Azure Cloud Infrastructure Deployment and Management Project

Team Members:

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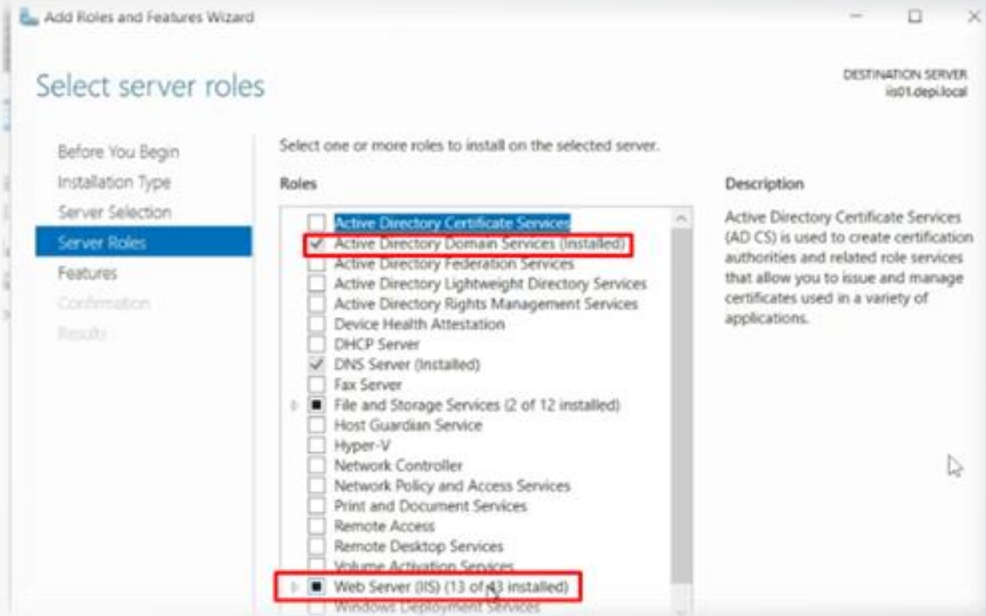
Azure AD setup

- Within Resource group named we manage to deploy 2 virtual machines (VMs) at the same VNET
- Both using windows server 2022OS and IIS feature installed
- The IIS01 server promoted to be Domain controller with domain name (depi.local) then IIS02 joined that domain
- Using AD we created some users like (dpi, Ismail,..)



Select server roles

DESTINATION SERVER
iis01.depi.local

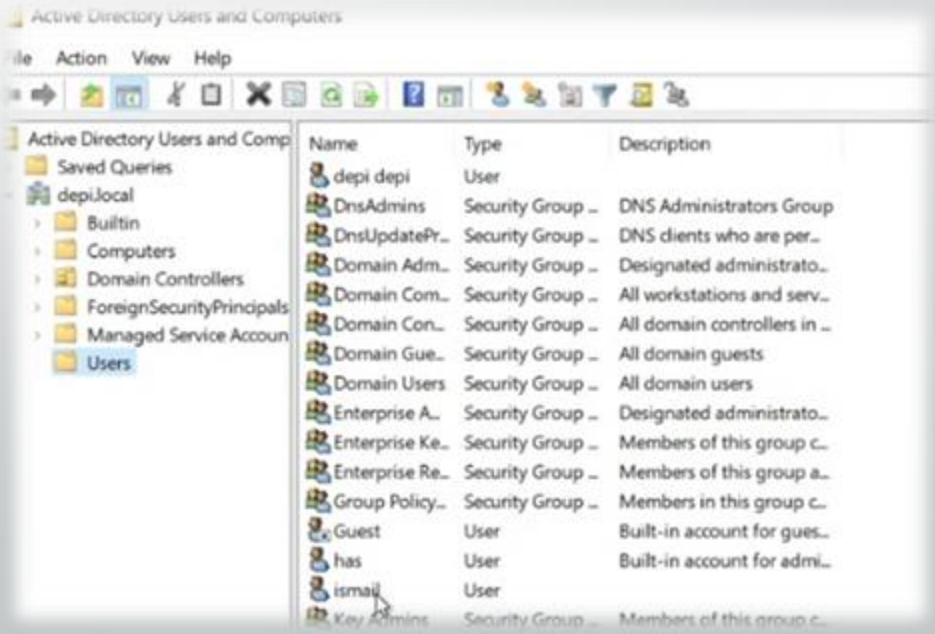
Select one or more roles to install on the selected server.

Roles

- □ Active Directory Certificate Services
- ☑ Active Directory Domain Services (Installed)
- □ Active Directory Federation Services
- □ Active Directory Lightweight Directory Services
- □ Active Directory Rights Management Services
- □ Device Health Attestation
- □ DHCP Server
- ☑ DNS Server (Installed)
- □ Fax Server
- ■ File and Storage Services (2 of 12 installed)
- □ Host Guardian Service
- □ Hyper-V
- □ Network Controller
- □ Network Policy and Access Services
- □ Print and Document Services
- □ Remote Access
- □ Remote Desktop Services
- □ Volume Activation Services
- ■ Web Server (IIS) (13 of 43 installed)
- □ Windows Deployment Services

Description

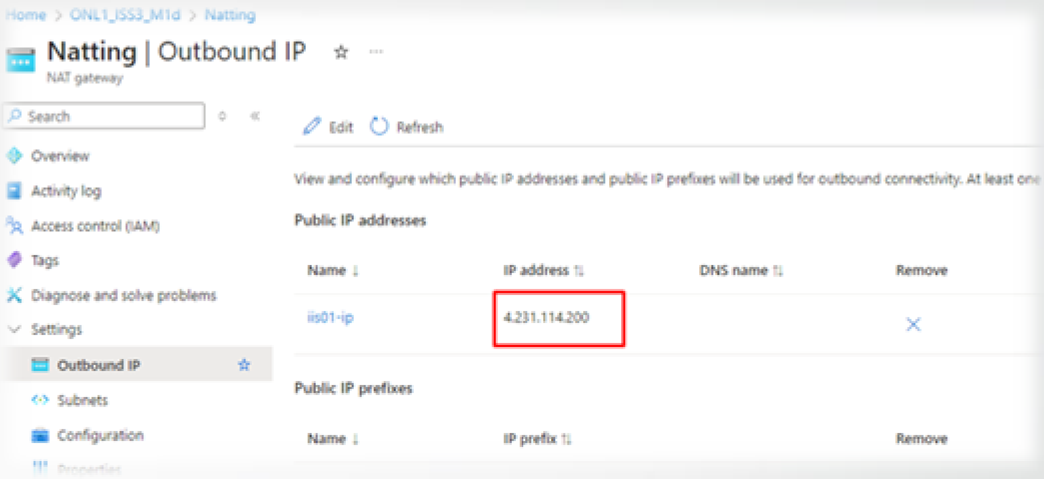
Active Directory Certificate Services (AD CS) is used to create certification authorities and related role services that allow you to issue and manage certificates used in a variety of applications.



Name	Type	Description
depi depi	User	
DnsAdmins	Security Group ...	DNS Administrators Group
DnsUpdatePr...	Security Group ...	DNS clients who are per...
Domain Adm...	Security Group ...	Designated administrato...
Domain Com...	Security Group ...	All workstations and serv...
Domain Con...	Security Group ...	All domain controllers in ...
Domain Gue...	Security Group ...	All domain guests
Domain Users	Security Group ...	All domain users
Enterprise A...	Security Group ...	Designated administrato...
Enterprise Ke...	Security Group ...	Members of this group c...
Enterprise Re...	Security Group ...	Members of this group a...
Group Policy...	Security Group ...	Members in this group c...
Guest	User	Built-in account for gues...
has	User	Built-in account for admi...
ismail	User	
Key Admins	Security Group ...	Members of this group c...

