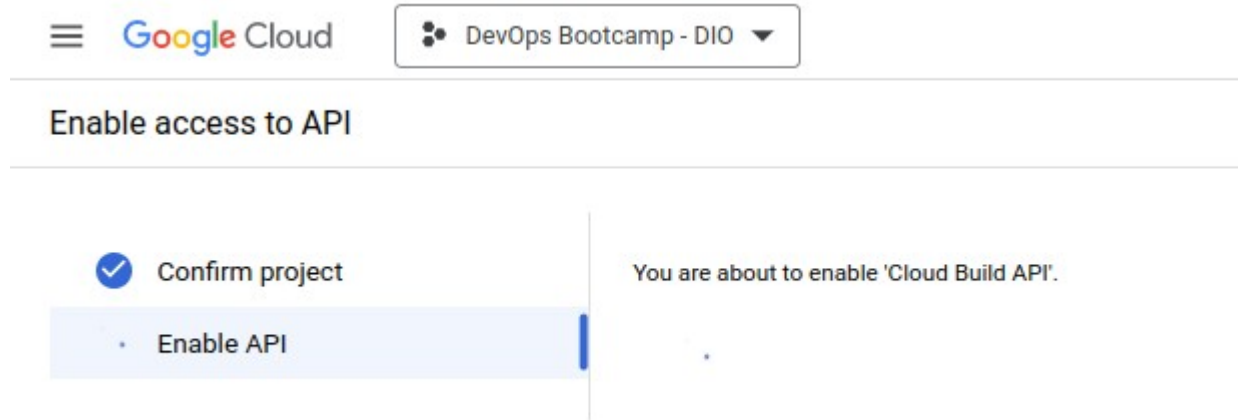



# Criando pipeline CI/CD

Cloud build e Terraform

- Cloud Build API




- Cloud Build API

 DevOps Bootcamp - DIO

---

[←](#) Product details

---



## Cloud Build API

[Google Enterprise API](#)


Continuously build, test, and deploy.

[MANAGE](#) [TRY THIS API](#) ✓ API Enabled

Click to manage this API

[OVERVIEW](#) [PRICING](#) [DOCUMENTATION](#)

- Compute Engine API




DevOps Bootcamp - DIO

---

[←](#) Product details

---



# Compute Engine API

[Google Enterprise API](#)

Compute Engine API

ENABLE

TRY THIS API [↗](#)

OVERVIEW

DOCUMENTATION

SUPPORT

---

- Service account permissions

The screenshot displays the Google Cloud IAM & Admin console interface. The left sidebar shows the navigation menu with 'IAM & Admin' selected. The main content area is titled 'Permissions for project "DevOps Bootcamp - DIO"' and shows a list of principals with their roles. The 'Principal' column lists '1070745533207@cloudbuild.gserviceaccount.com' and 'mic2890@gmail.com'. The 'Role' column shows 'Cloud Build Service Account' and 'Service Account User'. The 'IAM condition (optional)' column has links to '+ ADD IAM CONDITION'. The 'Edit access to "DevOps Bootcamp - DIO"' dialog is open on the right, showing the 'Principal' as '1070745533207@cloudbuild.gserviceaccount.com' and the 'Project' as 'DevOps Bootcamp - DIO'. The 'Assign roles' section lists four roles: 'Cloud Build Service Account', 'Compute Instance Admin (v1)', 'Service Account User', and 'Compute Network Admin'. Each role has a description and a link to '+ ADD IAM CONDITION'. At the bottom, there are buttons for 'SAVE', 'TEST CHANGES', and 'CANCEL'.

Google Cloud

DevOps Bootcamp - DIO

iam

IAM & Admin

IAM

GRANT ACCESS

REMOVE ACCESS

PERMISSIONS

RECOMMENDATIONS HISTORY

Permissions for project "DevOps Bootcamp - DIO"

These permissions affect this project and all of its resources.

