

Create a Virtual Machine (VM) :

Imagine you need to host a website or run a specific application that requires a Windows/Linux environment. Creating a VM in Azure can provide you with the required environment without needing physical hardware.

You can start to create and configure your vm on the link below:
<https://portal.azure.com/#create/Microsoft.VirtualMachine-ARM>

Microsoft Azure

Home > Virtual machines > Create a virtual machine

This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

Project details
Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Azure for Students
Resource group * (New) Resource group
[Create new](#)

Instance details

Virtual machine name *
Region * France Central
Availability options No infrastructure redundancy required
Security type Trusted launch virtual machines
[Configure security features](#)
Image * Ubuntu Server 20.04 LTS - x64 Gen2
[See all images](#) | [Configure VM generation](#)
VM architecture Arm64 ☐ x64 ☒
Run with Azure Spot discount ☐
Size Loading...
[See all sizes](#)
Enable Hibernation (preview) ☐
To enable Hibernation, you must register your subscription. [Learn more](#)

Administrator account

[Review + create](#) < Previous Next: Disks > [Give feedback](#)

By default it will be payment by month , but to save budget you can just choose to pay by hours by checking this checkbox in Basic tab

Run with Azure Spot discount ⓘ



I choose to develop my app on HTTP and HTTPS so i have to check these checkboxes below also

Select inbound ports *

HTTP (80), HTTPS (443), SSH (22)

- ☒ HTTP (80)
- ☒ HTTPS (443)
- ☒ SSH (22)

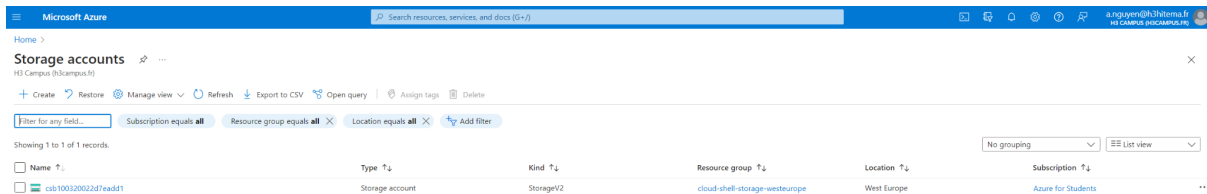
Now the rest is up to you to configure your machine and budget , to note , it's very important to also make an alert price.

Set Up Blob Storage :

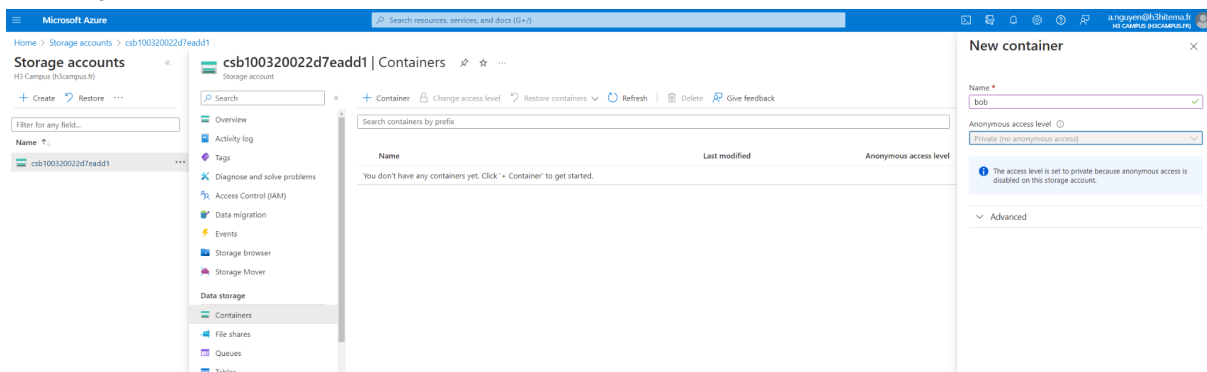
Consider a scenario where your application generates a large number of log files or images that need to be stored and accessed securely. Azure Blob Storage can be used to store such unstructured data.

To do it , go to the link below

<https://portal.azure.com/#view/HubsExtension/BrowseResource/resourceType/Microsoft.Storage%2FStorageAccounts>



Create your container



Up to you to do your configuration

Upload blob

sample-container/

Files

upload-blob.png

☐ Overwrite if files already exist

Advanced

Authentication type

Azure AD user account

Account key

Blob type

Block blob

☒ Upload .vhd files as page blobs (recommended)

Block size

4 MB

Access tier

Hot (Inferred)

Upload to folder

virtual-folder

Blob index tags

Key	Value

Encryption scope

☒ Use existing default container scope

☐ Choose an existing scope

Retention policy

☒ No retention

☐ Choose custom retention period:

10/25/2021

1:35:12 PM

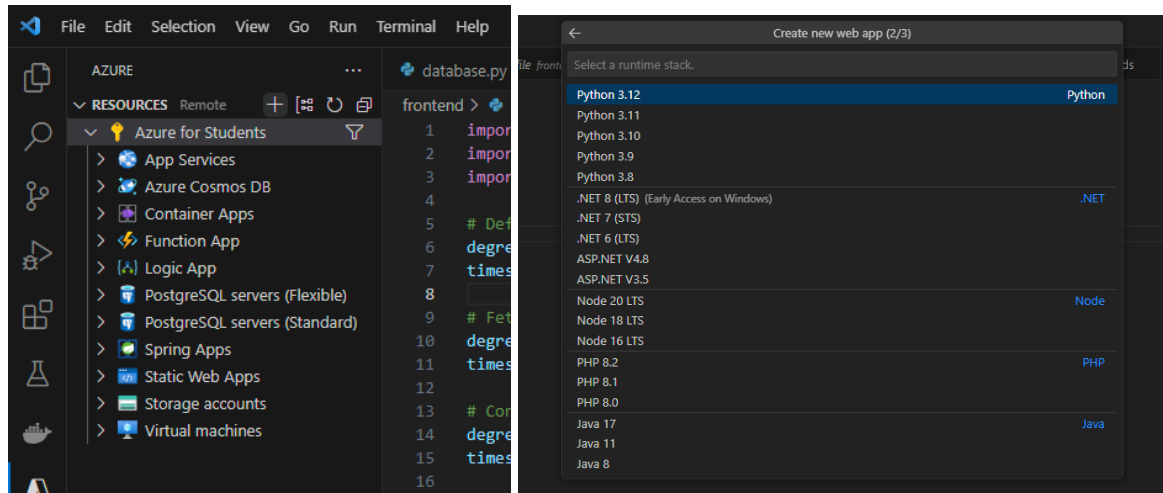
Enable version-level immutability on the container to set a retention policy.

Upload

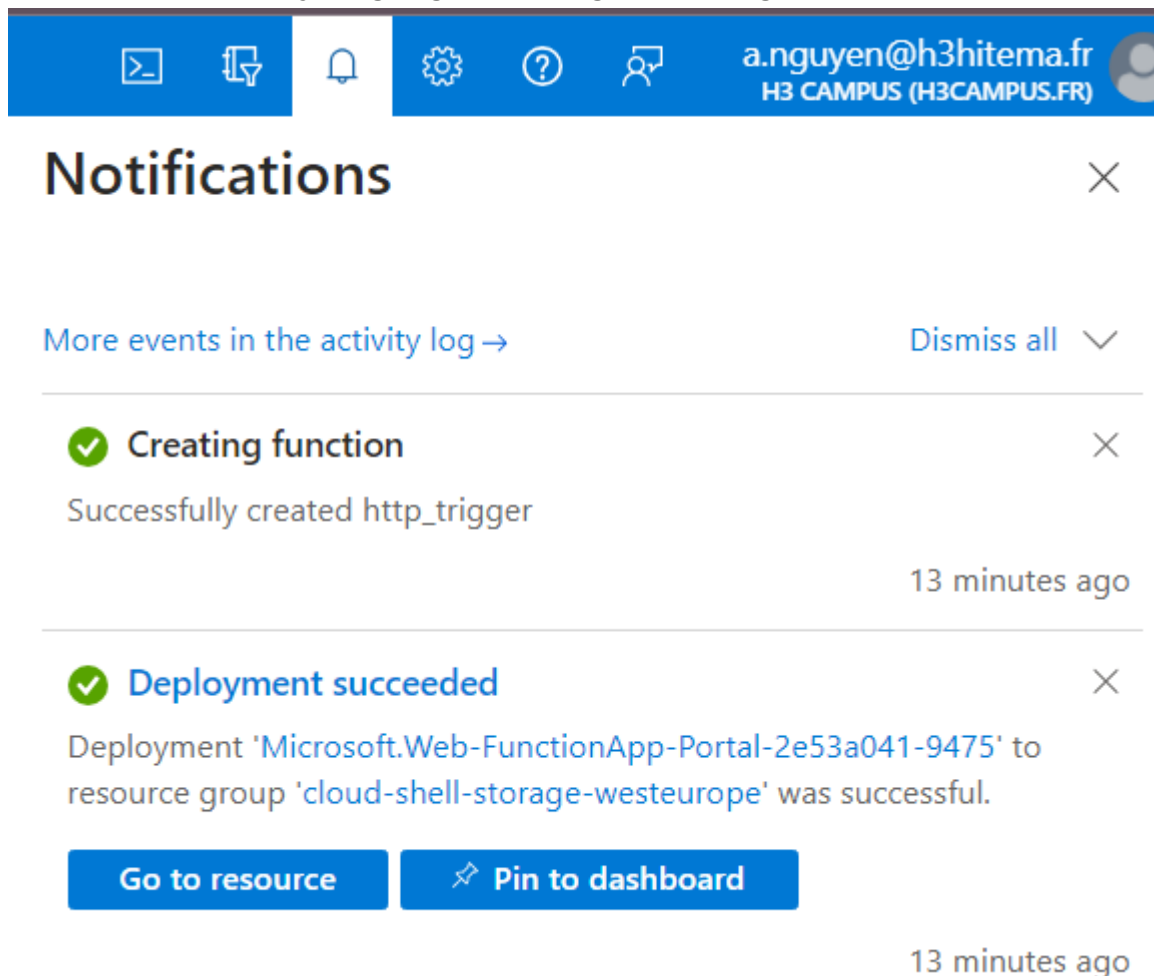
Deploy a Web App :

Suppose you have developed a web application and you need a platform to host it. Azure App Services can provide a managed platform to deploy web apps without managing the underlying infrastructure.