Network Configurations

- All of our recourses are at the same VNET named **IIS01-vnet** using **west Europe** Region .
- to save number or public IPs we created NAT gateway which allow the internet for VM01 and VM02 .
- the public IP of NAT gateway as shown.
- NSG named **iis-01** created and configured with inbound / outbound rules as needed then attached the 2 VM's to it.



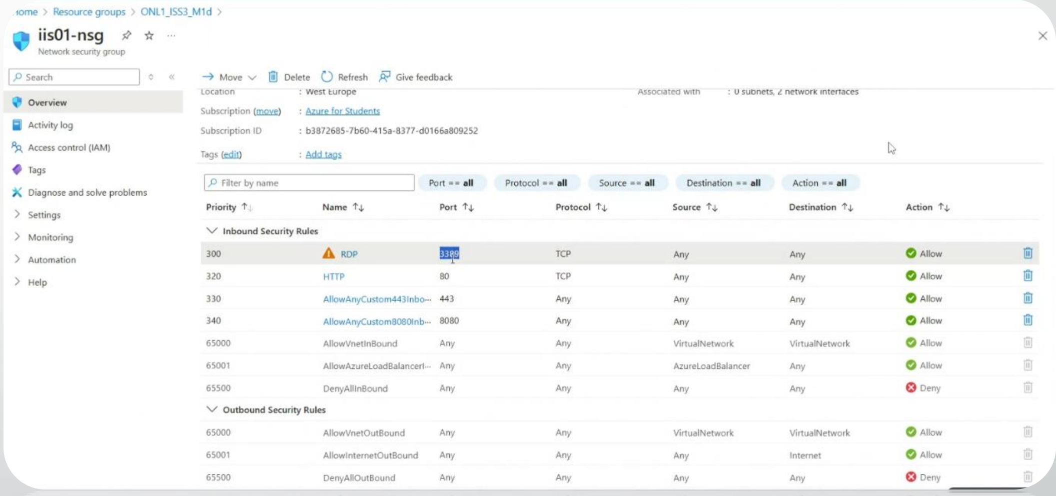
View and configure which public IP addresses and public IP prefixes will be used for outbound connectivity. At least one

Public IP addresses

Name	IP address	DNS name	Remove
iis01-ip	4.231.114.200		✕

Public IP prefixes

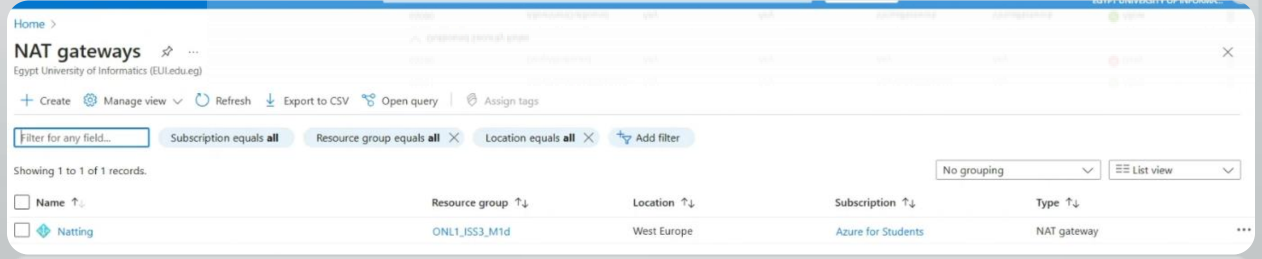
Name	IP prefix	Remove



Location : West Europe
Associated with : 0 subnets, 2 network interfaces
Subscription (move) : Azure for Students
Subscription ID : b3872685-7b60-415a-8377-d0166a809252
Tags (edit) : Add tags

Filter by name | Port == all | Protocol == all | Source == all | Destination == all | Action == all

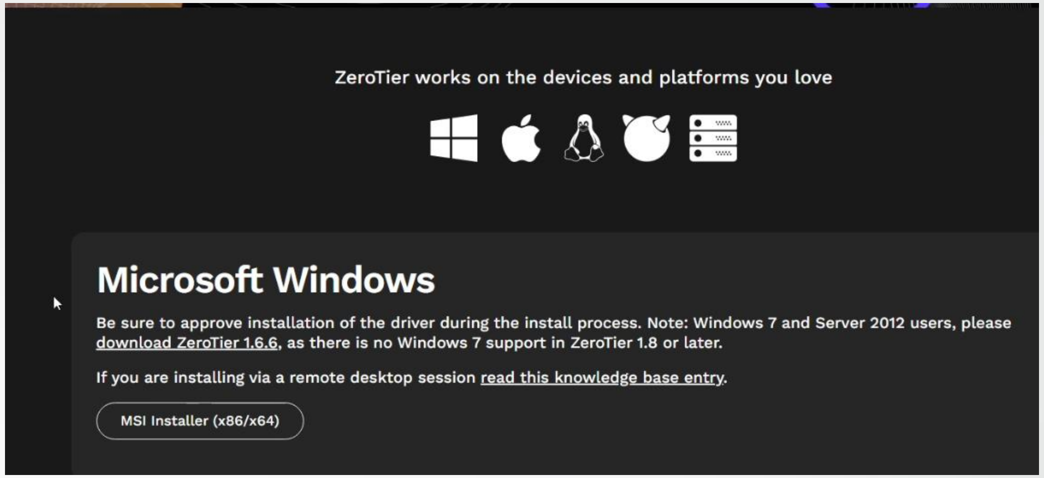
Priority	Name	Port	Protocol	Source	Destination	Action
Inbound Security Rules						
300	RDP	3389	TCP	Any	Any	Allow
320	HTTP	80	TCP	Any	Any	Allow
330	AllowAnyCustom443Inbo...	443	Any	Any	Any	Allow
340	AllowAnyCustom8080Inb...	8080	Any	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerI...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
Outbound Security Rules						
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny



Showing 1 to 1 of 1 records.

Name	Resource group	Location	Subscription	Type
Natting	ONL1_ISS3_M1d	West Europe	Azure for Students	NAT gateway

- To login to the VM we used before the bastion host, but we found that it is expensive, so we used another app name **Zero tier**
- After installation , open the app then join with the ID.
- The admin should allow which IP should connect to VM01 and VM02

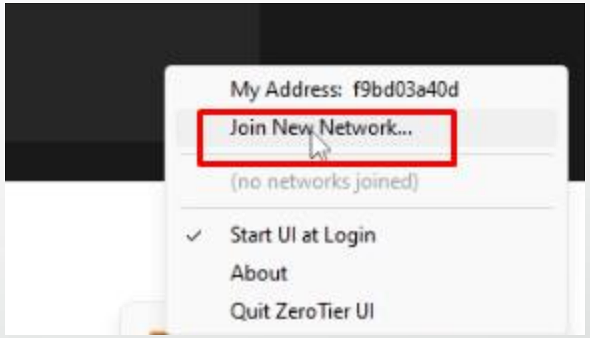


ZeroTier works on the devices and platforms you love

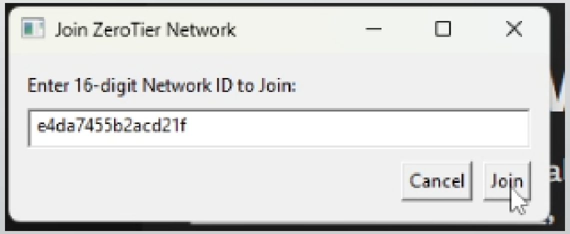
Microsoft Windows

Be sure to approve installation of the driver during the install process. Note: Windows 7 and Server 2012 users, please download ZeroTier 1.6.6, as there is no Windows 7 support in ZeroTier 1.8 or later.

If you are installing via a remote desktop session read this knowledge base entry.