VIEW BY PRINCIPALS

VIEW BY ROLES

Filter

Enter property name or value

| Type                     | Principal                                    | Role                        | IAM condition (optional) |
|--------------------------|--|-----------------------------|--------------------------|
| <input type="checkbox"/> | 1070745533207@cloudbuild.gserviceaccount.com | Cloud Build Service Account | + ADD IAM CONDITION      |
| <input type="checkbox"/> | mic2890@gmail.com                            | Service Account User        | + ADD IAM CONDITION      |

Edit access to "DevOps Bootcamp - DIO"

Principal

1070745533207@cloudbuild.gserviceaccount.com

Project

DevOps Bootcamp - DIO

Assign roles

Roles are composed of sets of permissions and determine what the principal can do with this resource. [Learn more](#)

| Role                        | IAM condition (optional) |
|-----------------------------|--------------------------|
| Cloud Build Service Account | + ADD IAM CONDITION      |
| Compute Instance Admin (v1) | + ADD IAM CONDITION      |
| Service Account User        | + ADD IAM CONDITION      |
| Compute Network Admin       | + ADD IAM CONDITION      |

+ ADD ANOTHER ROLE

SAVE

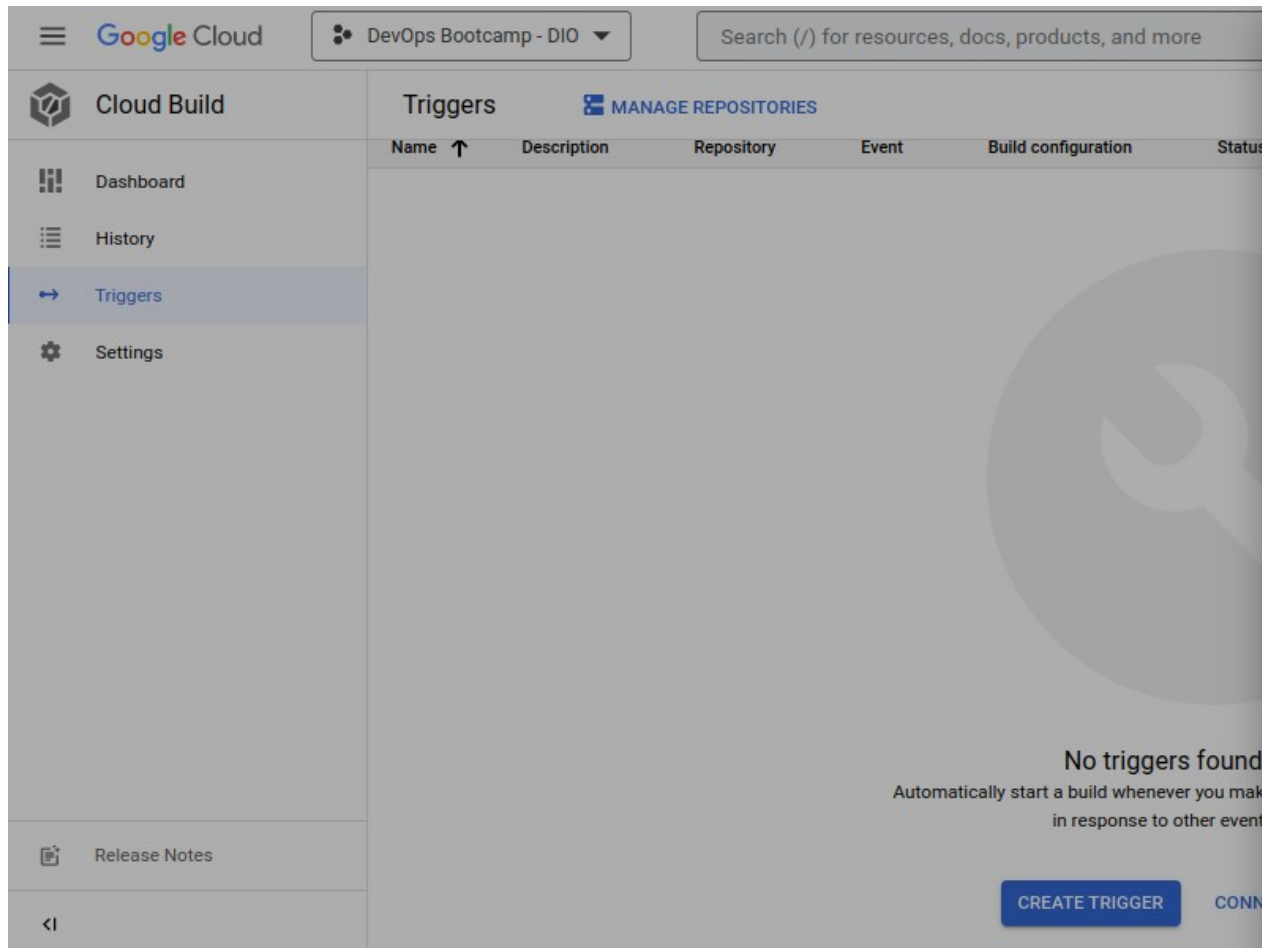
TEST CHANGES

CANCEL

- Git clone do repositório

```
mic2890@cloudshell:~ (devops-bootcamp-dio)$ git clone https://github.com/micael-ortega/terraform-gcp.git
Cloning into 'terraform-gcp'...
remote: Enumerating objects: 15, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (4/4), done.
remote: Total 15 (delta 1), reused 1 (delta 1), pack-reused 10
Receiving objects: 100% (15/15), done.
Resolving deltas: 100% (1/1), done.
```

# • Conecta o Cloud Build ao repositório



Region: global ?

✓ Select source

✓ Authenticate

✓ Select repository

4 Create a trigger (optional)

✓ Your micael-ortega/terraform-gcp repository is connected.

Cloud Build can automate builds in response to events that happen in your connected repositories. You can set up a trigger on your own or have a sample trigger created for you with the following values:

| Name           | Description   | Event          | Build configuration |
|----------------|---|----------------|---------------------|
| sample-trigger | Invokes a build every time code is pushed to any branch | Push to branch | Autodetected        |

You can change the configuration of any trigger after it's created.

CREATE A TRIGGER

CREATE SAMPLE TRIGGER

DONE

- Configuração do trigger

☰

Google Cloud

DevOps Bootcamp - DIO

Search (/) for resources, docs, products, and more

Cloud Build

Dashboard

History