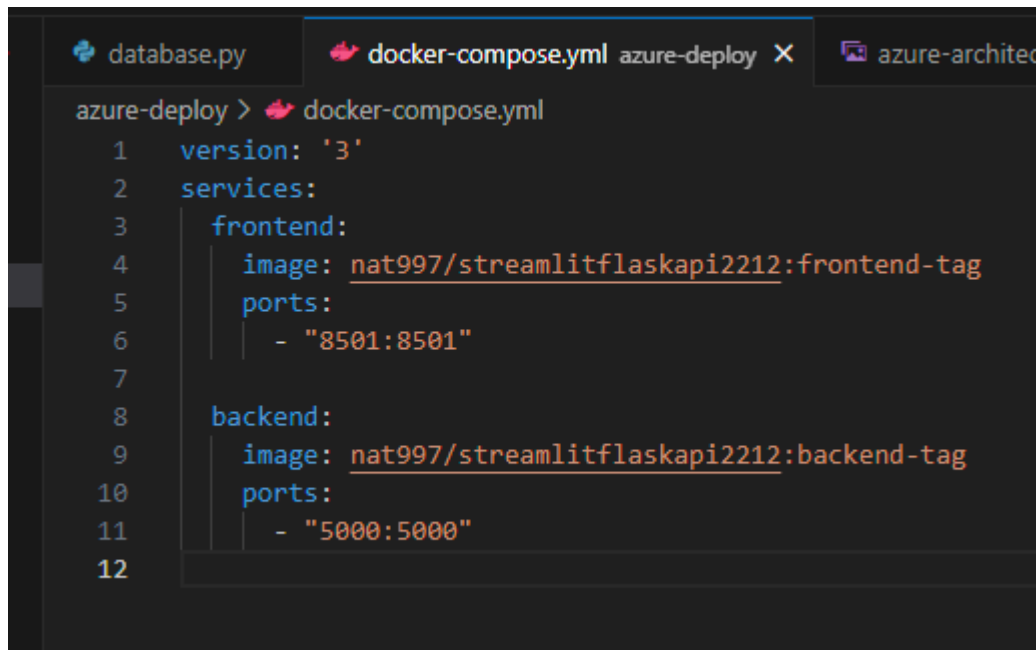
We can simply do it by using azure tool extension on vs code and click on the button + and then choose your configuration



At the end when everything is good u will get a message

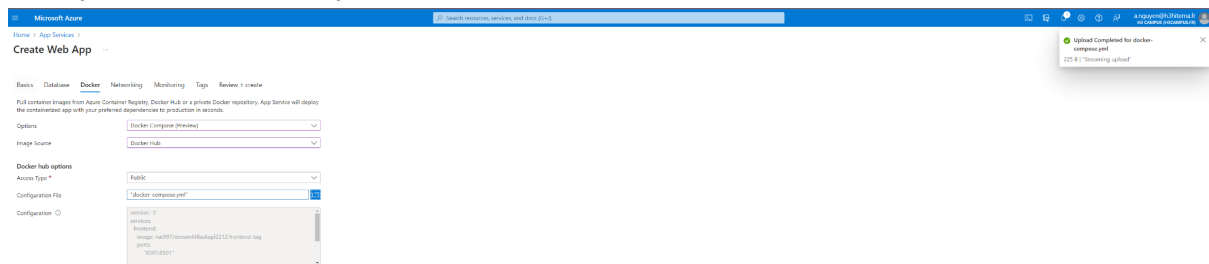


In my case specific , i have two docker images so i created a docker-compose file , what i did is i do a docker-compose file specific to your docker hub url



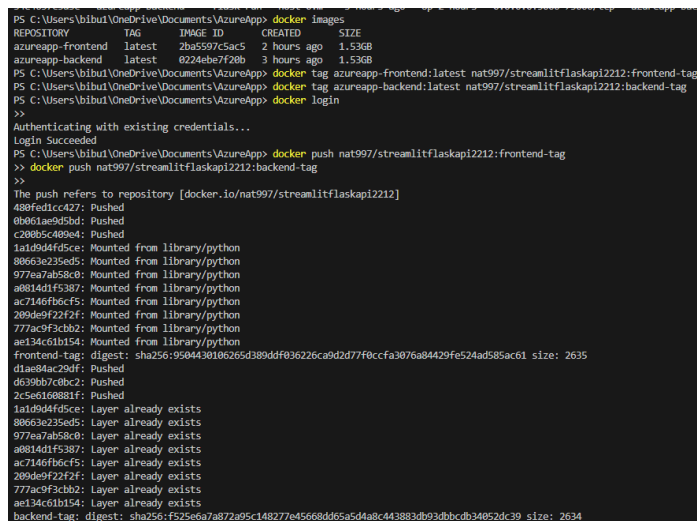
```
1 version: '3'
2 services:
3   frontend:
4     image: nat997/streamlitflaskapi2212:frontend-tag
5     ports:
6       - "8501:8501"
7
8   backend:
9     image: nat997/streamlitflaskapi2212:backend-tag
10    ports:
11      - "5000:5000"
12
```

Then you have to upload your docker-compose file on the azure portal



Here is how i push my 2 images on docker-hub:

- Create a repository on DockerHub
- Check your image tag , login , then push the images



```
PS C:\Users\bibul\OneDrive\Documents\AzureApp> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
azureapp-frontend   latest             2ba5597c5ac5        2 hours ago        1.53GB
azureapp-backend     latest             0224e8e7f28b        3 hours ago        1.53GB
PS C:\Users\bibul\OneDrive\Documents\AzureApp> docker tag azureapp-frontend:latest nat997/streamlitflaskapi2212:frontend-tag
PS C:\Users\bibul\OneDrive\Documents\AzureApp> docker tag azureapp-backend:latest nat997/streamlitflaskapi2212:backend-tag
PS C:\Users\bibul\OneDrive\Documents\AzureApp> docker login
Authenticating with existing credentials...
Login Succeeded
PS C:\Users\bibul\OneDrive\Documents\AzureApp> docker push nat997/streamlitflaskapi2212:frontend-tag
>> docker push nat997/streamlitflaskapi2212:backend-tag
>>
The push refers to repository [docker.io/nat997/streamlitflaskapi2212]
488f8d1cc427: Pushed
0b001ae9d5bd: Pushed
c208b5c409e4: Pushed
1a1d9d4fd5ce: Mounted from library/python
8063e235ed5: Mounted from library/python
977a7ab58e0: Mounted from library/python
a8814d1f5387: Mounted from library/python
ac7146fb6cf5: Mounted from library/python
209de9f22f2f: Mounted from library/python
777ac9f3cb2: Mounted from library/python
ae134c61b154: Mounted from library/python
frontend-tag: digest: sha256:9504430196265d389ddf036226ca9d2d77f0ccfa3076a84429fe524ad585ac61 size: 2635
41ae84ac20df: Pushed
d639bb7c0bc2: Pushed
2c5e6108881f: Pushed
1a1d9d4fd5ce: Layer already exists
8063e235ed5: Layer already exists
977a7ab58e0: Layer already exists
a8814d1f5387: Layer already exists
ac7146fb6cf5: Layer already exists
209de9f22f2f: Layer already exists
777ac9f3cb2: Layer already exists
ae134c61b154: Layer already exists
backend-tag: digest: sha256:f5256a7a872a95c148277e45668dd65a5d4a8c443883db93dbbcdb34052dc39 size: 2634
```

