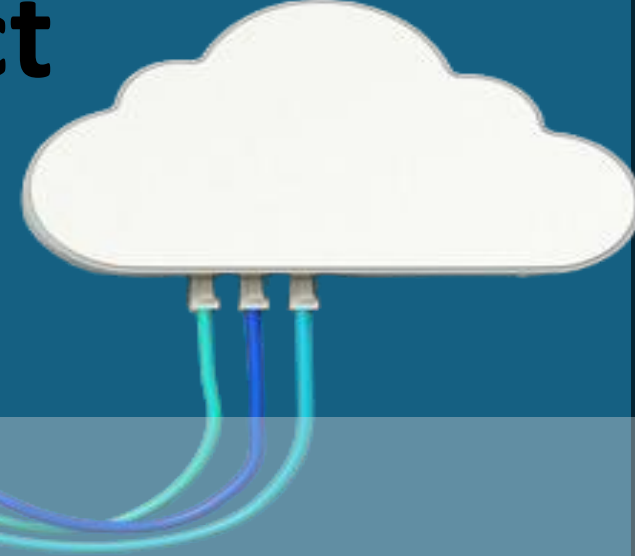




Azure Cloud Solution Admin & Architect



Team Members



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- Ismail Sabry Attwa
- Haytham Mohamed
- Ahmed Ibrahim Saad
- Abdel-Azizi Fouad
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Supervised by:

Eng. Omar Hussien

Project Overview

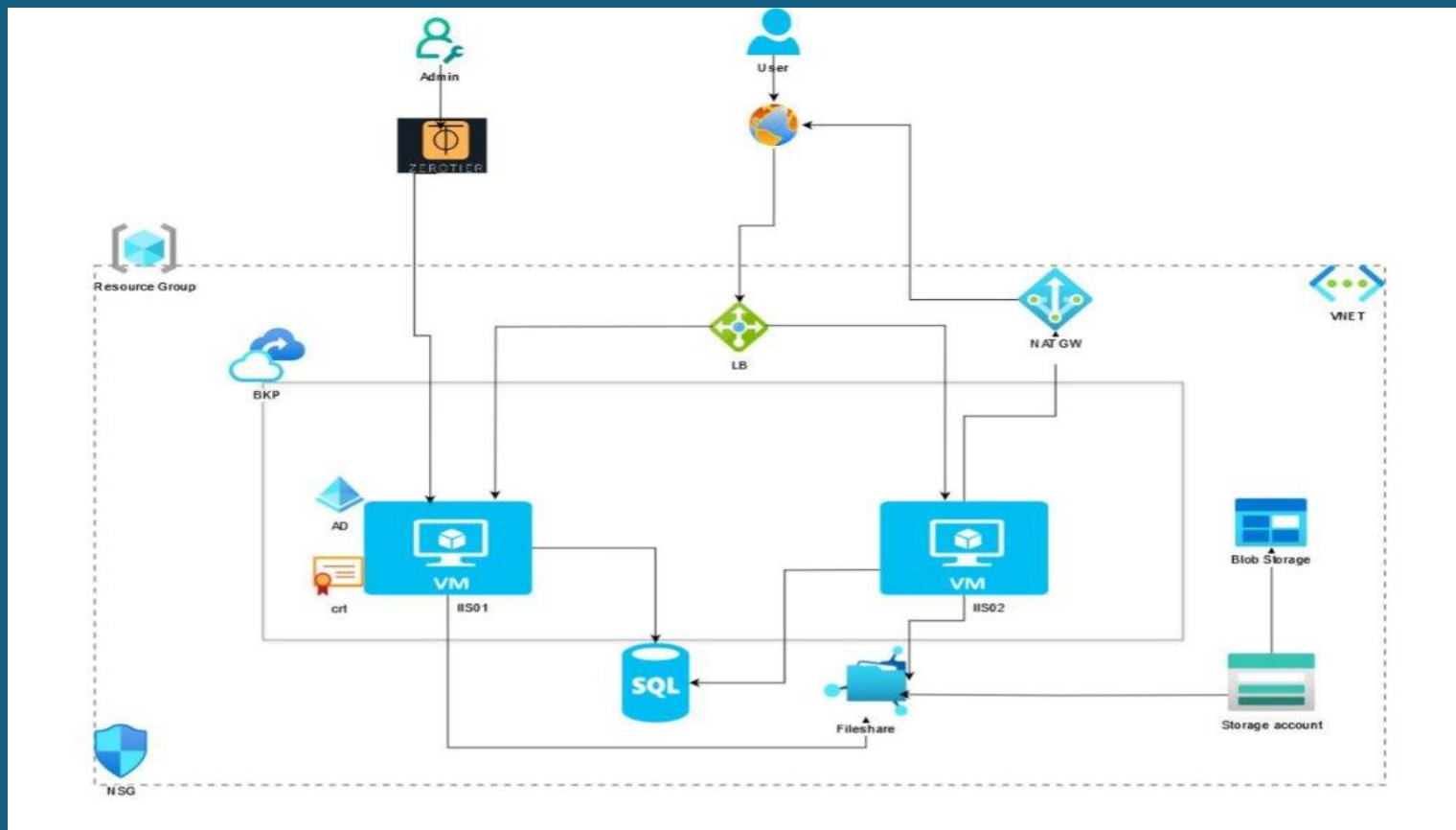


This project demonstrates a full-scale Azure cloud infrastructure deployment for a web app using secure and scalable practices, focusing on efficient VM management, networking, storage, and application hosting.

Components Deployed:

- 2-Virtual Machines (VMs) with Active Directory and IIS.
- Storage, backup, database setup, and load balancing.

The Full Diagram of the project



Virtual Machines and Active Directory Configuration

Virtual Machine Deployment:

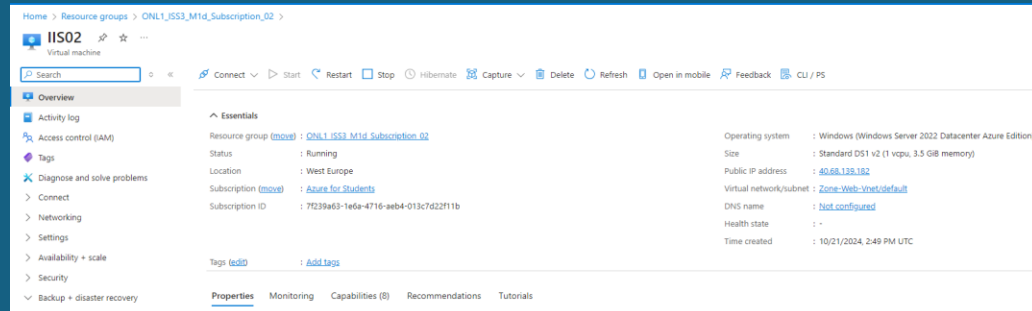
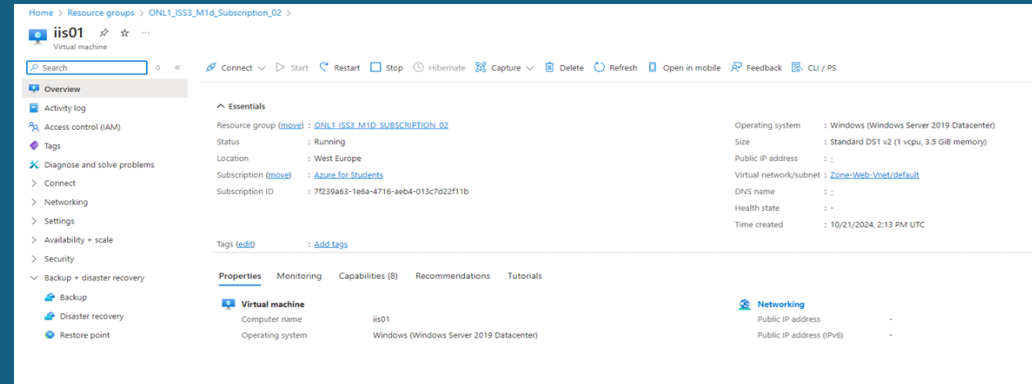
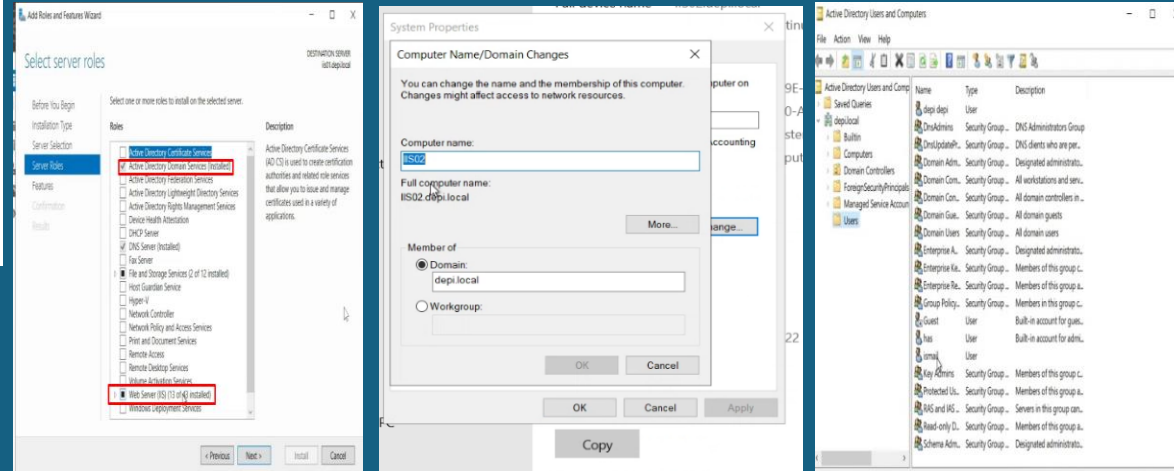
- Configuration:** Both VMs deployed within the same Virtual Network (*/IS01-vnet*) in the *West Europe* region.