Triggers

Settings

← Edit trigger

DISABLE

DELETE

Source: [michael-ortega/terraform-gcp](#) [View triggered builds](#)

Name \*

trigger-1

Must be unique within the project's region

Region \*

global (non-regional)

Description

Invokes a build every time code is pushed to any branch

Tags

terraform

Event

Repository event that invokes trigger

☒ Push to a branch

☐ Push new tag

☐ Pull request

Not available for Cloud Source Repositories




- Configuração do trigger


☰


Google Cloud


DevOps Bootcamp - DIO ▾


Search (/) for resources, docs, products, and more

 Cloud Build

 Dashboard

 History

 Triggers

 Settings

← Edit trigger

■ DISABLE

🗑️ DELETE

Or in response to

☐ Manual invocation

☐ Pub/Sub message

☐ Webhook event

Source

Repository generation

☒ 1st Generation

☐ 2nd Generation **PREVIEW**

Repository \*

micael-ortega/terraform-gcp (GitHub App) ▾

Select the repository to watch for events and clone when the trigger is invoked

Branch \*

^main\$

Trigger only for a branch that matches the given regular expression [Learn more](#)

☐ Invert Regex

Matches the branch: main

- Configuração do trigger

☰

Google Cloud

DevOps Bootcamp - DIO

Search (/) for resources, docs, products, and more

Cloud Build

Dashboard

History

Triggers

Settings

← Edit trigger

DISABLE

DELETE

Configuration

Type

☒ Autodetected

A cloudbuild.yaml or Dockerfile will be detected in the repository

☐ Cloud Build configuration file (yaml or json)

☐ Dockerfile

☐ Buildpacks

Location

☒ Repository

micael-ortega/terraform-gcp (GitHub App)

☐ Inline

Write inline YAML

Advanced

Approval

☐ Require approval before build executes

Build logs

☐ Send build logs to GitHub

Service account

Trigger a build with the following service account [Learn more](#)

Service account email

- Criando bucket para terraform state

Google Cloud

DevOps Bootcamp - DIO

storage

Search

Cloud Storage

Buckets

Monitoring **NEW**

Settings

Marketplace

Release Notes

Buckets


CREATE

REFRESH

Filter

Filter buckets

| <input type="checkbox"/> | Name ↑ | Created | Location type | Location | Default storage class ? | Last modified ? | Public access |
|--------------------------|--------|---------|---------------|----------|-------------------------|-----------------|---------------|
| No rows to display       |        |         |               |          |                         |                 |               |



**Store and retrieve your data**

Get started by creating a bucket — a container where you can organize and control access to your data and files in Cloud Storage.