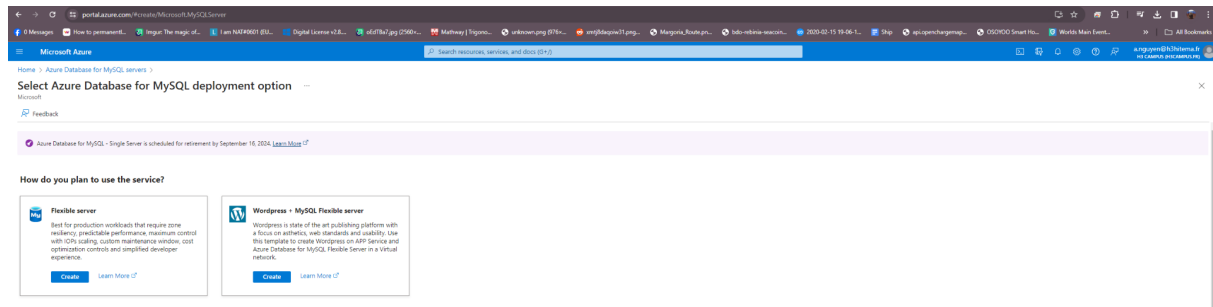
Create a SQL Database :

Imagine developing an application that requires a relational database backend. Creating an Azure SQL Database allows you to have a scalable and managed database service.

To create any MySQL server on azure you can simply going to

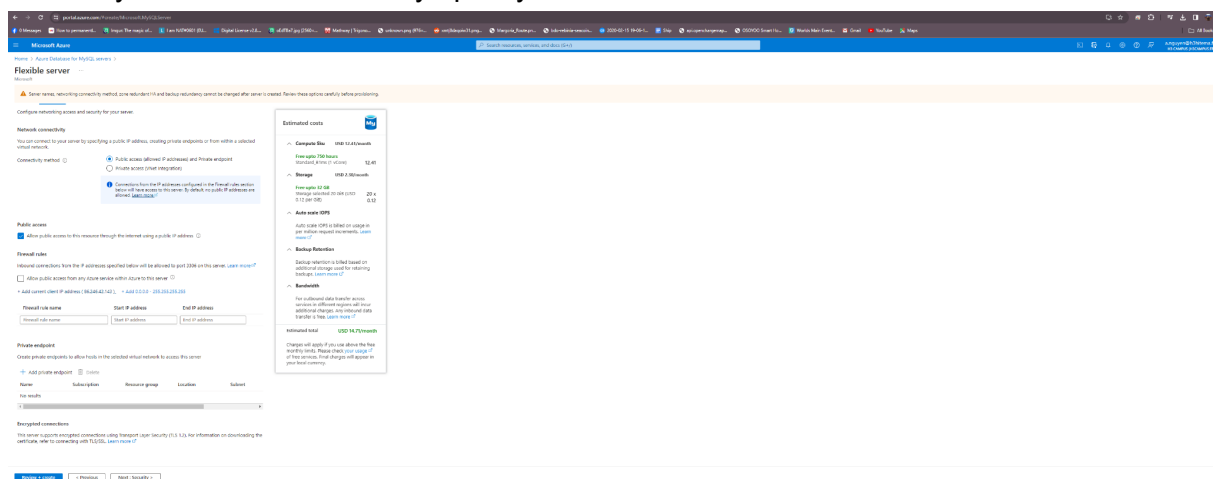
<https://portal.azure.com/#create/Microsoft.MySQLServer>

And then select the configuration that u would liked , in this case i use flexible server



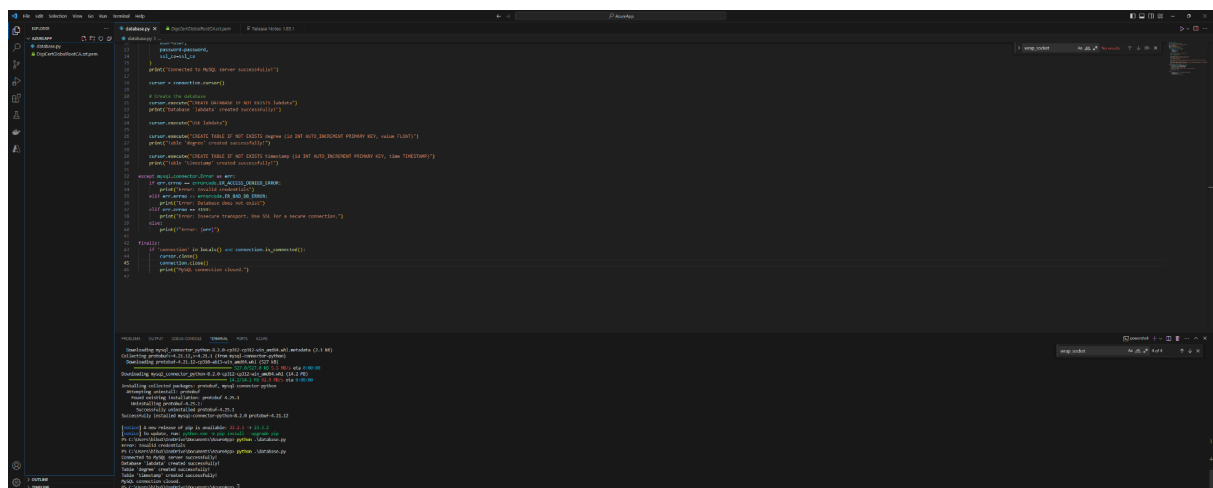
One important thing to note

You have to add your ip address into the networking otherwise you wouldn't be able to connect your azure database mysql on your local machine



