

Codincity Internship Documentation – Microsoft Azure Hands-on Journey

Introduction

During my internship, I worked on hands-on tasks related to Microsoft Azure. The objective was to gain practical experience with cloud computing, virtualization, automation, and security using Azure services.

Task 1: Create Azure Free Account and Resource Group

Objective

To set up an Azure free account and create a resource group, which acts as a logical container for managing Azure resources.

Step-by-Step Process

1. Create Azure Free Account

- Went to <https://azure.microsoft.com/free>.
- Clicked on **Start free**.
- Signed in with my Microsoft account.
- Entered required details: Name, phone number (for OTP verification), and credit/debit card (for free trial validation).
- Completed verification and activated the **Azure Free Trial subscription (₹13,300 / \$200 credits for 30 days)**.

2. Access Azure Portal

- Logged into the Azure Portal.
- Explored the dashboard to understand the interface.

3. Create Resource Group

- In the search bar → typed **Resource groups** → clicked **Create**.
- Selected subscription → *Free Trial*.
- Entered a resource group name (e.g., **RG-Internship**).
- Chose a region (e.g., Central India / East US).
- Clicked **Review + Create** → then **Create**.
- After deployment, confirmed the new resource group in the list.

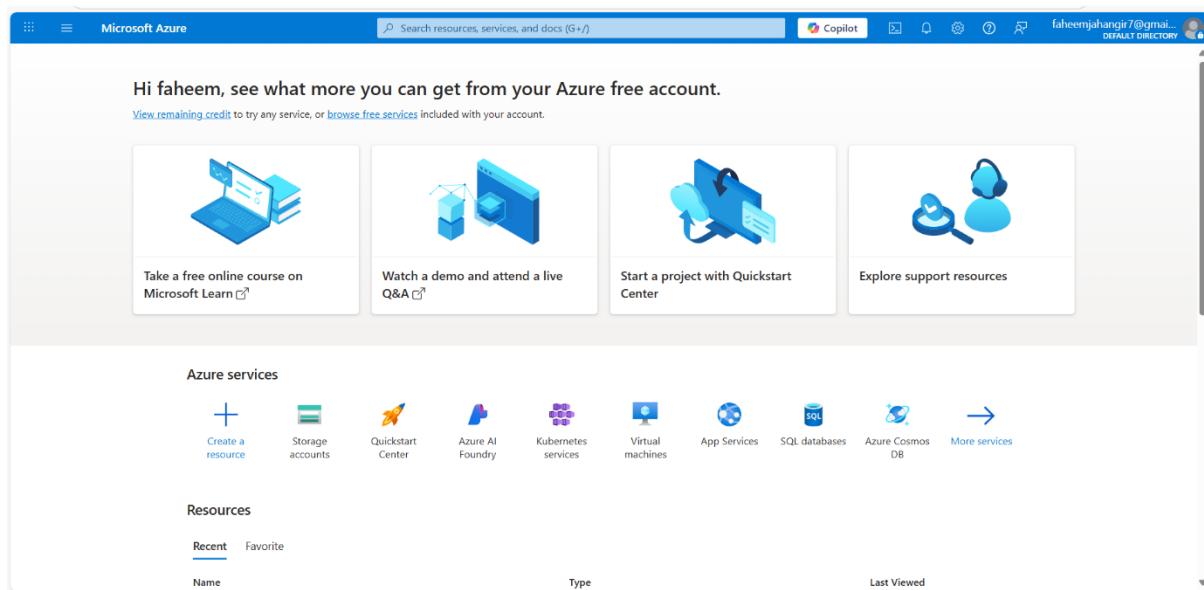
Errors Faced & Solutions

- **Error:** Resource group creation failed because I selected a disabled or unsupported region.
Solution: Changed to a supported region like *Central India* or *East US*.