CREATE BUCKET

TAKE QUICKSTART

# • Criando bucket para terraform state

Google Cloud DevOps Bootcamp - DIO storage X Search 3 ? :

Cloud Storage Bucket details REFRESH HELP ASSISTANT LEARN

Buckets Monitoring NEW Settings

micaelortega\_bucket

Location us (multiple regions in United States) Storage class Standard Public access Not public Protection None

OBJECTS CONFIGURATION PERMISSIONS PROTECTION LIFECYCLE OBSERVABILITY NEW

Buckets > micaelortega\_bucket

UPLOAD FILES UPLOAD FOLDER CREATE FOLDER TRANSFER DATA MANAGE HOLDS DOWNLOAD DELETE

Filter by name prefix only Filter Filter objects and folders Show deleted data

| <input type="checkbox"/> | Name | Size | Type | Created ? | Storage class | Last modified | Public access ? | Version history ? | Encryption ? | Retention expiration date ? | Holds ? |
|--------------------------|------|------|------|-----------|---------------|---------------|-----------------|-------------------|--------------|-----------------------------|---------|
| No rows to display       |      |      |      |           |               |               |                 |                   |              |                             |         |

Marketplace Release Notes <1

Created bucket micaelortega\_bucket X

- Configurando valores em main.tf

```
15 provider "google" {
16   project = "devops-bootcamp-dio"
17   region  = "us-central1"
18   zone    = "us-central1-c"
19 }
20
21 resource "google_compute_network" "vpc_network" {
22   name = "${var.network_name}"
23 }
24
25 resource "google_compute_instance" "vm_instance" {
26   name          = "terraform-instance"
27   machine_type  = "f1-micro"
28   tags          = ["prod"]
29
30   labels = {
31     centro_custo = "${var.centro_custo_rh}"
32   }
33
34   boot_disk {
35     initialize_params {
36       image = "debian-cloud/debian-11"
37     }
38   }
39 }
```

# • Terraform init

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ terraform init
```

**Initializing the backend...**

Successfully configured the backend "gcs"! Terraform will automatically use this backend unless the backend configuration changes.

**Initializing provider plugins...**

- Finding latest version of hashicorp/google...
- Installing hashicorp/google v4.50.0...
- Installed hashicorp/google v4.50.0 (signed by HashiCorp)

Terraform has created a lock file `.terraform.lock.hcl` to record the provider selections it made above. Include this file in your version control repository so that Terraform can guarantee to make the same selections by default when you run "terraform init" in the future.

**Terraform has been successfully initialized!**

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

If you ever set or change modules or backend configuration for Terraform, rerun this command to reinitialize your working directory. If you forget, other commands will detect it and remind you to do so if necessary.

# • Terraform plan

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ terraform plan
```

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

+ create

Terraform will perform the following actions:

```
# google_compute_instance.vm_instance will be created
+ resource "google_compute_instance" "vm_instance" {
  + can_ip_forward      = false
  + cpu_platform        = (known after apply)
  + current_status      = (known after apply)
  + deletion_protection = false
  + guest_accelerator   = (known after apply)
  + id                  = (known after apply)
  + instance_id         = (known after apply)
  + label_fingerprint   = (known after apply)
  + labels               = {
    + "centro_custo" = "rh"
  }
  + machine_type        = "f1-micro"
  + metadata_fingerprint = (known after apply)
  + min_cpu_platform    = (known after apply)
  + name                = "terraform-instance"
  + project              = (known after apply)
  + self_link            = (known after apply)
  + tags                 = [
    + "prod",
  ]
  + tags_fingerprint    = (known after apply)
  + zone                = (known after apply)

  + boot_disk {
```