So to test out the database and connections between i did some python scripts and a simple api with streamlit app to check:

Create database and tables



Showing databases and tables

```
PS C:\Users\bibu1\OneDrive\Documents\AzureApp> mysql -h myappstreamlit2112.mysql.database.azure.com -u nguyenanhtien -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 53
Server version: 8.0.34 Source distribution

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owners.

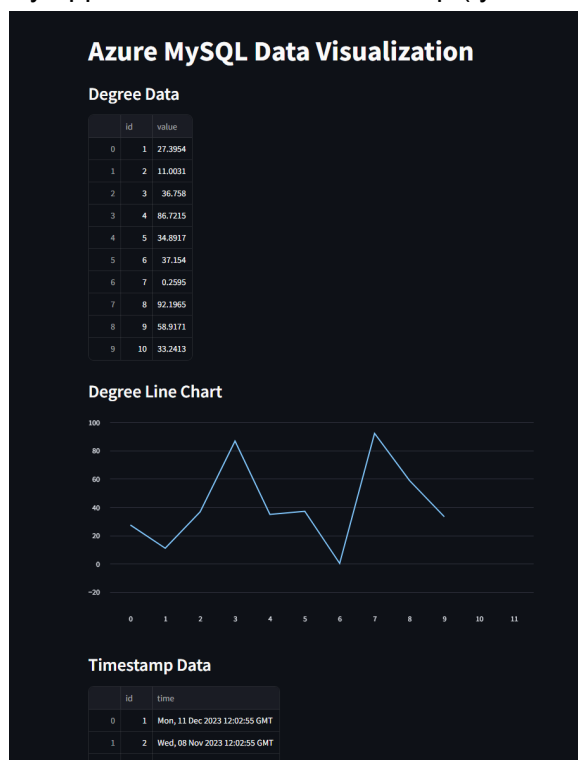
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| labdata |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.02 sec)

mysql> use labdata
Database changed
mysql> show tables;
+-----+
| Tables_in_labdata |
+-----+
| degree |
| timestamp |
+-----+
2 rows in set (0.02 sec)

mysql> 
```

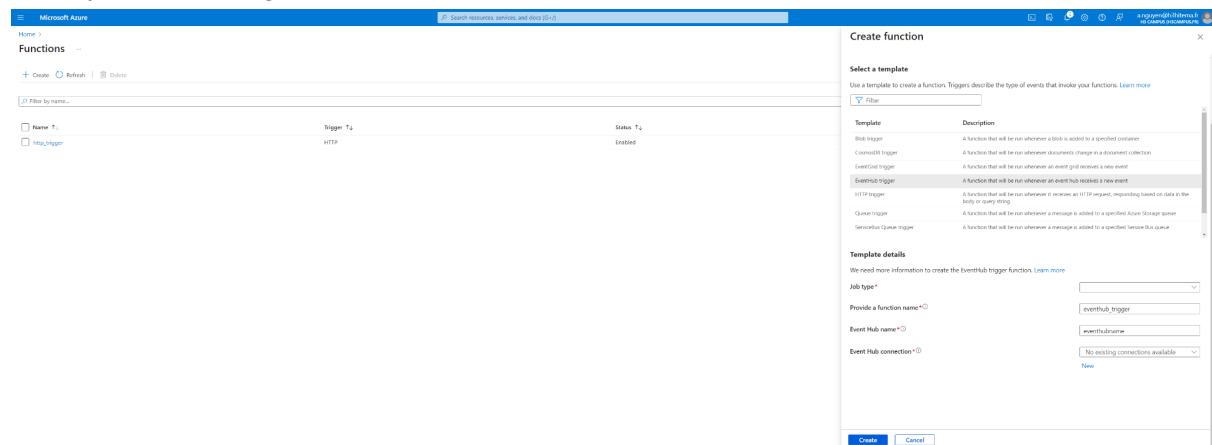
My application streamlit and it's ap (you can check my code at my github :



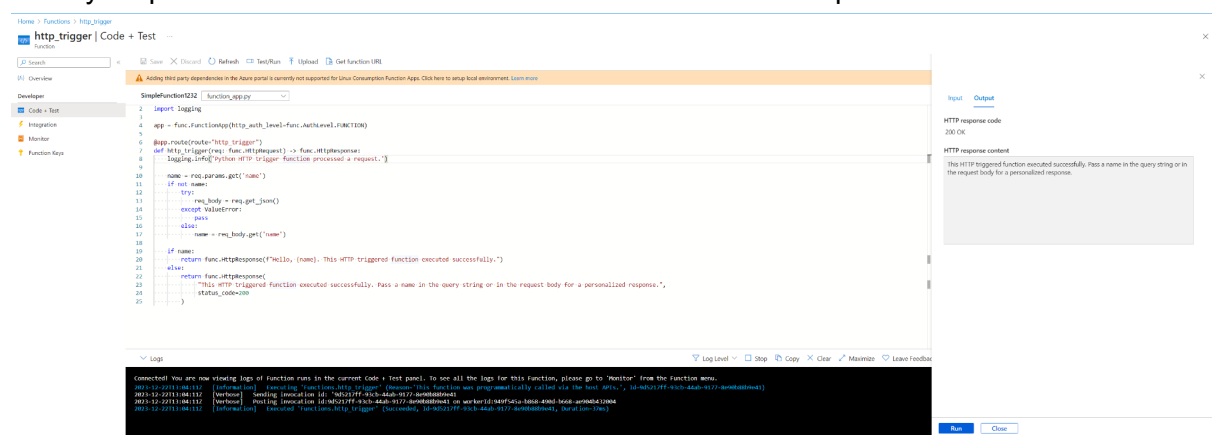
Implement a simple Azure Functions :

Consider a scenario where you need to process data or respond to events without a dedicated server. Azure Functions allow you to write event-driven functions that can be triggered on-demand.