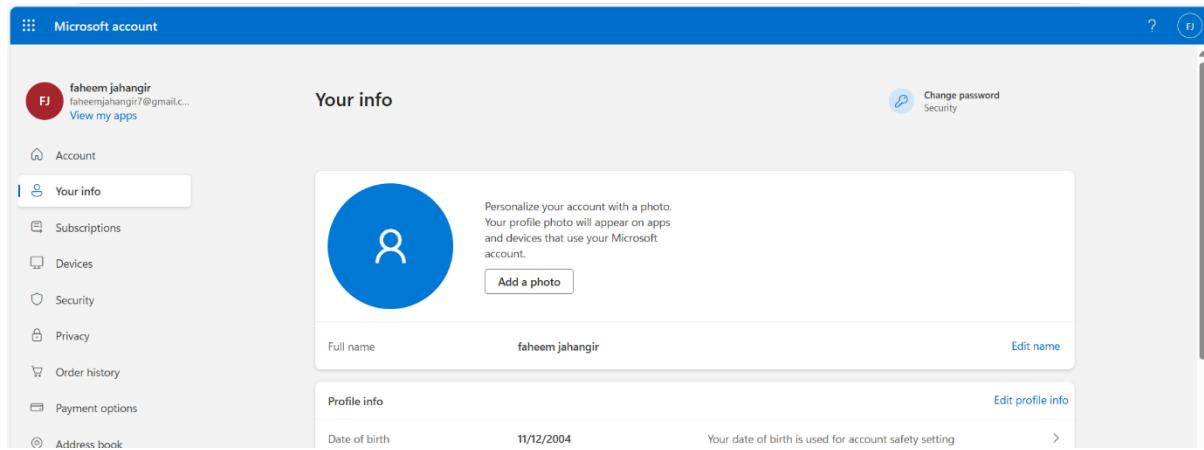
- **Error:** Free trial account did not activate due to incorrect card verification.
Solution: Used another valid card (only ₹2 was deducted temporarily for verification, refunded later).

Learning Outcome

- Learned how to set up an Azure Free Subscription.
- Understood the concept of **Resource Groups** as containers for managing related resources.
- Gained clarity about **regions and subscriptions** in Azure.
- Learned how billing is tied to subscriptions and how resources are organized under resource groups.



The screenshot shows the Microsoft Azure portal homepage. At the top, it greets the user with "Hi faheem, see what more you can get from your Azure free account." Below this, there are four cards: "Take a free online course on Microsoft Learn", "Watch a demo and attend a live Q&A", "Start a project with Quickstart Center", and "Explore support resources". Below these cards is a section titled "Azure services" with links to "Create a resource", "Storage accounts", "Quickstart Center", "Azure AI Foundry", "Kubernetes services", "Virtual machines", "App Services", "SQL databases", "Azure Cosmos DB", and "More services". At the bottom, there is a "Resources" section with tabs for "Recent" (selected) and "Favorite", and columns for "Name", "Type", and "Last Viewed".



The screenshot shows the Microsoft account settings page. On the left, there is a sidebar with links: "Account", "Your info" (selected), "Subscriptions", "Devices", "Privacy", "Order history", "Payment options", and "Address book". The main area is titled "Your info" and shows a placeholder for a profile photo with the text "Personalize your account with a photo. Your profile photo will appear on apps and devices that use your Microsoft account." Below this is a "Full name" field containing "faheem jahangir" with an "Edit name" link. Further down is a "Profile info" section with fields for "Date of birth" (11/12/2004) and "Edit profile info". On the right side, there is a "Change password" link and a "Security" section.

The screenshot shows the Microsoft Azure Resource Groups Overview page for the 'demorg' resource group. The left sidebar lists other resource groups: 'DefaultResourceGroup-EUS', 'demorg' (which is selected), and 'NetworkWatcherRG'. The main area displays a table of resources with columns for Name, Type, and Location. The resources listed are:

Name	Type	Location
alertred	Metric alert rule	Global
ASP-demorg-bd65	App Service plan	Canada Central
codered	Metric alert rule	Global
coderedalert	Metric alert rule	Global
demoaction	Action group	Global
demovm	Virtual machine	Japan East
demovm-ip	Public IP address	Japan East
demovm-nsg	Network security group	Japan East
demovnum132_v1	Network Interface	Japan East

Task 2: Deploy a Basic Azure Storage Account, Upload/Download a File

Objective

To create an Azure Storage Account, explore its services (Blob storage), and practice uploading and downloading files for data storage and access.

Step-by-Step Process

1. Create a Storage Account

- Logged into the **Azure Portal**.
- In the search bar → typed **Storage accounts** → clicked **Create**.
- Filled in the details:
 - **Subscription:** Free Trial
 - **Resource Group:** RG-Internship (created in Task 1)
 - **Storage account name:** internshipstorage01 (names must be globally unique, lowercase, and without spaces)
 - **Region:** Central India (or closest supported region)
 - **Performance:** Standard
 - **Redundancy:** Locally Redundant Storage (LRS)
- Clicked **Review + Create** → **Create**.

