Deploying a Web Server on Azure Linux VM with Nginx and Monitoring

Objective

The main objective of this project is to simulate a real-world Infrastructure as a Service (IaaS) deployment scenario by setting up a Linux-based virtual machine in Microsoft Azure. The goal is to install and configure an Nginx web server, implement secure network access, enable monitoring and insights, and verify successful web hosting via public access. This project demonstrates essential Azure administration skills.

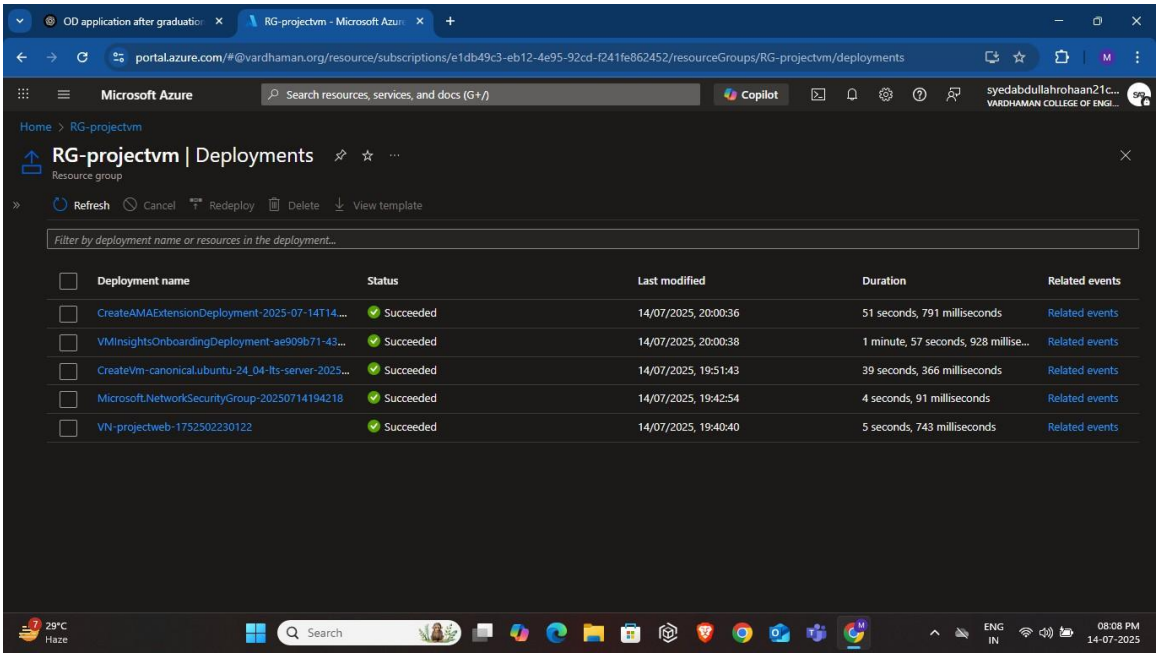
Tools & Technologies Used

- Microsoft Azure Portal (Azure for Students subscription)
- Linux Ubuntu 24.04 LTS
- Azure Virtual Machine (VM)
- Azure Network Security Group (NSG)
- Azure Monitor & Insights
- Nginx Web Server
- SSH Client (for VM access)
- HTML (for static web content)

Deployment Steps

1. Created Resource Group

A new resource group named 'RG-projectvm' was created in the Central India region to logically contain all project resources. Resource groups help organize and manage related Azure resources efficiently.