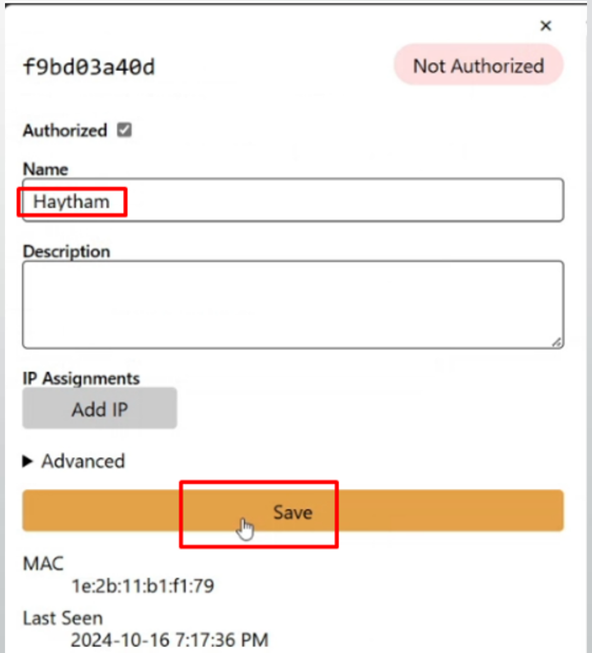


My Address: f9bd03a40d



Join ZeroTier Network

Enter 16-digit Network ID to Join: e4da7455b2acd21f



f9bd03a40d

Authorized ☑

Name: Haytham

Description

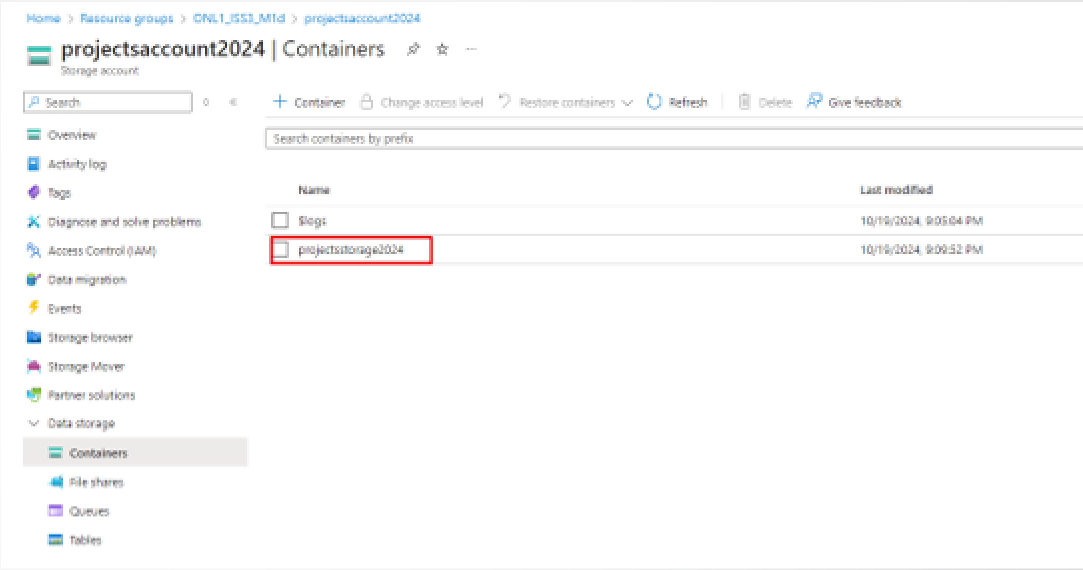
IP Assignments

MAC 1e:2b:11:b1:f1:79

Last Seen 2024-10-16 7:17:36 PM

Storage Solutions

- Storage account named **Projectsaccount2024** created then contained with same name
- PNG file uploaded to that container as **Block BLOB**
- SAS URLS created as well to be accessed from internet and **Hot Access tier** was selected

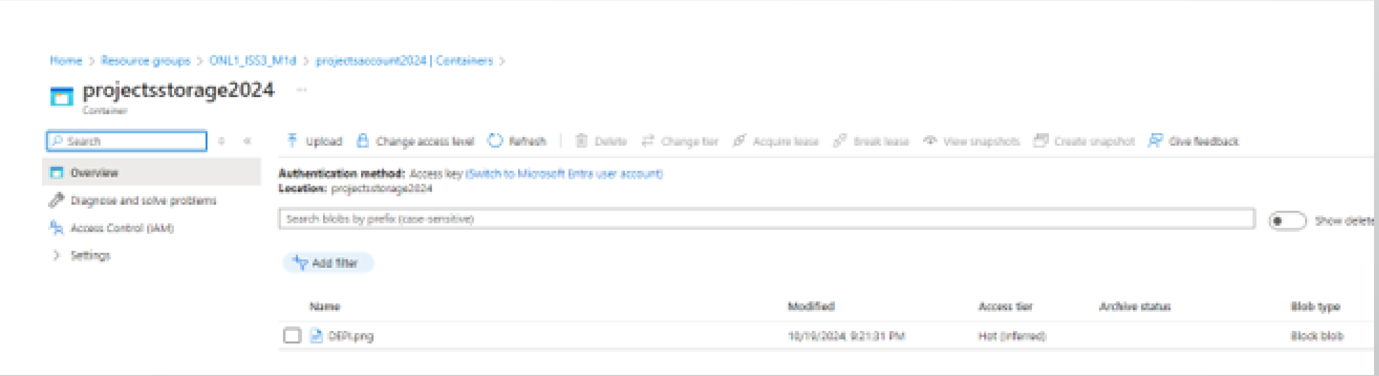


Home > Resource groups > ONL1_ISS3_M1d > projectsaccount2024

projectsaccount2024 | Containers

Storage account

Name	Last modified
□ $logs	10/19/2024, 9:05:04 PM
□ projectsstorage2024	10/19/2024, 9:09:52 PM



Home > Resource groups > ONL1_ISS3_M1d > projectsaccount2024 | Containers >

projectsstorage2024

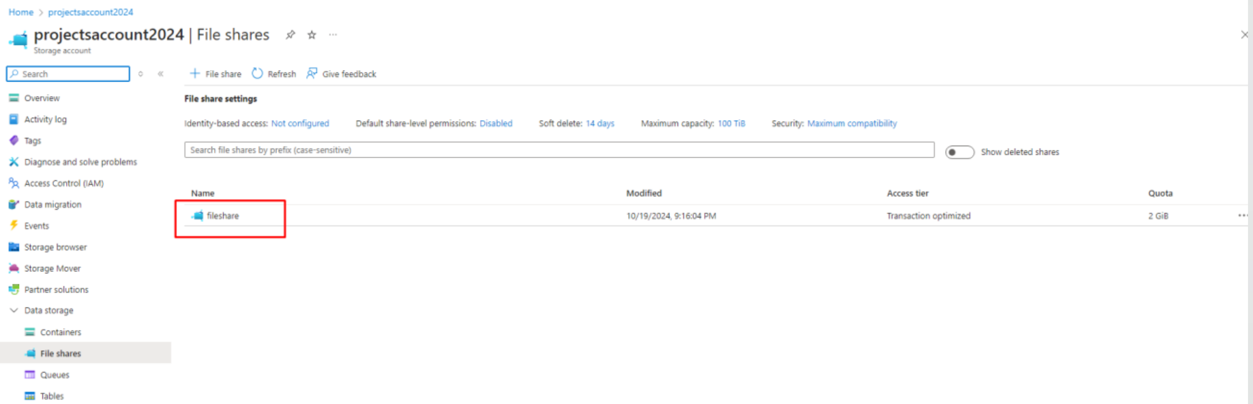
Container

Authentication method: Access key (Switch to Microsoft Entra user account)
Location: projectsstorage2024

Name	Modified	Access tier	Archive status	Blob type
□ DEPI.png	10/19/2024, 9:21:31 PM	Hot (Inferred)		Block blob

Creating NW fileshare & Backup

- Using the same storage account a Fileshare created and mapped to both VM’s
- Text file created and accessed by VM’s
- We enabled daily backup on both VM’s as well