- Operating System:** Each VM is running *Windows Server 2022* with *IIS* pre-installed for web services.

Domain Configuration:

- Domain Controller:** */IS01* has been promoted to Domain Controller under the domain (*depi.local*).

- Domain Membership:** */IS02* successfully joined the domain, ensuring centralized management and security policies across VMs.



Network and Security Setup

NAT Gateway:

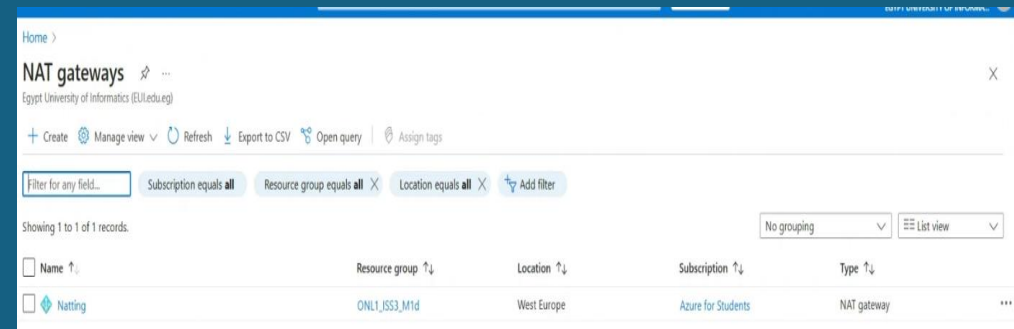
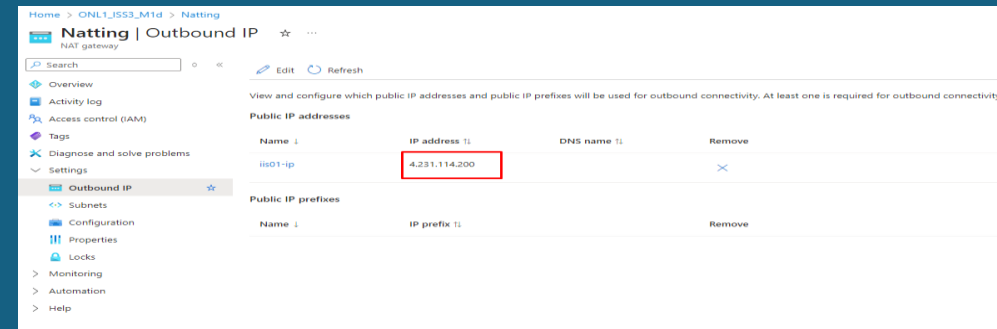
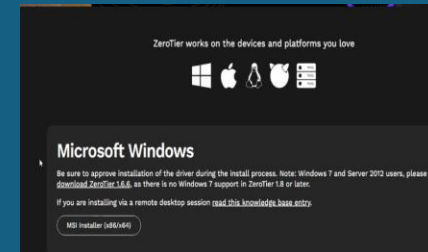
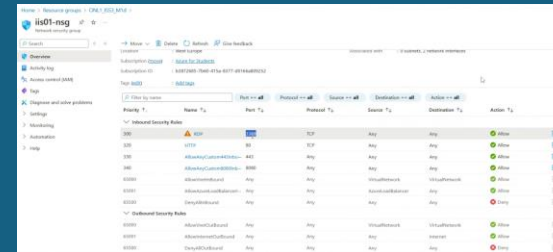
- **Purpose:** Configured to optimize public IP usage, providing internet access to both VMs while maintaining efficient resource utilization.