# • Terraform plan

```
+ tags                = [  
  + "prod",  
]  
+ tags_fingerprint    = (known after apply)  
+ zone                = (known after apply)  
  
+ boot_disk {  
  + auto_delete        = true  
  + device_name         = (known after apply)  
  + disk_encryption_key_sha256 = (known after apply)  
  + kms_key_self_link    = (known after apply)  
  + mode                = "READ_WRITE"  
  + source              = (known after apply)  
  
  + initialize_params {  
    + image = "debian-cloud/debian-11"  
    + labels = (known after apply)  
    + size   = (known after apply)  
    + type   = (known after apply)  
  }  
}  
  
+ confidential_instance_config {  
  + enable_confidential_compute = (known after apply)  
}
```

```
+ network_interface {  
  + ipv6_access_type = (known after apply)  
  + name              = (known after apply)  
  + network           = "terraform-network"  
  + network_ip        = (known after apply)  
  + stack_type        = (known after apply)  
  + subnetwork        = (known after apply)  
  + subnetwork_project = (known after apply)  
  
  + access_config {  
    + nat_ip        = (known after apply)  
    + network_tier = (known after apply)  
  }  
}  
  
+ reservation_affinity {  
  + type = (known after apply)  
  
  + specific_reservation {  
    + key    = (known after apply)  
    + values = (known after apply)  
  }  
}
```



# • Terraform plan

```
+ scheduling {
+   automatic_restart      = (known after apply)
+   instance_termination_action = (known after apply)
+   min_node_cpus          = (known after apply)
+   on_host_maintenance    = (known after apply)
+   preemptible            = (known after apply)
+   provisioning_model      = (known after apply)
+
+   node_affinities {
+     key      = (known after apply)
+     operator = (known after apply)
+     values   = (known after apply)
+   }
+ }
}
```

# google\_compute\_network.vpc\_network will be created

```
+ resource "google_compute_network" "vpc_network" {
+   auto_create_subnetworks = true
+   delete_default_routes_on_create = false
+   gateway_ipv4             = (known after apply)
+   id                      = (known after apply)
+   internal_ipv6_range      = (known after apply)
+   mtu                     = (known after apply)
+   name                    = "terraform-network"
+   project                 = (known after apply)
+   routing_mode             = (known after apply)
+   self_link               = (known after apply)
+ }
}
```

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

## Changes to Outputs:

```
+ ip = (known after apply)
```

- First commit

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git commit -m "first commit"
[main (root-commit) 953dfaf] first commit
 9 files changed, 138 insertions(+)
 create mode 100644 README.md
 create mode 100644 cloudbuild.yaml
 create mode 100644 terraform-exemplo/.terraform.lock.hcl
 create mode 100755 terraform-exemplo/.terraform/providers/registry.terraform.io/hashicorp/google/4.50.0/linux_amd64/terraform-provider-google_v4.50.0_x5
 create mode 100644 terraform-exemplo/.terraform/terraform.tfstate
 create mode 100644 terraform-exemplo/main.tf
 create mode 100644 terraform-exemplo/outputs.tf
 create mode 100644 terraform-exemplo/variables.tf
 create mode 100644 terraform.tfstate
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git remote add origin https://github.com/micael-ortega/terraform-gcp.git
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git push -u origin main
```

- First commit

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git commit -m "first commit"
[main (root-commit) 953dfaf] first commit
 9 files changed, 138 insertions(+)
 create mode 100644 README.md
 create mode 100644 cloudbuild.yaml
 create mode 100644 terraform-exemplo/.terraform.lock.hcl
 create mode 100755 terraform-exemplo/.terraform/providers/registry.terraform.io/hashicorp/google/4.50.0/linux_amd64/terraform-provider-google_v4.50.0_x5
 create mode 100644 terraform-exemplo/.terraform/terraform.tfstate
 create mode 100644 terraform-exemplo/main.tf
 create mode 100644 terraform-exemplo/outputs.tf
 create mode 100644 terraform-exemplo/variables.tf
 create mode 100644 terraform.tfstate
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git remote add origin https://github.com/micael-ortega/terraform-gcp.git
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git push -u origin main
```

- First commit

Compute Engine

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

START / RESUME

STOP

SUSPE

INSTANCES

OBSERVABILITY

NEW

INSTANCE SCHEDULES

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)