- Waited for deployment → confirmed the storage account was listed.

2. Upload a File (Blob Storage)

- Opened the new **Storage Account** → **Containers** → **+ Container**.
- Gave it a name internshipcontainer, set **Public Access** to *Private*.
- Inside the container → clicked **Upload** → selected a test file (e.g., sample.txt) → clicked **Upload**.
- Verified the file appeared in the container.

3. Download a File

- Selected the uploaded sample.txt.
- Clicked **Download**.
- File was saved locally → verified content.

Errors Faced & Solutions

- **Error:** *Storage account name not available* (name must be unique globally).
Solution: Changed to another unique lowercase name (e.g., faheemstorage123).
- **Error:** *Upload failed due to access denied*.
Solution: Checked container access level → changed to allow uploads via portal (kept container private but uploaded via account credentials).
- **Error:** *File download not working in browser*.
Solution: Refreshed portal, re-selected the file, and used the correct **Download** option.

Learning Outcome

- Learned how to create a **Storage Account** and organize files using **Blob Containers**.
- Understood storage account **naming rules** (unique, lowercase, no special characters).
- Gained hands-on practice in **uploading and downloading files**.
- Learned about **storage redundancy options (LRS, GRS, ZRS)** and their purpose.
- Understood how Azure Storage can be used for **backup, file sharing, and application data**.

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Storage center | Storage accounts (Blobs) > Create a storage account

Basics Advanced Networking Data protection Encryption Tags Review + create

[View automation template](#)

Basics

Subscription	Azure subscription 1
Resource group	demo
Location	Central India
Storage account name	faheemstorage2
Preferred storage type	Azure Blob Storage or Azure Data Lake Storage Gen 2
Performance	Standard
Replication	Locally-redundant storage (LRS)

Advanced

Enable hierarchical namespace	Disabled
Enable SFTP	Disabled
Enable network file system v3	Disabled
Allow cross-tenant replication	Disabled
Access tier	Hot
Enable large file shares	Enabled

Previous Next **Create** Give feedback

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > faheemstorage2_1757501983664 | Overview

Deployment

Overview ...

Search Delete Cancel Redeploy Download Refresh

Deployment details

Your deployment is complete

Deployment name: faheemstorage2_1757501983664
Subscription: Azure subscription 1
Resource group: demo

Start time: 9/10/2025, 4:30:38 PM
Correlation ID: 1724ae89-1dde-464e-a95e-8ebb44bd06ff

Next steps **Go to resource**

Give feedback [Tell us about your experience with deployment](#)

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Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > faheemstorage2_1757501983664 | Overview >

faheemstorage2 Storage account

Upload blob

1 file(s) selected: Screenshot 2025-09-10 152657.png

Drag and drop files here or [Browse for files](#)

Select an existing container
faheemdemo [Create new](#)

Overwrite if files already exist

Advanced

Upload Give feedback

Overview

Resource group (move) : demo

Location : centralindia

Subscription (move) : Azure subscription 1

Subscription ID : 2104388c-889b-43f7-8d31-2b5f566b7f1d

Disk state : Available

Tags (edit) : Add tags

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Tools + SDKs

Blob service

Setting	Value
Hierarchical namespace	Disabled
Default access tier	Hot
Blob anonymous access	Disabled
Blob soft delete	Enabled (7 days)
Container soft delete	Enabled (7 days)
Versioning	Disabled
Change feed	Disabled
NFS v3	Disabled
Allow cross-tenant replication	Disabled

Activity log Tags Diagnose and solve problems Access Control (IAM) Data migration Events Storage browser Storage Mover Partner solutions Resource visualizer Data storage Security + networking Data management Settings Monitoring Monitoring (classic)

Add or remove favorites by pressing Ctrl+Shift+F

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Storage center | Storage accounts (Blobs) > faheemstorage2

faheemdemo Container

Screenshot 2025-09-10 152657.png

blob

Save Discard Download Refresh Delete Change tier Acquire lease

Downloads

Screenshot 2025-09-10 152657.png Open file See more

Overview Versions Snapshots Edit Generate SAS

Properties

Property	Value
URL	https://faheemstorage2...
LAST MODIFIED	9/10/2025, 4:36:38 PM
CREATION TIME	9/10/2025, 4:36:38 PM
VERSION ID	-
TYPE	Block blob
SIZE	284.8 KiB
ACCESS TIER	Hot (Inferred)
ACCESS TIER LAST MODIFIED	N/A
ARCHIVE STATUS	-
REHYDRATE PRIORITY	-
SERVER ENCRYPTED	true
ETAG	0x8DDF05A1D047052B
VERSION-LEVEL IMMUTABILITY POLICY	Disabled
CACHE-CONTROL	
CONTENT-TYPE	image/png
CONTENT-MDS	rFXJ79EuQZGogZP19Y3GZA...
CONTENT-ENCODING	
CONTENT-LANGUAGE	

