to Google Cloud Storage". A red error message "Some form fields are incorrect" is displayed above the task list. The task list includes: "Choose a source", "Choose a destination", "Choose when to run job" (with a note "Batch • Run job once • starting now"), and "Choose settings" (with a note "Never delete files"). At the bottom of this section are "CREATE" and "CANCEL" buttons. To the right, there is a "Get started" section with a sub-task "Amazon S3 to Google Cloud Storage". It contains a note about optimizing performance and cost, a dropdown menu set to "SELECT S3-COMPATIBLE" (with "Amazon S3" selected), and dropdown menus for "Source type" (set to "Amazon S3") and "Destination type" (set to "Google Cloud Storage"). Below these are sections for "Scheduling mode" (set to "Batch") and "Event-driven" (which is disabled). At the bottom right of this section is a "NEXT STEP" button.



Leon Williams
NextWork Student

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Granting GCP Access to AWS

Identity federation is used to let GCP temporarily access my AWS S3 bucket without sharing permanent credentials. It creates a secure trust between platforms and issues short-lived access, making cross-cloud transfers safer and more efficient.

I created a custom IAM role to give GCP's Storage Transfer Service read-only access to my S3 bucket. This lets it pull data securely without giving unnecessary permissions.

The subject ID is how AWS knows the request is coming from my GCP project. It lets Storage Transfer securely access my S3 bucket without sharing permanent credentials, keeping my setup safe and reliable.



Leon Williams
NextWork Student

nextwork.org

The screenshot shows the AWS IAM 'Create role' interface. The top navigation bar includes 'AWS', a search bar, and a 'Global' dropdown. The main title is 'Create role'. Below the title, a note says 'Create a custom trust policy to enable others to perform actions in this account.' A large blue-highlighted area contains the JSON code for the custom trust policy:

```
1 * {
2   "Version": "2012-10-17",
3   "Statement": [
4     {
5       "Effect": "Allow",
6       "Principal": "*",
7       "Federated": "accounts.google.com"
8     },
9     {
10      "Action": "stsAssumeRoleWithWebIdentity",
11      "Condition": {
12        "StringEquals": {
13          "accounts.google.com:sub": "████████████████████████████████████████"
14        }
15      }
16    }
17 }
18 }
```

To the right of the policy editor, there's a sidebar titled 'Edit statement' with a sub-section 'Select a statement' and a button '+ Add new statement'.

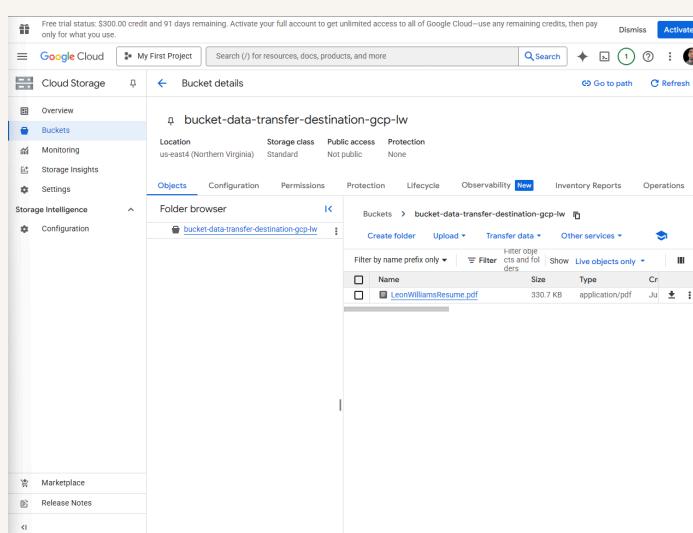
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NextWork Student

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Transferring from S3 to GCS!

For this project, I set the GCP bucket to Region location type, storing data in a single region for cost-efficiency and simplicity. I chose Standard storage class, ideal for frequently accessed data with low latency and high performance.

I verified the data transfer by monitoring the Storage Transfer Service job until it showed success then confirmed all files appeared correctly in the GCP bucket ensuring data integrity and smooth cloud migration.





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Transfer with a Manifest

I verified the data transfer by monitoring the Storage Transfer Service job until it showed success then confirmed all files appeared correctly in the GCP bucket ensuring data integrity and smooth cloud migration.



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