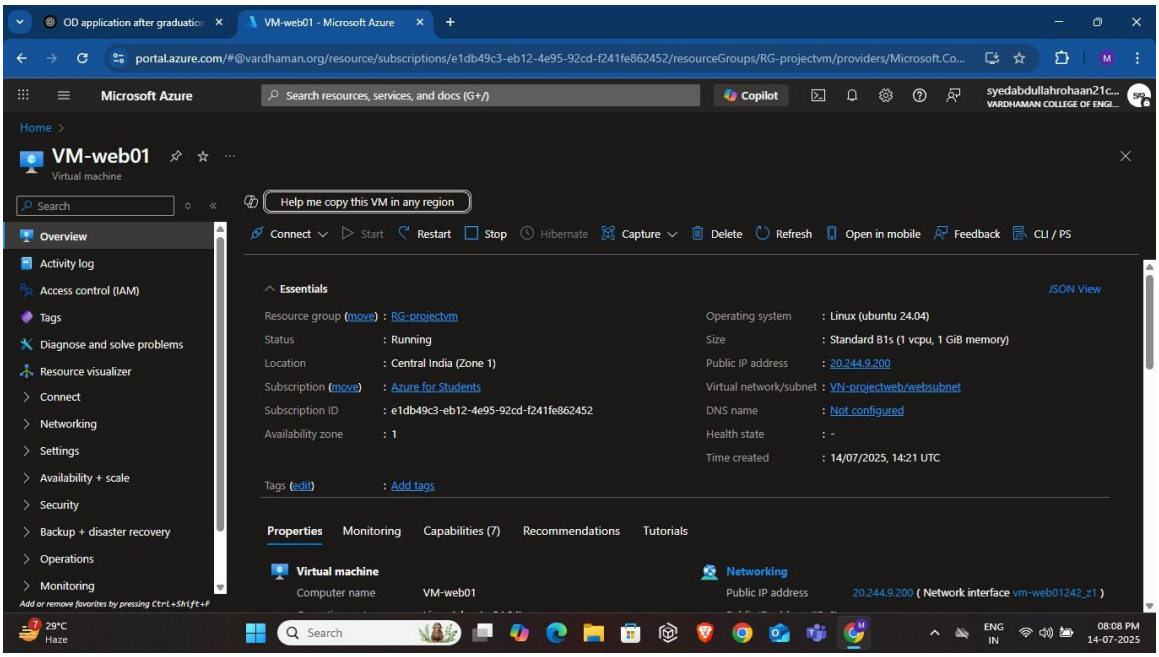


2. Created Virtual Network & Subnet

A virtual network (VNet) named 'VN-projectweb' and a subnet named 'websubnet' were created to establish a secure internal communication environment for the virtual machine. The subnet ensures isolation and control over traffic flow.