Overview

Diagnose and solve problems Access Control (IAM) Settings

Add or remove favorites by pressing Ctrl+Shift+F

Task 3: Document Examples of IaaS, PaaS, SaaS in Azure and Map Services to Each Category

Objective

To understand the three major cloud service models—**Infrastructure as a Service (IaaS)**, **Platform as a Service (PaaS)**, and **Software as a Service (SaaS)**—and identify Azure services that belong to each category.

Cloud Service Models

1. Infrastructure as a Service (IaaS)

- Provides **virtualized infrastructure** (servers, storage, networking) on-demand.
- Users manage the operating system, applications, and runtime.
- Azure is responsible for physical hardware and virtualization.

Examples in Azure:

- **Azure Virtual Machines (VMs)** – Run applications and host OS.
- **Azure Virtual Network (VNet)** – Secure and isolate network environment.
- **Azure Blob Storage / Disk Storage** – Store structured and unstructured data.
- **Azure Load Balancer** – Distributes network traffic across resources.

2. Platform as a Service (PaaS)

- Provides a **development and deployment environment**.
- Developers focus on applications, while Azure manages infrastructure, runtime, and scaling.

Examples in Azure:

- **Azure App Service** – Build and host web, mobile, and API apps.
- **Azure SQL Database** – Fully managed relational database.
- **Azure Functions** – Event-driven, serverless compute service.
- **Azure Kubernetes Service (AKS)** – Managed container orchestration.
- **Azure Logic Apps** – Automate and integrate workflows.

3. Software as a Service (SaaS)

- Provides **fully managed applications** delivered over the internet.
- End-users access applications without worrying about infrastructure or platform management.

Examples in Azure:

- **Microsoft 365 (Office 365)** – Productivity apps (Word, Excel, Teams, Outlook).
- **Dynamics 365** – Enterprise ERP and CRM solutions.
- **Microsoft Intune** – Cloud-based device and app management.

Task 4: Deploy Two VMs in the Same VNet, Ensure They Can Ping Each Other (Windows VM)

Objective

To deploy two Windows Virtual Machines (VMs) inside the same Virtual Network (VNet) in Azure and test connectivity between them using the **ping** command.

Step-by-Step Process

1. Create a Virtual Network (VNet)

- Logged into **Azure Portal**.
- Searched for **Virtual networks** → **Create**.
- Configured:
 - **Name:** InternshipVNet
 - **Address space:** 10.0.0.0/16
 - **Subnet:** 10.0.0.0/24 named default
- Selected **RG-Internship** as the resource group.
- Clicked **Review + Create** → **Create**.

2. Deploy VM1 (Windows)

- In portal → **Virtual Machines** → **Create**.
- **VM Name:** WinVM1
- **Image:** Windows Server 2019 Datacenter.
- **Size:** Standard B1s (Free tier eligible).
- **Authentication:** Username & Password.
- **Networking:** Selected InternshipVNet and default subnet.
- Clicked **Review + Create** → **Create**.

3. Deploy VM2 (Windows)

- Repeated the same steps, with:
 - **VM Name:** WinVM2

- Attached to **same VNet** (InternshipVNet) and **default subnet**.
- Deployed successfully.

4. Configure Firewall for ICMP (Ping)

- By default, Windows firewall blocks ping (ICMP).
- Connected to **VM1** via Remote Desktop (RDP).
- Opened **Windows Defender Firewall → Advanced Settings → Inbound Rules**.
- Enabled rule **File and Printer Sharing (Echo Request - ICMPv4-In)**.
- Repeated the same step in **VM2**.

5. Ping Test Between VMs

- In **VM1** → Opened Command Prompt → ran:
- ping 10.0.0.5 # (private IP of VM2)
- Reply received from VM2.
- In **VM2** → ran:
- ping 10.0.0.4 # (private IP of VM1)
- Reply received from VM1.
- Verified successful connectivity between the two VMs.

