

SBA- Azure Fundamentals Final Project

Germila Saint-Jean.- 02/09/2025

Introduction



I am an IT professional with a Bachelor's degree in Computer Science and Entrepreneurship, experienced in software development and project management. I hold a CompTIA A+ certification and graduated in IT Support from Per Scholas. I have worked as an IT Help Desk at PCA Companies and as a Technical Support Engineer II at Tek Experts. I am passionate about networking, learning new things, and sharing my expertise, and I am focused on advancing my career.

Project Overview

Background / Scenario-

AZFK-Tech, a newly founded business, has asked you, a contractor, to help them build up their cloud infrastructure. But before you can install your infrastructure in their production environment, you must first demonstrate your ability to do so in a virtual lab environment. Note that Azure only allows 3 public IPs per region.

Objectives-

- Using the skills learned throughout the course, complete the following Skills-Based assessment (SBA).
 - **Part 1: Set up Department Group Resources.**
 - **Part 2: Set up the VNets for each department.**
 - **Part 3: Set up VMs for each department.**
 - **Part 4: Create and Apply Security Group Policies to each department.**
 - **Part 5: Set up a Database.**
 - **Part 6: Set up a Web App for the Marketing and Sales (MAS) department.**
 - **Part 7: Deploy a shared storage between all departments.**
 - **Part 8: Deploy Monitoring resources.**
 - **Part 9: Questions.**
 - **Part 10: Presentation/Submission.**

Azure Fundamentals: Key services and concepts

Azure is Microsoft's cloud platform, providing a variety of services such as computing, analytics, storage, and networking.

Key services:

- **Compute:** VMs, App Services, AKS
- **Storage:** Blob, File, Disk
- **Networking:** VNet, Load Balancer, VPN Gateway
- **Database:** SQL Database, Cosmos DB, MySQL/PostgreSQL
- **Identity:** Active Directory, AD B2C

Compute services:

- **Cloud Computing Models:** IaaS, PaaS, SaaS
- **Architecture:** Regions, Availability Zones, Resource Groups
- **Management:** ARM, Azure Policy, Azure Monitor
- **Security:** Security Center, Key Vault

Implementation

- Set up Department Group Resources: MAS-HR-IT

The screenshot shows the Microsoft Azure Resource Groups interface with three resource groups listed:

- Gsaintjean-MAS**: Resource group
- Gsaintjean-HR**: Resource group
- Gsaintjean-IT**: Resource group

The **Gsaintjean-IT** resource group is selected and displayed in the main pane. The Overview tab is selected, showing the following details:

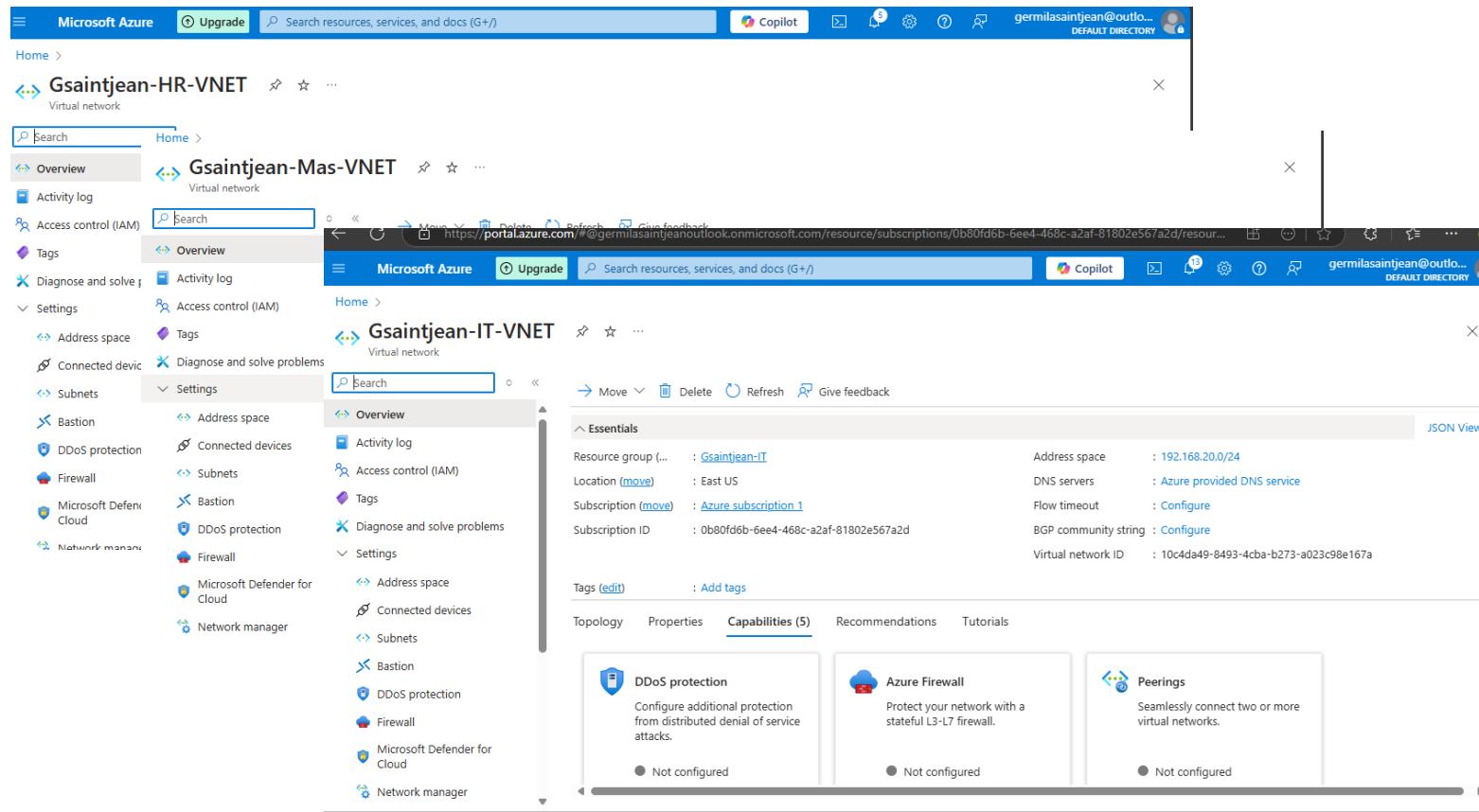
- Subscription (move) : Azure subscription 1
- Subscription ID : 0b80fd6b-6ee4-468c-a2af-81802e567a2d
- Deployments : 9 Succeeded
- Location : East US

The Resources section displays 11 records:

Name	Type	Location
Gsaintjean-IT-VNET	Virtual network	East US
ITAdmin	Virtual machine	East US
ITAdmin-ip	Public IP address	East US
ITAdmin-nsg	Network security group	East US
itadmin276_z3	Network Interface	East US
ITAdmin_disk1_d9960e0e366e4d678916b04f1cb90ee8	Disk	East US
NSG-IT	Network security group	East US

Implementation

- Set up VNets for each department



Implementation

- Set up VMs for each department

The image displays three separate Azure VM management interfaces, each showing the 'Recent' view for a different department. The interfaces are arranged horizontally, sharing a common header bar.

MasAdmin View:

- Recent list:
 - HRadmin
 - Gsaintjean-HR
 - ITAdmin
 - Gsaintjean-IT
 - Gsaintjean-HR-VNET
 - MasAdmin
 - Gsaintjean-MAS
 - Gsaintjean-Mas-VNET
 - Gsaintjean-IT-VNET
- Showing 1 - 9 of 9. Display count: 10

HRadmin View:

- Recent list:
 - HRadmin
 - Gsaintjean-HR
 - ITAdmin
 - Gsaintjean-IT
 - Gsaintjean-HR-VNET
 - MasAdmin
 - Gsaintjean-MAS
 - Gsaintjean-Mas-VNET
 - Gsaintjean-IT-VNET
- Showing 1 - 9 of 9. Display count: 10

ITAdmin View:

- Recent list:
 - HRadmin
 - Gsaintjean-HR
 - ITAdmin
 - Gsaintjean-IT
 - Gsaintjean-HR-VNET
 - MasAdmin
 - Gsaintjean-MAS
 - Gsaintjean-Mas-VNET
 - Gsaintjean-IT-VNET
- Showing 1 - 9 of 9. Display count: 10

Common Header Bar (Appears above all three views):

