

Terraform Remote Backend on AWS (S3 & DynamoDB)

Overview

- Terraform allows you to store your state file remotely using an AWS S3 bucket.
 - This ensures better collaboration and state consistency across teams.
 - Additionally, using AWS DynamoDB for state locking prevents simultaneous operations that could corrupt the state.
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Prerequisites

Before setting up the remote backend, ensure you have:

- An **AWS Account** with necessary permissions.
 - **AWS CLI** installed and configured.
 - **Terraform** installed on your system.
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Setting Up S3 Bucket and DynamoDB for Remote Backend

Steps:

1. Create the project directory: **aws-remote-terraform**.
2. Define providers:
 - Create a *providers.tf* file in the *aws-remote-terraform* directory.
 - Define:
 - terraform
 - required_providers
 - provider
 - aws
 - Reference: [providers.tf](#).
3. Define infrastructure:
 - Create *main.tf* file.
 - Use predefined modules:
 - module.s3-bucket
 - module.dynamodb
 - Reference: [main.tf](#).
4. Define local variables:
 - Create *locals.tf* file.
 - Define variables:
 - local.s3-bucket-arn
 - local.s3-bucket-properties
 - local.s3-bucket-policy
 - local.dynamodb-table-arn
 - local.dynamodb-properties
 - local.dynamodb-resource-policy

- Reference: [locals.tf](#).

Ensure you give the appropriate values to the variables defined in *locals.tf* file.

Provisioning the Infrastructure

Steps:

1. Open PowerShell.
 2. Navigate to `aws-remote-terraform` directory.
 3. Run:
 - `terraform fmt -recursive` → Format Terraform files.
 - `terraform init` → Initialize Terraform.
 - `terraform validate` → Validate configuration.
 - `terraform plan` → Plan resource creation.
 - `terraform apply` → Apply configuration (type `yes` when prompted).
 4. Verify the created resources in AWS Console.
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Configuring a Sample Project for Remote Backend

Steps:

1. Create the project directory: **sample-terraform**.
2. Define providers:
 - Create *providers.tf* file.
 - Define:
 - `terraform`
 - `required_providers`
 - `backend`
 - `provider`
 - `aws`
 - Reference: [providers.tf](#).
 - 3. **Define infrastructure:**
 - Create *main.tf* file.
 - Use predefined modules, e.g.,

```
module "s3-bucket" {  
  source = "github.com/inflection-templates/devops-  
templates/terraform/modules/aws/s3-bucket"  
  
  s3-bucket-properties = local.s3-bucket-properties  
  s3-bucket-policy     = local.s3-bucket-policy  
}
```

4. Define local variables:
 - Create *locals.tf* file.

- Define
 - `local.s3-bucket-arn`
 - `local.s3-bucket-properties`
 - `local.s3-bucket-policy`
- Reference: [locals.tf](#).

Ensure you give the appropriate values to the variables defined in `locals.tf` file.

Provisioning the Sample Infrastructure

Steps:

1. Open PowerShell.
2. Navigate to `sample-terraform` directory.
3. Run:
 - `terraform fmt -recursive` → Format files.
 - `terraform init` → Initialize Terraform.
 - `terraform validate` → Validate configuration.
 - `terraform plan` → Plan resource creation.
 - `terraform apply` → Apply configuration (type `yes` when prompted).
4. Verify resources in AWS Console.

Migrating an Existing Terraform State to Remote Backend

Steps:

1. Run `terraform init -migrate-state` to migrate local state to S3.
2. Run `terraform state list` to verify the migrated resources.
3. Run `terraform show` to confirm the remote state.
4. Run `terraform plan` and `terraform apply` to reapply infrastructure if needed.

Destroying the Sample Infrastructure

Steps:

1. Open PowerShell.
2. Navigate to `sample-terraform` directory.
3. Run `terraform destroy` (type `yes` when prompted).
4. Resources will be deleted.

Destroying the AWS Remote Backend Infrastructure

Steps:

1. Open PowerShell.
2. Navigate to `aws-remote-terraform` directory.

3. Run **terraform destroy** (type **yes** when prompted).
 4. Resources will be deleted.
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Conclusion

- By following this guide, you have successfully set up a Terraform remote backend using AWS S3 for state storage and DynamoDB for state locking.
 - This ensures secure, scalable, and team-friendly infrastructure management.
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