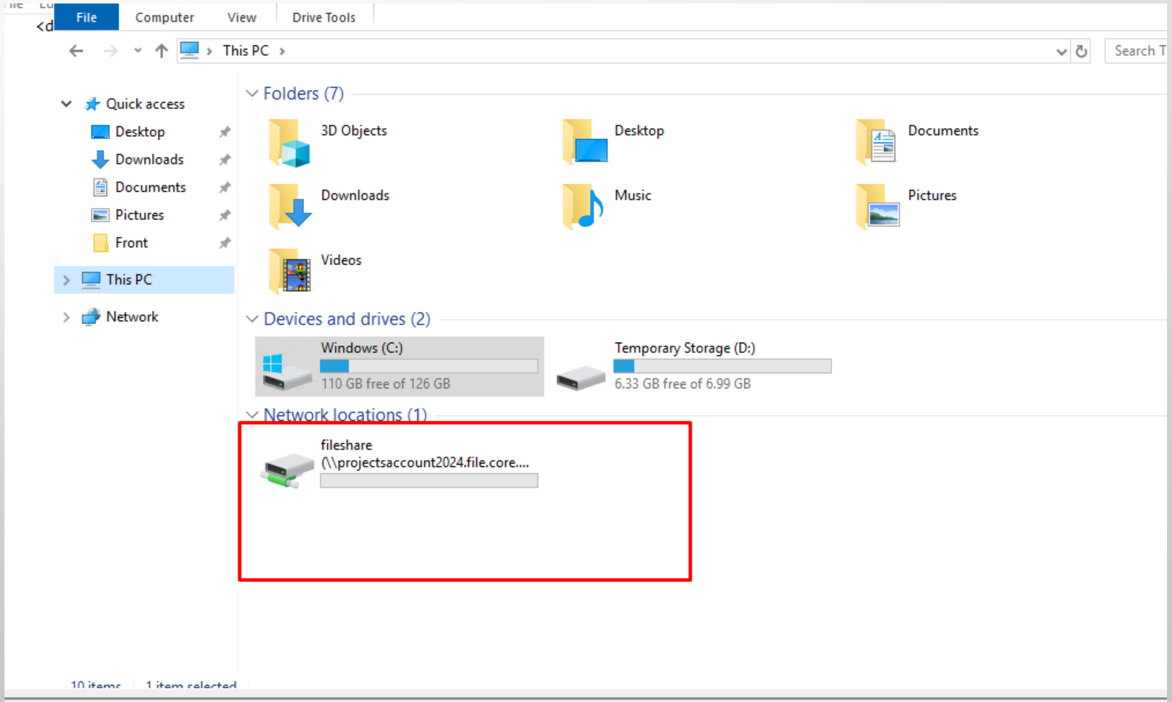
projectsaccount2024 | File shares

Storage account

File share settings

Identity-based access: Not configured   Default share-level permissions: Disabled   Soft delete: 14 days   Maximum capacity: 100 TiB   Security: Maximum compatibility

Name	Modified	Access tier	Quota
fileshare	10/19/2024, 9:16:04 PM	Transaction optimized	2 GiB



Windows (C:)
110 GB free of 126 GB

Temporary Storage (D:)
6.33 GB free of 6.99 GB

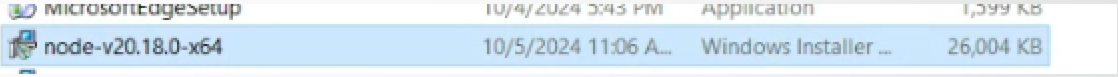
fileshare
(\\projectsaccount2024.file.core....

Final Integration

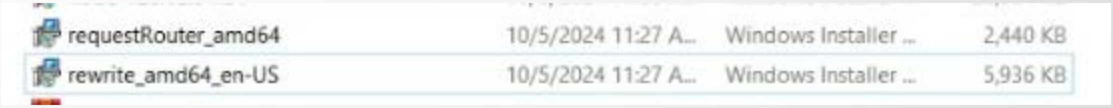
- Our app is 3-tier (Front – Back – DB)

- Some dependencies installed to launch the wep app like (node.js …)

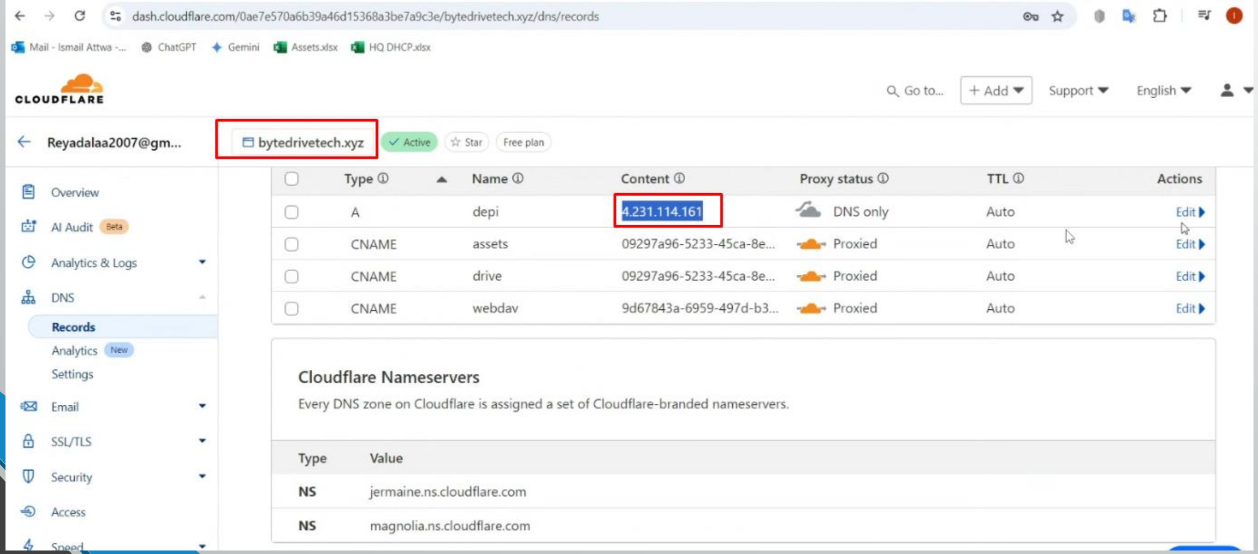
- To make it secured we installed Certify app will give us a free cert for 90 days.



MicrosoftEdgeSetup	10/4/2024 5:43 PM	Application	1,599 KB
node-v20.18.0-x64	10/5/2024 11:06 A...	Windows Installer ...	26,004 KB



requestRouter_amd64	10/5/2024 11:27 A...	Windows Installer ...	2,440 KB
rewrite_amd64_en-US	10/5/2024 11:27 A...	Windows Installer ...	5,936 KB



dash.cloudflare.com/0ae7e570a6b39a46d15368a3be7a9c3e/bytedrivetech.xyz/dns/records

Reyadalaa2007@gm...