Network Security Group (NSG):

- **Configuration:** Applied to both VMs, enabling defined inbound and outbound traffic rules for enhanced security and controlled network access.

Remote Access via ZeroTier:

- **Alternative Solution:** Utilized as a cost-effective, secure, peer-to-peer alternative to Azure Bastion for remote access, reducing expenses without compromising secure connectivity.



• Storage Solutions

Storage Account Configuration:

- **Account Name:** *ProjectsAccount2024* with Blob storage container for optimized, scalable storage.

File Share Setup:

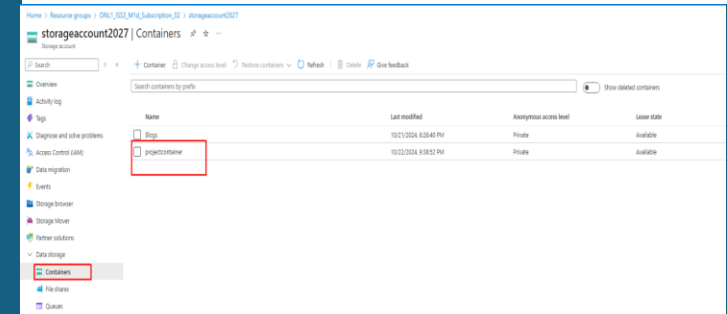
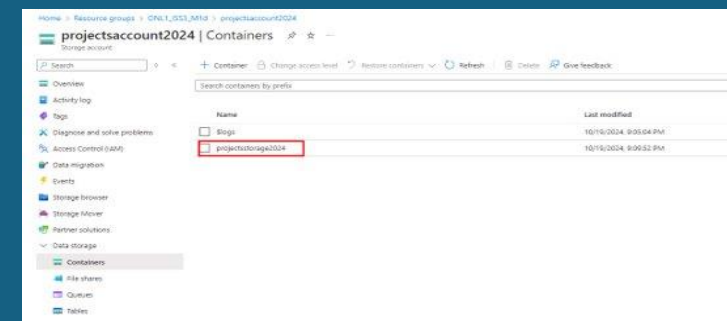
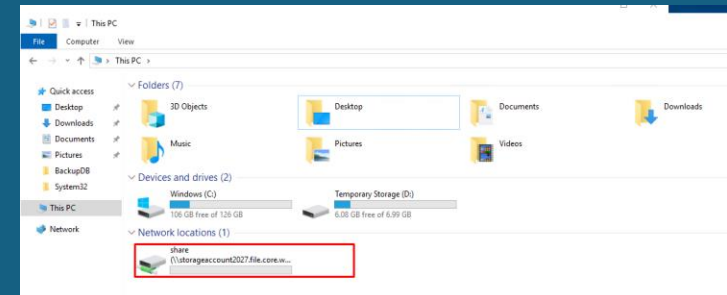
- **Configuration:** Created and mapped to both virtual machines, enabling seamless data accessibility across VMs.

Data Access Control:

- **Access Method:** Shared Access Signature (SAS) URL for controlled file-sharing access.

