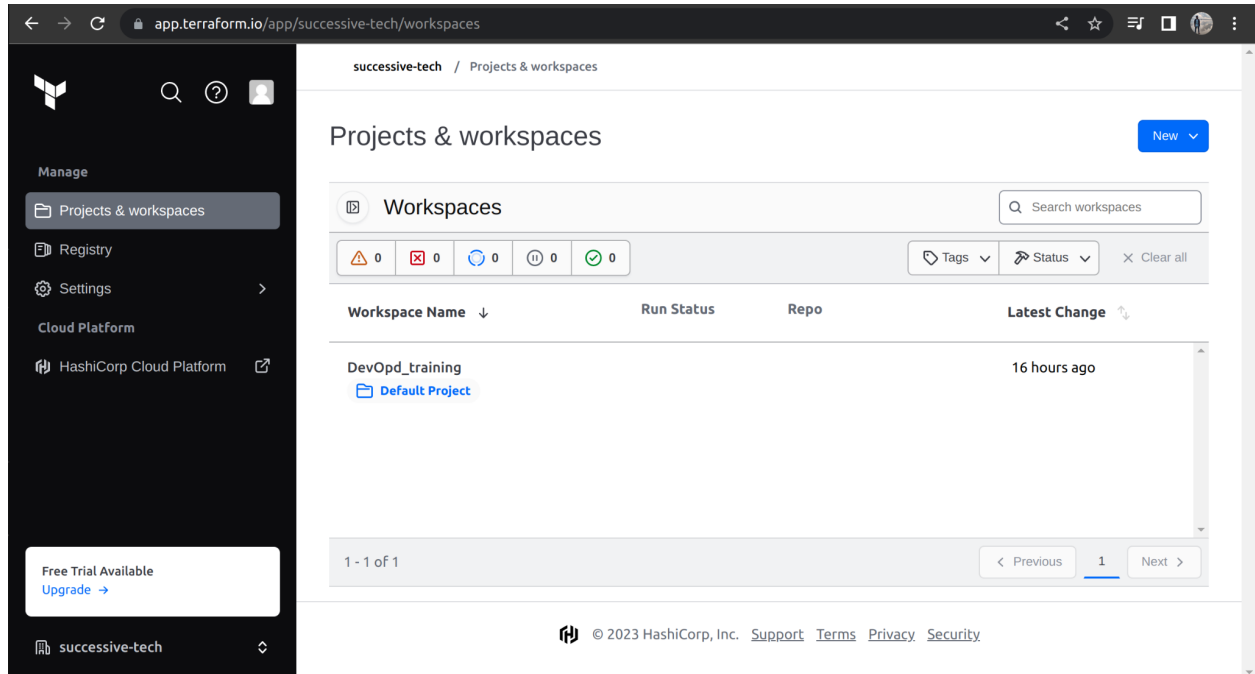# Terraform Task

1. Terraform Cloud

2. File structure

```
akashraut@akash:~/Downloads/grafana$ tree -a
.
├── backend.tf
├── charts
│   └── grafana
│       ├── Chart.yaml
│       ├── templates
│       │   ├── deployment.yaml
│       │   ├── _helpers.tpl
│       │   ├── service.yaml
│       │   └── tests
│       │       └── test-connection.yaml
│       └── values.yaml
├── local.tf
├── main.tf
├── modules
│   ├── main.tf
│   ├── output.tf
│   └── variables.tf
├── output.tf
├── provider.tf
├── .terraform
│   ├── environment
│   ├── modules
│   │   └── modules.json
│   ├── providers
│   │   └── registry.terraform.io
│   │       └── hashicorp
│   │           ├── aws
│   │           │   └── 4.56.0
│   │           │       └── linux_amd64
│   │           │           └── terraform-provider-aws_v4.56.0_x5
│   │           ├── helm
│   │           │   └── 2.9.0
│   │           │       └── linux_amd64
│   │           │           └── terraform-provider-helm_v2.9.0_x5
│   │           ├── kubernetes
│   │           │   └── 2.18.1
│   │           │       └── linux_amd64
│   │           │           └── terraform-provider-kubernetes_v2.18.1_x5
│   │           └── null
│   │               └── 3.2.1
│   │                   └── linux_amd64
│   │                       └── terraform-provider-null_v3.2.1_x5
│   └── terraform.tfstate
├── .terraform.lock.hcl
├── terraform.tfvars
└── variables.tf

22 directories, 24 files
akashraut@akash:~/Downloads/grafana$
```

Terraform code execution

terraform init

```
akashraut@akash:~/Downloads/grafana$ terraform init
 Initializing modules...

 Initializing Terraform Cloud...

 Initializing provider plugins...
 - Reusing previous version of hashicorp/aws from the dependency lock file
 - Reusing previous version of hashicorp/null from the dependency lock file
 - Reusing previous version of hashicorp/kubernetes from the dependency lock file
 - Reusing previous version of hashicorp/helm from the dependency lock file
 - Using previously-installed hashicorp/null v3.2.1
 - Using previously-installed hashicorp/kubernetes v2.18.1
 - Using previously-installed hashicorp/helm v2.9.0
 - Using previously-installed hashicorp/aws v4.56.0

 Terraform Cloud has been successfully initialized!

 You may now begin working with Terraform Cloud. Try running "terraform plan" to
 see any changes that are required for your infrastructure.

 If you ever set or change modules or Terraform Settings, run "terraform init"
 again to reinitialize your working directory.
akashraut@akash:~/Downloads/grafana$
```