Errors Faced & Solutions

- **Error: Ping request timed out.**
Solution: Enabled ICMP inbound rule in Windows Firewall on both VMs.
- **Error: Wrong IP address used for ping.**
Solution: Checked the **private IP address** of each VM in Azure Portal → Networking → NIC → Private IP. Used the correct one.
- **Error: VM deployment failed due to unsupported size.**
Solution: Changed VM size to an available SKU (e.g., Standard B1s).

Learning Outcome

- Learned how to **deploy multiple VMs** in the same VNet and subnet.
- Understood the concept of **private IP addresses** in Azure.
- Learned how to configure **Windows Firewall** rules to allow ICMP traffic.
- Gained practical experience in **VM-to-VM communication** inside a VNet.

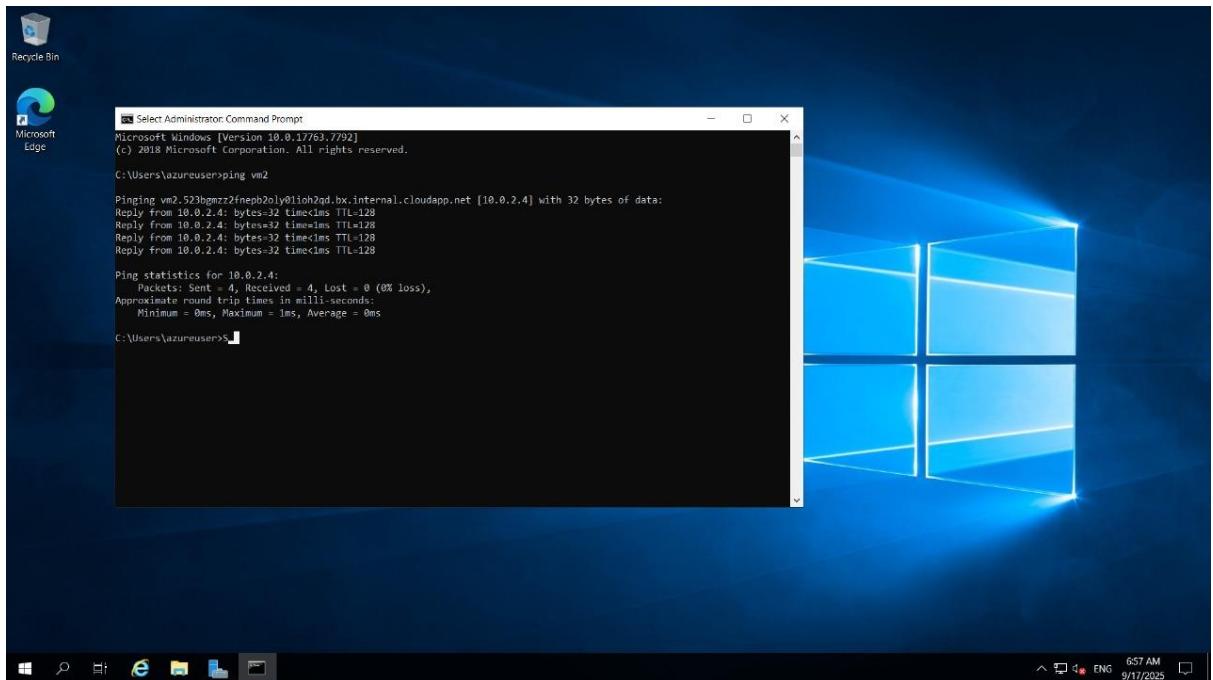
- Understood how Azure networking enables secure communication without requiring a public IP.

The screenshot shows the Microsoft Azure Deployment Overview page for a deployment named "fahvnet-1758000957852". The status is "Your deployment is complete". Deployment details include a name of "fahvnet-1758000957852", a subscription of "Azure subscription 1", and a resource group of "rg_centralindia". The start time was 9/16/2025, 11:05:59 AM, and the correlation ID is 9a2b071f-80eb-4bd7-837d-e699d8deed54. On the right side, there are links for "Cost management", "Microsoft Defender for Cloud", and "Free Microsoft tutorials".

The screenshot shows the Microsoft Azure Deployment Overview page for the same deployment, now in progress. The status is "Deployment is in progress". Deployment details remain the same. On the right side, there are links for "Microsoft Defender for Cloud", "Free Microsoft tutorials", and "Work with an expert".

