

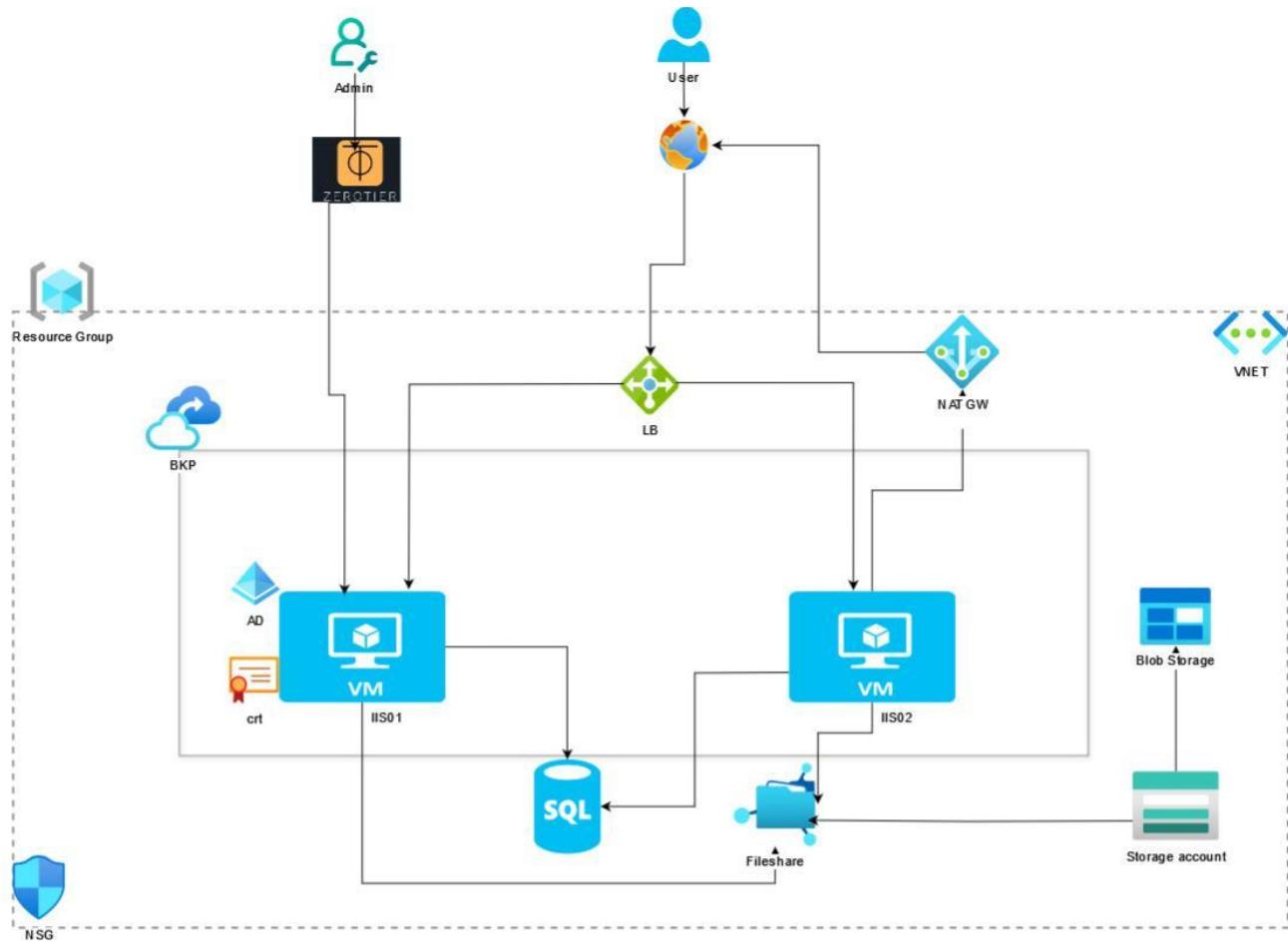
# AZURE CLOUD INFRASTRUCTURE DEPLOYMENT AND MANAGEMENT PROJECT

## Team Members:

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## The Full Diagram of the project



## Week 1: Azure Fundamentals & Setup:

**Task:** Define cloud computing, cloud models, and benefits. Set up an Azure subscription and create a Resource Group.

What is cloud computing?

The Azure cloud platform has more than 200 products and cloud services designed to help you bring new solutions to life—to solve today's challenges and create the future. Build,

run, and manage applications across multiple clouds, on-premises, and at the edge, with the tools and frameworks of your choice.

## Cloud models:

- IaaS

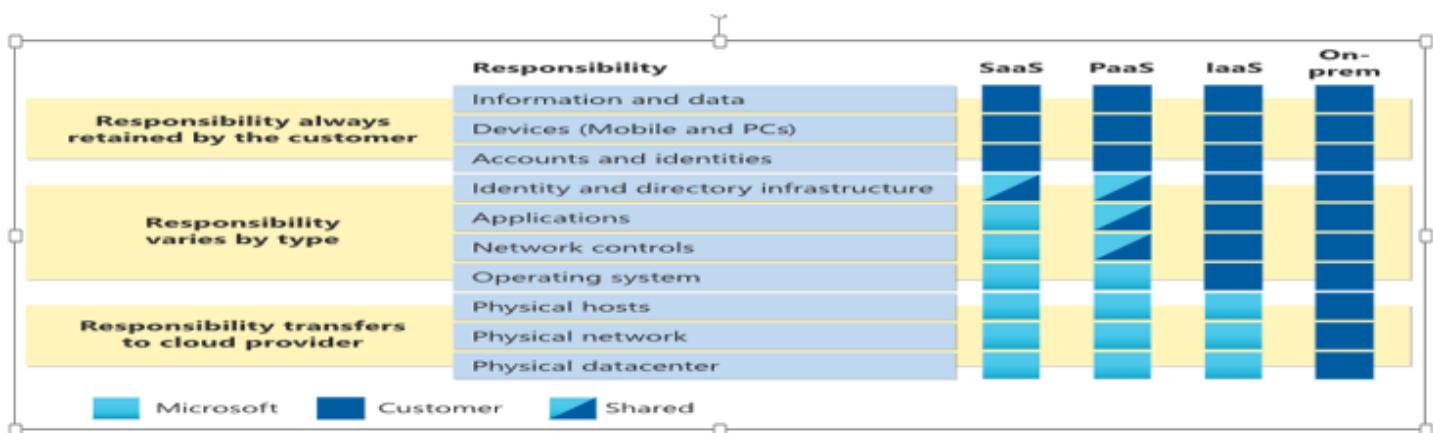
The most basic category of cloud computing services. With infrastructure as a service (IaaS), you rent IT infrastructure—servers and virtual machines (VMs), storage, networks, operating systems—from a cloud provider on a pay-as-you-go basis.

- PaaS

Platform as a service (PaaS) refers to cloud computing services that supply an on-demand environment for developing, testing, delivering, and managing software applications. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network, and databases needed for development.

- SaaS

Software as a service (SaaS) is a method for delivering software applications over the internet, on demand and typically on a subscription basis. With SaaS, cloud providers host and manage the software application and underlying infrastructure, and handle any maintenance, like software upgrades and security patching. Users connect to the application over the internet, usually with a web browser on their phone, tablet, or PC.





## Benefits of cloud computing:

Cloud computing is a big shift from the traditional way businesses think about IT resources. Here are seven common reasons organizations are turning to cloud computing services:

- **Cost:** Cloud computing reduces capital expenses by eliminating the need for onsite hardware and infrastructure.
- **Speed:** Cloud services are available on demand, allowing rapid provisioning of resources in minutes.
- **Global scale:** Cloud enables elastic scaling, providing the right IT resources when and where needed.
- **Productivity:** Cloud computing reduces the need for hardware setup and maintenance, freeing IT teams for more strategic work.
- **Performance:** Cloud services offer high-performance

### Create Resource Group

 ONL1\_ISS3\_M1d\_Subscription\_02 ⚡  
Resource group

We created a resource group with the below services:

- Network Services:

- VNET
- Load Balancer
- NAT Gateway
- NSG
- Reserved Public IP



- Compute Services:

- Virtual machine

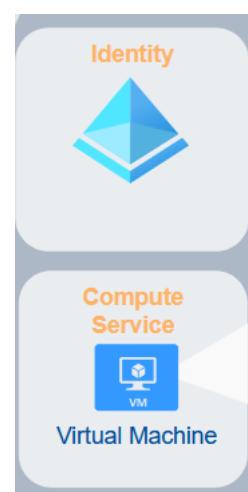
- Storage Services:

- Storage Account
- SQL DB
- File Share
- BLOB



- Identity Services:

- Active directory





## Week 2: Deploy and Manage Azure Resources

### 2.1 Azure AD setup

#### • create Virtual network

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 >

**Zone-Web-Vnet** Virtual network

Search Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Address space Connected devices Subnets Bastion DDoS protection Firewall Microsoft Defender for Cloud Network manager

Move Delete Refresh Give feedback

Essentials

Resource group (move)	: ONL1_ISS3_M1d_Subscription_02	Address space	: 10.0.0.0/16
Location (move)	: West Europe	DNS servers	: Azure provided DNS service
Subscription (move)	: Azure for Students	Flow timeout	: Configure
Subscription ID	: 7f239a63-1e6a-4716-aeb4-013c7d22f11b	BGP community string	: Configure
		Virtual network ID	: 3813b757-5c8e-43b7-9a06-733d215d7bce

Tags (edit) : Add tags Capabilities (5) Recommendations Tutorials

DDoS protection Azure Firewall Peering Microsoft Defender for Cloud Private endpoints

Configure additional protection from distributed denial of service attacks. Protect your network with a stateful L3-L7 firewall. Seamlessly connect two or more virtual networks. Strengthen the security posture of your environment. Privately access Azure services without sending traffic across internet.

Not configured Not configured Not configured Not configured

#### • Create subnet

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > Zone-Web-Vnet

**Zone-Web-Vnet | Subnets** Virtual network

Search Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Address space Connected devices Subnets Bastion

Subnet Refresh Manage users Delete

Create subnets to segment the virtual network address space into smaller ranges for use by your applications. When you deploy resources into a subnet, Azure assigns the resource an IP address from the subnet.

