

A dark blue vertical bar runs down the left side of the page. A blue arrow points to the right from this bar, containing the date.

27/06/2022

TP4

DevOps

Several thin, curved lines in dark blue and light grey originate from the bottom left and sweep upwards and to the right.

ABED Karim
EFREI PARIS

On commence par se connecter à Azure en utilisant Azure CLI.

```
Windows PowerShell
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Installez la dernière version de PowerShell pour de nouvelles fonctionnalités et améliorations ! https://aka.ms/PSWindows

Le chargement des profils personnels et système a duré 8667 ms.
(base) PS C:\Users\karim> az login
A web browser has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize. Please continue the login in the web browser. If no web browser is available or if the web browser fails to open, use device code flow with 'az login --use-device-code'.
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "413688cf-bd4e-4c7c-8a61-69e73cdd7f31",
    "id": "765266c6-9a23-4638-af32-d81e32613847",
    "isDefault": true,
    "managedByTenants": [],
    "name": "Efrei - Apprentis BDML",
    "state": "Enabled",
    "tenantId": "413688cf-bd4e-4c7c-8a61-69e73cdd7f31",
    "user": {
      "name": "karim.abed@efrei.net",
      "type": "user"
    }
  },
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "413688cf-bd4e-4c7c-8a61-69e73cdd7f31",
    "id": "987b27a8-0264-4b87-a63b-aa9456cbb3d3",
    "isDefault": false,
    "managedByTenants": [],
    "name": "Azure for Students",
    "state": "Disabled",
    "tenantId": "413688cf-bd4e-4c7c-8a61-69e73cdd7f31",
    "user": {
      "name": "karim.abed@efrei.net",
      "type": "user"
    }
  }
]
(base) PS C:\Users\karim> terraform init
Terraform initialized in an empty directory!

The directory has no Terraform configuration files. You may begin working
with Terraform immediately by creating Terraform configuration files.
(base) PS C:\Users\karim> cd D:\Projets\DevOps\TP4
(base) PS D:\Projets\DevOps\TP4> terraform init

Initializing the backend...

Initializing provider plugins...
```

On crée un fichier au format .tf pour initialiser des ressources

```
File Edit Selection View Go Run Terminal Help
main.tf - Untitled (Workspace) - Visual Studio Code

EXPLORER
  UNINITIALIZED WORKSPACE
  Projets
  DevOps
  TP4
  Terraform
    terraform.lock.hcl
    -S4_devops_ABED_Karim.odt
    -W6_0657.tmp
    main.tf
    terraform.tfstate
    TP4_devops_ABED_Karim.odt
  NLP

main.tf
1 terraform {
2   required_version = ">=0.12"
3   required_providers {
4     azure = {
5       source = "hashicorp/azure"
6       version = "~>3.0.0"
7     }
8   }
9 }
10
11 provider "azure" {
12   subscription_id = "765266c6-9a23-4638-af32-d81e32613847"
13   features {}
14 }
15
16 resource "azurerm_public_ip" "public_ip" {
17   name                = "devops-20201104"
18   resource_group_name = data.azure_resource_group.tp4.name
19   location             = "francecentral"
20   allocation_method   = "Dynamic"
21 }
22
23 resource "azurerm_network_interface" "main" {
24   name                = "devops-20201104"
25   resource_group_name = data.azure_resource_group.tp4.name
26   location             = "francecentral"
27
28   ip_configuration {
29     name                 = "testconfiguration1"
30     subnet_id            = data.azure_subnet.internal.id
31     private_ip_address_allocation = "Dynamic"
32     public_ip_address_id    = azurerm_public_ip.public_ip.id
33   }
34 }
35
36
37
38
39
40
41
42
43
```

On initialise terraform avec un terraform init.

