LO17 – TP5 Idriss KOUROUMA

PARTIE 1 - Premier environnement :

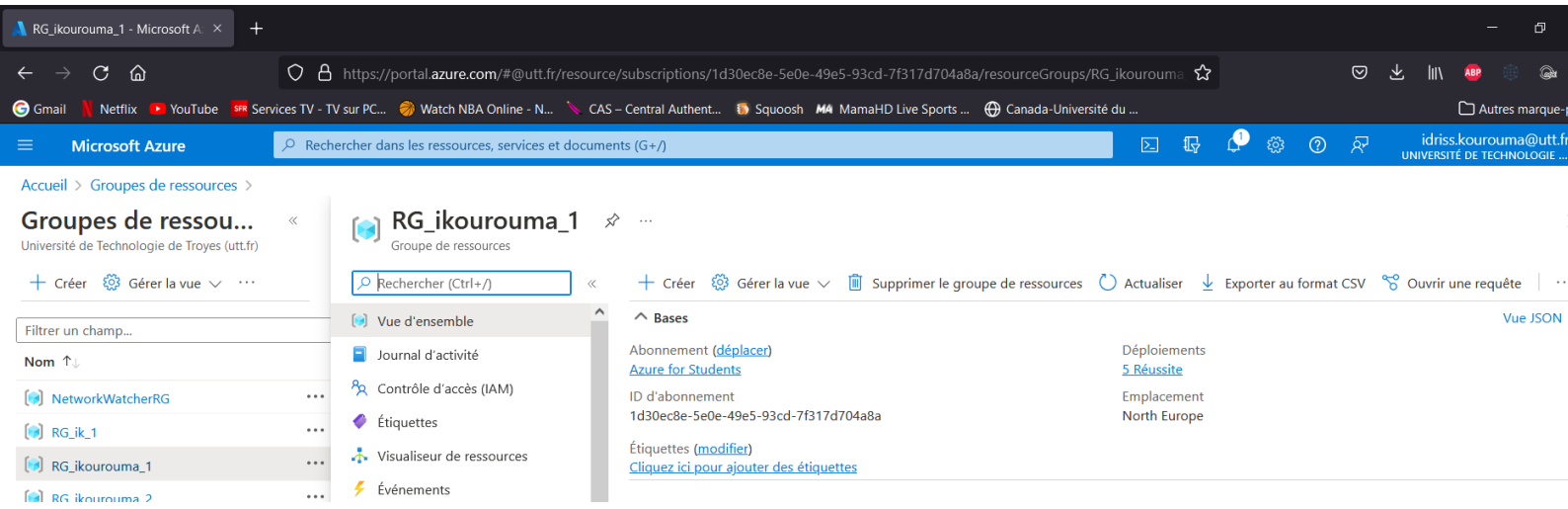
Intro :

Dans ce TP nous allons explorer l'environnement Cloud Azure. Le TP se sépare en deux partie. Premièrement, nous allons étudier et apprendre à utiliser l'interface du portail Azure. Pour ce faire nous créerons, à l'aide de l'interface graphique, des environnements composées de ressources (groupe de ressource, réseau virtuel, machine virtuelle).
Au cours de la deuxième partie nous effectuerons les mêmes créations d'environnement mais cette fois-ci à l'aide de Terraform.

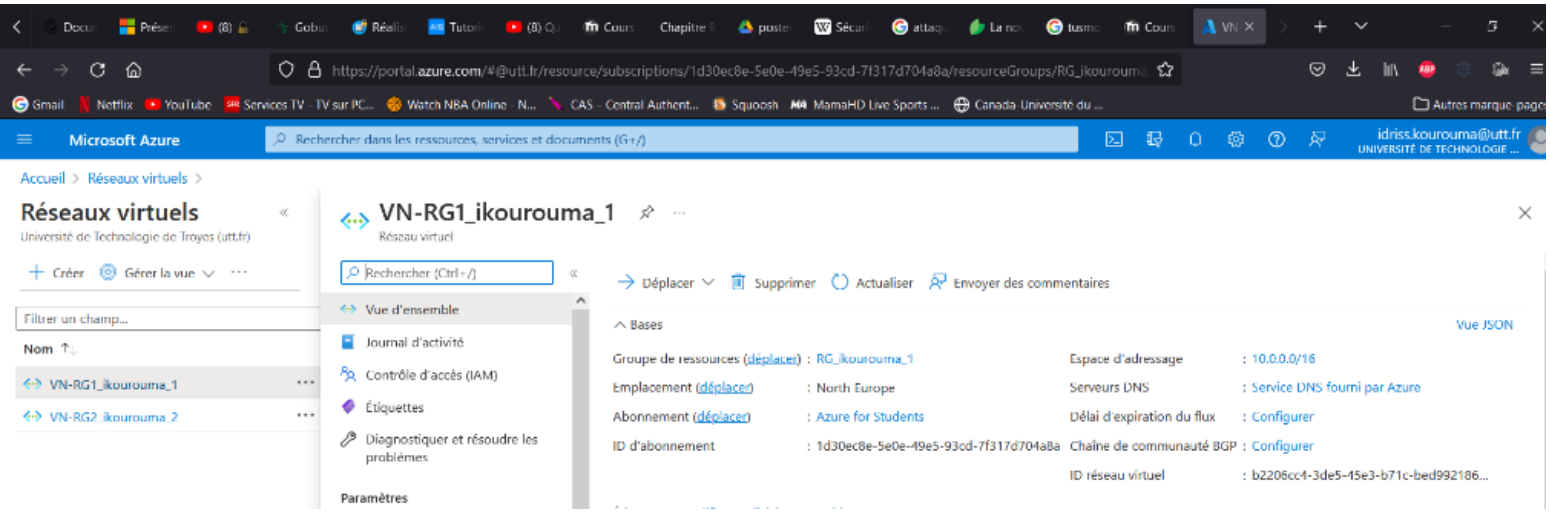
I- Partie 1 : Mode graphique

a. Premier environnement

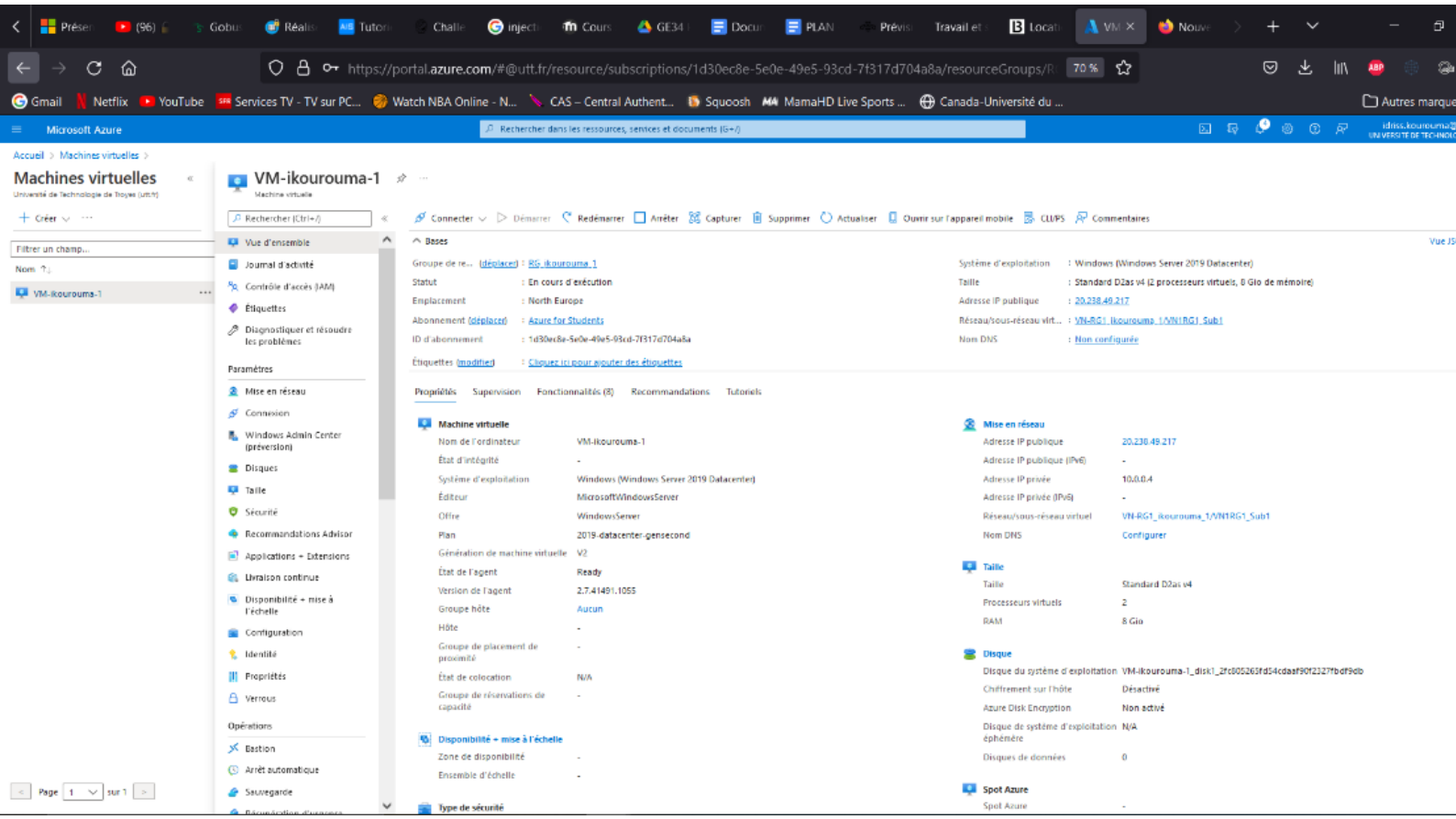
i. Création d'un groupe de ressource



ii. Création d'un réseau virtuel



iii. Création d'une machine virtuelle



Hostname / ipconfig sur la VM1 :