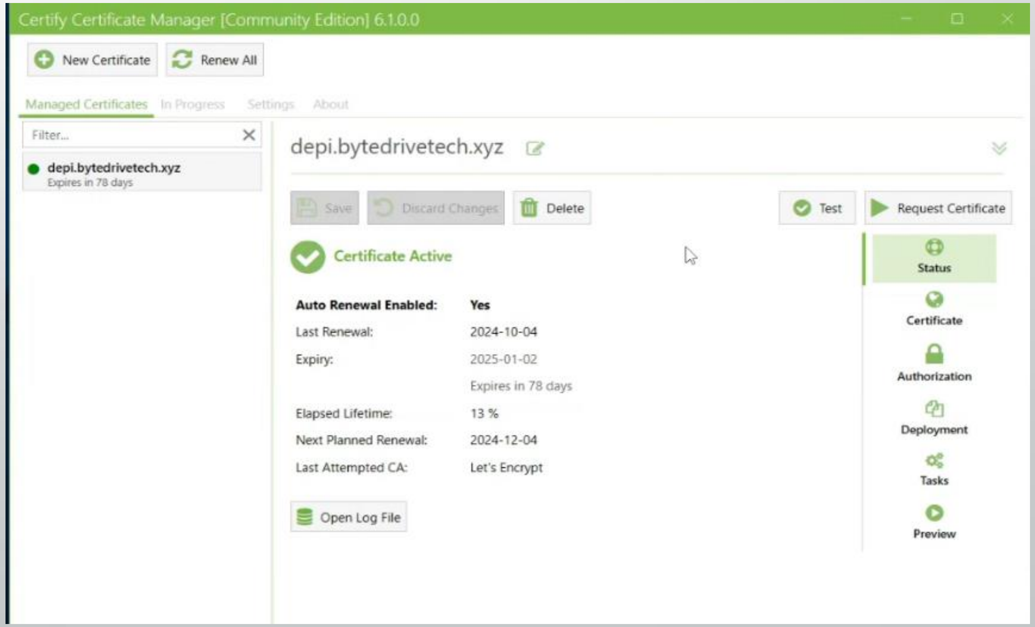
bytedrivetech.xyz

Type	Name	Content	Proxy status	TTL	Actions
A	depi	4.231.114.161	DNS only	Auto	Edit
CNAME	assets	09297a96-5233-45ca-8e...	Proxied	Auto	Edit
CNAME	drive	09297a96-5233-45ca-8e...	Proxied	Auto	Edit
CNAME	webdav	9d67843a-6959-497d-b3...	Proxied	Auto	Edit

Cloudflare Nameservers

Every DNS zone on Cloudflare is assigned a set of Cloudflare-branded nameservers.

Type	Value
NS	jermaine.ns.cloudflare.com
NS	magnolia.ns.cloudflare.com



Certify Certificate Manager [Community Edition] 6.1.0.0

depi.bytedrivetech.xyz
Expires in 78 days

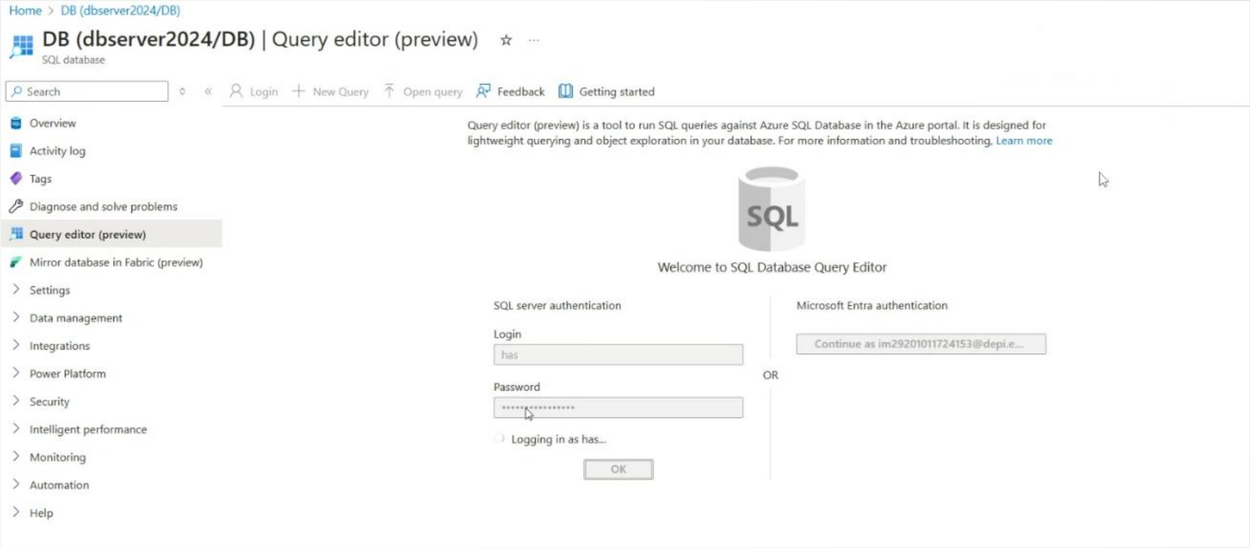
depi.bytedrivetech.xyz

Certificate Active

Auto Renewal Enabled:	**Yes**
Last Renewal:	2024-10-04
Expiry:	2025-01-02 Expires in 78 days
Elapsed Lifetime:	13 %
Next Planned Renewal:	2024-12-04
Last Attempted CA:	Let's Encrypt

- We created DB server and DB instance.

- We crated a table named Users to store **users'** info after registration.



Query editor (preview) is a tool to run SQL queries against Azure SQL Database in the Azure portal. It is designed for lightweight querying and object exploration in your database. For more information and troubleshooting, Learn more

Welcome to SQL Database Query Editor

SQL server authentication

Login: has

Password: ****************

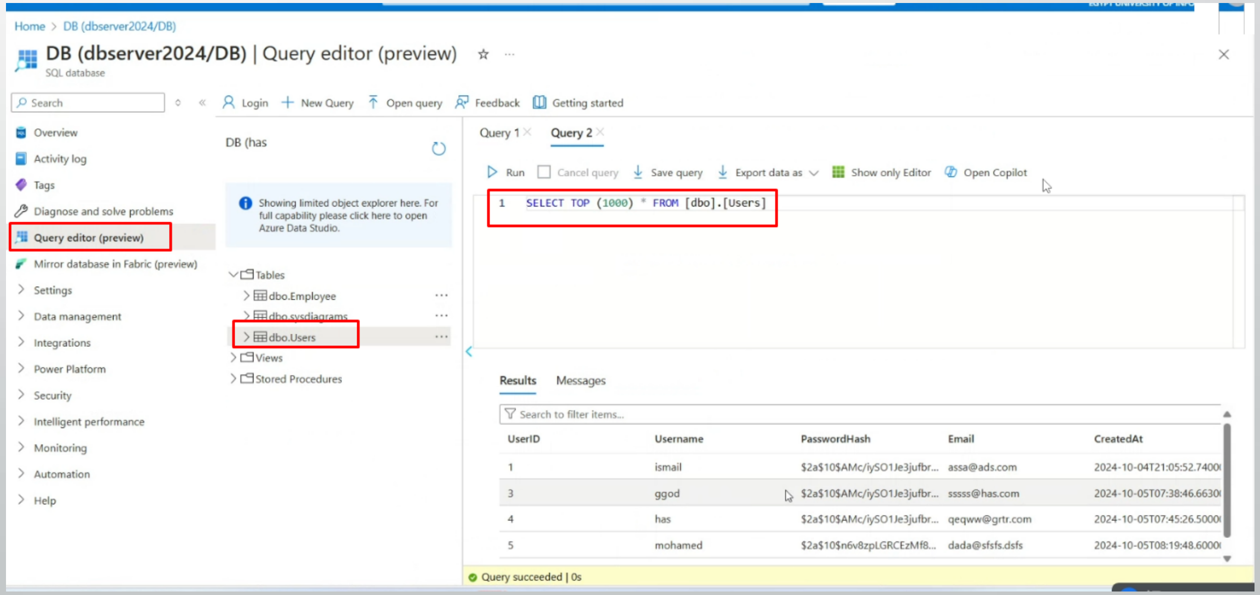
Logging in as has...

OK

OR

Microsoft Entra authentication

Continue as im29201011724153@depi.e...



Showing limited object explorer here. For full capability please click here to open Azure Data Studio.