To create a simple function you can just go on search bar and type azure function , it will direct you to this page



After that , you can choose a language that u wanna developpe with , create your code directly on portal azure website and execute it : here is an example



As you see we got HTTP response code 200 OK

Set Up a Networking ressource :

Suppose you have multiple VMs or services that need to communicate securely. Creating a Virtual Network in Azure allows you to isolate and manage network traffic between resources.

You can go to this tab and choose to open port of your application , choose https http

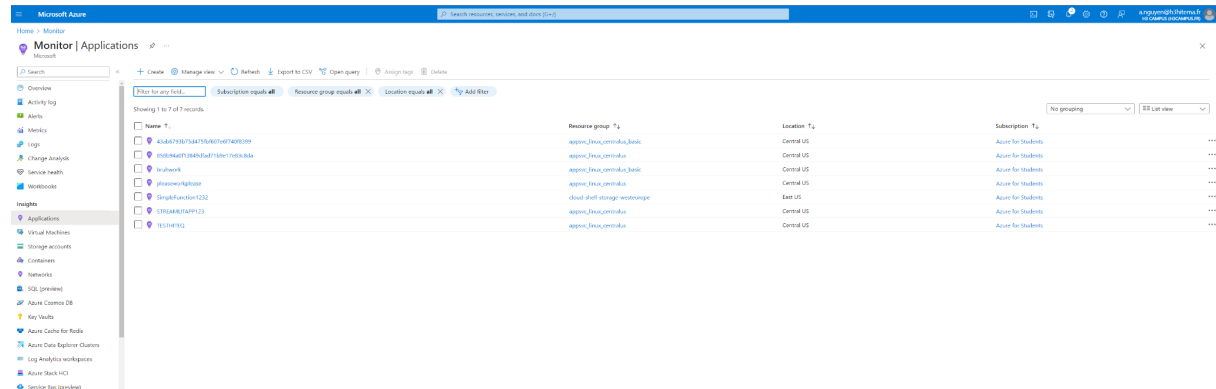
The screenshot displays the Azure portal interface for a virtual machine named 'nguyenanhien'. The left sidebar shows the 'Network settings' tab selected. The main content area shows the 'Network settings' page for the VM. The 'Essentials' section lists various network-related settings, including the network interface, virtual network, public IP address, private IP address, admin security rules, load balancers, application security groups, network security group, accelerated networking, and effective security rules. The 'Rules' section is expanded, showing the 'Network security group' settings for 'nguyenanhien-nsg'. A table of rules is displayed, including inbound and outbound rules. The table has columns for Priority, Name, Port, Protocol, Source, Destination, and Action. The rules are as follows:

Priority	Name	Port	Protocol	Source	Destination	Action
300	SSH	22	TCP	Any	Any	Allow
320	HTTPS	443	TCP	Any	Any	Allow
340	HTTP	80	TCP	Any	Any	Allow
350	AllowAnyCustom5000Inbound	5000	TCP	Any	Any	Allow
360	AllowAnyCustom3306Inbound	3306	TCP	Any	Any	Allow
65000	AllowVnetInbound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

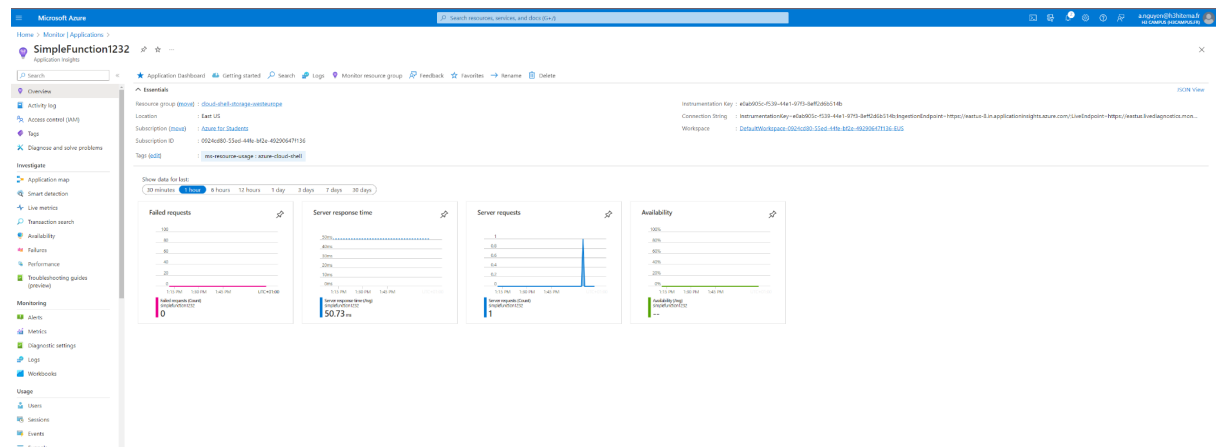
Configure Monitoring and Logging :

Imagine needing insights into the performance and health of your resources. Azure Monitor provides detailed telemetry and logs to help you diagnose issues and optimize performance.