Filter

Enter property name or value

|                          | Status | Name ↑                             | Zone          | Recommendations | In use by | Internal IP                            | External IP                           |
|--------------------------|--------|------------------------------------|---------------|-----------------|-----------|--|---------------------------------------|
| <input type="checkbox"/> | ✓      | <a href="#">terraform-instance</a> | us-central1-c |                 |           | 10.128.0.2<br>( <a href="#">nic0</a> ) | 34.68.105.37 ( <a href="#">nic0</a> ) |

- First commit

## micaelortega\_bucket



| Location                               | Storage class | Public access | Protection |
|--|---------------|---------------|------------|
| us (multiple regions in United States) | Standard      | Not public    | None       |

[OBJECTS](#) [CONFIGURATION](#) [PERMISSIONS](#) [PROTECTION](#) [LIFECYCLE](#) [OBSERVABILITY](#) [NEW](#)

Buckets > micaelortega\_bucket > terraform > state 

[UPLOAD FILES](#) [UPLOAD FOLDER](#) [CREATE FOLDER](#) [TRANSFER DATA](#) [MANAGE HOLDS](#) [DOWNLOAD](#) [DELETE](#)

Filter by name prefix only ▼  Filter | Filter objects and folders

| <input type="checkbox"/> | Name  | Size   | Type                      | Created  |
|--------------------------|---|--------|---------------------------|---|
| <input type="checkbox"/> |  <a href="#">default.tfstate</a> | 5.8 KB | text/plain; charset=utf-8 | Jan 23, 2023, 10:52:38 PM   |

- Rename instance commit

```
resource "google_compute_instance" "vm_instance" {  
  name      = "cloudbuildterraform"  
  machine_type = "f1-micro"  
  tags      = ["prod"]  
  
  labels = {  
    centro_custo = "${var.centro_custo_rh}"  
  }  
  
  boot_disk {  
    initialize_params {  
      image = "debian-cloud/debian-11"  
    }  
  }  
  
  network_interface {  
    network = google_compute_network.vpc_network.name  
    access_config {  
    }  
  }  
}
```

- Rename instance commit

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git status
On branch main
Your branch is up to date with 'origin/main'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   main.tf
```

```
no changes added to commit (use "git add" and/or "git commit -a")
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git add .
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git status
On branch main
Your branch is up to date with 'origin/main'.
```

```
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   main.tf
```

```
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ git commit -m "Rename instance"
[main e2d1715] Rename instance
 1 file changed, 1 insertion(+), 1 deletion(-)
mic2890@cloudshell:~/terraform-gcp (devops-bootcamp-dio)$ █
```

- Rename instance commit

Changes to Outputs:

```
~ ip = "10.128.0.2" -> (known after apply)
google_compute_instance.vm_instance: Destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance]
0mgoogle_compute_instance.vm_instance: Still destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance, 10s elapsed]
google_compute_instance.vm_instance: Still destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance, 20s elapsed]
google_compute_instance.vm_instance: Still destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance, 30s elapsed]
google_compute_instance.vm_instance: Still destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance, 40s elapsed]
google_compute_instance.vm_instance: Still destroying... [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/terraform-instance, 50s elapsed]
google_compute_instance.vm_instance: Destruction complete after 51s
google_compute_instance.vm_instance: Creating...
google_compute_instance.vm_instance: Still creating... [10s elapsed]
google_compute_instance.vm_instance: Creation complete after 12s [id=projects/devops-bootcamp-dio/zones/us-central1-c/instances/cloudbbuildterraform]
```


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

Outputs:

```
ip = "10.128.0.3"
PUSH
DONE
```



- Rename instance commit

 **Compute Engine**

Virtual machines ^

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

VM instances

CREATE INSTANCE

IMPORT VM

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SU...

INSTANCES

OBSERVABILITY

NEW

INSTANCE SCHEDULES

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)

Filter

Enter property name or value

| <input type="checkbox"/> | Status | Name ↑                               | Zone          | Recommendations | In use by | Internal IP                            | External IP                              |
|--------------------------|--------|--------------------------------------|---------------|-----------------|-----------|--|--|
| <input type="checkbox"/> | ✓      | <a href="#">cloudbbuildterraform</a> | us-central1-c |                 |           | 10.128.0.3<br>( <a href="#">nic0</a> ) | 35.224.97.73<br>( <a href="#">nic0</a> ) |