Name	IPAM Pool	IPv4	IPv6	Available IPs	Delegated to	Security gro...	Route table
default	-	10.0.0.0/24	-	249	-	-	-

#### • create first VM (iis01)

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 >

**iis01** Virtual machine

Search Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Connect Networking Settings Availability + scale Security Backup + disaster recovery Backup Disaster recovery Restore point

Essentials

Resource group (move)	: ONL1_ISS3_M1D_SUBSCRIPTION_02	Operating system	: Windows (Windows Server 2019 Datacenter)
Status	: Running	Size	: Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Location	: West Europe	Public IP address	: -
Subscription (move)	: Azure for Students	Virtual network/subnet	: Zone-Web-Vnet/default
Subscription ID	: 7f239a63-1e6a-4716-aeb4-013c7d22f11b	DNS name	: -
		Health state	: -
		Time created	: 10/21/2024, 2:13 PM UTC

Tags (edit) : Add tags Properties Monitoring Capabilities (8) Recommendations Tutorials

**Virtual machine**

Computer name	iis01
Operating system	Windows (Windows Server 2019 Datacenter)

**Networking**

Public IP address	-
Public IP address (IPv6)	-



## • create first VM (iis02)

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 >

IIS02 Virtual machine

Search Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Networking

Settings

Availability + scale

Security

Backup + disaster recovery

Essentials

Resource group (move) : ONL1\_ISS3\_M1d\_Subscription\_02

Status : Running

Location : West Europe

Subscription (move) : Azure for Students

Subscription ID : 7f239a63-1e6a-4716-aeb4-013c7d22f11b

Operating system : Windows (Windows Server 2022 Datacenter Azure Edition)

Size : Standard D51 v2 (1 vcpu, 3.5 GiB memory)

Public IP address : 40.68.139.182

Virtual network/subnet : Zone-Web-Vnet/default

DNS name : Not configured

Health state : -

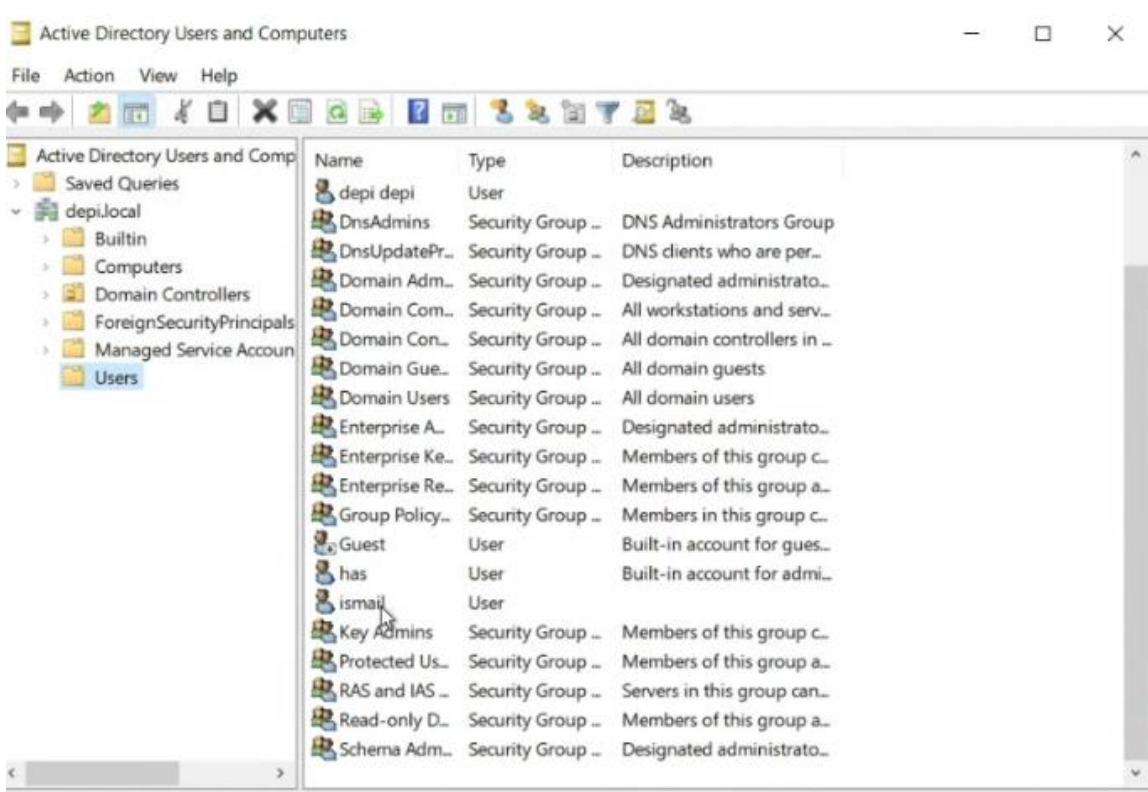
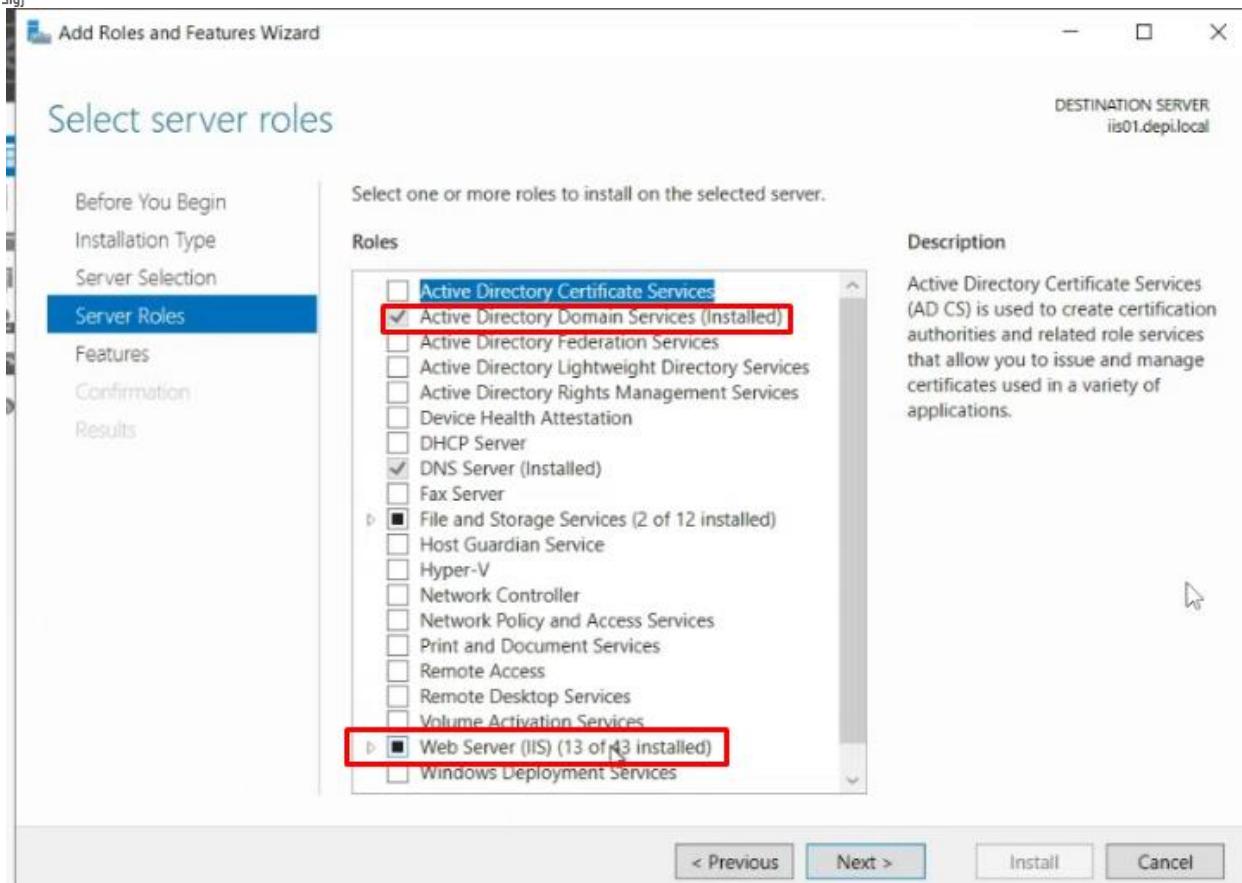
Time created : 10/21/2024, 2:49 PM UTC

Tags (edit) : Add tags

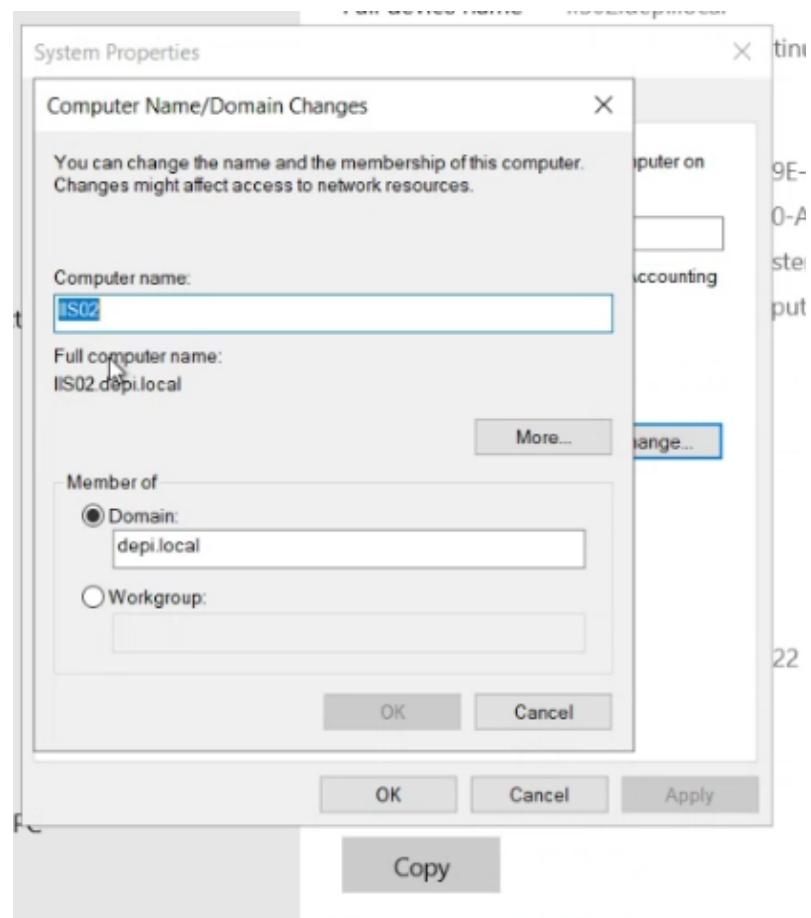
Properties Monitoring Capabilities (0) Recommendations Tutorials

## • Install AD and IIS

- Within Resource group named we manage to deploy 2 virtual machines (VMs) at the same VNET
- Both using windows server 2022 OS 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,)



Here we joined the 2nd machine to the domain



- **Install NAT GW and create NSG**

- to save number or public IPs we created NAT gateway which allow the internet for IIS01 and IIS02.
- 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.