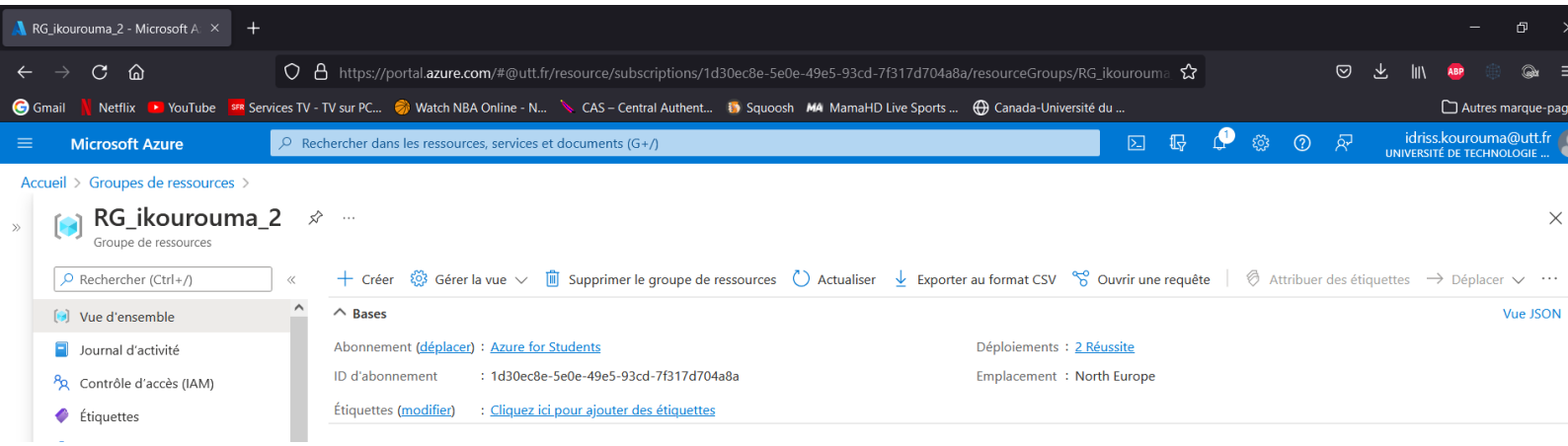
VM-ikourouma-1 - 20.238.49.217:3389 - Connexion Bureau à distance

Administrator: Command Prompt

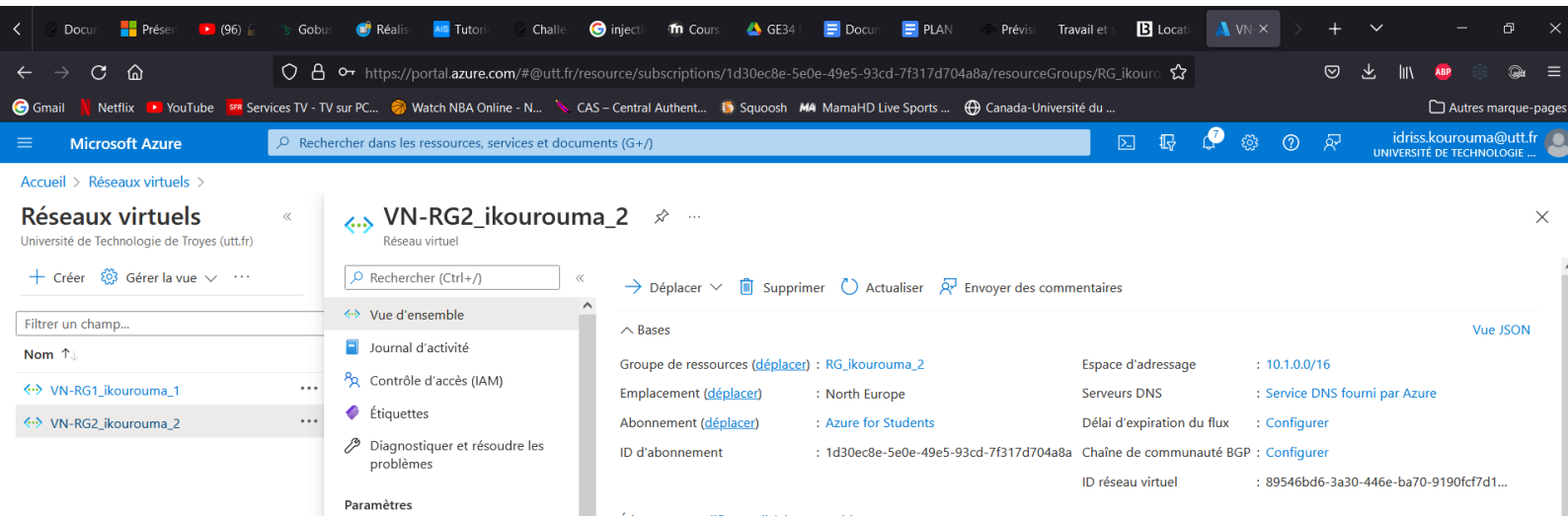
```
Microsoft Windows [Version 10.0.17763.2803]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\ikourouma>
C:\Users\ikourouma>hostname
VM-ikourouma-1

C:\Users\ikourouma>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : yrwcbmxfhxrulny2x1mzegdosc.fx.internal.cloudapp.net
   Link-local IPv6 Address . . . . . : fe80::3460:23f0:82df:9529%6
   IPv4 Address. . . . . . . . . . . : 10.0.0.4
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.0.0.1

C:\Users\ikourouma>
```

b. Deuxième environnement

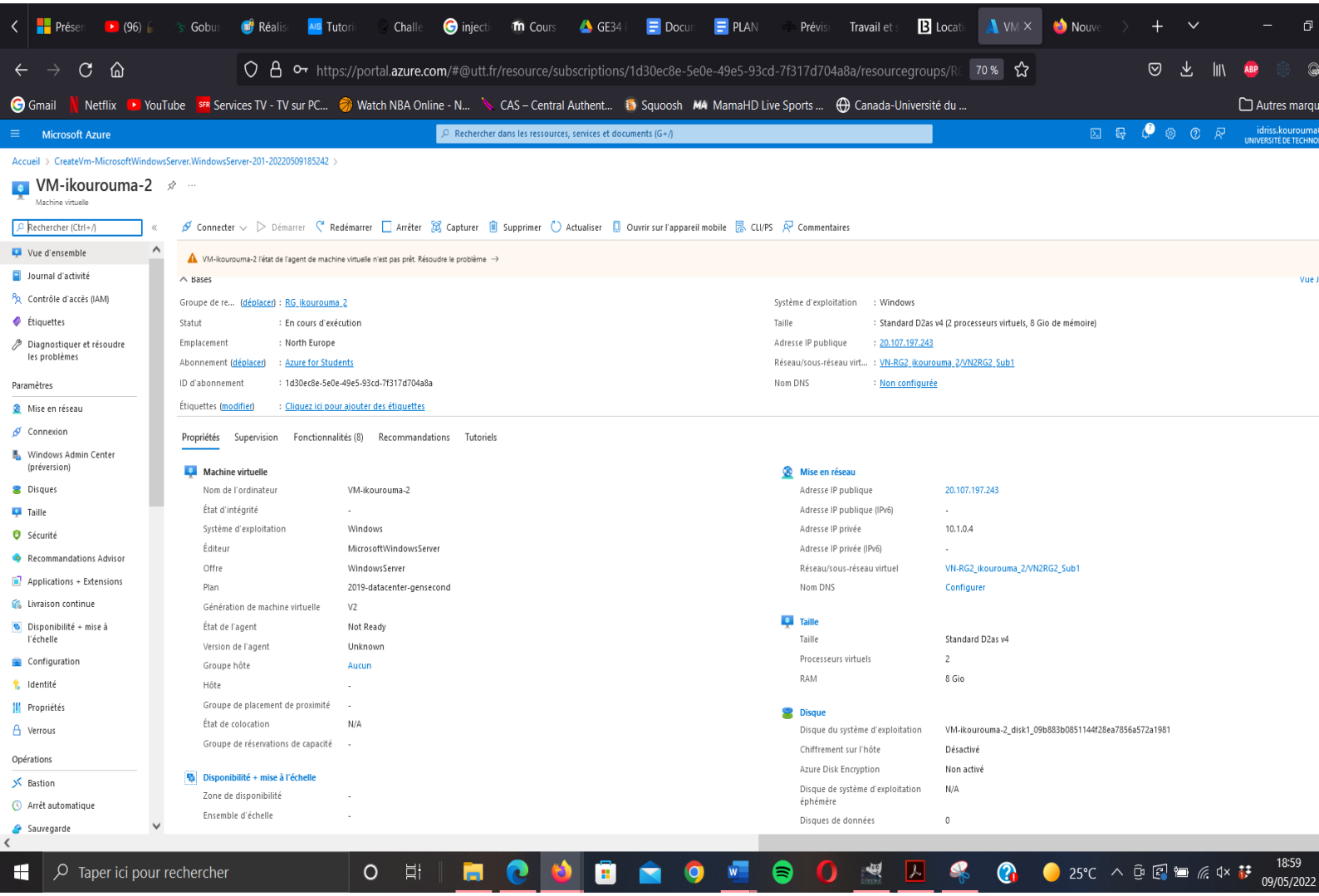
i. Groupe de ressource 2



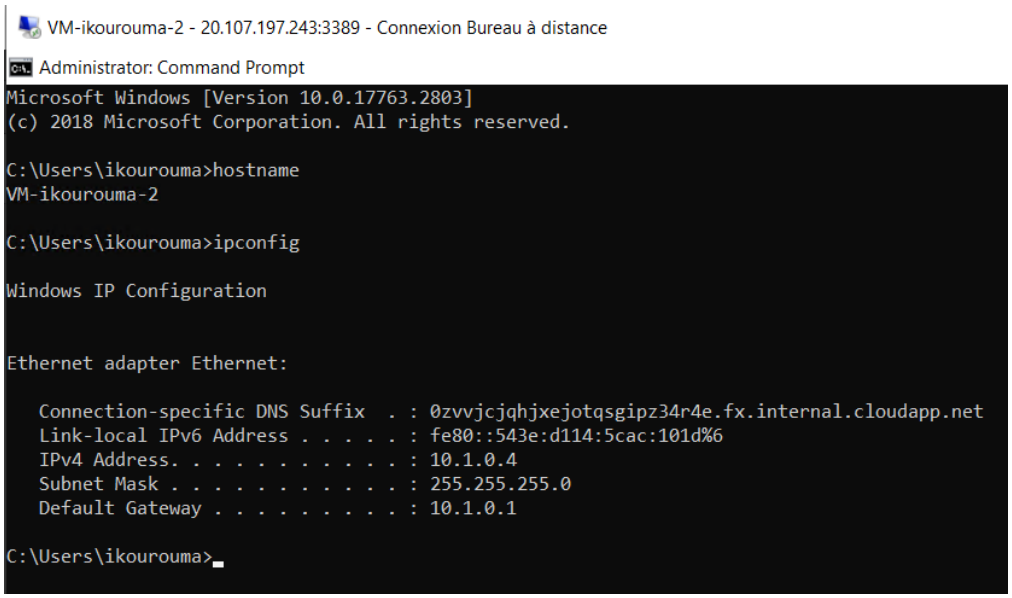
ii. Réseau virtuel 2 :