- Microsoft Azure Upgrade Search resources, services, and docs (G+)
- Copilot
- Help me copy this VM in any region
- Overview Connect Start Restart Stop Hibernate Capture Delete Refresh
- germilasaintjean@outlook.com DEFAULT DIRECTORY

Right-hand pane (Visible in the ITAdmin view):

- Essentials**
 - Resource group ([move](#)) **Gsaintjean-IT**
 - Status **Running**
 - Location **East US (Zone 3)**
 - Subscription ([move](#)) **Azure subscription 1**
 - Subscription ID **0b80fd6b-6ee4-468c-a2af-81802e567a2d**
 - Availability zone **3**
- Operating system **Windows (Windows Server 2019 Datacenter)**
- Size **Standard B1s (1 vcpu, 1 GiB memory)**
- Public IP address **172.208.68.187**
- Virtual network/subnet **Gsaintjean-IT-VNET/default**
- DNS name **Not configured**
- Health state **-**
- Time created **2/4/2025, 11:41 AM UTC**
- Tags (edit) Add tags

Implementation

- Create and Apply Security Group Policies to each department

The screenshot displays three Network Security Groups (NSG-HR, NSG-Mas, and NSG-IT) in the Microsoft Azure portal. Each group has its own configuration page with tabs for Overview, Essentials, and Settings.

- NSG-HR:** Located in East US, associated with a specific subscription and resource group. It shows 100 inbound security rules and 110 outbound security rules.
- NSG-Mas:** Located in East US, associated with a specific subscription and resource group. It shows 100 inbound security rules and 110 outbound security rules.
- NSG-IT:** Located in East US, associated with a specific subscription and resource group. It shows 100 inbound security rules and 110 outbound security rules.

The NSG-IT settings page is expanded, showing the following details:

- Essentials:** Resource group: Gsaintjean-IT, Location: East US, Subscription: Azure subscription 1, Subscription ID: 0b80fd6b-6ee4-46bc-a2af-81802e567a2d, Tags: Add tags.
- Monitoring:** Alerts, Diagnostic settings, Logs, NSG flow logs.
- Inbound Security Rules:** A table listing rules from priority 100 to 65500. Key entries include:
 - Priority 100: AllowAnyCustomAnyInbound, Any, ICMP, Any, Any, Allow
 - Priority 110: AllowAnyRDPinbound, 3389, TCP, Any, Any, Allow
 - Priority 120: AllowAnyHTTPSiInbound, 443, TCP, Any, Any, Allow
 - Priority 65000: AllowVnetInBound, Any, Any, VirtualNetwork, VirtualNetwork, Allow
 - Priority 65001: AllowAzureLoadBalancerInbound, Any, Any, AzureLoadBalancer, Any, Allow
 - Priority 65500: DenyAllInbound, Any, Any, Any, Any, Deny
- Outbound Security Rules:** A table listing rules from priority 140 to 65500. Key entries include:
 - Priority 140: AllowAnyCustomAnyOutbound, Any, ICMP, Any, Any, Allow
 - Priority 150: AllowAnyRDPOutbound, 3389, TCP, Any, Any, Allow
 - Priority 160: AllowAnyHTTPSOOutbound, 443, TCP, Any, Any, Allow
 - Priority 65000: AllowVnetOutbound, Any, Any, VirtualNetwork, VirtualNetwork, Allow
 - Priority 65001: AllowInternetOutbound, Any, Any, Internet, Internet, Allow
 - Priority 65500: DenyAllOutbound, Any, Any, Any, Any, Deny

Implementation

Set up Database

The image shows two overlapping windows. The background window is the Microsoft Azure portal, specifically the 'All services' view under the 'Microsoft Azure' section. It displays several database resources: 'gsaintjean-hr-database (server-it/gsaintjean-hr-database)', 'gsaintjean-it-database (server-it/gsaintjean-it-database)', and 'gsaintjean-mas-database (server-it/gsaintjean-mas-database)'. The 'gsaintjean-mas-database' card is selected, showing its details like 'Status: On', 'Subscription: (mas)', and 'Number of role assignments for this database: 13'. The foreground window is the 'ODBC Data Source Administrator (64-bit)' application. It shows a 'Test Results' dialog box with the message 'SUCCESS! Successfully connected to data source!' and details about the connection: 'ODBC Version: 03.80', 'Driver Version: 2.0.6.1005', 'Bitness: 64-bit', and 'Locale: en_US'. The 'OK' button is highlighted at the bottom of the dialog.