To check the state of your application to help you diagnose problems , you can simply use monitor function of azure portal for live web application and choose your application

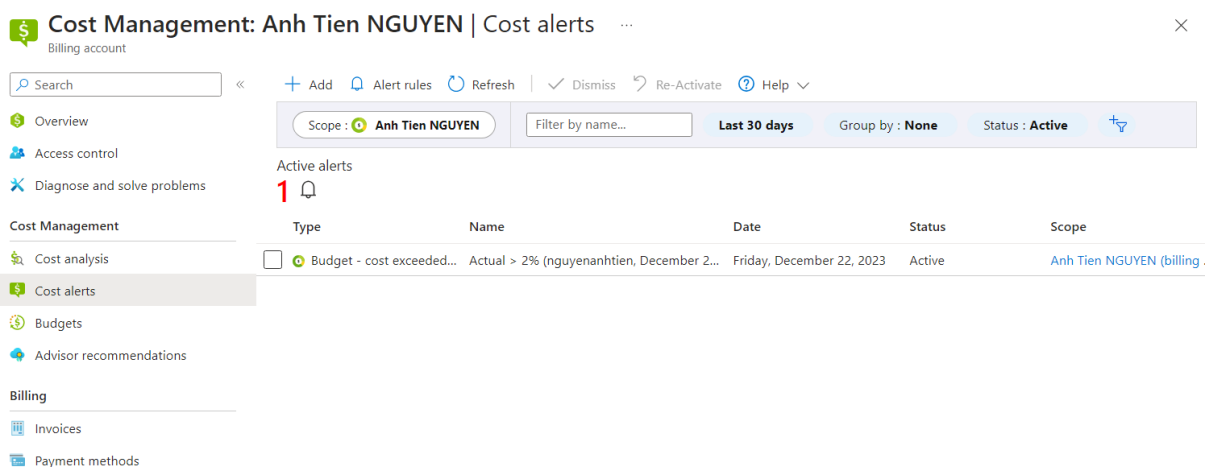


It will tell your time to respond from the server , health of the application Here is an example of my azure function i created



I also created a cost alert

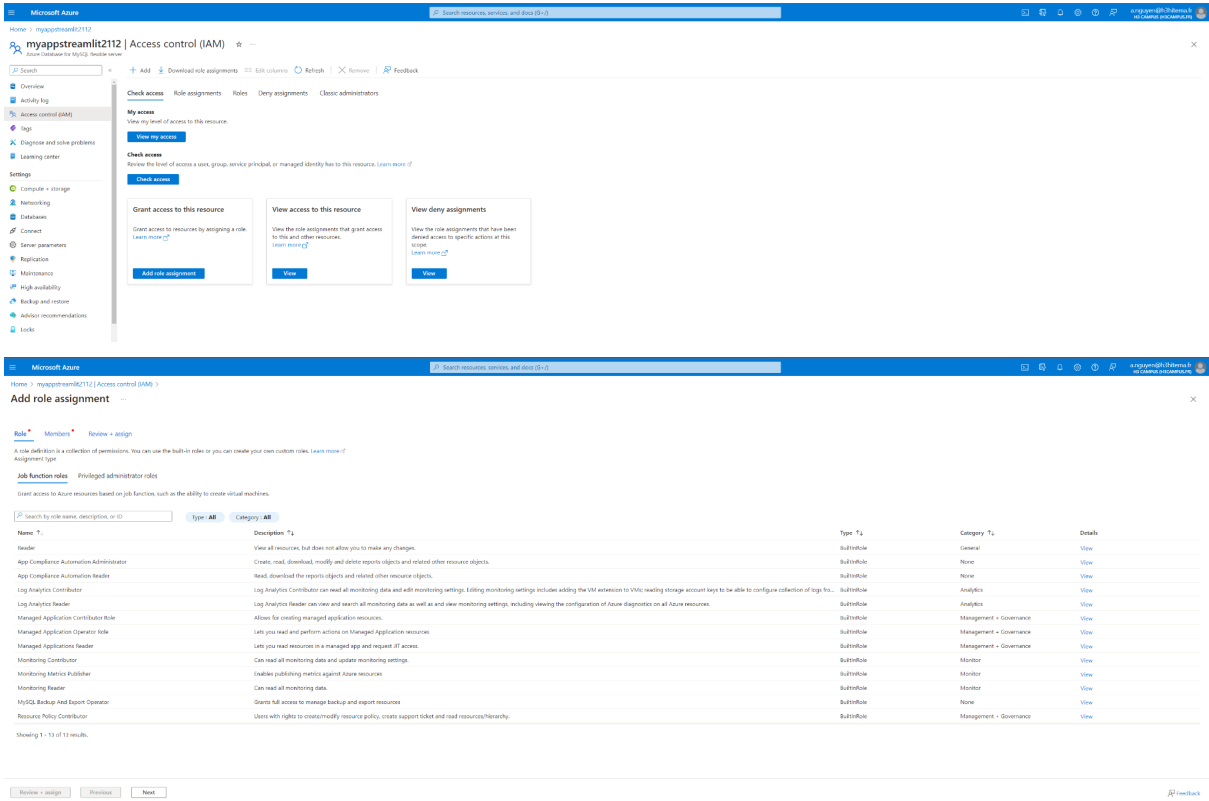
Home > Cost Management: Anh Tien NGUYEN



Implement Azure Identity by creating a simple dev role :