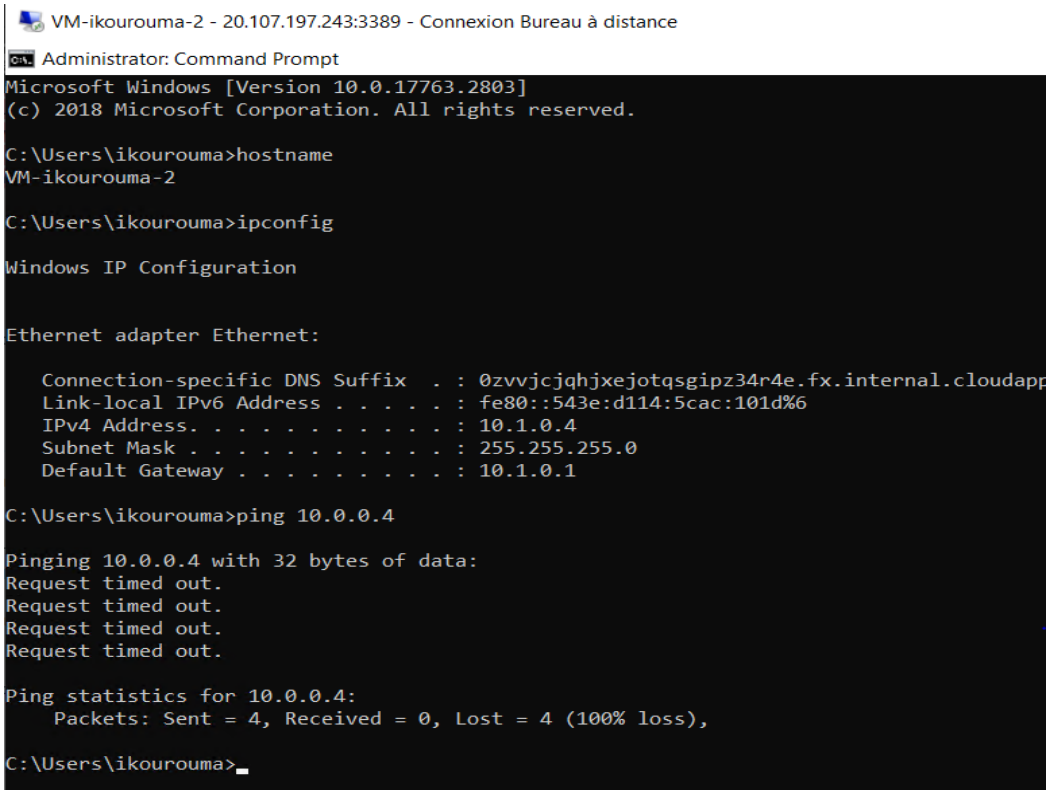
iii. Machine virtuelle 2



Hostname / ipconfig de la 2ème machine virtuelle :

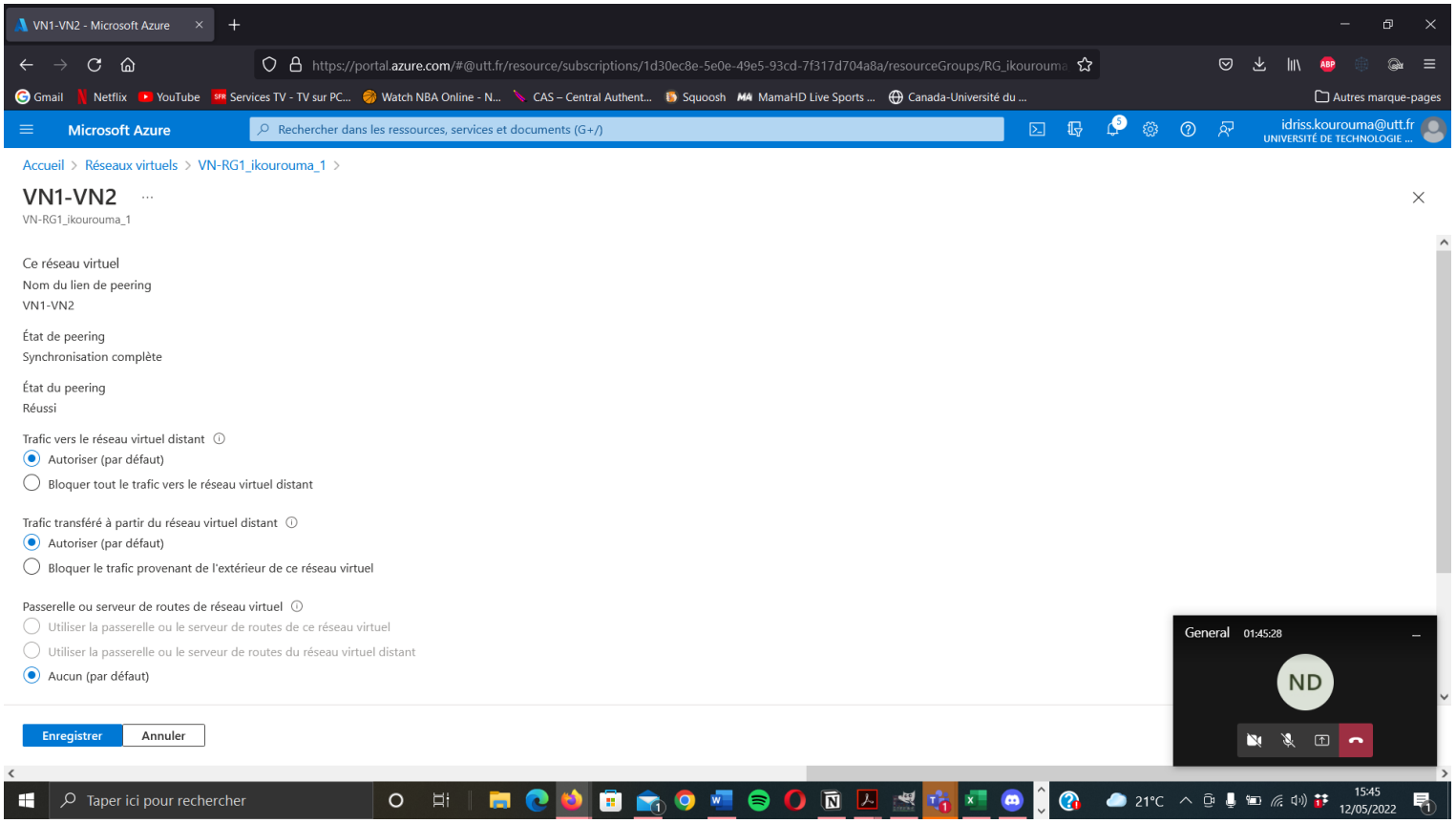


iv. **Le ping de la VM2 vers la VM1 ne marche pas.** Il faut faire une configuration réseau.

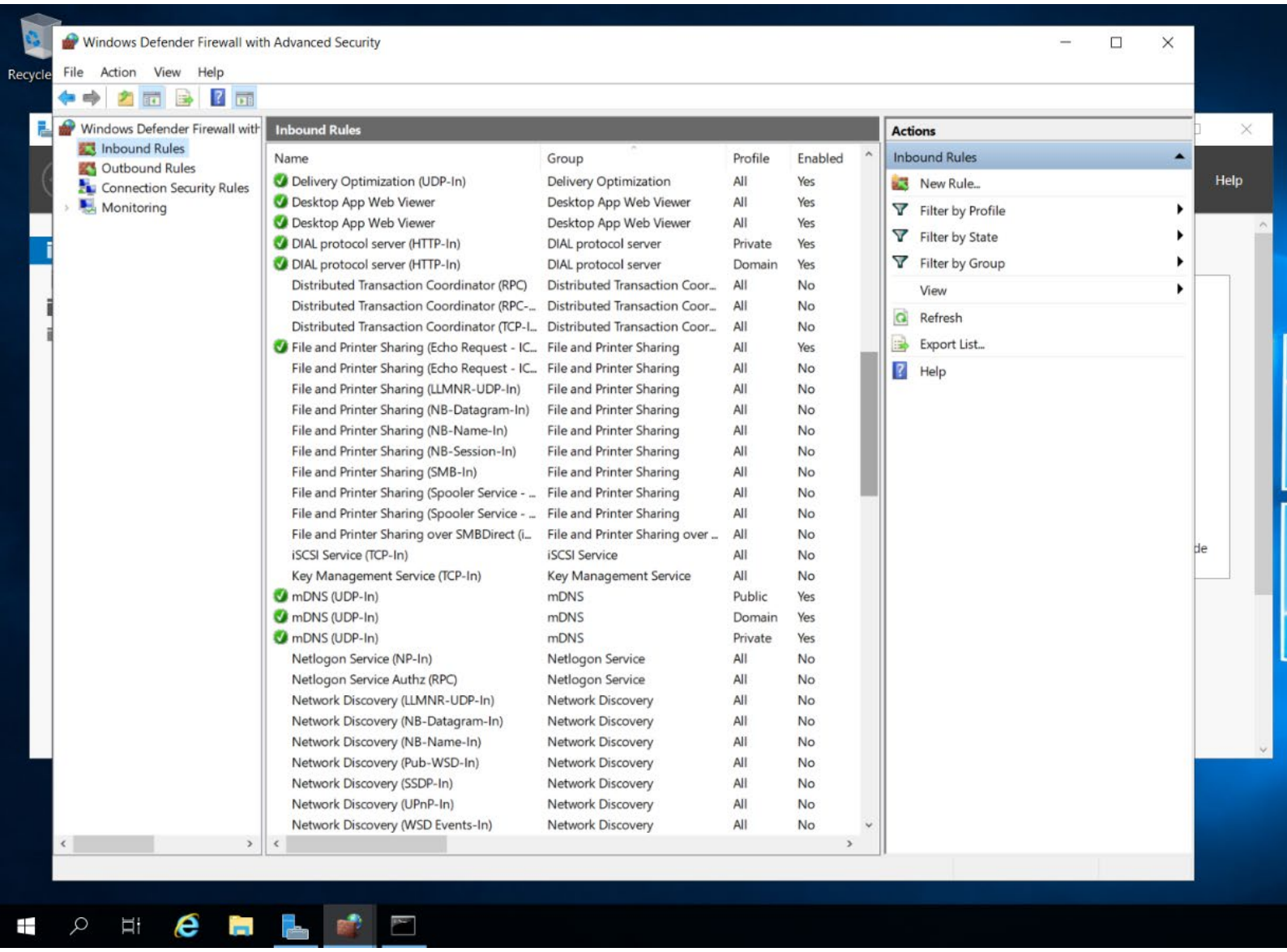


v. Configuration du réseau :