terraform plan

```
akashraut@akash:~/Downloads/grafana$ terraform plan
Acquiring state lock. This may take a few moments...
module.helm_grafana.null_resource.start_minikube: Refreshing state... [id=398367374547795300]
module.helm_grafana.helm_release.grafana: Refreshing state... [id=grafana]
null_resource.top: Refreshing state... [id=1831879393519903688]

Note: Objects have changed outside of Terraform

Terraform detected the following changes made outside of Terraform since the last "terraform apply" which may have affected this plan:

  # module.helm_grafana.helm_release.grafana has been deleted
  - resource "helm_release" "grafana" {
      - chart       = "./charts/grafana" -> null
      - id          = "grafana" -> null
        name        = "grafana"
      - status      = "deployed" -> null
      - version     = "0.1.0" -> null
        # (23 unchanged attributes hidden)

        # (2 unchanged blocks hidden)
    }


Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to
undo or respond to these changes.

_____

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
  + create
-/+ destroy and then create replacement

Terraform will perform the following actions:

  # null_resource.top must be replaced
-/+ resource "null_resource" "top" {
      ~ id       = "1831879393519903688" -> (known after apply)
      ~ triggers = { # forces replacement
          ~ "always_run" = "20230228140331" -> (known after apply)
        }
    }

  # module.helm_grafana.helm_release.grafana will be created
  + resource "helm_release" "grafana" {
```
                                                                                          Ln 1, Col 1   Spaces: 2   UTF-8   LF   {} Terraform   ☡ ☐

terraform apply

```
● akashraut@akash:~/Downloads/grafana$ terraform apply
  Acquiring state lock. This may take a few moments...
  module.helm_grafana.null_resource.start_minikube: Refreshing state... [id=398367374547795300]
  module.helm_grafana.helm_release.grafana: Refreshing state... [id=grafana]
  null_resource.top: Refreshing state... [id=1831879393519903688]

  Note: Objects have changed outside of Terraform

  Terraform detected the following changes made outside of Terraform since the last "terraform apply" which may have affected this plan:

    # module.helm_grafana.helm_release.grafana has been deleted
    - resource "helm_release" "grafana" {
        - chart             = "./charts/grafana" -> null
        - id                = "grafana" -> null
          name              = "grafana"
        - status            = "deployed" -> null
        - version           = "0.1.0" -> null
          # (23 unchanged attributes hidden)

          # (2 unchanged blocks hidden)
      }


  Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to
  undo or respond to these changes.
  _____

  Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
    + create
  -/+ destroy and then create replacement

  Terraform will perform the following actions:

    # null_resource.top must be replaced
  -/+ resource "null_resource" "top" {
        ~ id        = "1831879393519903688" -> (known after apply)
        ~ triggers = { # forces replacement
            ~ "always_run" = "20230228140331" -> (known after apply)
          }
      }

    # module.helm_grafana.helm_release.grafana will be created
```
```
        + version           = "0.1.0"
        + wait              = true
        + wait_for_jobs     = false

        + set {
            + name  = "replicas"
            + value = "1"
          }
        + set {
            + name  = "service.type"
            + value = "NodePort"
          }
      }

  Plan: 2 to add, 0 to change, 1 to destroy.

  Changes to Outputs:
    ~ grafana_release_id = "grafana" -> (known after apply)

  Do you want to perform these actions in workspace "DevOps_training"?
    Terraform will perform the actions described above.
    Only 'yes' will be accepted to approve.

    Enter a value: yes

  null_resource.top: Destroying... [id=1831879393519903688]
  null_resource.top: Destruction complete after 0s
  module.helm_grafana.helm_release.grafana: Creating...
  module.helm_grafana.helm_release.grafana: Still creating... [10s elapsed]
  module.helm_grafana.helm_release.grafana: Still creating... [20s elapsed]
  module.helm_grafana.helm_release.grafana: Still creating... [30s elapsed]
  module.helm_grafana.helm_release.grafana: Still creating... [40s elapsed]
  module.helm_grafana.helm_release.grafana: Creation complete after 42s [id=grafana]
  null_resource.top: Creating...
  null_resource.top: Provisioning with 'local-exec'...
  null_resource.top (local-exec): Executing: ["/bin/sh" "-c" "       rm -f top_*.txt\n        top -b -n 1 > top_20230301102218.txt\n"]
  null_resource.top: Creation complete after 0s [id=58870405095951143]

  Apply complete! Resources: 2 added, 0 changed, 1 destroyed.

  Outputs:

  grafana_chart_name = "./charts/grafana"
  grafana_release_id = "grafana"
  grafana_release_status = "deployed"
  grafana_version = "0.1.0"
  akashraut@akash:~/Downloads/grafana$
```

.

terraform.tfstate on terraform cloud

Unlocked

Actions ⌄

← Workspaces

DevOps_training

Overview

States

Settings →

Free Trial Available
Upgrade →

successive-tech

New state #sv-VqsCi1NWSZLdHk3B
Akashraut triggered from Terraform 2 minutes ago

Download

Older

filter   Apply   ⓘ Learn more about filtering JSON data.   ⟳ Expand   ⤢ Full screen

```
 1  {
 2    "version": 4,
 3    "terraform_version": "1.3.9",
 4    "serial": 4,
 5    "lineage": "afd3ffa8-6458-c264-6e40-3e98c5f6bdd4",
 6    "outputs": {
 7      "grafana_chart_name": {
 8        "value": "./charts/grafana",
 9        "type": "string"
10      },
11      "grafana_release_id": {
12        "value": "grafana",
13        "type": "string"
14      },
15      "grafana_release_status": {
16        "value": "deployed",
17        "type": "string"
```