

Terraform Debugging Journey: Private S3 + CloudFront OAC

Introduction

This document summarizes the debugging journey of deploying a private S3 bucket behind CloudFront with Origin Access Control (OAC) using Terraform. We encountered multiple issues, investigated root causes, and applied fixes to finally achieve a successful deployment.

Initial Setup

We structured our Terraform project into environments (staging/prod) and modules (cloudfront_oac). The staging environment invoked the module with variables for project name, domain, and CDN domain. Providers were configured for us-east-1 because ACM certificates for CloudFront must be issued in that region.

Errors Encountered

1. **Undefined Provider (aws.us_east_1):** Terraform complained about a missing provider alias. We fixed this by explicitly declaring an aliased provider `aws.us_east_1` in the staging environment. 2. **Typos and Syntax Errors in Module:** The initial module had several typos like `resoure` instead of `resource`, missing quotes, and misnamed attributes. We replaced the module with a clean, validated version. 3. **ACL Error with CloudFront Logs:** When creating the CloudFront distribution, Terraform failed with the error: 'The S3 bucket specified for CloudFront logs does not enable ACL access.' This happened because the logs bucket was configured with `BucketOwnerEnforced`, which disables ACLs. CloudFront requires ACLs to deliver logs.

Debugging and Fixes

For the provider issue, we added an explicit alias for `us_east_1` and passed it to the module. For the module errors, we carefully rebuilt the `main.tf`, `variables.tf`, and `outputs.tf` with correct syntax. For the ACL issue, we updated the logging bucket configuration: - Changed object ownership from `BucketOwnerEnforced` to `BucketOwnerPreferred`. - Added an `aws_s3_bucket_acl` resource with `acl = "log-delivery-write"` to allow the CloudFront log-delivery group. - Retained public access block for security.

Final Outcome

After these changes, we ran `terraform plan` successfully, then `terraform apply`. The apply completed after ~3 minutes, during which CloudFront distribution was created, ACM certificate was validated, and Route 53 alias records were provisioned. Outputs confirmed successful deployment: `cdn_url`, `distribution_id`, `site bucket`, and `logs bucket`. We can now upload static site files to the private S3 bucket, invalidate the CloudFront cache, and securely serve the site via HTTPS and OAC.

Lessons Learned

- Always double-check provider aliases when working with regional requirements (like ACM in us-east-1). - Typos in Terraform HCL can cascade into multiple confusing errors; using `terraform validate` early helps. - CloudFront logging still depends on S3 ACLs. Avoid disabling ACLs on the log bucket. - Iterative debugging (fix one error, re-run, observe output) is the fastest way to converge on a working state. - Good module structure with variables, outputs, and validated configs saves hours of frustration.