1. Peering des réseaux virtuels 1 et 2 :



2. Ouverture du flux firewall ICMP sur VM1 :



3. **A la suite des config le ping VM2 vers VM1 fonctionne :**

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.2803]
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C:\Users\ikourouma>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : 0zvvjcjqhjxejotqsgipz34r4e.fx.internal.cloudapp.net
   Link-local IPv6 Address . . . . . : fe80::543e:d114:5cac:101d%7
   IPv4 Address. . . . . . . . . . . : 10.1.0.4
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.1.0.1

C:\Users\ikourouma>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:
Reply from 10.0.0.4: bytes=32 time=1ms TTL=128
Reply from 10.0.0.4: bytes=32 time<1ms TTL=128
Reply from 10.0.0.4: bytes=32 time<1ms TTL=128
Reply from 10.0.0.4: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\ikourouma>
```
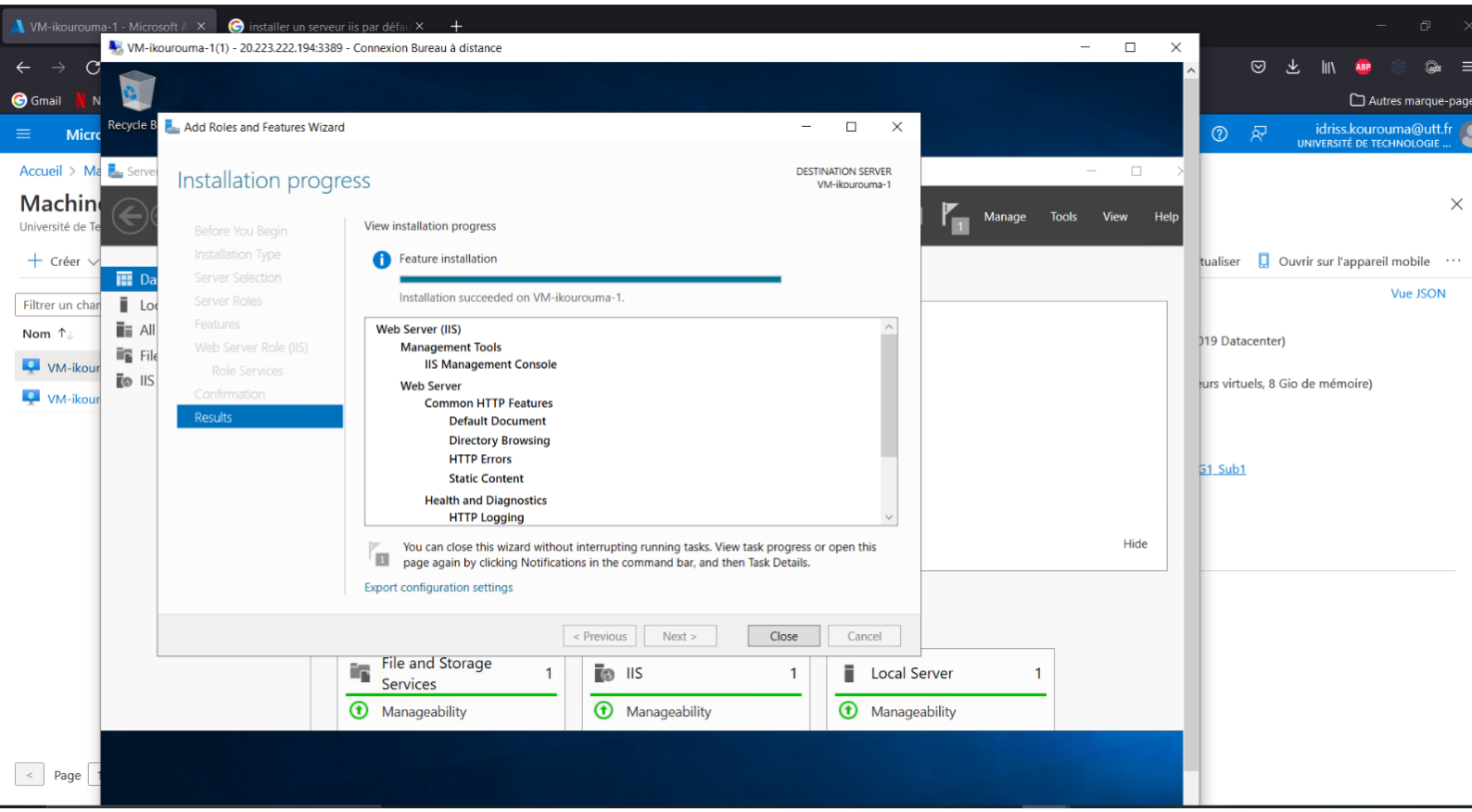
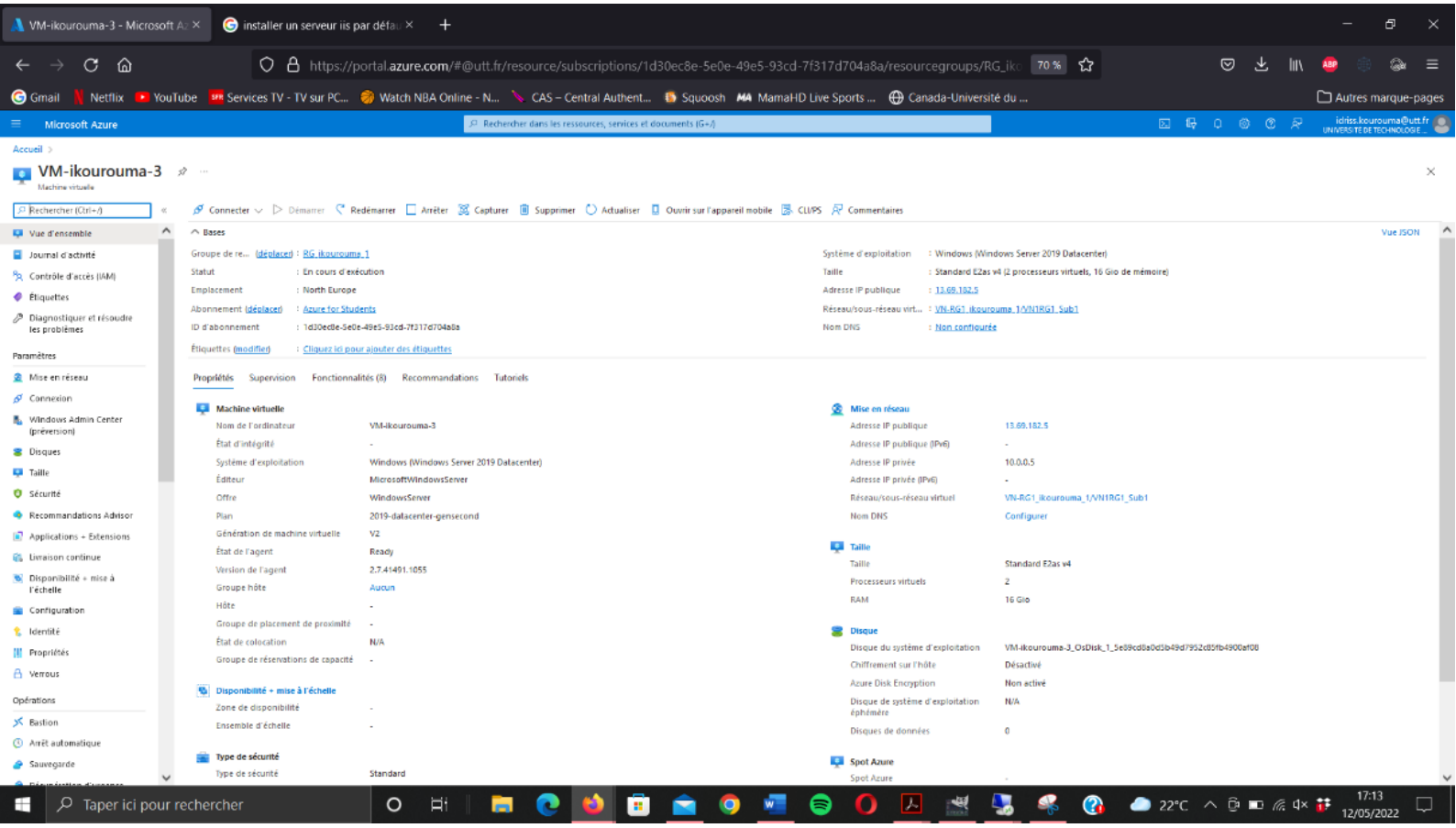

c. OPTIONNEL – Load Balancer :

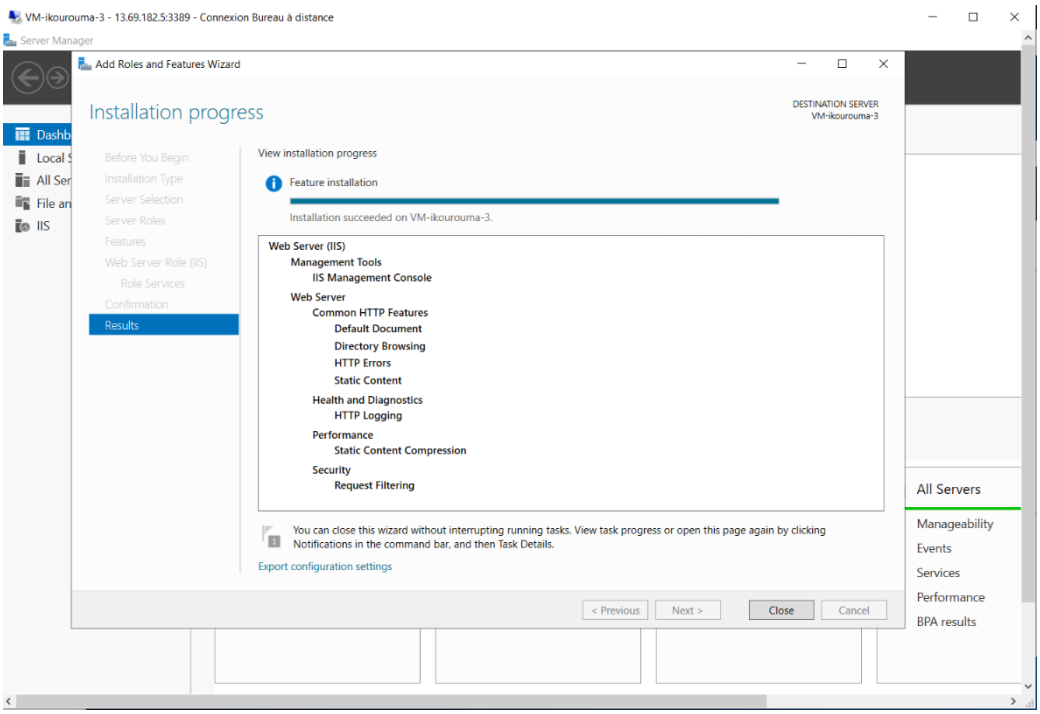
i. Installation du serveur IIS par défaut sur la première machine virtuelle :



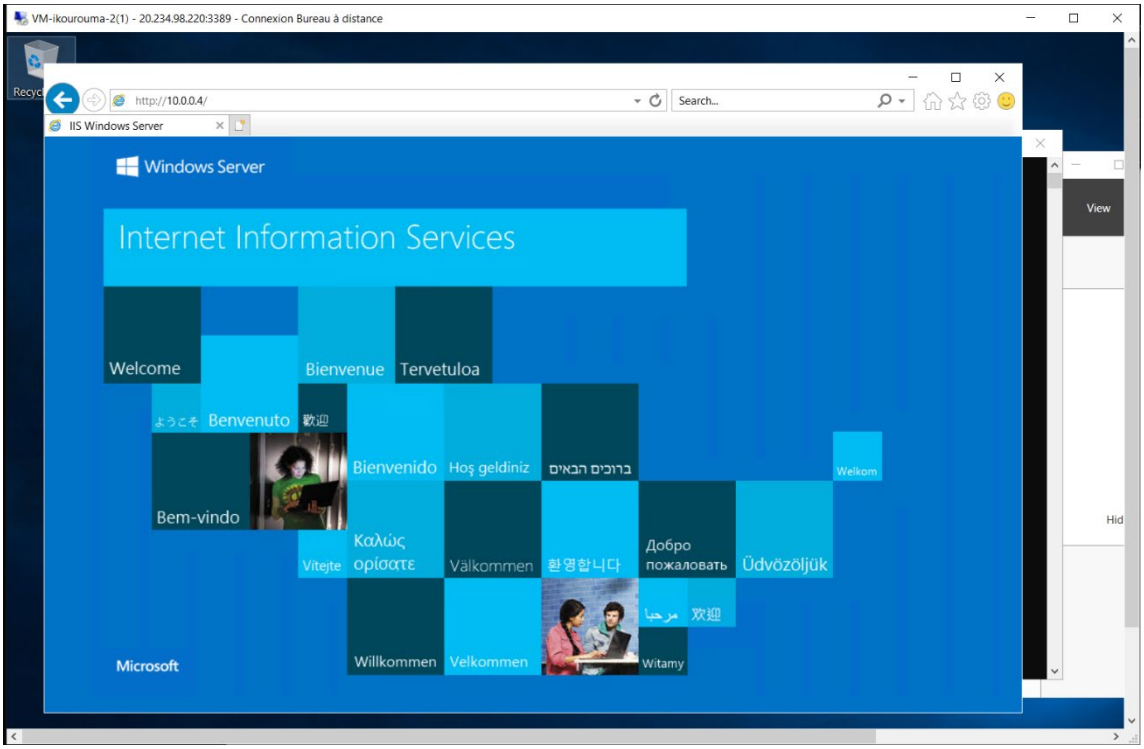