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Home > NAT gateways

Egypt University of Informatics (EUI.edu.eg)

+ Create Manage view Refresh Export to CSV Open query Assign tags

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

Showing 1 to 1 of 1 records.

Name ↑	Resource group ↑↓	Location ↑↓	Subscription ↑↓	Type ↑↓
<input type="checkbox"/> Natting	ONL1_ISS3_M1d	West Europe	Azure for Students	NAT gateway

Home > ONL1\_ISS3\_M1d > Natting

Natting | Outbound IP

NAT gateway

Search Edit Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Outbound IP Subnets Configuration Properties Locks Monitoring Automation Help

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

Public IP addresses

Name ↓	IP address ↑↓	DNS name ↑↓	Remove
iis01-ip	4.231.114.200		X

Public IP prefixes

Name ↓	IP prefix ↑↓	Remove

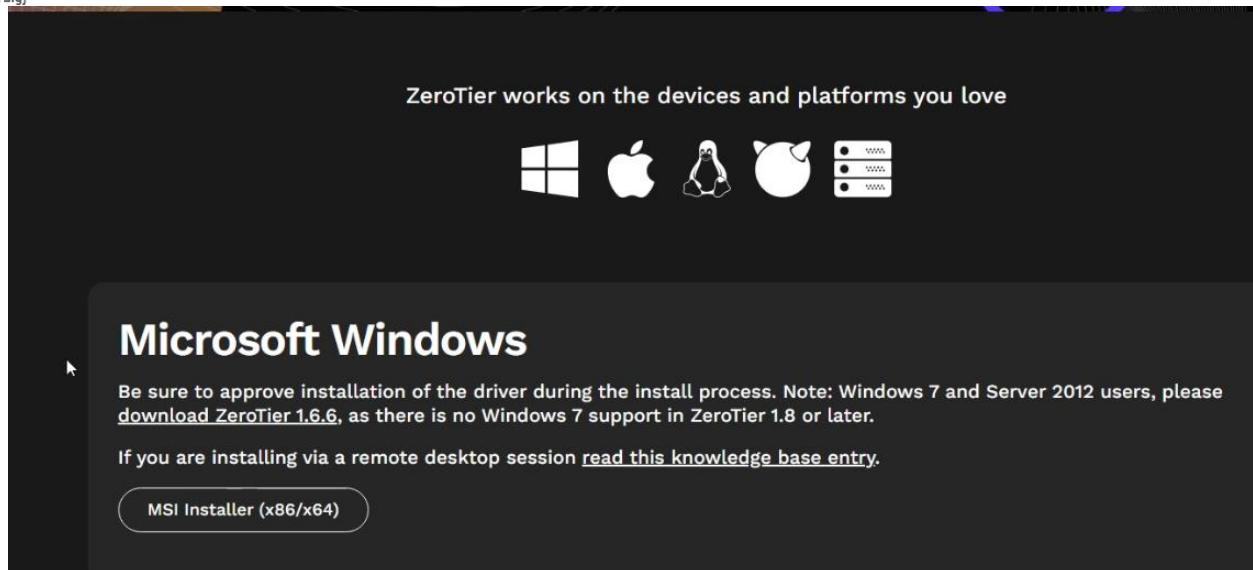
Here is the NSG named **iis01-nsg**



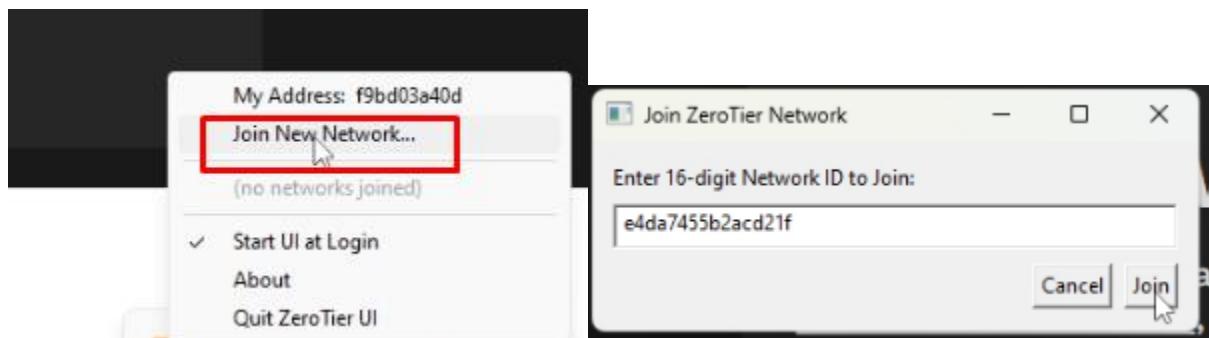
Priority ↑	Name ↑	Port ↑↓	Protocol ↑↓	Source ↑↓	Destination ↑↓	Action ↑↓
300	RDP	3389	TCP	Any	Any	Allow
320	HTTP	80	TCP	Any	Any	Allow
330	AllowAnyCustom443Inbo...	443	Any	Any	Any	Allow
340	AllowAnyCustom8080Inbo...	8080	Any	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerIn...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

## • Manage the VMs with( ZeroTier )

- 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**
- ZeroTier is a peer-to-peer virtual networking platform that functions like a VPN, enabling secure communication between devices across the internet. It offers end-to-end encryption, low-latency mesh networking, and cross-platform support (Windows, macOS, Linux, iOS, Android). ZeroTier is ideal for creating virtual LANs over the internet, enabling remote access, IoT networking, and private cloud connections. Unlike traditional VPNs, it eliminates the need for central servers by establishing direct peer-to-peer connections.
- After installation, open the app then join with the ID.
- The admin should allow which IP should connect to VM01 and VM02



open the app then, join with the ID





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https://my.zerotier.com/network/e4da7455b2acd21f

ZEROTIER

Network ID: e4da7455b2acd21f

Included Devices: 3 / 10  
Upgrade to Essential for more devices and unlimited networks/admins/sso

Members

Refresh	Search all columns...	AUTHORIZATION	ACTIVITY	Reset Filters			
	All	All	All				
<input type="checkbox"/>	<input checked="" type="radio"/>	Authorized (3)	<input type="radio"/>	Inactive (0)			
<input type="checkbox"/>	<input type="radio"/>	Not authorized (0)	<input type="radio"/>	Active (3)			
				Private IP for VM01			
Edit	Auth	Address	Name/Desc	Managed IPs	Last Seen	Version	Physical IP
<input type="checkbox"/>	<input checked="" type="checkbox"/>	A40544DF6F 1e:76:a9:f6:8a:1b	IIS01	<b>10.147.20.10</b>	1 minute	1.14.1	<b>4.231.114.200</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	A78294C4B5 1e:75:2e:26:91:c1	Ismail-Work	<b>10.147.20.46</b>	1 minute	1.14.1	156.198.221.77
<input type="checkbox"/>	<input checked="" type="checkbox"/>	BA24098155 1e:68:88:bb:d4:21	IIS02	<b>10.147.20.8</b>	1 minute	1.14.1	<b>4.231.114.200</b>

Private IP for VM02

Public IP for NAT Gateway

The admin should allow which IP should connect to VM01 and VM02

f9bd03a40d

Not Authorized

Authorized

Name  
Haytham

Description

IP Assignments  
Add IP

► Advanced

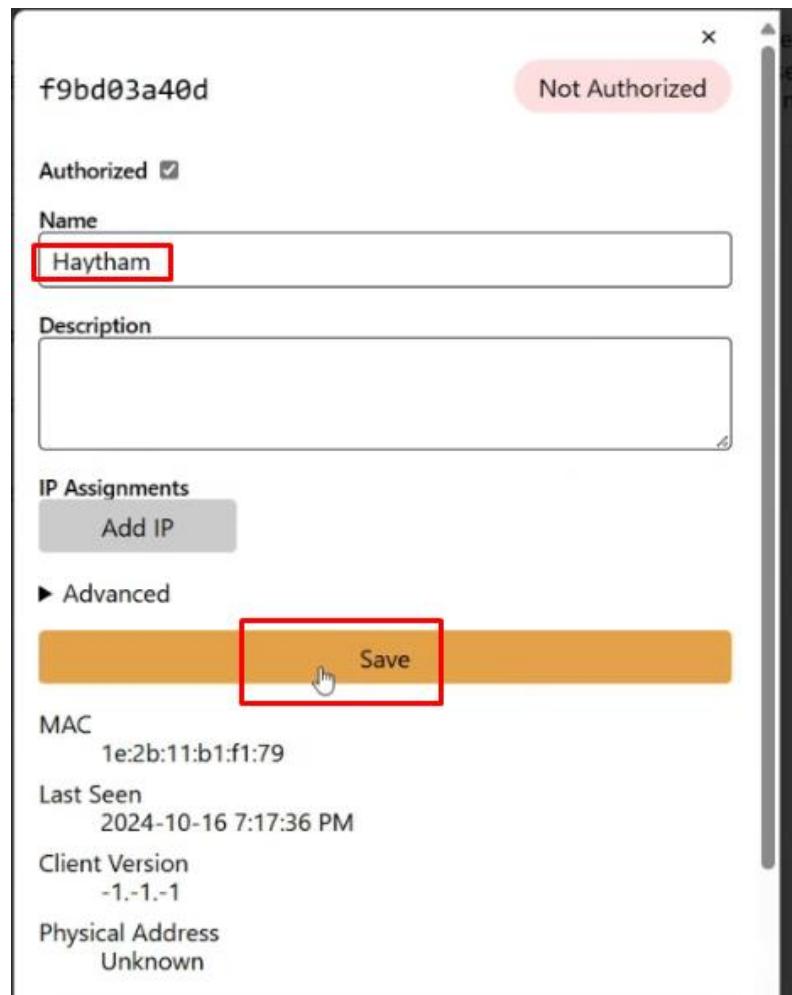
Save

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

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

Client Version  
-1.-1.-1

Physical Address  
Unknown



now I am authorized to connect to our VMs



depi

Network ID:

e4da7455b2acd21f

4 total members

4 filtered members

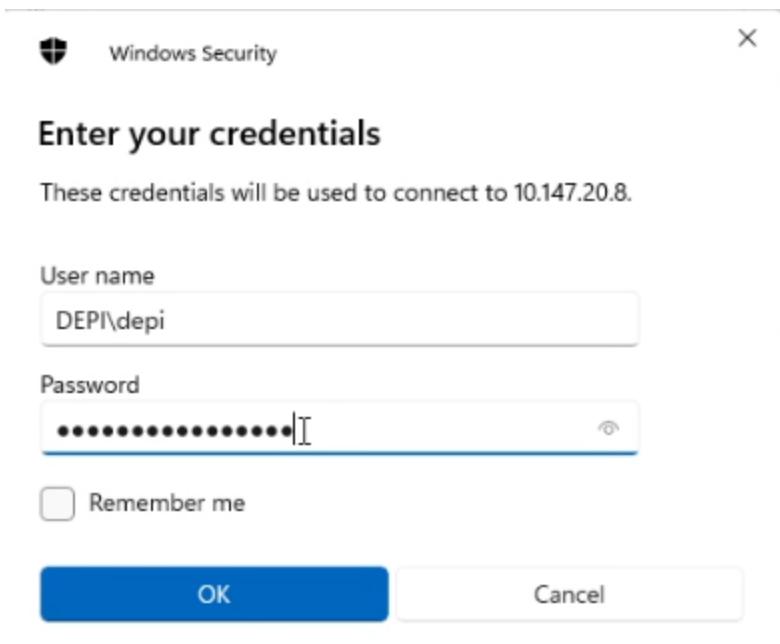
Authorized  (4) Inactive  (0)

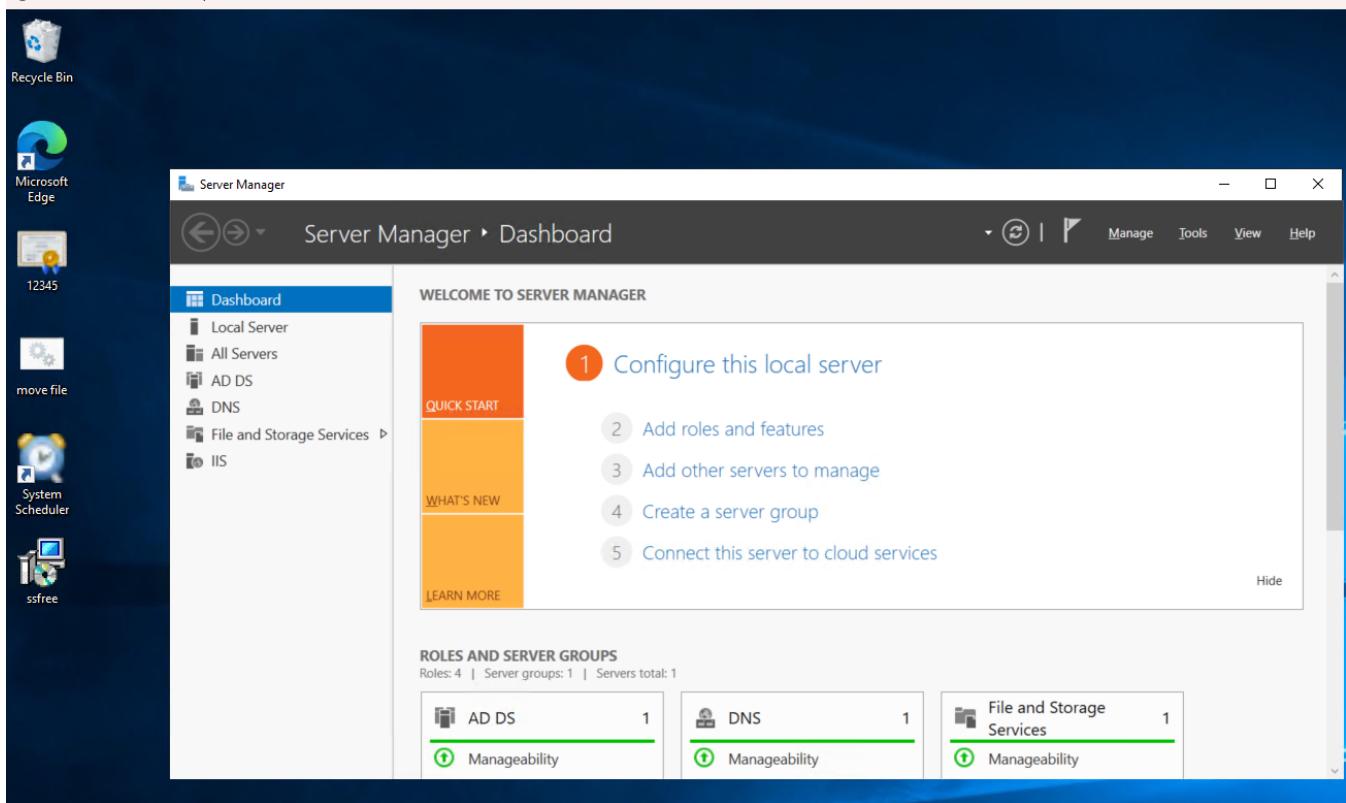
Not authorized  (0) Active  (4)

Refresh

<input type="checkbox"/>	Edit	Auth	Address	Name/Desc	Managed IPs	Last Seen	Version	Physical IP
<input type="checkbox"/>		<input checked="" type="checkbox"/>	A40544DF6F 1e:76:a9:f6:8a:1b	IIS01	10.147.20.10	1 minute	1.14.1	4.231.114.200
<input type="checkbox"/>		<input checked="" type="checkbox"/>	A78294C4B5 1e:75:2e:26:91:c1	Ismail-Work	10.147.20.46	1 minute	1.14.1	156.198.221.77
<input type="checkbox"/>		<input checked="" type="checkbox"/>	BA24098155 1e:68:88:bb:d4:21	IIS02	10.147.20.8	1 minute	1.14.1	4.231.114.200
<input type="checkbox"/>		<input checked="" type="checkbox"/>	F98D03A40D 1e:2b:c1:11:b1:f1:79	Haytham	10.147.20.70	1 minute	1.14.1	

Then I can connect to the VMs





## Week 3: Implement 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.



## storageaccount2027

Storage account

The screenshot shows the Azure Storage account overview for 'storageaccount2027'. The left sidebar includes links for Overview, Activity log, Tags, Diagnose and solve problems, Access Control (IAM), Data migration, Events, Storage browser, Storage Mover, and Partner solutions. Under 'Data storage', the 'Containers' link is selected and highlighted with a red box. The main content area displays the following details:

Essentials		Properties		Blob service		Security		Networking			
Resource group (move)	: ONL1_ISS3_M1d_Subscription_02	Performance	: Standard	Hierarchical namespace	Disabled	Require secure transfer for REST API operations	Enabled	Container soft delete	Enabled (7 days)	Storage account key access	Enabled
Location	: westeurope	Replication	: Locally-redundant storage (LRS)	Default access tier	Hot	Minimum TLS version	Version 1.2	Container soft delete	Enabled (7 days)	Infrastructure encryption	Disabled
Subscription (move)	: Azure for Students	Account kind	: StorageV2 (general purpose v2)	Blob anonymous access	Disabled						
Subscription ID	: 7f239a63-1e6a-4716-aeb4-013c7d22f11b	Provisioning state	: Succeeded	Blob soft delete	Enabled (7 days)						
Disk state	: Available	Created	: 10/21/2024, 6:26:18 PM	Container soft delete	Enabled (7 days)						
Tags (edit)	: Add tags	Versioning	Disabled	Container soft delete	Enabled (7 days)						

## ● create blob storage

## storageaccount2027 | Containers

Storage account

The screenshot shows the 'Containers' page for 'storageaccount2027'. The left sidebar includes links for Overview, Activity log, Tags, Diagnose and solve problems, Access Control (IAM), Data migration, Events, Storage browser, Storage Mover, and Partner solutions. Under 'Data storage', the 'Containers' link is selected and highlighted with a red box. The main content area displays a table of existing containers:

Name	Last modified	Anonymous access level	Lease state
slogs	10/21/2024, 6:26:40 PM	Private	Available
projectcontainer	10/22/2024, 9:38:52 PM	Private	Available



## • Upload file inside blob container with SAS

SAS ( )

Azure Blob Storage

1. :  
Blob Storage    Azure  
Blob ( ).  
2. SAS ( ):  
(SAS)    Azure ( Blob ).

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > storageaccount2027 | Containers >  
projectcontainer Container

Search    Upload    Change access level    Refresh    Delete    Change tier    Acquire lease    Break lease    View snapshots    Create snapshot    Give feedback

Overview    Diagnose and solve problems    Access Control (IAM)    Settings

Add filter

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
DEPI.png	10/22/2024, 9:39:14 PM	Hot (Inferred)		Block blob	254.2 KB	

DEPI.png ...

Save    Discard    Download    Refresh    Delete

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

Diagnose and solve problems    Show deleted blobs

Add filter

Name: DEPI.png

Start and expiry date/time:

Start: 10/22/2024    End: 9:39:42 PM  
(UTC +02:00) Cairo

Expiry: 10/31/2024    End: 5:39:42 AM  
(UTC +02:00) Cairo

Allowed IP addresses: for example, 168.1.5.65 or 168.1.5.65-168.1...

Allowed protocols: HTTPS only    HTTPS and HTTP

Generate SAS token and URL

Activate Windows

Go to Settings to activate Windows.