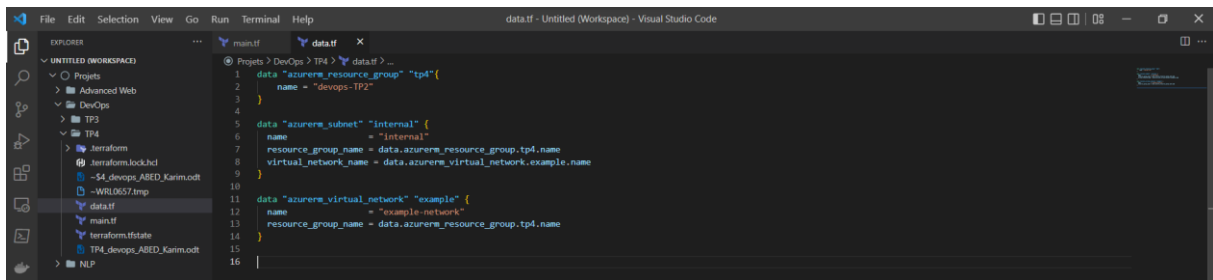
```
(base) PS C:\Users\karim> terraform init
Terraform initialized in an empty directory!

The directory has no Terraform configuration files. You may begin working
with Terraform immediately by creating Terraform configuration files.
(base) PS C:\Users\karim> cd D:\Projets\DevOps\TP4
(base) PS D:\Projets\DevOps\TP4> terraform init

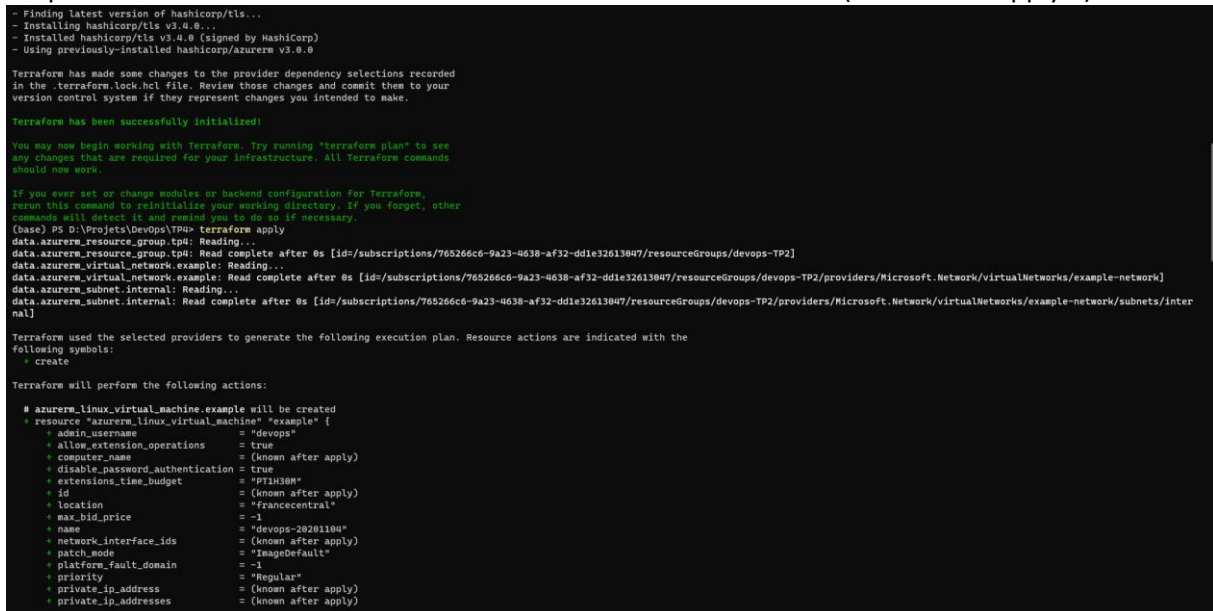
Initializing the backend...

Initializing provider plugins...
```

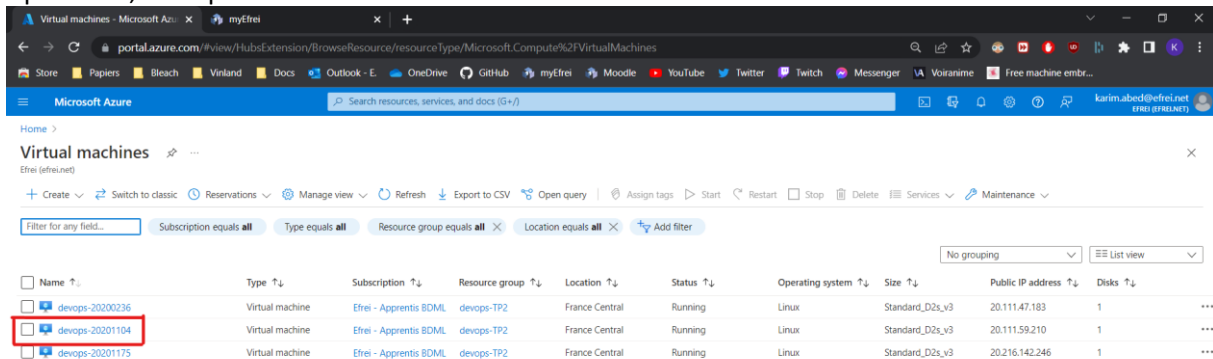
On crée un autre fichier .tf afin de référencer les data.



On peut maintenant lancer la création des ressources avec terraform. (« terraform apply »)



Après cela, nous pouvons vérifier si la ressource a bien été créée sur Azure.