ii. Création de la 3ème VM :



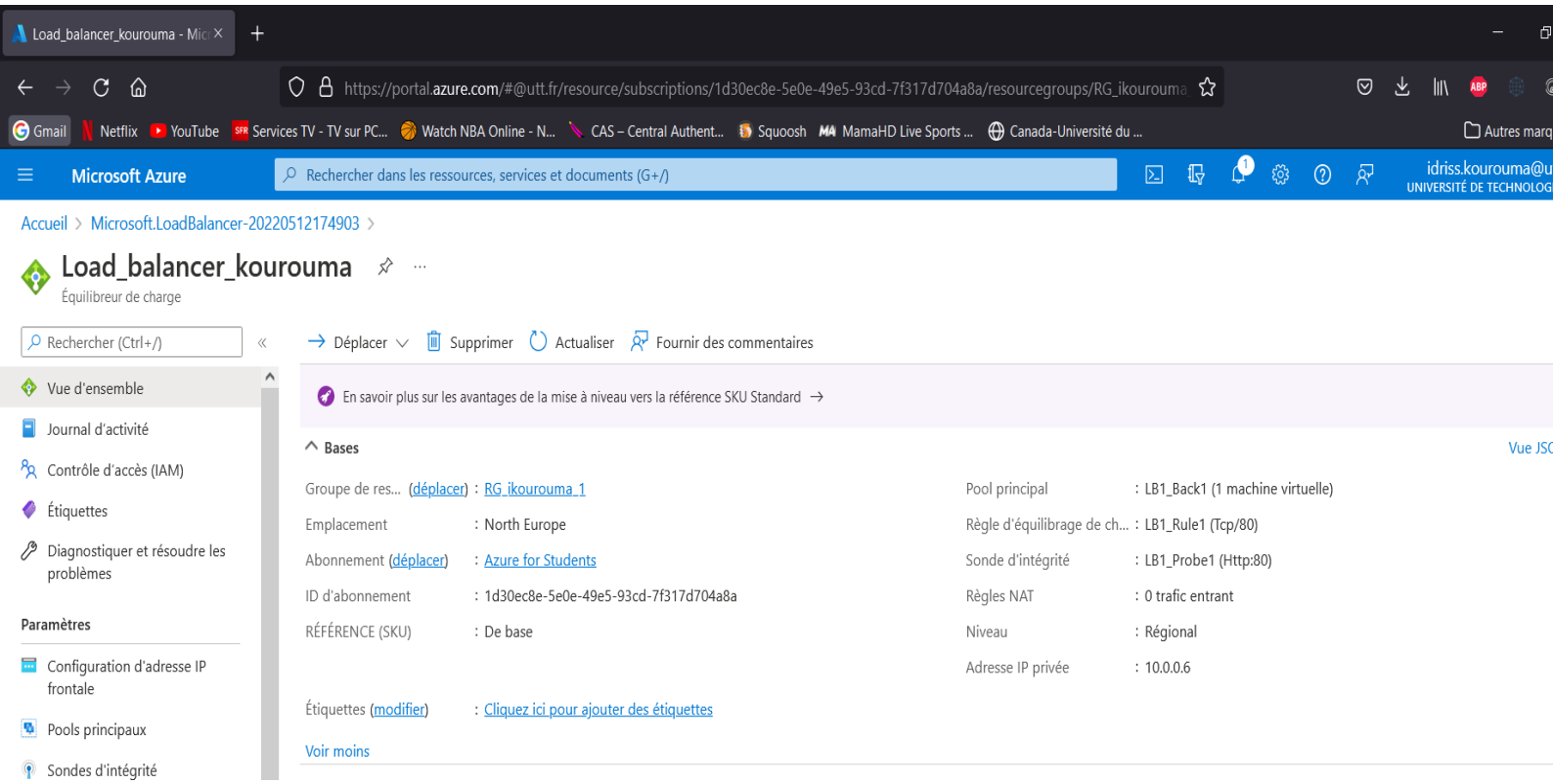
iii. Installation du serveur IIS sur la 3ème VM :



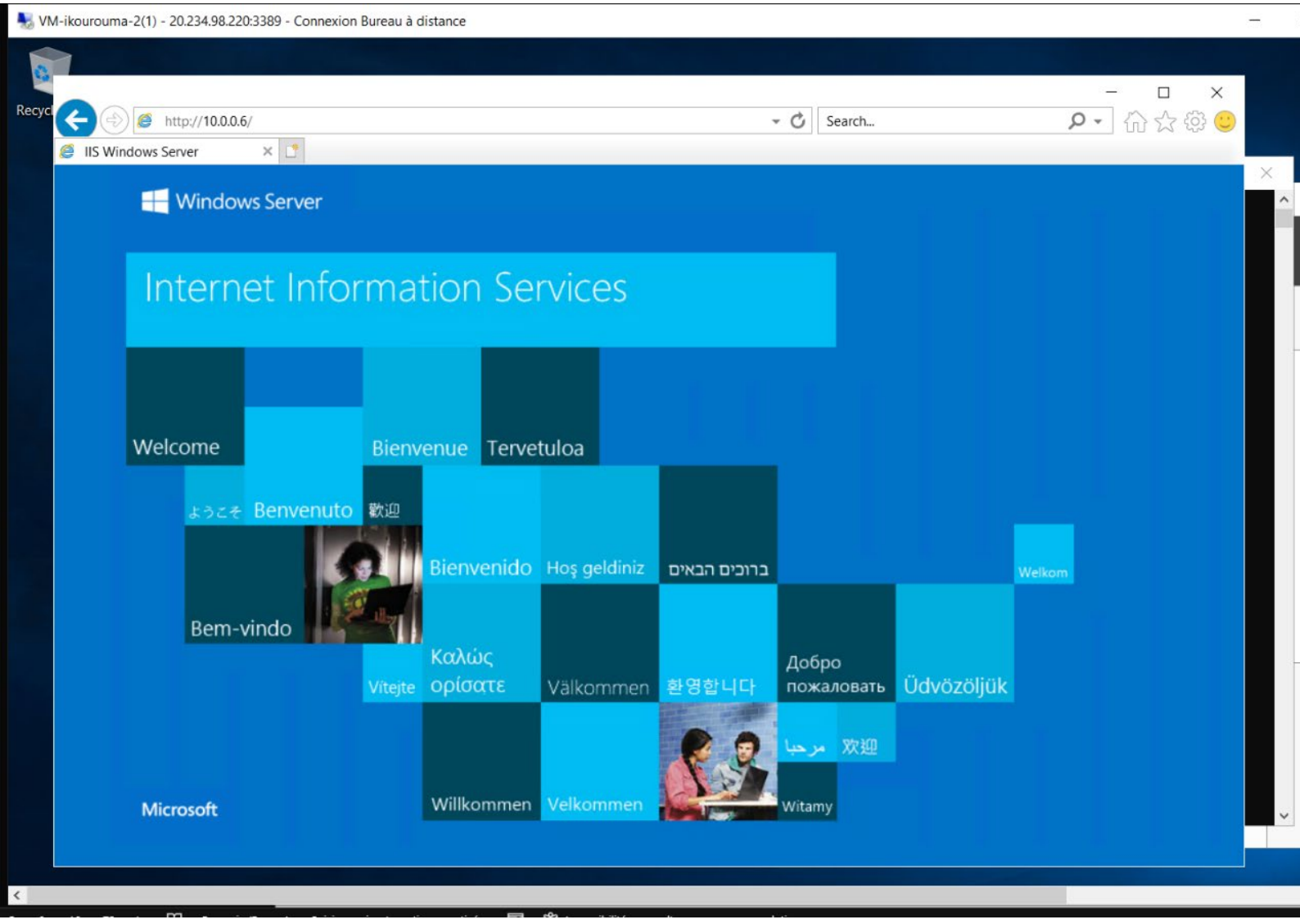
iv. Test de fonctionnement du serveur web depuis la VM2 (accès web à 10.0.0.4):



v. Load balancer :

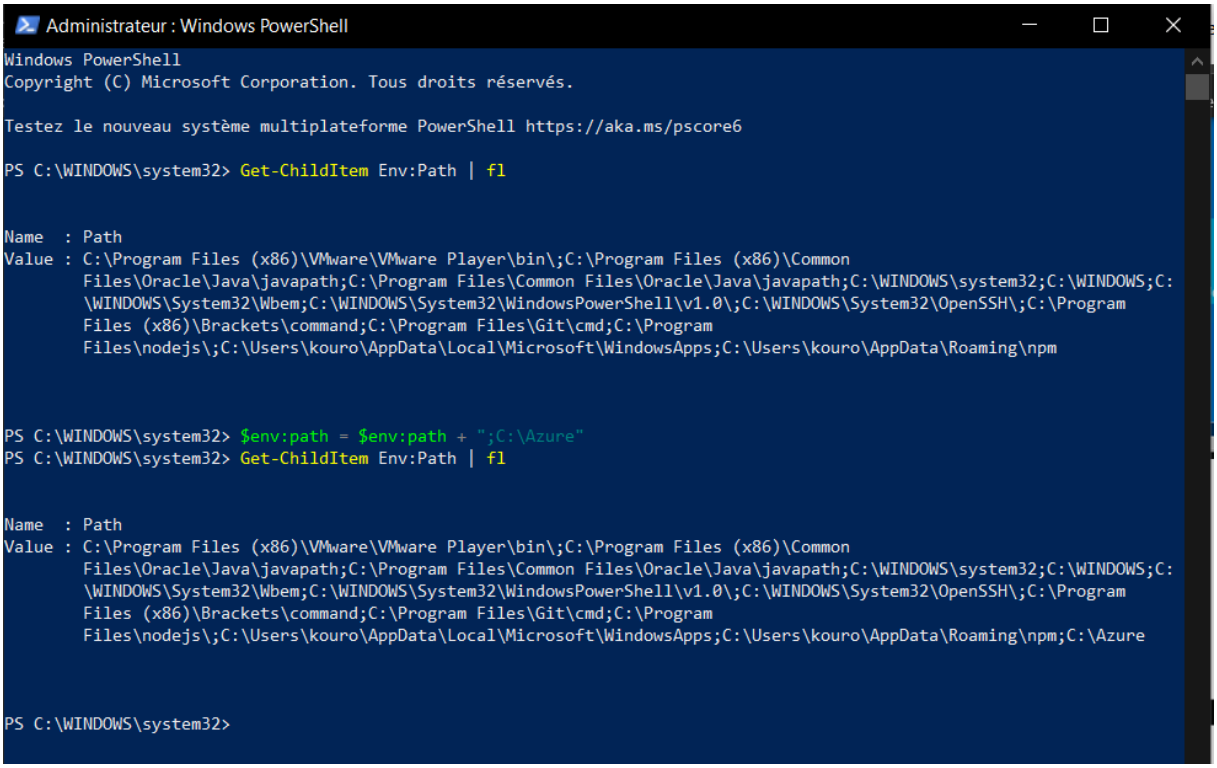


vi. Accès à l'IP du load balancer depuis la VM2 (accès à 10.0.0.6):

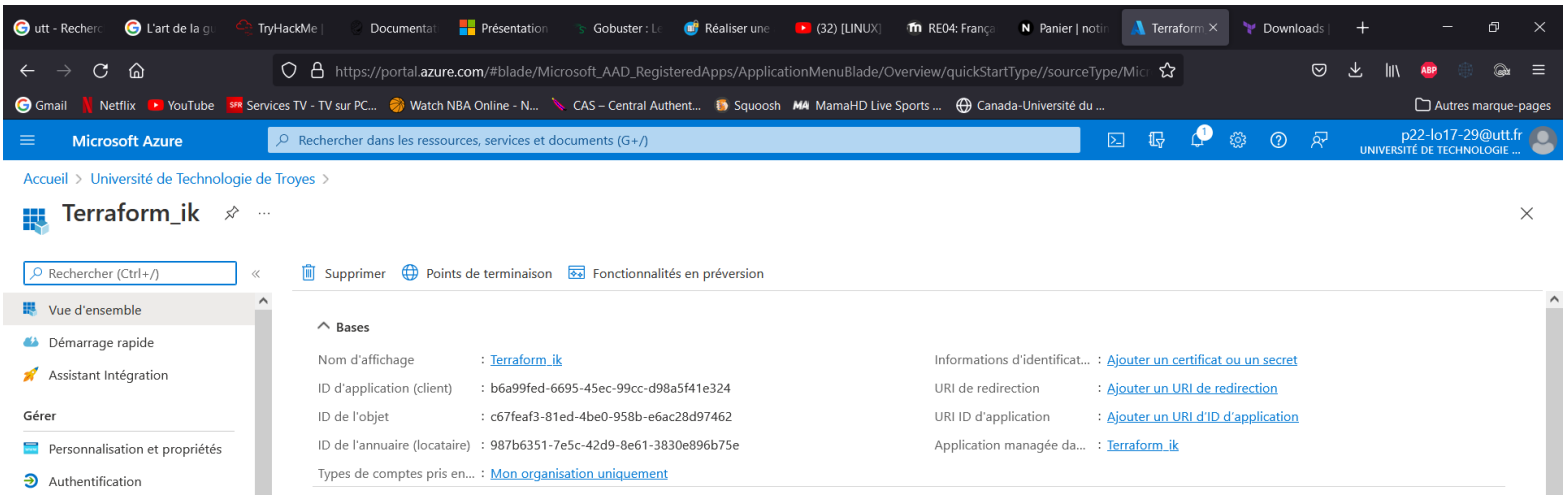


II- Partie 2 : Terraform

a. Paramétrage et installation de Terraform :



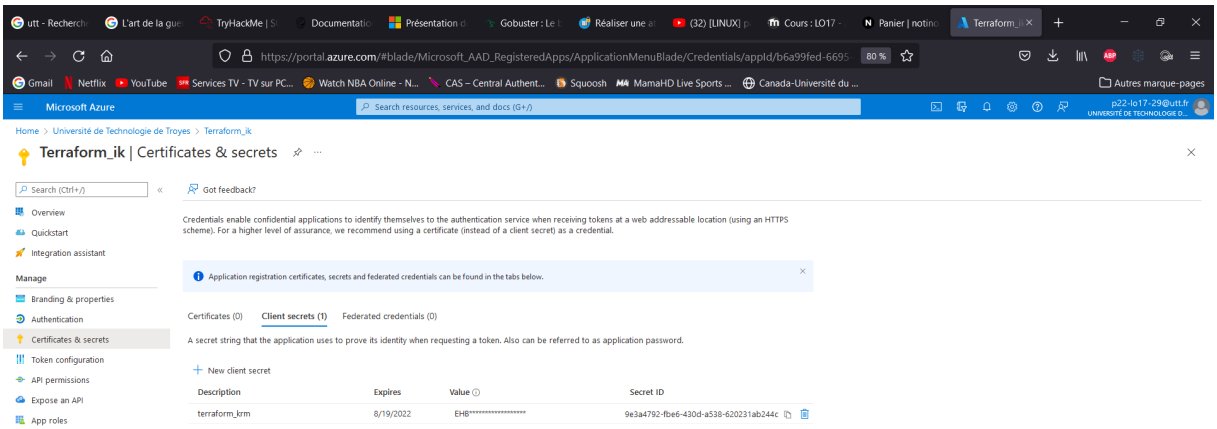