Blob SAS token: sp=r&t=2024-10-22T18:39:42Z&se=2024-10-31T02:39:42Z&spr=https&sv=2022-11-02&sr=b&sig=QMqJFKNstb15VczaZ4akDxipTnFjp4Rkb%2BdyfO%2BfdEU%3D

Blob SAS URL: https://storageaccount2027.blob.core.windows.net/projectcontainer/DEPI.png?sp=r&t=2024-10-22T18:39:42Z&se=2024-10-31T02:39:42Z&spr=https&sv=2022-11-02&sr=b&sig=QMqJFKNstb15VczaZ4akDxipTnFjp4Rkb%2BdyfO%2BfdEU%3D

Link:

<https://storageaccount2027.blob.core.windows.net/projectcontainer/DEPI.png?sp=r&t=2024-10-22T18:39:42Z&se=2024-10-31T02:39:42Z&spr=https&sv=2022-11-02&sr=b&sig=QMqJFKNstb15VczaZ4akDxipTnFjp4Rkb%2BdyfO%2BfdEU%3D>



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storageaccount2027.blob.core.windows.net/projectcontainer/DEPI.png?sp=r&st=2024-10-22T18:39:42Z&se=2024-10-31T02:39:42Z&spr=https&sv=2022-11-02&sr=b&sig=QMqJFKNstb15VczaZ4akDxlpTnFjp4Rkb%2BdyfO%2BfdEU%3D



- **Creating NW fileshare**

- Using the same storage account a File share created and mapped to both VM's
- Text file created and accessed by VM's

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > storageaccount2027

storageaccount2027 | File shares ⚡ ...

Storage account

Search + File share Refresh Give feedback

File share settings

Identity-based access: Not configured Default share-level permissions: Disabled Soft delete: 7 days Maximum capacity: 100 TiB Security: Maximum compatibility

Search file shares by prefix (case-sensitive)

Show deleted shares

Name	Modified	Access tier	Quota
+ share	10/21/2024, 8:59:22 PM	Cool	100 TiB

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage browser

Storage Mover

Partner solutions

Data storage

Containers

File shares

Queues

Tables



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The screenshot shows the Windows File Explorer interface. On the left, there's a sidebar with 'This PC' selected. The main area displays several sections: 'Folders (7)' containing Desktop, Documents, Downloads, Pictures, Videos, 3D Objects, Music, and Pictures; 'Devices and drives (2)' showing Windows (C:) with 106 GB free of 126 GB and Temporary Storage (D:) with 6.08 GB free of 6.99 GB; and 'Network locations (1)' which lists a share named 'share' located at '\\storageaccount2027.file.core.w...'. This last item is highlighted with a red box.

- **Creating Backup for VM01 and VM02**

The screenshot shows the Azure Backup blade for the 'iis01' virtual machine. The top navigation bar includes 'Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > iis01'. The main content area has a 'Backup now' button highlighted with a red box. Below it, there's an 'Essentials' section with details like Recovery services vault: defaultVault758, Subscription: Azure for Students, Subscription ID: 7f239a63-1e6a-4716-aeb4-013c7d22f11b, and Alerts (in last 24 hours): View alerts. To the right, there are status indicators for Backup Pre-Check (Passed), Last backup status (Warning (initial backup pending)), Backup policy (DailyPolicy-m2j3g3sa (Standard)), Oldest restore point (-), and Included disk(s) (All disks). The 'Backup' section in the sidebar is also highlighted with a red box.



رواد مصر الرقمية

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > IIS02

IIS02 | Backup ⋆ ⋮

Virtual machine

Search

Backup now

Restore VM File Recovery Stop backup Resume backup Delete backup data Restore to Secondary Region Undelete Feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Networking

Settings

Availability + scale

Security

Backup + disaster recovery

Backup

Disaster recovery

Restore point

Operations

Monitoring

Automation

Help

Backup now

Try our new Business Continuity Center for at scale BCDR management of your resources protected across Azure Backup and Site Recovery.

Essentials

Recovery services vault : defaultVault758

Last backup status : Passed

Subscription (move) : Azure for Students

Backup policy : DailyPolicy-m2j3g3sa (Standard)

Subscription ID : 7f239a63-1e6a-4716-aeb4-013c7d22f11b

Oldest restore point : -

Alerts (in last 24 hours) : [View alerts](#)

Included disk(s) : [All disks](#)

Jobs (in last 24 hours) : [View jobs](#)

Recovery points

This list is filtered for last 30 days of recovery points. To recover from recovery point older than 30 days, as well as vault-archive, [click here](#).

Long term recovery points can be moved to vault-archive. To move all 'recommended recovery points' to vault-archive tier, [click here](#).

CRASH CONSISTENT	APPLICATION CONSISTENT	FILE-SYSTEM CONSISTENT	Creation time ↑	Consistency	Recovery type
0	0	0			

No restore points available.

- Creating DB on Azure

- We created DB server and DB instance.
  - We created a table named Users to store **users**' info after registration.

Welcome to SQL Database Query Editor

SQL server authentication

Login  
has

Password  
\*\*\*\*\*

OR

Logging in as has...

OK



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Home > DB (dbserver2024/DB) | Query editor (preview) ☆ ...

SQL database

Search Login New Query Open query Feedback Getting started

Overview Activity log Tags Diagnose and solve problems **Query editor (preview)** Mirror database in Fabric (preview)

Settings Data management Integrations Power Platform Security Intelligent performance Monitoring Automation Help

DB (has)

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

Tables > dbo.Employee ... > dbo.syndicograms > **dbo.Users** ... Views Stored Procedures

Query 1 × Query 2 ×

Run Cancel query Save query Export data as Show only Editor Open Copilot

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

Results Messages

Search to filter items...

UserID	Username	PasswordHash	Email	CreatedAt
1	ismail	\$2a\$10\$AMc/ySO1je3jufr...	assa@ads.com	2024-10-04T21:05:52.7400
3	ggod	\$2a\$10\$AMc/ySO1je3jufr...	sssss@has.com	2024-10-05T07:38:46.6630
4	has	\$2a\$10\$AMc/ySO1je3jufr...	qeqww@grr.com	2024-10-05T07:45:26.5000
5	mohamed	\$2a\$10\$n6v8zplGRCEzMfB...	dada@sfs.dsfs	2024-10-05T08:19:48.6000

Query succeeded | 0s

The screenshot shows the Azure Database Query Editor interface. On the left, there's a sidebar with navigation links like Home, Overview, Activity log, Tags, etc., and a 'Query editor (preview)' section highlighted with a red box. The main area has two tabs: 'Query 1' and 'Query 2', with 'Query 2' selected. A red box highlights the query text: '1 SELECT TOP (1000) \* FROM [dbo].[Users]'. Below the query, the results tab is active, displaying a table with five rows of user data. The table columns are UserID, Username, PasswordHash, Email, and CreatedAt. The first row is for 'ismail' with the timestamp '2024-10-04T21:05:52.7400'. The second row is for 'ggod' with 'sssss@has.com' and timestamp '2024-10-05T07:38:46.6630'. The third row is for 'has' with 'qeqww@grr.com' and timestamp '2024-10-05T07:45:26.5000'. The fourth row is for 'mohamed' with 'dada@sfs.dsfs' and timestamp '2024-10-05T08:19:48.6000'. At the bottom, a message says 'Query succeeded | 0s'.



## DB (dbserver2024/DB) | Query editor (preview)

SQL database

 ◇ <<

- [Overview](#)
- [Activity log](#)
- [Tags](#)
- [Diagnose and solve problems](#)
- [Query editor \(preview\)](#)
- [Mirror database in Fabric \(preview\)](#)
- [Settings](#)
- [Data management](#)
  - [Replicas](#)
  - [Sync to other databases](#)
- [Integrations](#)
  - [Azure Synapse Link](#)
  - [Stream analytics \(preview\)](#)
  - [Add Azure AI Search](#)

SQL server authentication

Login \*

Password \*

 ✓

✖ This database has reached the monthly free amount allowance for the month of October 2024 and is paused for the remainder of the month. The free amount will renew at 12:00 AM (UTC) on November 01, 2024. To regain access immediately, open the Compute and Storage tab from the database menu on the Azure Portal and select the "Continue using database with additional charges" option. This will resume the database and bill you for additional usage charges the rest of this month. For more details, see <https://go.microsoft.com/fwlink/?linkid=2243105&clcid=0x409>.

