



Projet Terraform

DevOps and MLOps

But : créer une VM Azure via terraform et faire tourner une application dessus.

Voici les étapes à suivre pour lancer le code terraform et créer la VM Azure :

1. Se placer dans le dossier contenant les fichiers.
2. Se connecter à son compte Azure pour authentifier la session afin de gérer les ressources Azure à partir de la ligne de commande.

>> `az login`

```
PS C:\Users\cleme\OneDrive\Efrei\M2\Semestre 2\DevOps and MLOps\Projet> az login
Please select the account you want to log in with.
```

3. Choisir la suscription Azure a utiliser.

>> `1`

```
Retrieving tenants and subscriptions for the selection...
[Tenant and subscription selection]

No      Subscription name      Subscription ID      Tenant
-----
[1] *   Azure for Students   b187a864-8967-4880-bc17-98cc660111a8   Efrei

The default is marked with an *; the default tenant is 'Efrei' and subscription is 'Azure for Students' (b187a864-8967-4880-bc17-98cc660111a8).
Select a subscription and tenant (Type a number or Enter for no changes): 1

Tenant: Efrei
Subscription: Azure for Students (b187a864-8967-4880-bc17-98cc660111a8)

[Announcements]
With the new Azure CLI login experience, you can select the subscription you want to use more easily. Learn more about it and its configuration at https://go.microsoft.com/fwlink/?linkid=2271236

If you encounter any problem, please open an issue at https://aka.ms/azclibug

[Warning] The login output has been updated. Please be aware that it no longer displays the full list of available subscriptions by default.
```

4. Initialiser un répertoire de travail Terraform.

>> *terraform init*

```
● PS C:\Users\cleme\OneDrive\Efrei\M2\Semestre 2\DevOps and MLOps\Projet> terraform init

Initializing the backend...

Initializing provider plugins...
- Reusing previous version of hashicorp/azurerm from the dependency lock file
- Reusing previous version of hashicorp/null from the dependency lock file
- Using previously-installed hashicorp/null v3.2.2
- Using previously-installed hashicorp/azurerm v3.111.0

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.
```

5. Générer un plan d'exécution en comparant l'état actuel des ressources avec l'état attendu après les modifications proposées.

>> *terraform plan*

>> *[Entrez le mot de passe de la vm]*

>> *yes*

```
● PS C:\Users\cleme\OneDrive\Efrei\M2\Semestre 2\DevOps and MLOps\Projet> terraform plan
var.password
  User password

Enter a value: [votre mot de passe]

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

6. Appliquer les modifications décrites dans le plan.

```
>> terraform apply
>> [Entrez le mot de passe de la vm]
>> yes
```

```
PS C:\Users\cleme\OneDrive\Efrei\M2\Semestre 2\DevOps and MLOps\Projet> terraform apply
var.password
  User password

Enter a value: [votre mot de passe]

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

7. Les différents outils demandés ont été installé.

```
null_resource.installations (remote-exec): Docker est installé avec succès.
null_resource.installations (remote-exec): Git est installé avec succès.
null_resource.installations (remote-exec): Python est installé avec succès.
null_resource.installations (remote-exec): Flask est installé avec succès.
null_resource.installations (remote-exec): Apache2 est installé avec succès.
```

8. L'API se lance automatiquement grâce au code Terraform et on peut effectuer des requêtes CRUD. Pour cela, récupérer l'IP publique de la VM et voici les différentes requêtes possibles :

```
GET      http://<vm_public_ip>:5000/articles
GET      http://<vm_public_ip>:5000/articles/<article_id>
POST     http://<vm_public_ip>:5000/articles
PUT      http://<vm_public_ip>:5000/articles/<article_id>
DELETE   http://<vm_public_ip>:5000/articles/<article_id>
```

```
null_resource.installations (remote-exec): * Serving Flask app 'api' (lazy loading)
null_resource.installations (remote-exec): * Environment: production
null_resource.installations (remote-exec): WARNING: This is a development server. Do not use it in a production deployment.
null_resource.installations (remote-exec): Use a production WSGI server instead.
null_resource.installations (remote-exec): * Debug mode: off
null_resource.installations (remote-exec): * Running on all addresses.
null_resource.installations (remote-exec): WARNING: This is a development server. Do not use it in a production deployment.
null_resource.installations (remote-exec): * Running on http://10.0.1.4:5000/ (Press CTRL+C to quit)
null_resource.installations: Still creating... [3m0s elapsed]
null_resource.installations (remote-exec): 90.11.51.143 - - [07/Jul/2024 17:24:17] "GET /articles HTTP/1.1" 200 -
null_resource.installations: Still creating... [3m10s elapsed]
null_resource.installations (remote-exec): 90.11.51.143 - - [07/Jul/2024 17:24:21] "POST /articles HTTP/1.1" 201 -
null_resource.installations (remote-exec): 90.11.51.143 - - [07/Jul/2024 17:24:23] "PUT /articles/2 HTTP/1.1" 200 -
null_resource.installations (remote-exec): 90.11.51.143 - - [07/Jul/2024 17:24:27] "DELETE /articles/3 HTTP/1.1" 200 -
```

9. Détruire toutes les ressources gérées par Terraform dans l'état actuel du répertoire de travail.

```
>> terraform destroy
>> [Entrez le mot de passe de la vm]
>> yes
```

```
PS C:\Users\cleme\OneDrive\Efrei\M2\Semestre 2\DevOps and MLOps\Projet> terraform destroy
var.password
  User password

Enter a value: [votre mot de passe]
```

```
azurem_resource_group.rg: Still destroying... [id=/subscriptions/b187a864-8967-4880-bc17-...60111a8/resourceGroups/myResourceGroup, 1m30s elapsed]
azurem_resource_group.rg: Still destroying... [id=/subscriptions/b187a864-8967-4880-bc17-...60111a8/resourceGroups/myResourceGroup, 1m40s elapsed]
azurem_resource_group.rg: Still destroying... [id=/subscriptions/b187a864-8967-4880-bc17-...60111a8/resourceGroups/myResourceGroup, 1m50s elapsed]
azurem_resource_group.rg: Still destroying... [id=/subscriptions/b187a864-8967-4880-bc17-...60111a8/resourceGroups/myResourceGroup, 2m0s elapsed]
azurem_resource_group.rg: Destruction complete after 2m6s

Destroy complete! Resources: 9 destroyed.
```