Implementation

- Set up a web App for the marketing and Sales (MAS) department

The screenshot shows the Microsoft Azure portal interface for managing a web application. The URL is https://portal.azure.com/#@germila.saintjean.outlook.onmicrosoft.com/resource/subscriptions/0b80fd6b-6ee4-468c-a2af-81802e567a2d/resourceGroups/Gsaintjean-MAS/providers/Microsoft.Web/sites/MAS-WebServer. The page title is "MAS-WebServer" under the "Web App" category. The main content area displays the "Overview" tab with the following details:

Resource group	: Gsaintjean-MAS	Default domain	: mas-webserver-fnathjb3d0bwawgf.canadacentral-01...
Status	: Running	App Service Plan	: ASP-GsaintjeanMAS-a7d6 (B1: 1)
Location (move)	: Canada Central	Operating System	: Linux
Subscription (move)	: Azure subscription 1	Health Check	: Not Configured
Subscription ID	: 0b80fd6b-6ee4-468c-a2af-81802e567a2d		

Below the overview, there are tabs for "Properties", "Monitoring", "Logs", "Capabilities", "Notifications", and "Recommendations". Under "Properties", the "Web app" section shows:

Name	MAS-WebServer
Publishing model	Container
Container Image	mcr.microsoft.com/appsvc/staticsite:latest

At the bottom, there is a "Domains" section.

Welcome to nginx!

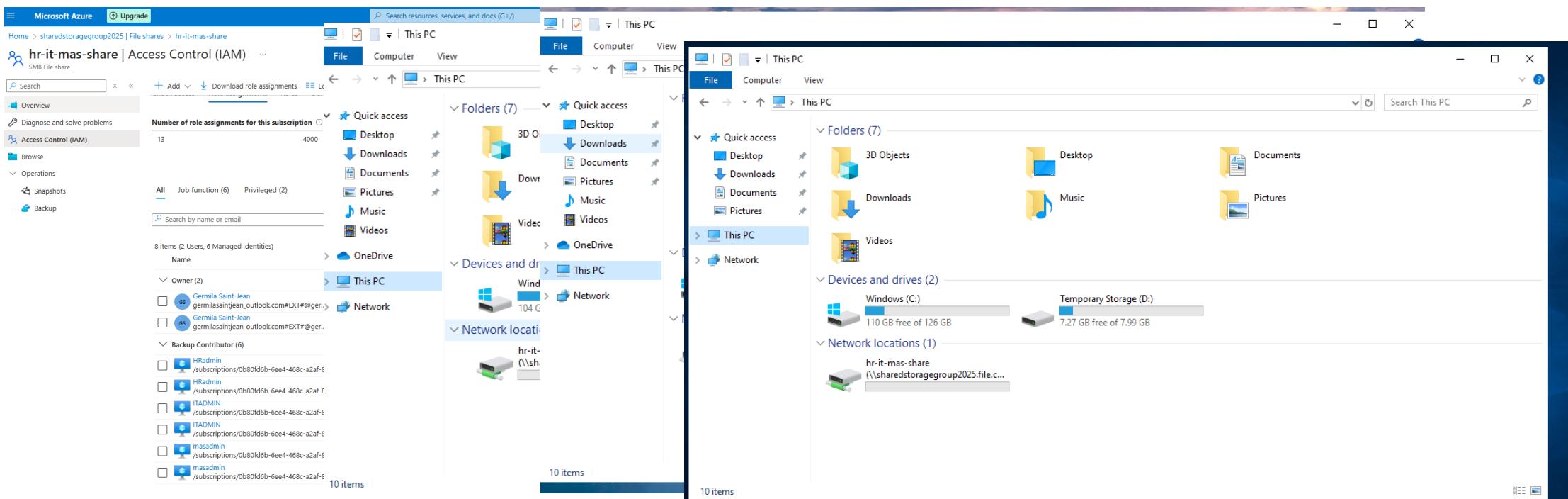
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