### • Creating DB on On Prem

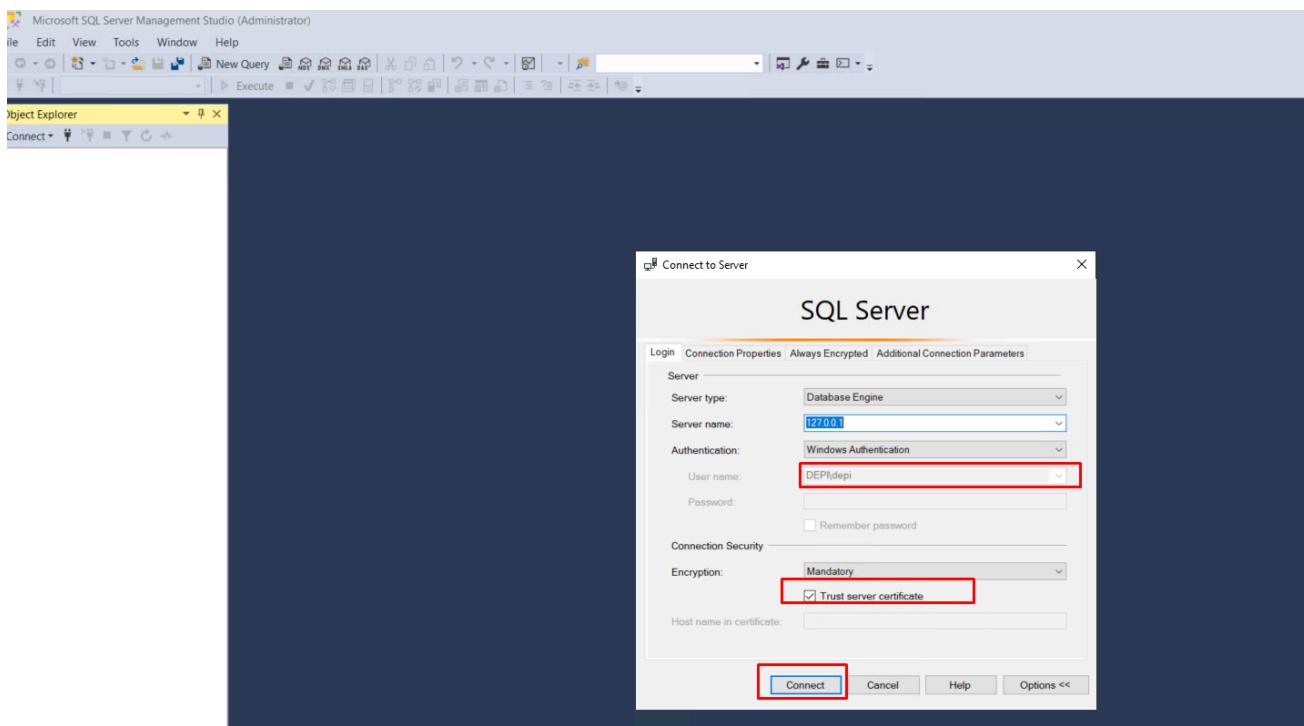
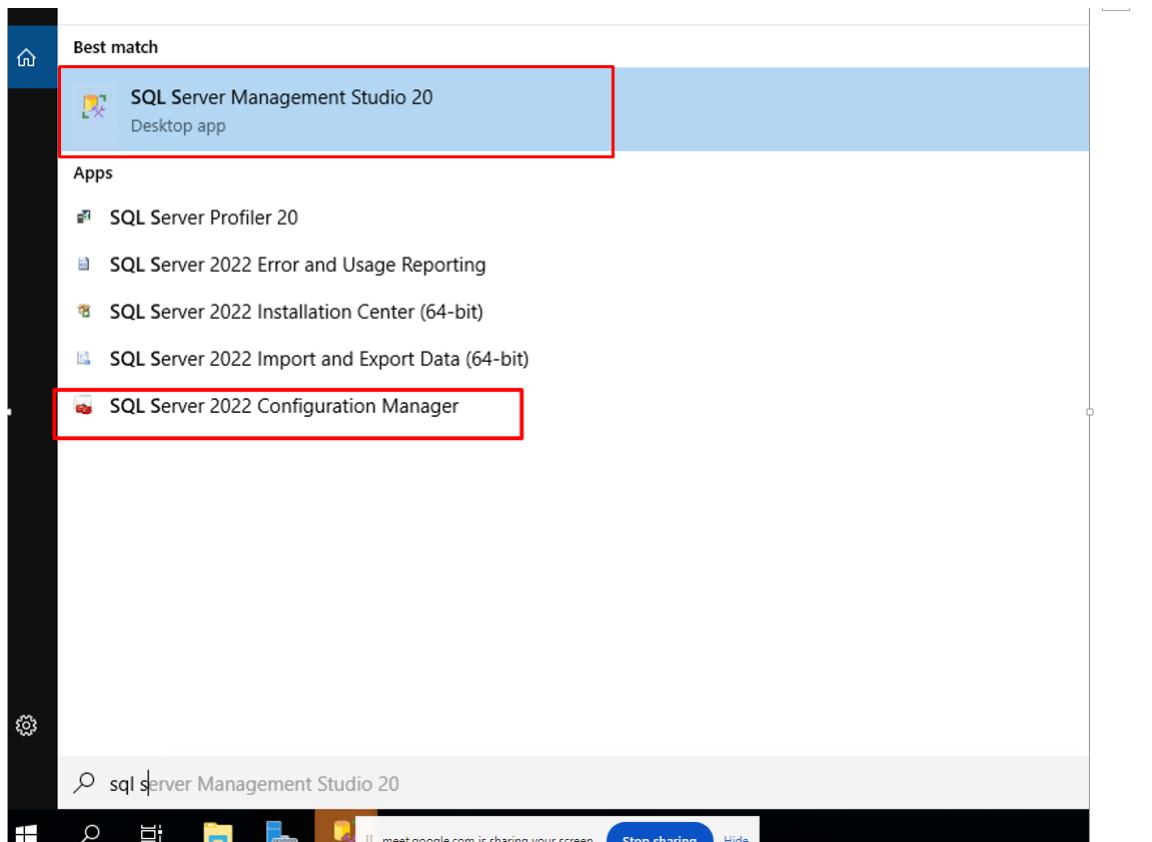
- download SQL server 2022 and sql management then install them

File	Date	Type	Size
SQLServer2022-x64-ENU	10/21/2024 2:51 PM	Disc Image File	1,135,792 KB
SSMS-Setup-ENU	10/21/2024 3:10 PM	Application	484,561 KB

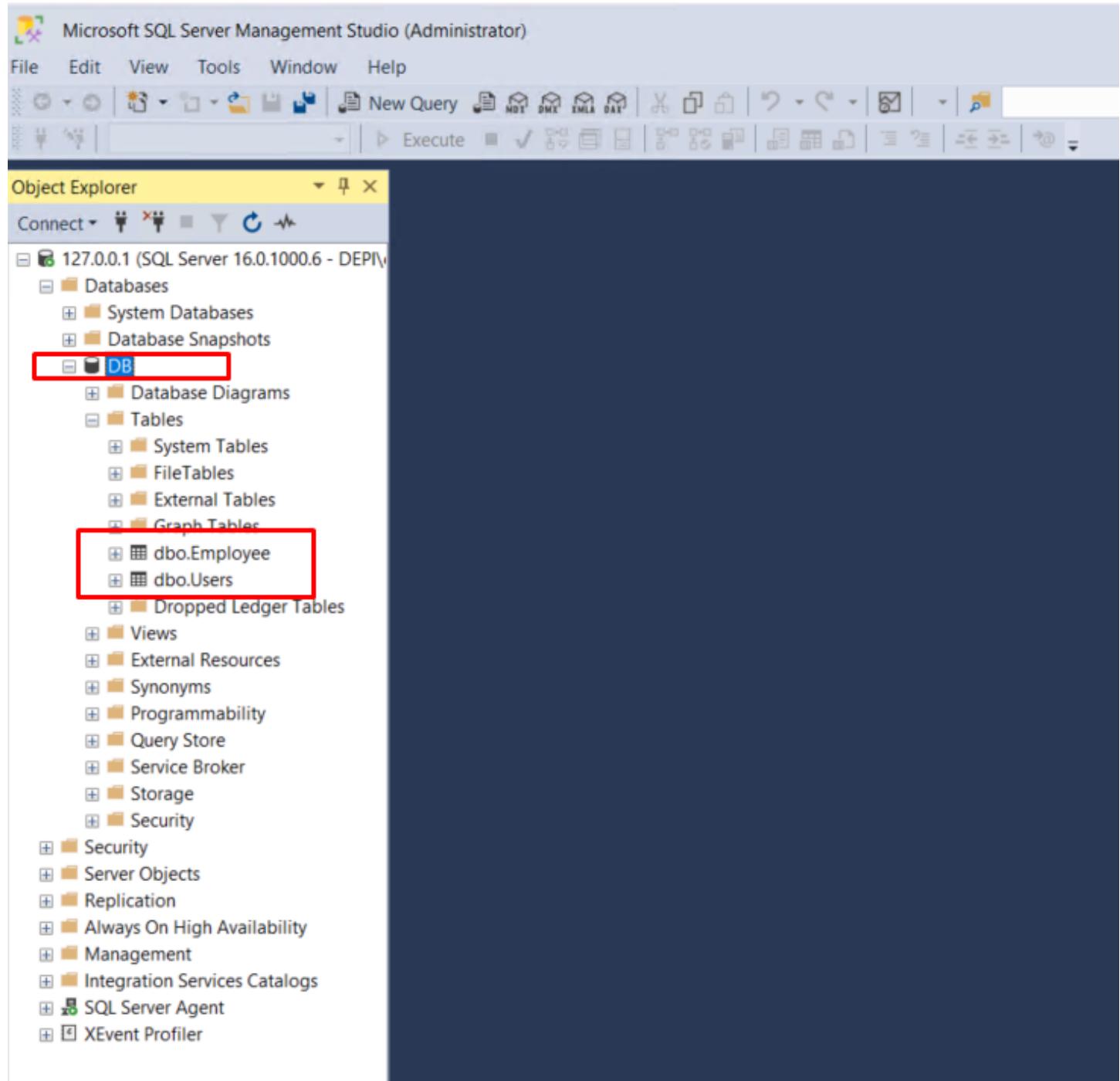


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- open from taskbar



created one DB and two tables





جامعة مصر المفتوحة

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. In the Object Explorer on the left, a connection to '127.0.0.1 (SQL Server 16.0.1000.6 - DEPI)' is selected. Under the 'DB' node, several system and user-defined objects are listed, including 'Database Diagrams', 'Tables' (with sub-items like 'System Tables', 'FileTables', 'External Tables', 'Graph Tables'), 'dbo.Employee', 'dbo.Users', 'Dropped Ledger Tables', 'Views', 'External Resources', 'Synonyms', 'Programmability', 'Query Store', 'Service Broker', 'Storage', and 'Security'. A context menu is open over the 'Tables' node, with options like 'New Table...', 'Filter', 'Start PowerShell', 'Reports', and 'Refresh'. In the center pane, a query window titled 'SQLQuery3.sql - 12...DB (DEPI\depi (57))' contains the following T-SQL code:

```
SELECT TOP (1000) [EmployeeID]
      ,[FullName]
      ,[Position]
      ,[HireDate]
  FROM [DB].[dbo].[Employee]
```

The results grid below the query window displays the following data:

EmployeeID	FullName	Position	HireDate
1	haytham	Senior Devops	2020-12-10
2	ismail	Senior System Engineer	2020-10-20
3	essam	Senior System Engineer	2020-10-20
4	Ahmed	Senior System Engineer	2020-10-20
5	mohamed	Cloud Engineer	2020-10-20
6	abdleiaziz	Cloud Engineer	2020-10-20

## create a SQL user for app connection string

The screenshot shows the 'Logins' node under 'Security' in the Object Explorer. A context menu is open over the 'Logins' node, with options like 'New Login...', 'Filter', 'Start PowerShell', 'Reports', and 'Refresh'. Below the tree view, a list of existing logins is shown, including '#\$', '#\$', 'de', 'iis01', 'NT', 'NT', 'NT SERVICE\SQLSERVERAGE', 'NT SERVICE\SQLTELEMETRY', 'NT SERVICE\SQLWriter', and 'NT SERVICE\Winmgmt'. A new login named 'depi' has been created and is highlighted with a red box in the list.