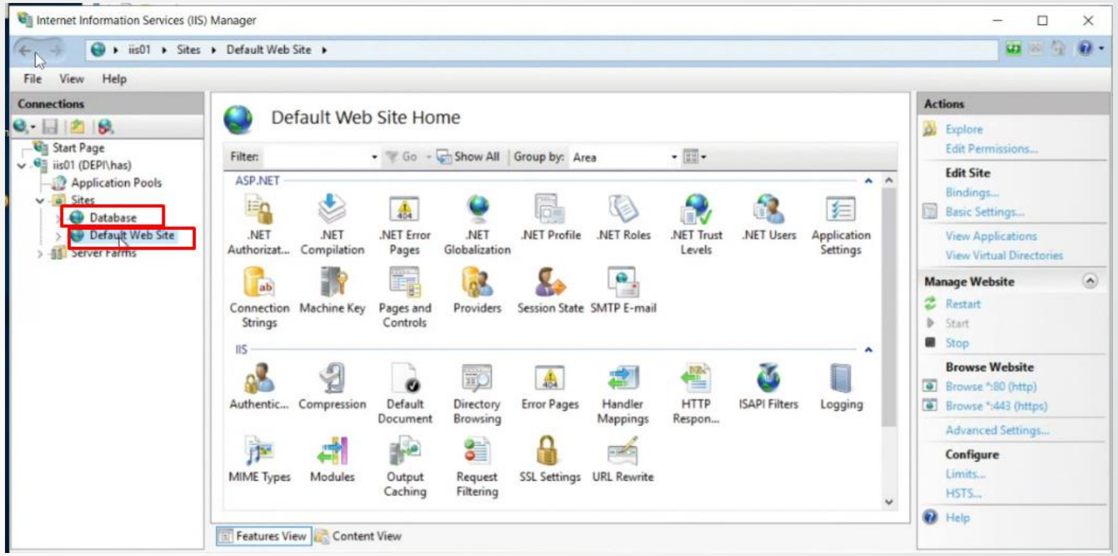
```
SELECT TOP (1000) * FROM [dbo].[Users]
```

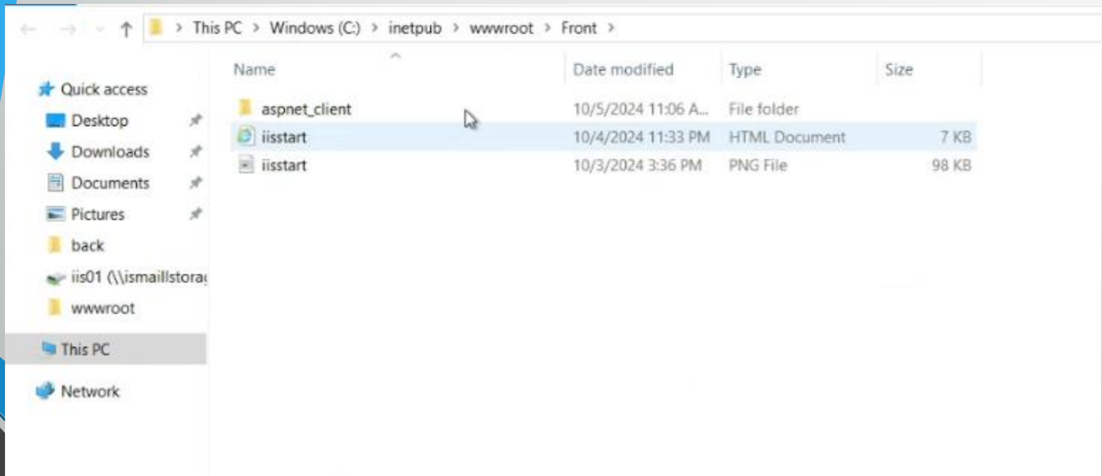
UserID	Username	PasswordHash	Email	CreatedAt
1	ismail	$2a$10$AMc/iySO1Je3jufbr...	assa@ads.com	2024-10-04T21:05:52.7400
3	ggod	$2a$10$AMc/iySO1Je3jufbr...	sssss@has.com	2024-10-05T07:38:46.6630
4	has	$2a$10$AMc/iySO1Je3jufbr...	qeqww@grtr.com	2024-10-05T07:45:26.5000
5	mohamed	$2a$10$n6v8zpLGRCEzMf8...	dada@sfsfs.dsfs	2024-10-05T08:19:48.6000

Query succeeded | 0s

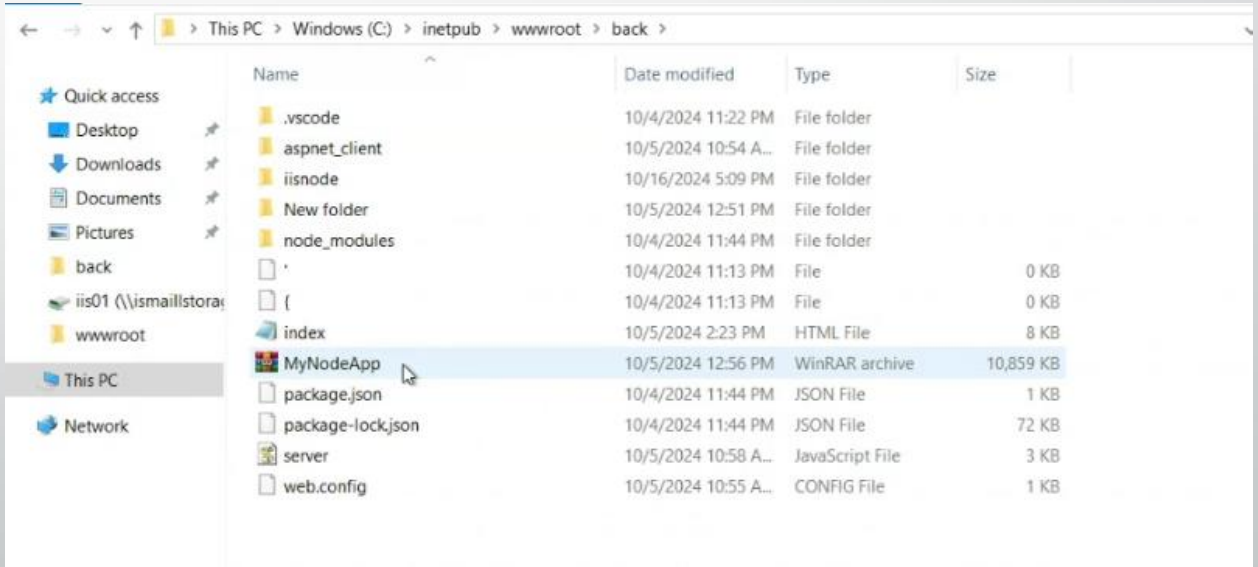
- On **IIS01 server,** we created two sites one for web and one for DB.
- the document root for the web site shown below.

- the backend server the one that has node.js app





Name	Date modified	Type	Size
aspnet_client	10/5/2024 11:06 A...	File folder	
iisstart	10/4/2024 11:33 PM	HTML Document	7 KB
iisstart	10/3/2024 3:36 PM	PNG File	98 KB