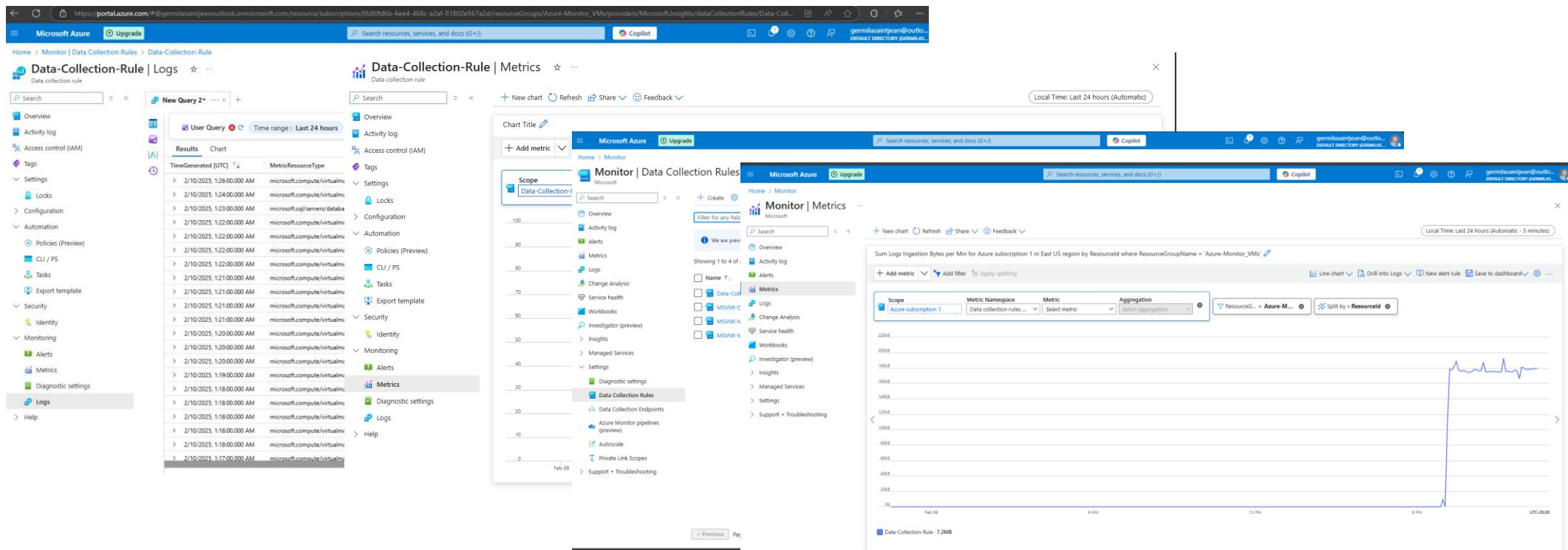
Implementation

- Deploy a shared storage between all departments



Implementation

- Deploy Monitoring resources



Challenge and Solutions

- One of my first challenge was after deploying my IT-VM. It took me a while to figure out how to access HR-DB and MAS-DB because I didn't have enough space in my IT-VM. Whenever I tried to connect, the screen would freeze. I reconnected to my Azure portal, resized my CPU and RAM, and the VM finally ran properly.
- Setting up firewalls for each department was another challenge. I did a lot of research to figure out the ports that should not be able to ping any department.
- Creating databases for each department was also challenging. Every time I chose a region; I failed until I tried several regions and was successful. I created an Azure Cosmos SQL database for the MAS department and SQL databases for both HR and IT. I did a lot of research to find out which tools to use to access the different databases. I finally discovered that SQL Server Management Studio is suitable for SQL databases and Open Database Connectivity (ODBC) drivers for Azure Cosmos DB.
- Another challenge was accessing my file share in my VMs because I had entered the wrong path. After some research, I found the correct path.

Results and Benefits

- I feel more comfortable deploying infrastructure in the Azure cloud.
- The challenges and errors I encountered taught me a lot as I was able to fix them.
- I now have a better understanding of the concepts and services.
- My research led me to discover a lot of helpful documentation.
- Previous labs and my notes were instrumental in deploying this project.
- By reviewing my previous labs, I realized there were things I didn't understand well.
- Now, I feel ready to focus on my Azure exam, as I have a better grasp of the concepts and services

Conclusion and Final thoughts

I appreciate everyone's time