The screenshot shows the Microsoft Azure Compute Infrastructure Virtual machines page. It displays two virtual machines: "vm1" and "vm2". Both are running Windows operating systems in the Standard_F1s size, located in the East US region with a public IP address of 20.81.41.81 and 20.83.172.73 respectively. The left sidebar shows navigation options like Overview, All resources, Infrastructure, and Virtual machines.

Name	Subscription	Resource Group	Location	Status	Operating system	Size	Public IP address	Disks
vm1	Azure subscription 1	rgeastus	East US	Running	Windows	Standard_F1s	20.81.41.81	1
vm2	Azure subscription 1	new-rg	East US	Running	Windows	Standard_F1s	20.83.172.73	1



Task 5: Create and Use a Blob Storage Account for File Upload/Download

Objective

To create an Azure Blob Storage container, upload files to it, and download them back, demonstrating how Azure stores and manages unstructured data.

Step-by-Step Process

1. **Create a Storage Account (if not already created in Task 2)**
 - Azure Portal → **Storage accounts** → **Create**.
 - Chose **Subscription:** Free Trial, **Resource Group:** RG-Internship.
 - Gave a unique name: faheemblobstore01.
 - Region: Central India, Performance: Standard, Redundancy: LRS.
 - Clicked **Review + Create** → **Create**.
2. **Create a Blob Container**
 - Opened the storage account → **Data Storage** → **Containers**.
 - Clicked **+ Container**.
 - Name: internshipblobcontainer.
 - Public access level: Private (for security).
 - Clicked **Create**.

3. Upload a File to Blob Storage

- Inside internshipblobcontainer, clicked **Upload**.
- Selected a test file (e.g., resume.docx or project.txt).
- Verified the file appeared in the blob list with size and properties.

4. Download a File from Blob Storage

- Selected the uploaded file → clicked **Download**.
- File was saved locally → verified its contents.

5. Optional: Test with Azure Storage Explorer

- Installed **Azure Storage Explorer** tool.
- Logged in with Azure account.
- Navigated to faheemblobstore01 → internshipblobcontainer.
- Verified upload/download directly from the desktop tool.

Errors Faced & Solutions

- **Error:** *Upload failed due to insufficient permissions.*
Solution: Ensured I had **Storage Blob Data Contributor** role on the storage account.
- **Error:** *File upload blocked due to size limit.*
Solution: Split the file or tested with smaller files (Azure free tier allows smaller uploads).
- **Error:** *Blob container not visible in Azure Storage Explorer.*
Solution: Refreshed account in Storage Explorer and verified correct subscription was selected.

Learning Outcome

- Understood the concept of **Blob Storage** for unstructured data (text, images, documents, videos).
- Learned to **create containers, upload, and download blobs**.
- Learned about **public vs. private access levels** in blob containers.
- Explored **Azure Storage Explorer** for easier blob management.
- Realized blob storage can be used for **backup, application storage, and secure file sharing**.

The screenshot shows the Microsoft Azure Storage center interface. The top navigation bar includes 'Microsoft Azure' and 'Upgrade' buttons, a search bar, and a Copilot icon. The main title is 'Storage center | Storage accounts (Blobs)'. A sidebar on the left lists categories like Overview, All storage resources, Object storage, File storage, Block storage, Data management, Migration, Partner solutions, Management services, and Help. The main content area is titled 'Resources' and shows a table of storage accounts. The table has columns for Name, Type, Kind, Resource group, Location, and Subscription. Two entries are listed: 'faheemdemo2' (Storage account, StorageV2, blob_storage, Central India, Azure subscription 1) and 'faheemstorage2' (Storage account, StorageV2, demo, Central India, Azure subscription 1). Filter options at the top include 'Subscription equals all', 'Resource group equals all', 'Location equals all', and an 'Add filter' button. Navigation at the bottom includes 'Previous', 'Page 1 of 1', and 'Next' buttons.

Name	Type	Kind	Resource group	Location	Subscription
faheemdemo2	Storage account	StorageV2	blob_storage	Central India	Azure subscription 1
faheemstorage2	Storage account	StorageV2	demo	Central India	Azure subscription 1

The screenshot shows a Microsoft OneDrive interface. On the left, there's a navigation bar with 'faheem - Personal > Documents'. A search bar at the top right says 'Search Documents'. The main area displays a list of files and folders:

Name	Status	Date modified	Type
Custom Office Templates	Green circle	15-09-2025 15:11	File folder
examples of iaas,paas,saaS	Green circle	15-09-2025 16:07	Microsoft Word Document

Below this is a file selection dialog box:

File name: examples of iaas,paas,saaS All files

Buttons: Upload from mobile, Open, Cancel

At the bottom of the dialog, it says '100 items found'.