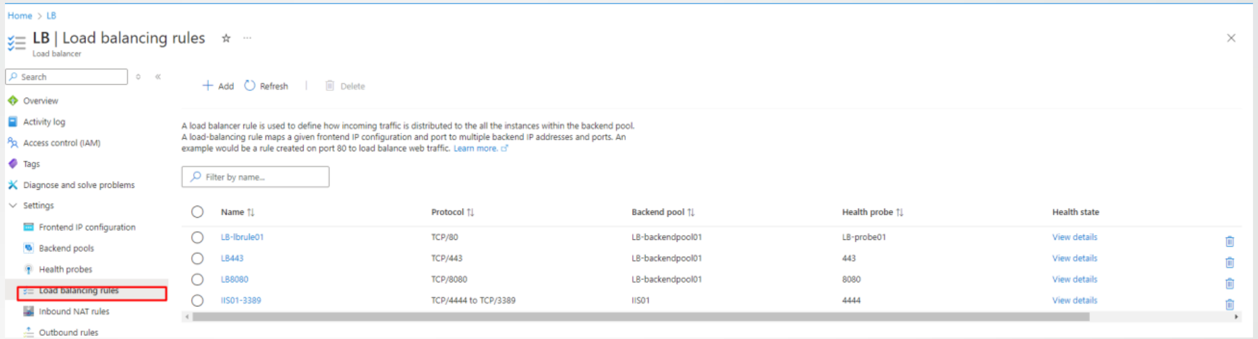
Name	Date modified	Type	Size
.vscode	10/4/2024 11:22 PM	File folder	
aspnet_client	10/5/2024 10:54 A...	File folder	
iisnode	10/16/2024 5:09 PM	File folder	
New folder	10/5/2024 12:51 PM	File folder	
node_modules	10/4/2024 11:44 PM	File folder	
'	10/4/2024 11:13 PM	File	0 KB
{	10/4/2024 11:13 PM	File	0 KB
index	10/5/2024 2:23 PM	HTML File	8 KB
MyNodeApp	10/5/2024 12:56 PM	WinRAR archive	10,859 KB
package.json	10/4/2024 11:44 PM	JSON File	1 KB
package-lock.json	10/4/2024 11:44 PM	JSON File	72 KB
server	10/5/2024 10:58 A...	JavaScript File	3 KB
web.config	10/5/2024 10:55 A...	CONFIG File	1 KB

- We crated Load balancer

- Front-end IP configured

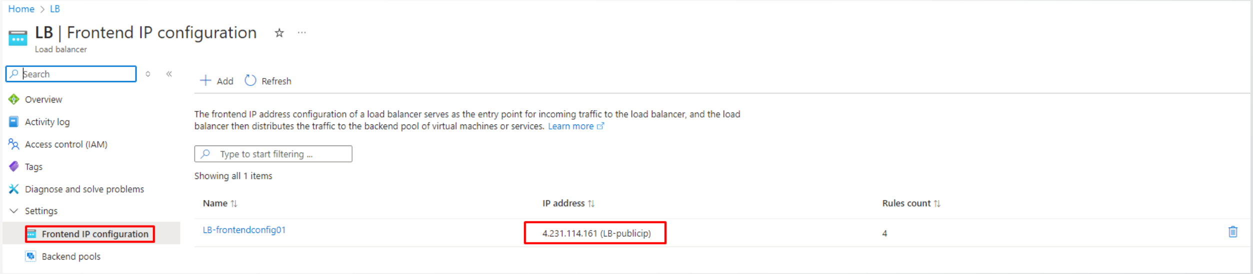
- Back-end pool configured

- We added some health check probes



A load balancer rule is used to define how incoming traffic is distributed to the all the instances within the backend pool. A load-balancing rule maps a given frontend IP configuration and port to multiple backend IP addresses and ports. An example would be a rule created on port 80 to load balance web traffic. Learn more.

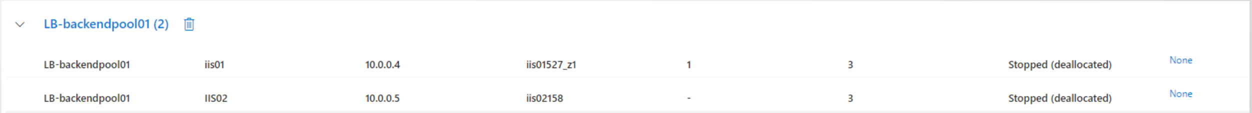
Name	Protocol	Backend pool	Health probe	Health state
LB-lbrule01	TCP/80	LB-backendpool01	LB-probe01	View details
LB443	TCP/443	LB-backendpool01	443	View details
LB8080	TCP/8080	LB-backendpool01	8080	View details
IIS01-3389	TCP/4444 to TCP/3389	IIS01	4444	View details


Home > LB
LB | Frontend IP configuration
Load balancer
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Frontend IP configuration
Backend pools
Add
Refresh
Type to start filtering ...

The frontend IP address configuration of a load balancer serves as the entry point for incoming traffic to the load balancer, and the load balancer then distributes the traffic to the backend pool of virtual machines or services. Learn more

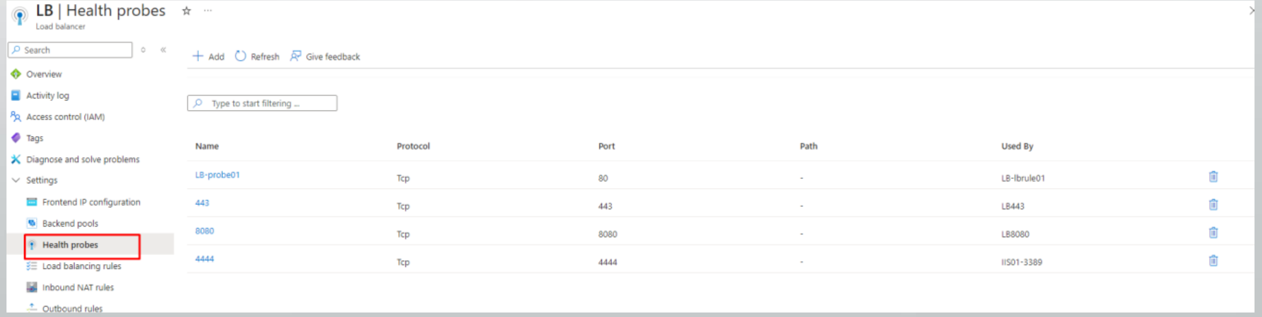
Showing all 1 items

Name	IP address	Rules count
LB-frontendconfig01	4.231.114.161 (LB-publicip)	4



LB-backendpool01 (2)

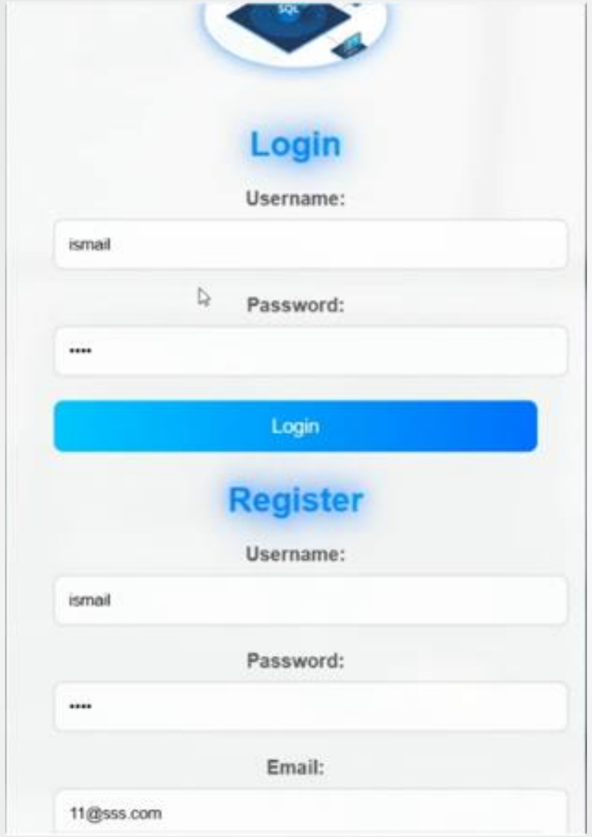
LB-backendpool01	iis01	10.0.0.4	iis01527_z1	1	3	Stopped (deallocated)	None
LB-backendpool01	IIS02	10.0.0.5	iis02158	-	3	Stopped (deallocated)	None



Name	Protocol	Port	Path	Used By
LB-probe01	Tcp	80	-	LB-lbrule01
443	Tcp	443	-	LB443
8080	Tcp	8080	-	LB8080
4444	Tcp	4444	-	IIS01-3389

- Using the DNS record from cloud flare ,Users can login to the following domain to access the webapp https://depi.bytedrivetech.xyz:8080

and once login shows below:



Login

Username: ismail

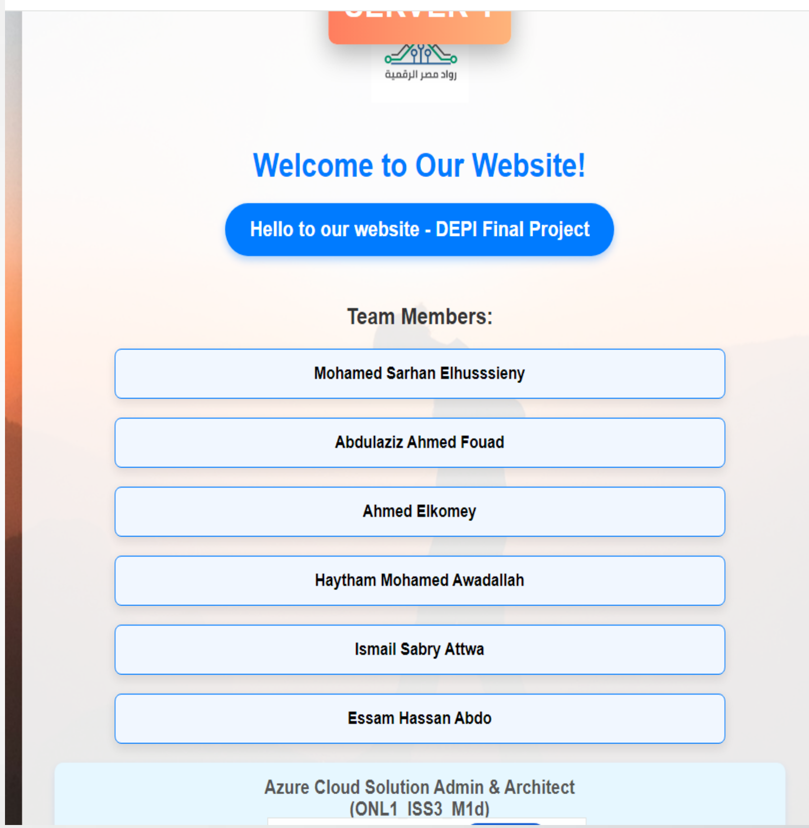
Password: ••••

Register

Username: ismail

Password: ••••

Email: 11@sss.com



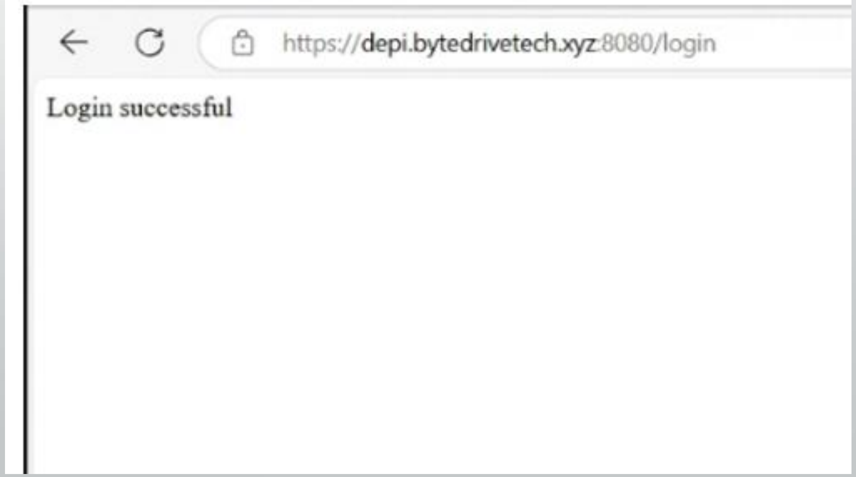
Welcome to Our Website!

Hello to our website - DEPI Final Project

Team Members:

- Mohamed Sarhan Elhusssieny
- Abdulaziz Ahmed Fouad
- Ahmed Elkomey
- Haytham Mohamed Awadallah
- Ismail Sabry Attwa
- Essam Hassan Abdo

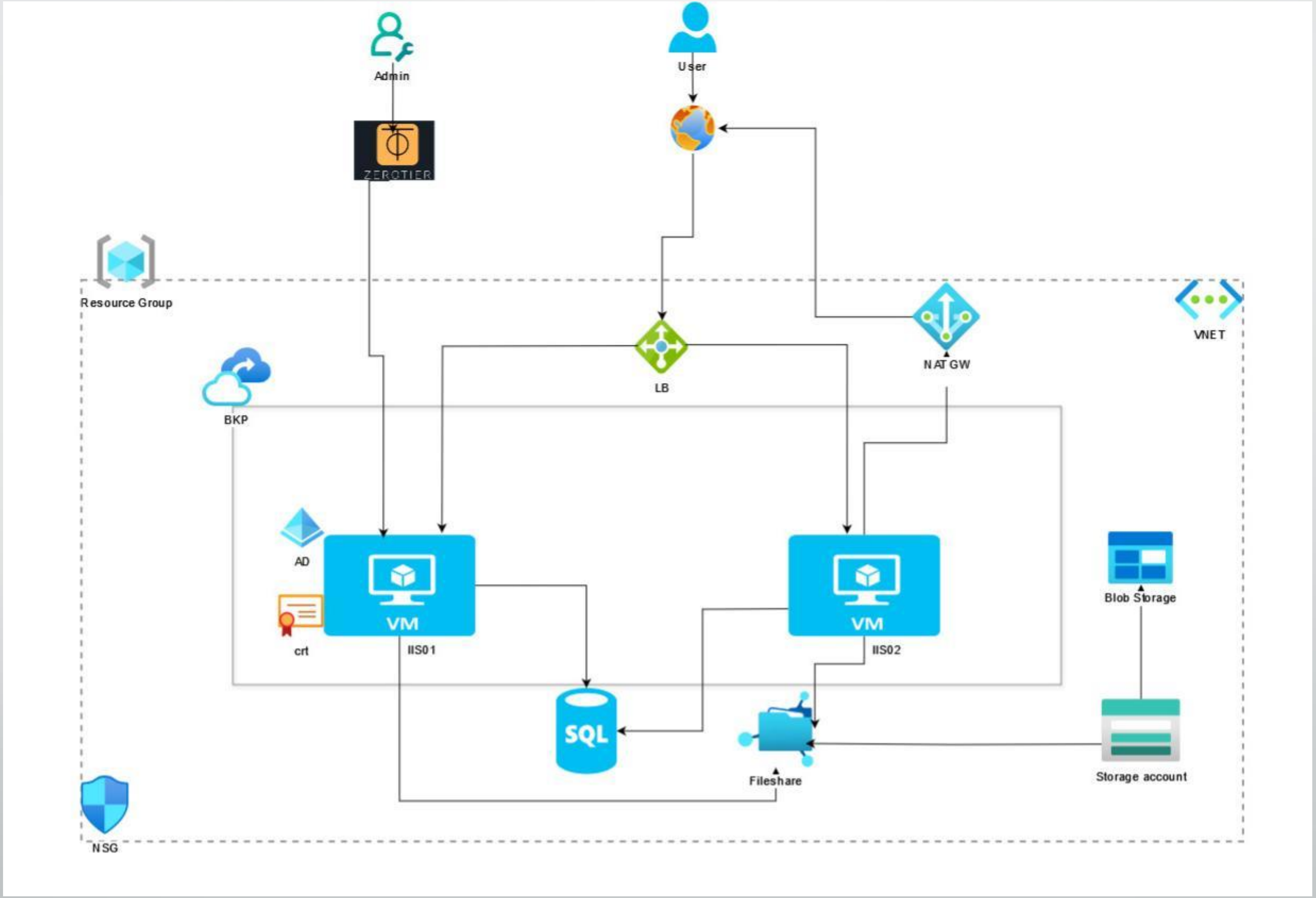
Azure Cloud Solution Admin & Architect (ONL1_ISS3_M1d)



https://depi.bytedrivetech.xyz:8080/login

Login successful

The Full Diagram of the project



Thank You