رواد مصر الرقمية

then go to SQL server agent => backup => steps => backup

The screenshot shows the SQL Server Management Studio interface. In the Object Explorer, under the 'SQL Server Agent' node, a new job named 'Backup' is being created. The 'General' page of the 'Job Properties - Backup' dialog is open, showing a single step named 'Backup'. The 'Script' tab is selected in the right-hand pane, displaying the T-SQL code for the backup job:

```
DECLARE @BackupFile NVARCHAR(255)
-- Format the current date and time as YYYYMMDD_HHMMSS
SET @BackupFile = N'C:\Backup\01DB_Backup_`'+FORMAT(GETDATE(), 'yyMMdd_hhmmss')+'`'
-- Perform the backup
BACKUP DATABASE [01DB] TO DISK=@BackupFile
WITH NOFORMAT, NOINIT,
NAME = '01DB Backup',
SKIP, NOREWIND, NOUNLOAD, STATS = 10;
```

automatic backup every day at 12:00 AM

The screenshot shows the SQL Server Management Studio interface. In the Object Explorer, under the 'SQL Server Agent' node, a new job named 'Backup' is being created. The 'Schedules' page of the 'Job Properties - Backup' dialog is open, showing a schedule named 'Backup' with the description 'Occurs every day at 12:00:00 AM. Schedule will be...'. The 'Script' tab is selected in the right-hand pane, displaying the T-SQL code for the backup job:

```
DECLARE @BackupFile NVARCHAR(255)
-- Format the current date and time as YYYYMMDD_HHMMSS
SET @BackupFile = N'C:\Backup\01DB_Backup_`'+FORMAT(GETDATE(), 'yyMMdd_hhmmss')+'`'
-- Perform the backup
BACKUP DATABASE [01DB] TO DISK=@BackupFile
WITH NOFORMAT, NOINIT,
NAME = '01DB Backup',
SKIP, NOREWIND, NOUNLOAD, STATS = 10;
```

## Move the backup from C drive to file share

```
move file - Notepad
File Edit Format View Help
@echo off
setlocal

rem Define the source and destination paths
set "source=C:\BackupDB"
set "destination=Z:\BackupDB"
set "logfile=C:\BackupDB\backup_move_log.txt"

rem Create or clear the log file
echo Backup Move Log - %date% %time% > "%logfile%"
echo ----- >> "%logfile%"

rem Find the most recent .bak file
for /f "delims=" %%i in ('dir /b /a-d /o-d "%source%\*.bak"') do (
    set "latest=%%i"
    goto :move
)

:move
rem Move the latest backup file to the mapped drive
if defined latest (
    move "%source%\latest" "%destination%" >> "%logfile%" 2>&1
    if errorlevel 1 (
        echo Error moving: %latest% to %destination% >> "%logfile%"
    ) else (
        echo Moved: %latest% to %destination% >> "%logfile%"
    )
) else (
    echo No backup files found in %source%. >> "%logfile%"
)

endlocal
```

## Week 4: Final Integration and Documentation

- Our app is a 3-tier (Front – Back – DB)
  - Some dependencies installed to launch the webapp like (node.js ...)
  - To make it secured we installed Certify app will give us a free cert for 90 days.
- 
- 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.



Internet Information Services (IIS) Manager

File View Help

Connections

- Start Page
- iis01 (DEP\dep)
- Application Pools
- Sites
  - Backend
  - Front**
- Server Farms

Front Home

Filter: Show All Group by: Area

ASP.NET

- .NET Authorizat...
- .NET Compilation
- .NET Error Pages
- .NET Globalization
- .NET Profile
- .NET Roles
- .NET Trust Levels
- .NET Users
- Application Settings

IIS

- Connection Strings
- Machine Key
- Pages and Controls
- Providers
- Session State
- SMTP E-mail
- ASP
- Authentic...
- Compression
- Default Document
- Directory Browsing
- Error Pages
- Handler Mappings
- HTTP Respon...
- Logging
- MIME Types
- Modules
- Output Caching
- Request Filtering
- SSL Settings
- URL Rewrite
- ISAPI Filters

Features View Content View

Actions

- Explore
- Edit Permissions...
- Edit Site
- Bindings...
- Basic Settings...
- View Applications
- View Virtual Directories

Manage Website

- Restart
- Start
- Stop

Browse Website

- Browse \*:80 (http)
- Browse \*:443 (https)

Advanced Settings...

Configure

- Limits...
- HSTS...

Help

Ready

Internet Information Services (IIS) Manager

File View Help

Connections

- Start Page
- iis01 (DEP\dep)
- Application Pools
- Sites
  - Backend
  - Front
- Server Farms

Backend Home

Filter: Show All Group by: Area

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IIS

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- URL Rewrite
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Features View Content View

Actions

- Explore
- Edit Permissions...
- Edit Site
- Bindings...
- Basic Settings...
- View Applications
- View Virtual Directories

Manage Website

- Restart
- Start
- Stop

Browse Website

- Browse \*:8080 (https)

Advanced Settings...

Configure

- Limits...
- HSTS...

Help

Ready



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File Home Share View

← → ↑ This PC > Windows (C:) > inetpub > wwwroot >

Name	Date modified	Type	Size
back	10/21/2024 4:17 PM	File folder	
Front	10/21/2024 3:28 PM	File folder	
back	10/21/2024 3:44 PM	WinRAR archive	21,746 KB

Quick access

- Desktop
- Downloads
- Documents
- Pictures
- BackupDB
- System32

This PC

Network

← → ↑ This PC > Windows (C:) > inetpub > wwwroot > Front >

Name	Date modified	Type	Size
aspnet_client	10/21/2024 3:28 PM	File folder	
iisstart	10/22/2024 7:24 PM	HTML Document	7 KB
iisstart	10/3/2024 12:36 PM	PNG File	98 KB

Quick access

- Desktop
- Downloads
- Documents
- Pictures
- BackupDB
- System32

This PC

Network



رواد مصر الرقمية

Name	Date modified	Type	Size
.vscode	10/4/2024 8:22 PM	File folder	
aspnet_client	10/5/2024 7:54 AM	File folder	
iisnode	10/22/2024 7:00 PM	File folder	
New folder	10/5/2024 9:51 AM	File folder	
node_modules	10/4/2024 8:44 PM	File folder	
'	10/4/2024 8:13 PM	File	0 KB
{	10/4/2024 8:13 PM	File	0 KB
index	10/5/2024 11:23 AM	HTML Document	8 KB
MyNodeApp	10/5/2024 9:56 AM	WinRAR archive	10,859 KB
package.json	10/4/2024 8:44 PM	JSON File	1 KB
package-lock.json	10/4/2024 8:44 PM	JSON File	72 KB
server	10/21/2024 4:09 PM	JavaScript File	3 KB
web.config	10/5/2024 7:55 AM	CONFIG File	1 KB

#### . Cloudflare Proxy:

Cloudflare forwards the traffic from the user to your web server or VM IP. This can happen securely over HTTP or HTTPS based on your configuration.

When you enable Cloudflare's proxy (the orange cloud icon), users don't see your actual VM's IP; they see Cloudflare's IPs. Cloudflare acts as an intermediary, securing and managing traffic between your website visitors and your VM or web server.

#### 4. Traffic Flow:

User -> Cloudflare -> Your VM (with Frontend Website):

When someone visits your website using your domain name, Cloudflare handles the SSL handshake, and then it forwards the request to your VM's IP (which has the website frontend).

Cloudflare encrypts traffic from the user to its servers, and then, depending on your setup, it can encrypt or just forward the traffic to your VM.

#### Summary:

Cloudflare connects the domain (with the SSL certificate) to your VM's IP. Users connect to Cloudflare's SSL-secured domain, and Cloudflare forwards the requests to your VM's IP hosting the frontend website. This setup ensures your website is secure, and Cloudflare provides additional benefits like DDoS protection, caching, and performance optimizations.

## create domain and certificate

The screenshot shows the Cloudflare DNS interface on the left and the Certificate Manager on the right. In the DNS section, a new A record is being created for the domain bytedrivetech.xyz, pointing to the IP 123.114.161. In the Certificate Manager, a certificate for depi.bytedrivetech.xyz is listed as active, with auto-renewal enabled. The certificate expires in 78 days.



## create LB

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > LB

LB Load balancer

Search Move Delete Refresh Give feedback

Overview

Activity log Access control (IAM) Tags Diagnose and solve problems Settings

Frontend IP configuration Backend pools Health probes Load balancing rules Inbound NAT rules Outbound rules Properties Locks Monitoring Automation Help

Resource group (move) : ONL1\_ISS3\_M1d Subscription\_02 Location : West Europe Subscription (move) : Azure for Students Subscription ID : 7f239a63-166a-4716-aeb4-013c7d22f11b SKU : Standard Tags (edit) : Add tags See more

Backend pool : LB-backendpool01 (2 virtual machines)  
Load balancing rule : 3 rules  
Health probe : 3 probes  
NAT rules : 0 inbound  
Tier : Regional

Configure high availability and scalability for your applications

Create highly-available and scalable applications in minutes by using built-in load balancing for cloud services and virtual machines. Azure Load Balancer supports TCP/UDP-based protocols and protocols used for real-time voice and video messaging applications. [Learn more](#)

Balance IPv4 and IPv6 addresses Build highly reliable applications Secure your networks

Native dual-stack endpoints help meet regulatory requirements and address the fast-growing number of devices in mobile and IoT. [Learn more](#)

View frontend IP configuration View health probes View load balancing rules

View backend pools

## Frontend

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > LB

LB | Frontend IP configuration Load balancer

Search Add Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings

Frontend IP configuration Backend pools Health probes Load balancing rules Inbound NAT rules Outbound rules Properties Locks Monitoring Automation Help

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](#)

Type to start filtering ...

Name	IP address	Rules count
LB-frontendconfig01	40.68.139.182 (LB-publicip)	3



## Backend

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > LB

### LB | Backend pools

Load balancer

The backend pool is a critical component of the load balancer. The backend pool defines the group of resources that will serve traffic for a given load-balancing rule. [Learn more.](#)

Backend pool	Resource Name	IP address	Network interface	Availability zone	Rules count	Resource Status	Admin state
LB-backendpool01 (2)	iis01	10.0.0.4	iis01893	-	3	Running	None
	iis02	10.0.0.5	iis02514	-	3	Running	None

Search  Add Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Frontend IP configuration Backend pools Health probes Load balancing rules Inbound NAT rules Outbound rules Properties Locks Monitoring Automation Help

## Health Probes

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > LB

### LB | Health probes

Load balancer

Type to start filtering ...