Access Tier:

- Configured with the *Hot Access Tier* for high-frequency data access and quick retrieval.



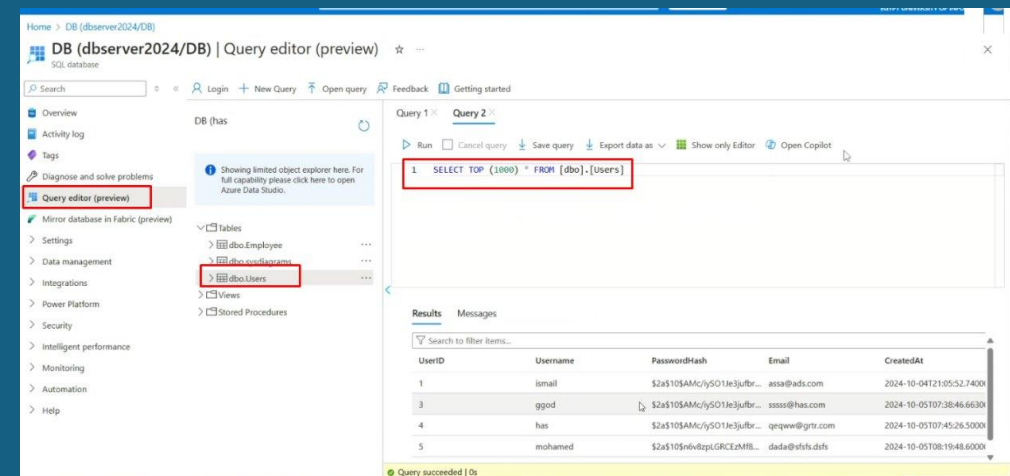
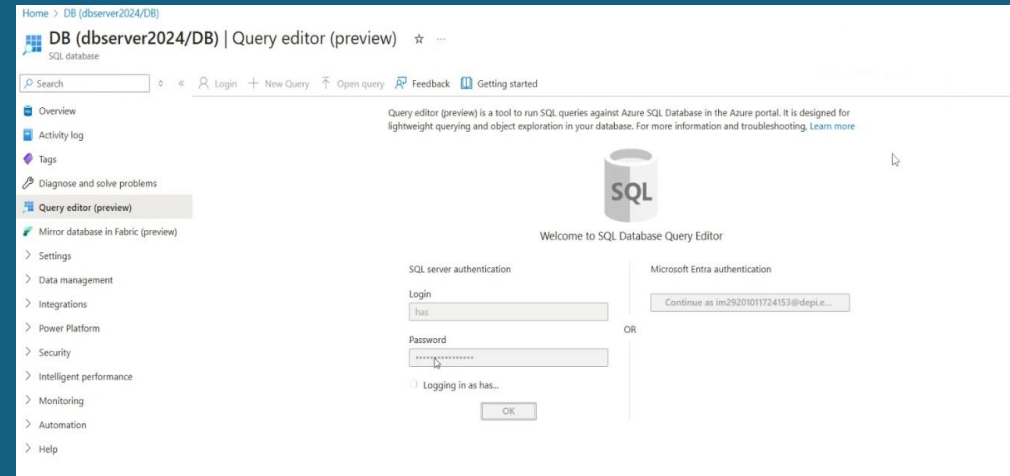
• Database Deployment

Azure SQL Database:

- Deployed SQL Server with a dedicated *Users* table for structured data storage.

On-Premises SQL Server:

- Configured SQL Server 2022 with automated daily backups for enhanced data protection and continuity.