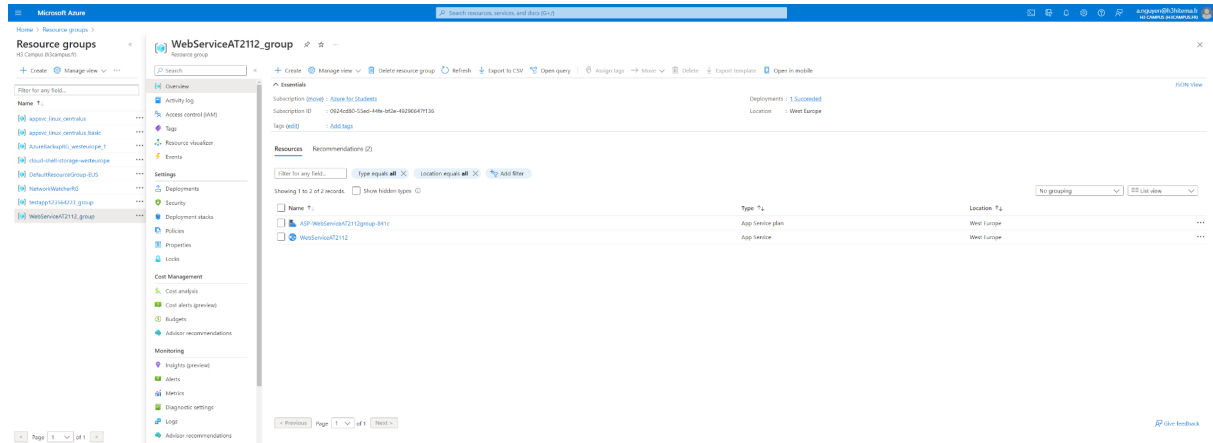
Consider a scenario where you need to manage user access to resources. Azure Active Directory allows you to manage identities and control access to resources.

You can also add an access role for anyone . By simply going to IAM and add role assignment and choose the right and the people you wanted

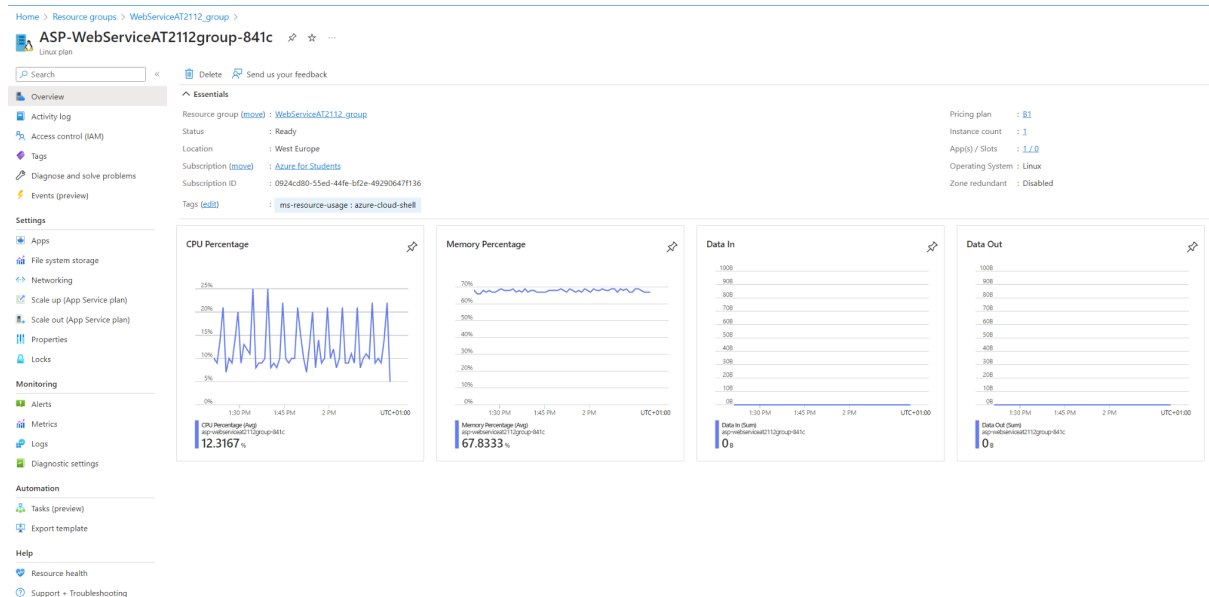


Create a personalized Resource Group :

Imagine needing to organize and manage related Azure resources. Resource Groups in Azure provide a way to group resources based on lifecycle, permissions, or other criteria.



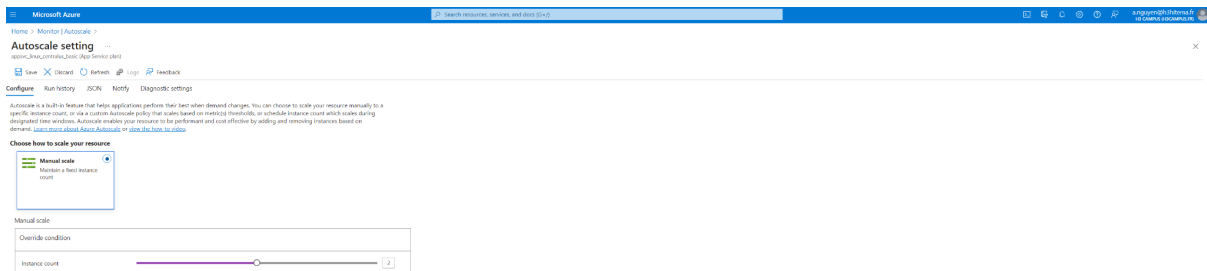
It will help you to manage the resource , as u see below an example of my application , it shows cpu usages etc ...



Set Up Auto-Scaling :

Suppose you have a variable workload and need to adjust resources based on demand. Auto-scaling in Azure allows you to dynamically adjust resources to maintain performance and manage costs.

You can set up your auto scaling via Azure Monitor , and choose the option you would like , here to save budget 100\$ student i didn't set any cause i don't have many clients or users that access my application .



HERE IS WHAT MY APPLICATION LOOK LIKE