Name	Protocol	Port	Path	Used By
LB-probe01	Tcp	80	-	LB-lbrule01
LB-lbrule02	Tcp	443	-	LB-lbrule02
LB-lbrule03	Tcp	8080	-	LB-lbrule03

Search  Add Refresh Give feedback

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Frontend IP configuration Backend pools Health probes Load balancing rules Inbound NAT rules Outbound rules Properties Locks Monitoring Automation Help

## LB rules

Home > Resource groups > ONL1\_ISS3\_M1d\_Subscription\_02 > LB

### LB | Load balancing rules

Load balancer

A load balancer rule is used to define how incoming traffic is distributed to 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	<a href="#">View details</a>
LB-lbrule02	TCP/443	LB-backendpool01	LB-lbrule02	<a href="#">View details</a>
LB-lbrule03	TCP/8080	LB-backendpool01	LB-lbrule03	<a href="#">View details</a>

Search  Add Refresh Delete

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Frontend IP configuration Backend pools Health probes Load balancing rules Inbound NAT rules Outbound rules Properties Locks Monitoring Automation Help



## Frontend

Link: <https://depi/bytedrivetech.xyz/>

The screenshot shows a web browser window with the URL <https://depi.bytedrivetech.xyz/>. The page has a header with the text "SERVER 1" and the logo of رواد مصر الرقمية (Road Egypt Digital). Below the header, there is a large orange button with the text "Welcome to Our Website!". Underneath it, a blue button says "Hello to our website - DEPI Final Project". A section titled "Team Members:" lists six team members: Mohamed Sarhan Elhusssieny, Abdulaziz Ahmed Fouad, Ahmed Elkomey, Haytham Mohamed Awadallah, Ismail Sabry Attwa, and Essam Hassan Abdo. At the bottom of the page, a light blue footer box contains the text "Azure Cloud Solution Admin & Architect (ONL1\_ISS3\_M1d)".



## SERVER 2



# 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)

Link: <https://depi/bytedrivetech.xyz:8080>



جامعة مصر الرقمية

Advanced Preferences

Login and Registration

+



Back



Forward



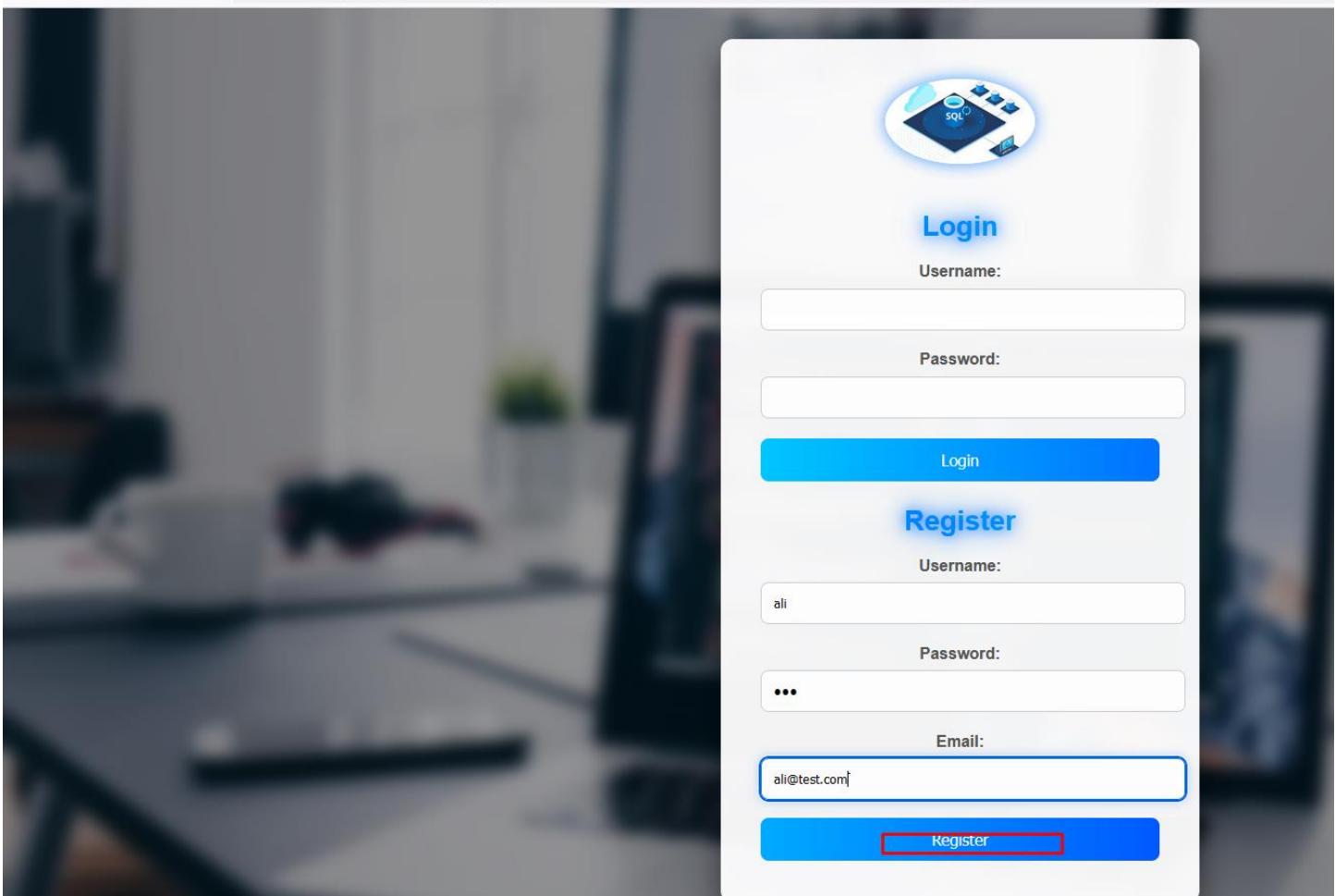
Secure



SSL



https://depi/bytedrivetech.xyz:8080





## Login

Username:

Password:

**Login**

## Register

Username:

Password:

Email:

**Register**

← → ⌂



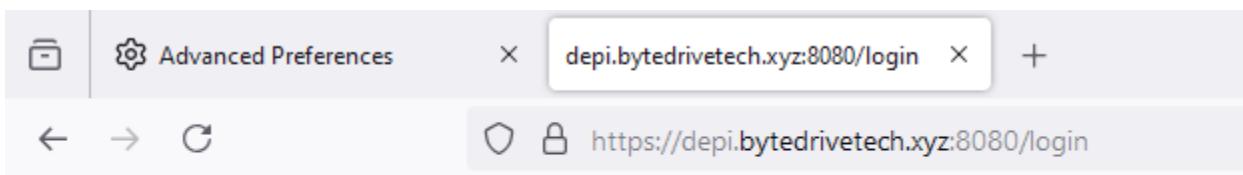
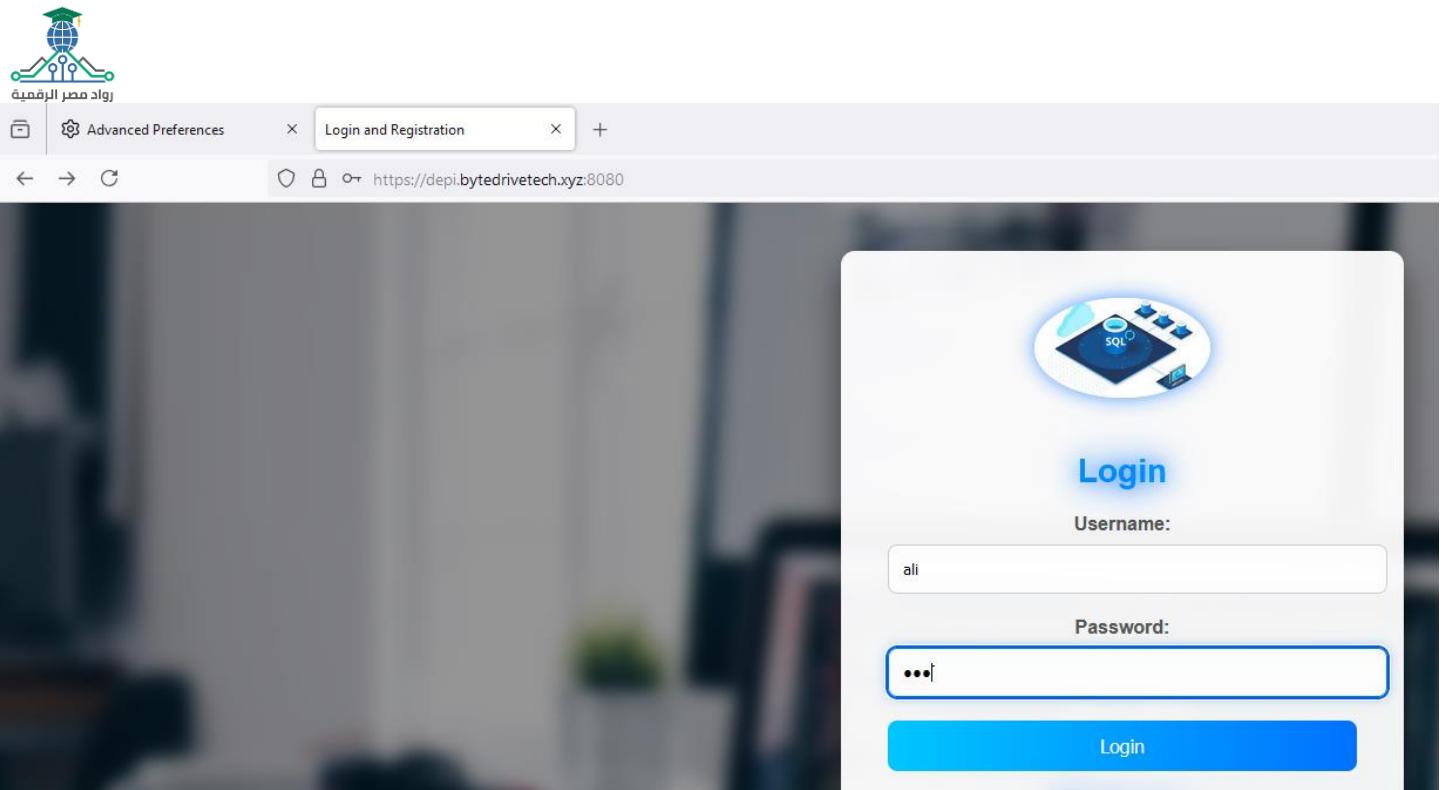
Secure



SSL

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

Registration successful



## The Full Diagram of the project