Puis, comme nous venons de finir le TP, il ne nous reste plus qu'à détruire la ressource créée sur Azure.

```
C:\Users\karim\AppData\Roam\...
Windows PowerShell
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Installer la dernière version de PowerShell pour de nouvelles fonctionnalités et améliorations ! https://aka.ms/PSWindows

Le chargement des profils personnels et système a duré 4071 ms.
(base) PS C:\Users\karim> cd D:\Projets\DevOps\TP4
(base) PS D:\Projets\DevOps\TP4> terraform destroy
tls_private_key.rsa-4096-example: Refreshing state... [id=77a59438c87e6b62a8c99efb7f8f935c13012f1e]
data.azure_resource_group.tp4: Reading...
data.azure_resource_group.tp4: Read complete after 1s [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2]
data.azure_virtual_network.example: Reading...
data.azure_public_ip.public_ip: Refreshing state... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104]
data.azure_virtual_network.example: Read complete after 2s [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network]
data.azure_subnet.internal: Reading...
data.azure_subnet.internal: Read complete after 1s [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network/subnets/internal]
azure_network_interface.main: Refreshing state... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/networkInterfaces/devops-20201104]
azure_public_ip.public_ip: Refreshing state... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Compute/virtualMachines/devops-20201104]

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

Terraform will perform the following actions:

# azure_resource_group.tp4 will be destroyed
- resource "azure_resource_group" "tp4" {
  admin_username      = "devops" -> null
  allow_extensions    = true -> null
  computer_name       = "devops-20201104" -> null
  disable_password_authentication = true -> null
  encryption_at_rest_enabled = false -> null
  extensions_time_budget = "PT1H30M" -> null
  id                  = "/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Compute/virtualMachines/devops-20201104" -> null
  location             = "francecentral" -> null
  max_bid_price        = -1 -> null
  name                 = "devops-20201104" -> null
  network_interface_ids = [
    "/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/networkInterfaces/devops-20201104",
  ] -> null
  patch_mode           = "ImageDefault" -> null
  platform_fault_domain = 1 -> null
  priority              = "Regular" -> null
  private_ip_address    = "10.3.1.6" -> null
  private_ip_addresses  = [
    "10.3.1.6",
  ] -> null
  provision_vm_agent    = true -> null
  public_ip_address     = "20.111.59.210" -> null
  public_ip_addresses   = [
  ] -> null
}

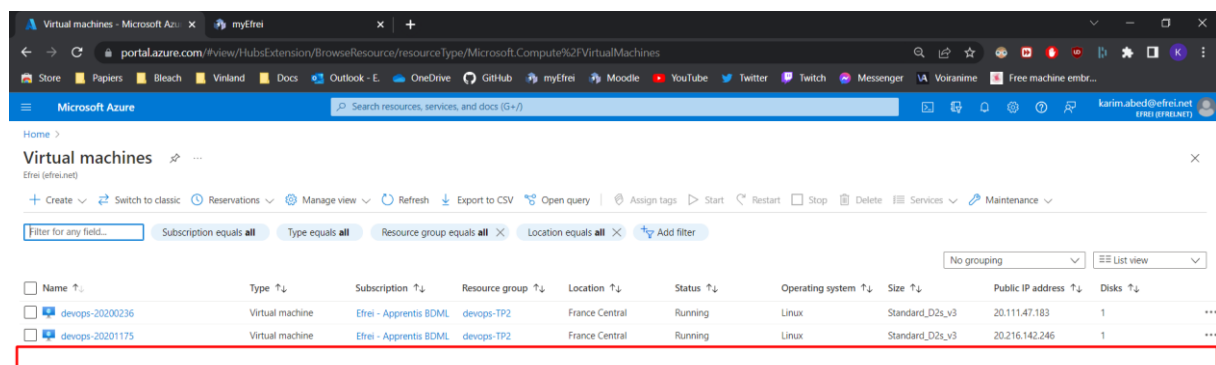
Plan: 0 to add, 0 to change, 4 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

azure_resource_group.tp4: Destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Compute/virtualMachines/devops-20201104]
azure_virtual_network.example: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network, 20s elapsed]
azure_public_ip.public_ip: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104, 20s elapsed]
azure_subnet.internal: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network/subnets/internal, 30s elapsed]
azure_network_interface.main: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/networkInterfaces/devops-20201104, 40s elapsed]
azure_public_ip.public_ip: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104, 50s elapsed]
azure_virtual_network.example: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network, 1m0s elapsed]
azure_subnet.internal: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/virtualNetworks/example-network/subnets/internal, 1m0s elapsed]
azure_network_interface.main: Destruction complete after 1m0s
azure_public_ip.public_ip: Destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104]
tls_private_key.rsa-4096-example: Destruction complete after 0s
azure_network_interface.main: Destruction complete after 5s
azure_public_ip.public_ip: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104]
azure_public_ip.public_ip: Still destroying... [id=/subscriptions/765266c6-9a23-4638-af32-dd1e32613047/resourceGroups/devops-TP2/providers/Microsoft.Network/publicIPAddresses/devops-20201104, 10s elapsed]
azure_public_ip.public_ip: Destruction complete after 10s

Destroy complete! Resources: 4 destroyed.
(base) PS D:\Projets\DevOps\TP4>
```



Name	Type	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
devops-20200236	Virtual machine	Efrei - Apprentis BDML	devops-TP2	France Central	Running	Linux	Standard_D2s_v3	20.111.47.183	1
devops-20201175	Virtual machine	Efrei - Apprentis BDML	devops-TP2	France Central	Running	Linux	Standard_D2s_v3	20.216.142.246	1

L'avantage principal d'utiliser Terraform est le fait qu'on puisse créer des ressources sur le Cloud très rapidement. Nous n'avons plus besoin de configurer chaque VM une par une. En plus de ça, le langage de configuration est assez simple, il permet un grand accès aux différentes fonctionnalités de chaque provider. On peut, en plus de ça, voir avec une simple commande (« terraform plan ») toutes les ressources créées.