i. Création d'une application dans Azure Active Directory :



ID d'application : b6a99fed-6695-45ec-99cc-d98a5f41e324

ID de l'annuaire : 987b6351-7e5c-42d9-8e61-3830e896b75e

ii. Création du secret :

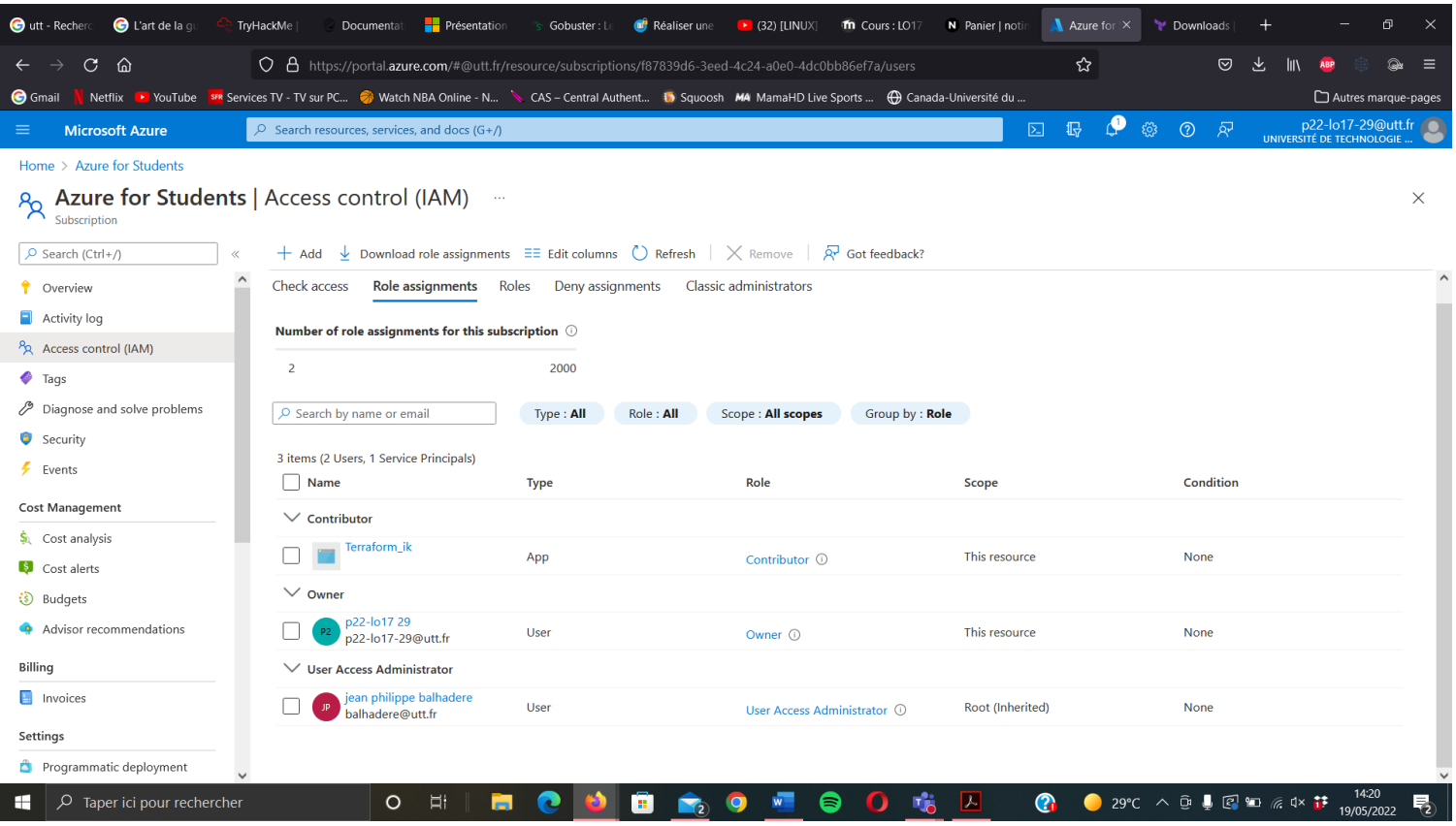


Abonnement ID : f87839d6-3eed-4c24-a0e0-4dc0bb86ef7a

Id secret : 9e3a4792-fbe6-430d-a538-620231ab244c

Valeur du secret : EHB8Q~VuVdZYq-fpnmCzZzvOfUOf2bQTXA4mZc56

iii. Accès control (IAM) :



b. Initialisation de Terraform et création d'un groupe de ressource

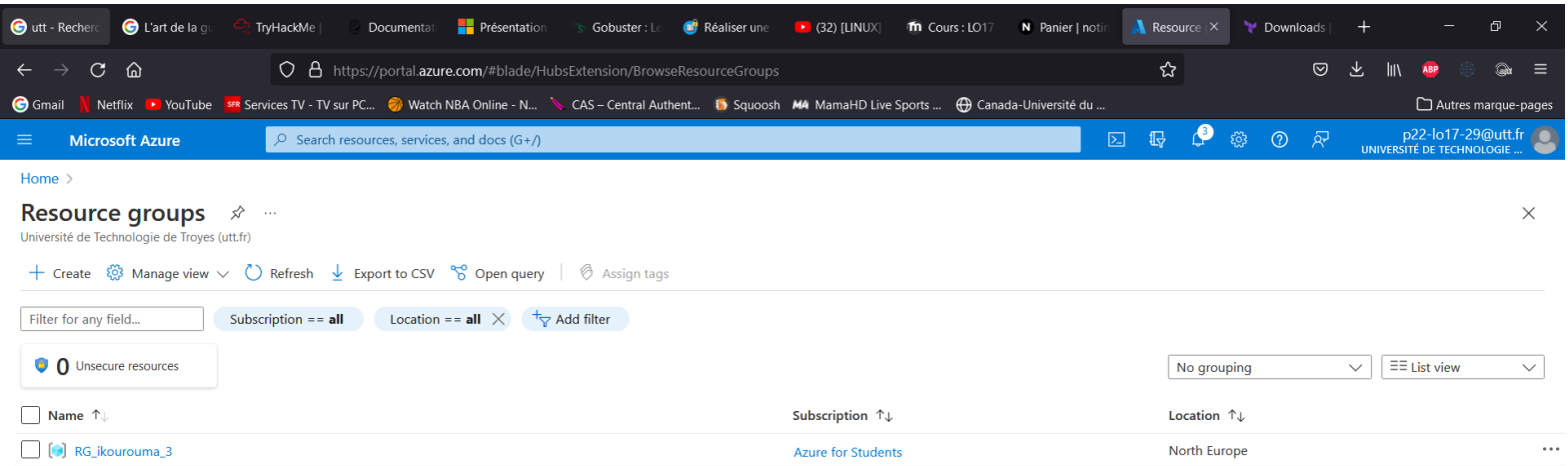
i. Terraform init : Initialisation du code Terraform