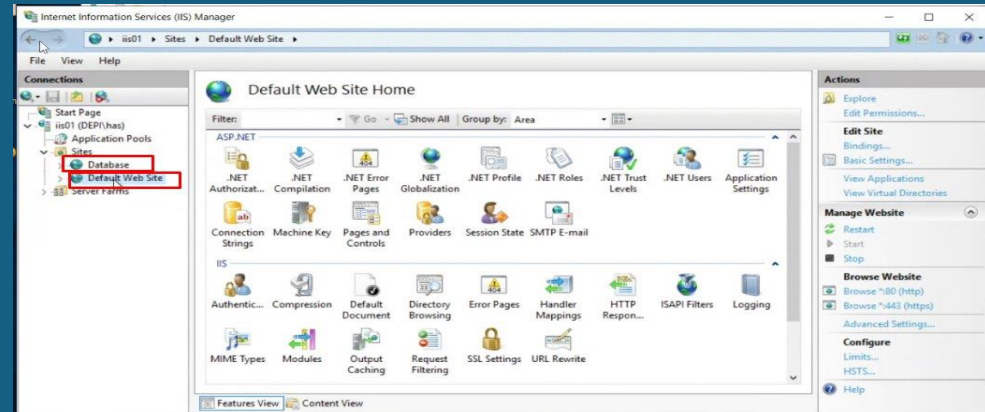


Web Application and Security Integration



3-Tier Architecture:

- **Frontend (IIS):** User-facing layer hosted on IIS, providing the application interface.
- **Backend (Node.js):** Logic layer where Node.js handles requests, linking frontend to the database.
- **Database:** Centralized data management, accessed by the backend.

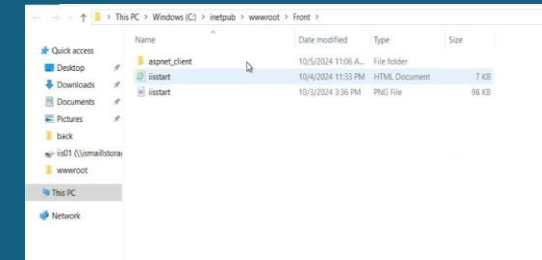
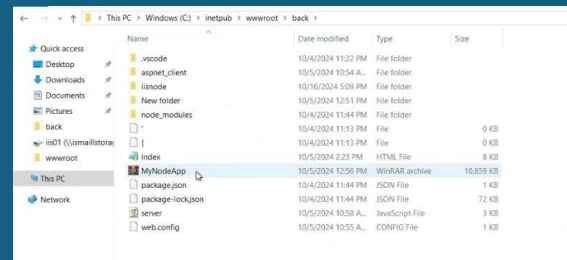


SSL Security:

- Configured with a 90-day certificate through Certify app for secure access.

IIS Sites:

- Two distinct sites hosted on *IIS01*, supporting both frontend and backend services.



Load Balancer and Health Monitoring



Load Balancer Setup:

- **Frontend IP:** Configured to manage incoming traffic, directing it to the designated resources.
- **Backend Pool:** Includes specific VMs to balance loads effectively and enhance performance.
- **Health Probes:** Monitors the health of backend resources continuously, ensuring high availability and reliability.

Access Overview:

- Provides secure entry points to both the frontend interface and backend services.
- Designed to ensure seamless connectivity and optimal performance, leveraging Azure's robust load-balancing capabilities.

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Load balancer

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Diagnose and solve problems

Settings

Frontend IP configuration

Backend pools

Health probes

Load balancing rules

Inbound NAT rules

Outbound rules

A load balancing 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](#)

Filter by name...

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
II501-3389	TCP/4444 to TCP/3389	II501	4444	View details

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Frontend IP configuration

Backend pools

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...

Showing all 1 items

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

LB-backendpool01 (2)

Backend pool	IP address	Port	Backend pool	Instances	Health	Status	Notes
LB-backendpool01	II501	10.0.0.4	II501527_z1	1	3	Stopped (deallocated)	None
LB-backendpool01	II502	10.0.0.5	II502158	-	3	Stopped (deallocated)	None

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Type to start filtering...

Name	Protocol	Port	Path	Used By
LB-probe01	Tcp	80	-	LB-lbRule01
443	Tcp	443	-	LB443
8080	Tcp	8080	-	LB8080
4444	Tcp	4444	-	II501-3389

Web Interface Snapshot





Login

Username:

Password:

Login

Register


Username:

Password:

Email:

Register

SERVER 2



Welcome to Our Website!

Hello to our website - DEPI Final Project

Team Members:

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Ahmed Elkomey


Haytham Mohamed Awadallah

Ismail Sabry Attwa

Essam Hassan Abdo

Azure Cloud Solution Admin & Architect
(ONL1_ISS3_M1d)

SERVER 1



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