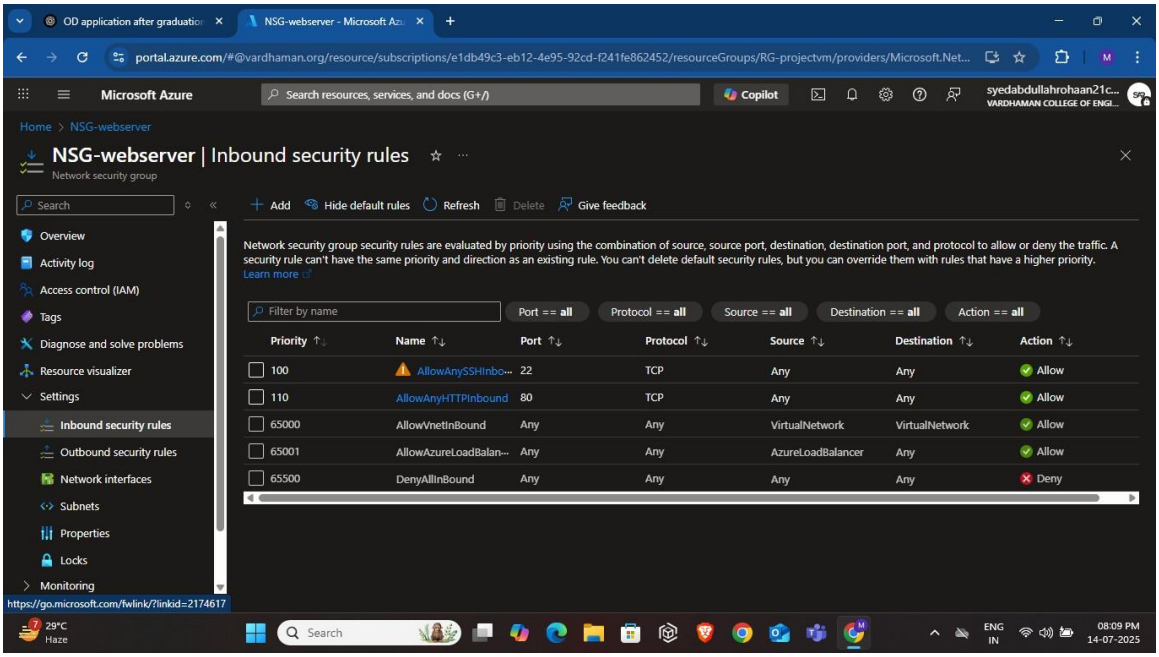
3. Created Ubuntu Linux VM

An Ubuntu Server 24.04 LTS virtual machine named 'VM-web01' was deployed with the B1s size configuration (1 vCPU, 1 GiB RAM). A public IP was assigned for remote access via SSH. Boot diagnostics were enabled to track the health and logs of the VM.



4. Configured NSG (Network Security Group)

An NSG was configured to define inbound and outbound security rules. Port 22 was opened for SSH access and port 80 for HTTP web traffic. The default 'DenyAllInbound' rule was kept as a fallback to enhance network security.



5. Installed and Configured Nginx

After SSH connection to the VM using its public IP, Nginx web server was installed and started. The default web directory was used to host a custom static HTML file located at '/var/www/html/default.html'. This HTML page was used to verify that the server was running correctly.

Commands used:

```
sudo apt update
sudo apt install nginx y
```

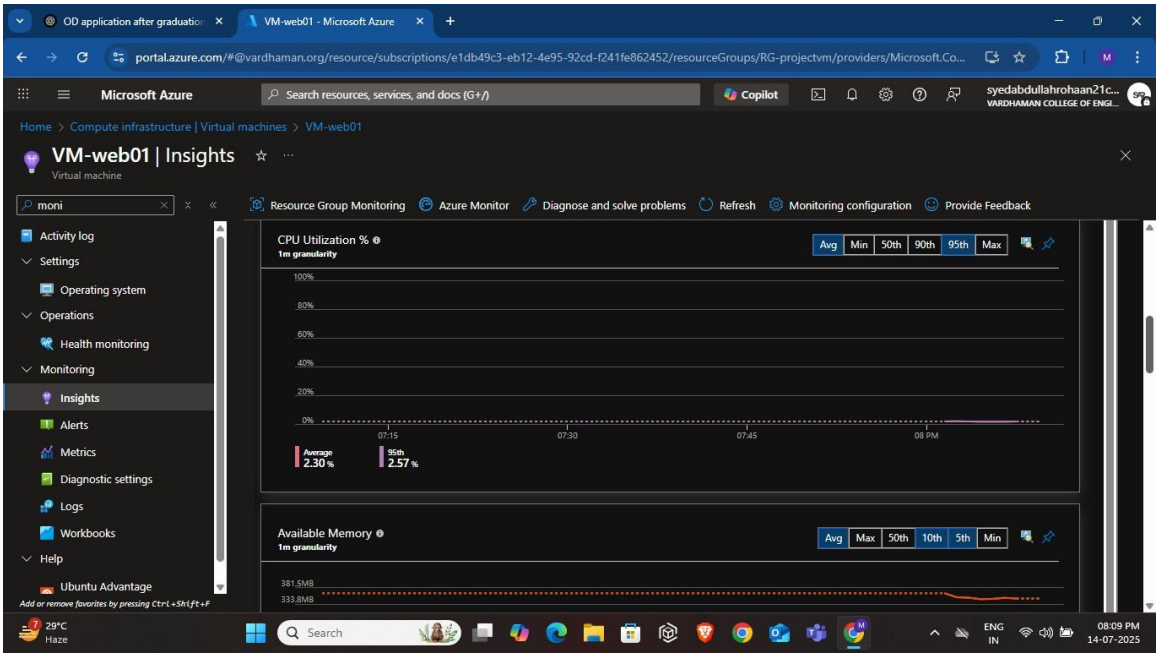
Created Static HTML Page.