```
PS C:\Azure\UTT> .\terraform.exe init

Initializing the backend...

Initializing provider plugins...
- Reusing previous version of hashicorp/azurerm from the dependency lock file
- Using previously-installed hashicorp/azurerm v3.6.0

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.
PS C:\Azure\UTT>
```

ii. Terraform plan & apply :

```
Administrateur : Windows PowerShell
PS C:\Azure\UTT> .\terraform.exe 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:

  # azurerm_resource_group.rg will be created
  + resource "azurerm_resource_group" "rg" {
      + id       = (known after apply)
      + location = "northeurope"
      + name     = "RG_ikourouma_3"
    }

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

Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions
if you run "terraform apply" now.
PS C:\Azure\UTT> .\terraform.exe apply

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:

  # azurerm_resource_group.rg will be created
  + resource "azurerm_resource_group" "rg" {
      + id       = (known after apply)
      + location = "northeurope"
      + name     = "RG_ikourouma_3"
    }

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

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

  Enter a value: yes

azurerm_resource_group.rg: Creating...
azurerm_resource_group.rg: Creation complete after 1s [id=/subscriptions/f87839d6-3eed-4c24-a0e0-4dc0bb86ef7a/resourceGroups/RG_ikourouma_3]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
PS C:\Azure\UTT>
```

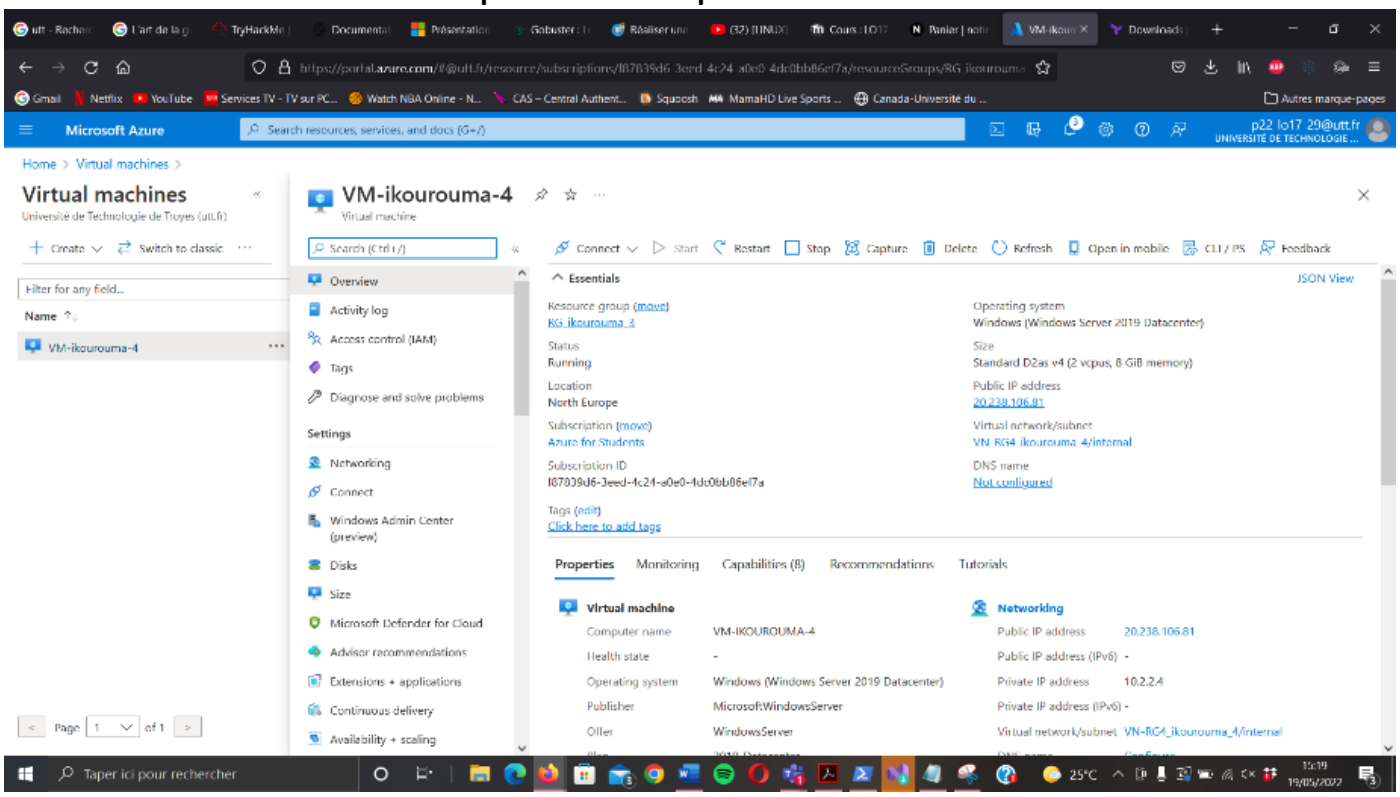
Le groupe de ressource est bien crée dans le portail Azure :



iii. Suppression du groupe de ressource :

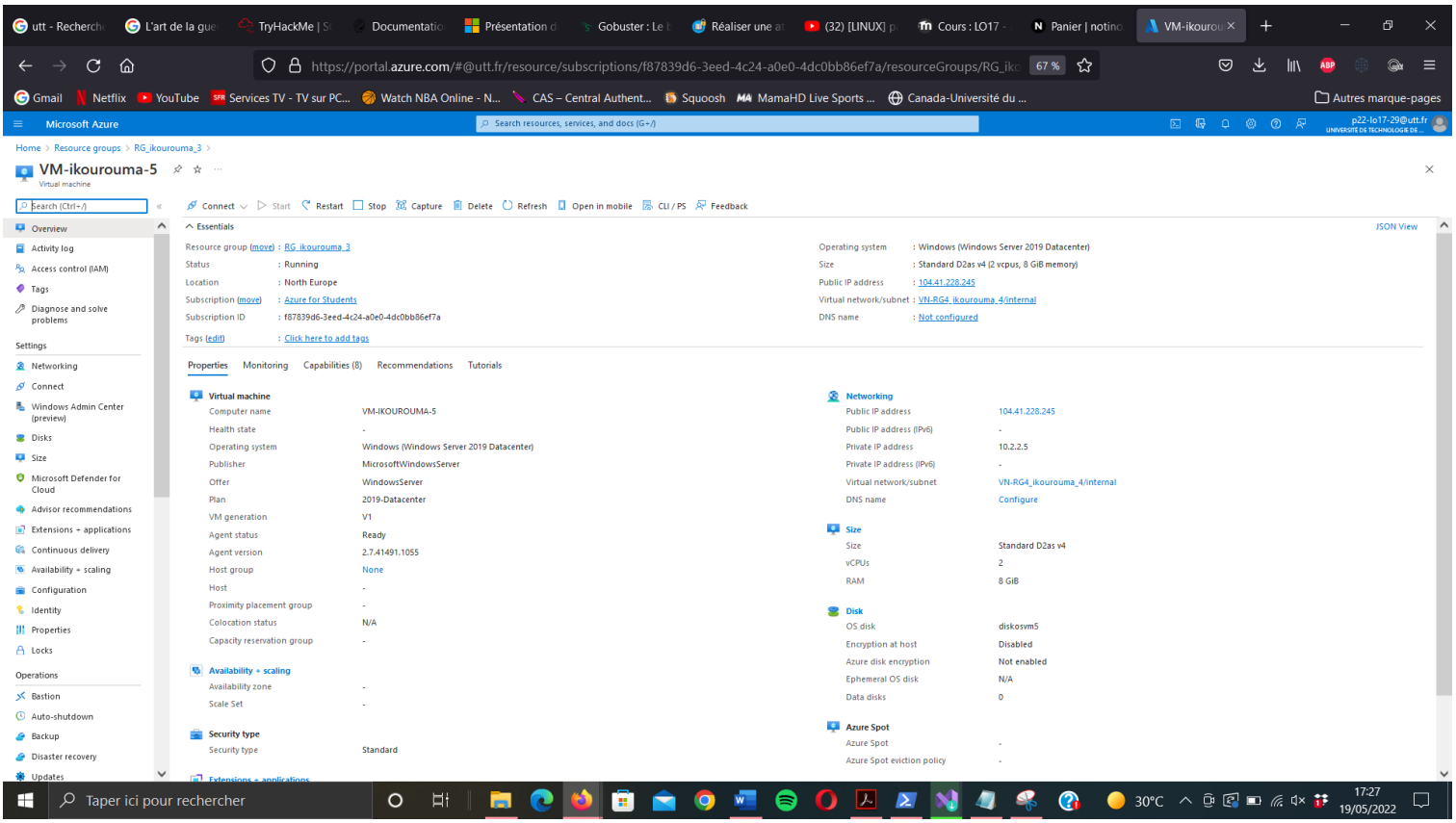
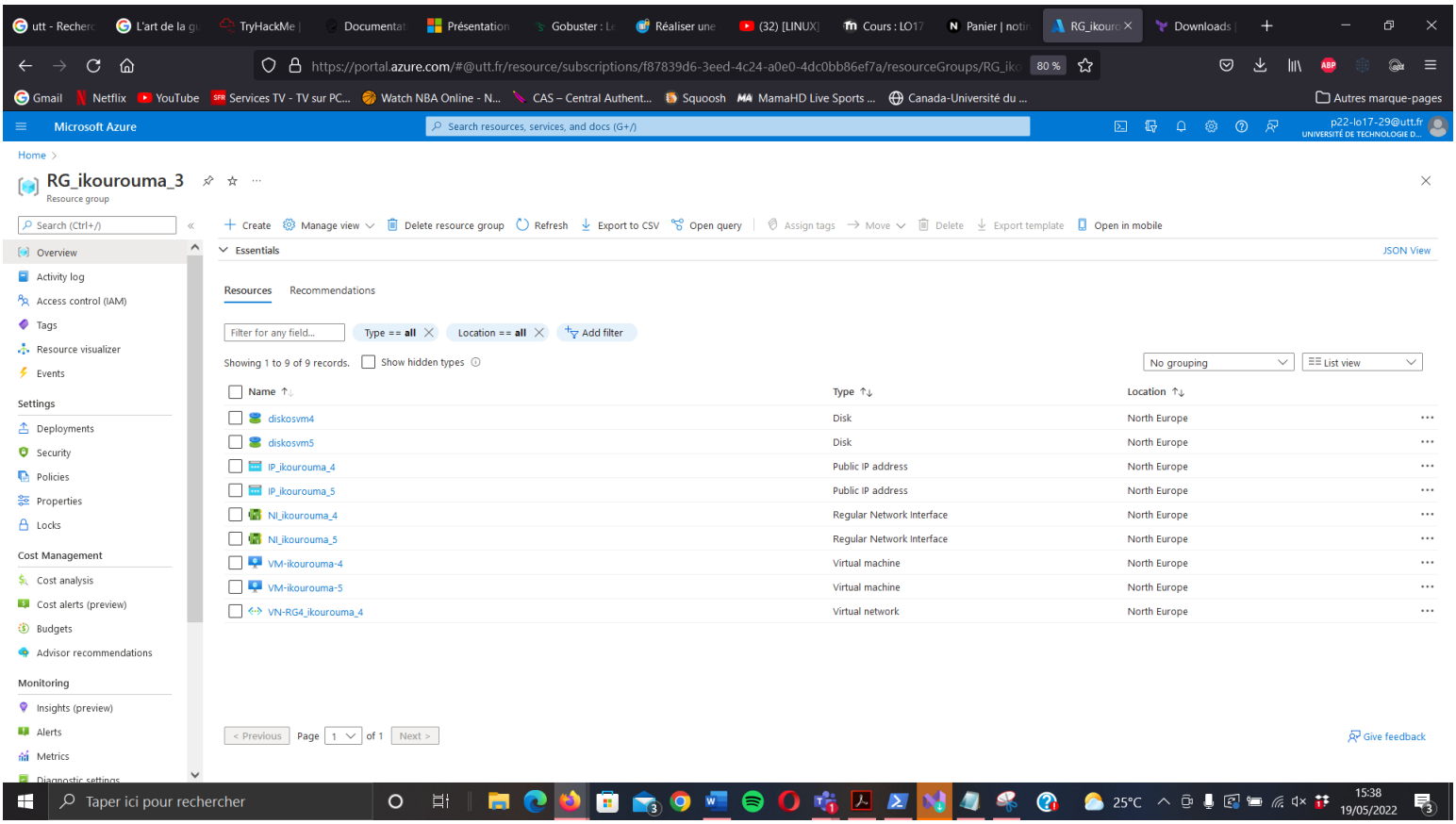
```
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
PS C:\Azure\UTT> .\terraform.exe destroy
azurerm_resource_group.rg: Refreshing state... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-4dc0bb86ef7a/resourceGroups/RG_ikourouma_3]

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:

  # azurerm_resource_group.rg will be destroyed
  - resource "azurerm_resource_group" "rg" {
      - id       = "/subscriptions/f87839d6-3eed-4c24-a0e0-4dc0bb86ef7a/resourceGroups/RG_ikourouma_3" -> null
      - location = "northeurope" -> null
      - name     = "RG_ikourouma_3" -> null
      - tags     = {} -> null
    }

Plan: 0 to add, 0 to change, 1 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

azurerm_resource_group.rg: Destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-4dc0bb86ef7a/resourceGroups/RG_ikourouma_3]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 10s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 20s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 30s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 40s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 50s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 1m0s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 1m10s elapsed]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/f87839d6-3eed-4c24-a0e0-...bb86ef7a/resourceGroups/RG_ikourouma_3, 1m20s elapsed]
azurerm_resource_group.rg: Destruction complete after 1m22s

Destroy complete! Resources: 1 destroyed.
PS C:\Azure\UTT>
```

c. Création de la première VM depuis Terraform :



d. Création de la 2ème VM :

i. Config VM 2 :



ii. Capture de l'ensemble des ressources