File Path: `/var/www/html/default.html` **Content:**

```
<h1>Welcome to My Azure Project!</h>
<p>This VM is deployed and configured using Azure>Portal</p>
```

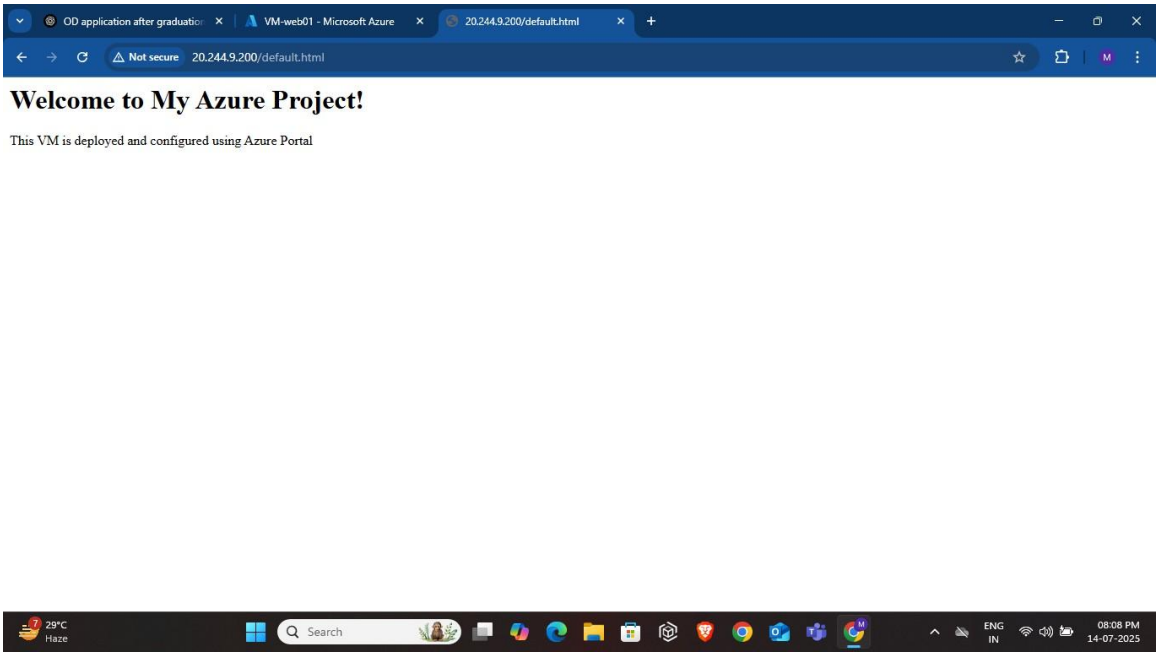
6. Enabled Monitoring and Insights

Azure Monitor and VM Insights were enabled to track performance metrics such as CPU usage, memory utilization, disk IOPS, and network activity. These insights helped validate that the virtual machine and web service were operating optimally.



7. Verified Public Access

The hosted web page was successfully accessed from the browser using the VM's public IP address (http://20.244.9.200/default.html). The page displayed the custom HTML message, confirming that Nginx was serving content publicly.



Outcome

The project was completed successfully. It demonstrates the full deployment lifecycle of an Azure Virtual Machine for web hosting, covering provisioning, security, web configuration,

monitoring, and validation. The Nginx web page was accessible from the public internet using the VM's IP address, proving correct setup.

Skills Demonstrated

- Azure Infrastructure Setup (IaaS)
- Virtual Machine provisioning and configuration
- Network Security and NSG Rule Management
- Linux system administration
- Nginx installation and web hosting
- Azure Monitoring and Performance Insights

Subscription Used

Azure for Students (No billing involved).