To the right of the dialog is an 'Upload blob' interface:

Upload blob

Cloud icon with an upward arrow. Text: Drag and drop files here or [Browse for files](#).

Overwrite if files already exist

[Advanced](#)

Upload button

Give feedback button

Microsoft Azure Upgrade Search resources, services, and docs (G+) Copilot faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7@GMAIL.COM)

All services > newdemo123 | Containers >

docsfiles Container

Overview Add Directory Upload Change access level Refresh Delete Copy Paste Rename Acquire lease Break lease Edit columns

Search blobs by prefix (case-sensitive) Only show active blobs

Showing all 1 items

Name	Last modified	Access tier	Block type	Size	Lease state
examples of iaas,paas,saas.docx	16/9/2025, 3:21:13 pm	Hot (Inferred)	Block blob	19.71 KiB	Available

Add or remove favorites by pressing Ctrl+Shift+F

Microsoft Azure Upgrade Search resources, services, and docs (G+) Copilot faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7@GMAIL.COM)

All services > newdemo123 | Containers >

docsfiles Container

Overview Add Directory Blob Save Discard Download Refresh Delete Change tier Acquire lease

Authentication method: Access key (Switch to Microsoft Entra user account) Add filter Search blobs by prefix (case-sensitive)

Showing all 1 items

Name
examples of iaas,paas,saas.docx

Properties

URL
https://newdemo123.blob.core.windows.net/docsfiles/examples%20of%20iaas,paas,saas.docx

LAST MODIFIED: 9/16/2025, 3:21:13 PM
CREATION TIME: 9/16/2025, 3:21:13 PM
VERSION ID: -
TYPE: Block blob
SIZE: 19.71 KiB
ACCESS TIER: Hot (Inferred)
ACCESS TIER LAST MODIFIED: N/A
ARCHIVE STATUS: -
REHYDRATE PRIORITY: -
SERVER ENCRYPTED: true
ETAG: 0x8DDF50692D43C4C
VERSION-LEVEL IMMUTABILITY POLICY: Disabled
CACHE-CONTROL:
CONTENT-TYPE: application/vnd.openxmlfor...
CONTENT-MD5: sNc9gafgOn7XPO1Wn0l5Q...
CONTENT-ENCODING:
CONTENT-LANGUAGE:
See more

Downloads

- examples of iaas,paas,saas.docx Open file
- fahvm1 (5).rdp Open file
- fahvm1 (4).rdp Open file
- fahvm1 (3).rdp Open file
- fahvm1 (2).rdp Open file
- fahvm2_key.pem Open file
- fahem.pem Open file
- fahvm2.rdp Open file
- fahvm1 (1).rdp Open file
- fahvm1.rdp Open file

Task 6: Secure VM Ports Using a Network Security Group (NSG) and Test Access

Objective

To create and configure a **Network Security Group (NSG)** in Azure to control inbound and outbound traffic for a Virtual Machine (VM), and then test secure access.

Step-by-Step Process

1. Create a Network Security Group (NSG)

- In Azure Portal, searched for **Network security groups** → **Create**.
- **Resource Group:** RG-Internship
- **Name:** Internship-NSG
- **Region:** Central India
- Clicked **Review + Create** → **Create**.

2. Associate NSG with VM's Network Interface

- Opened **Virtual Machines** → **WinVM1** → **Networking**.
- Found the **Network Interface (NIC)** of the VM.
- Under **Network Security Group**, clicked **Associate**.
- Selected Internship-NSG.

3. Configure Inbound Security Rules

- Opened Internship-NSG.
- Went to **Inbound security rules** → **+ Add**.
- Added rules:
 - **Allow RDP** → Port 3389, Protocol TCP, Source Any, Action Allow.
 - **Allow ICMP** (for ping test) → Protocol ICMP, Source Any, Action Allow.
- Denied all other traffic by default (since NSG blocks all unless explicitly allowed).

4. Configure Outbound Security Rules (optional)

- By default, outbound internet access is allowed.
- No changes made, but rules can be added if restrictions are required.

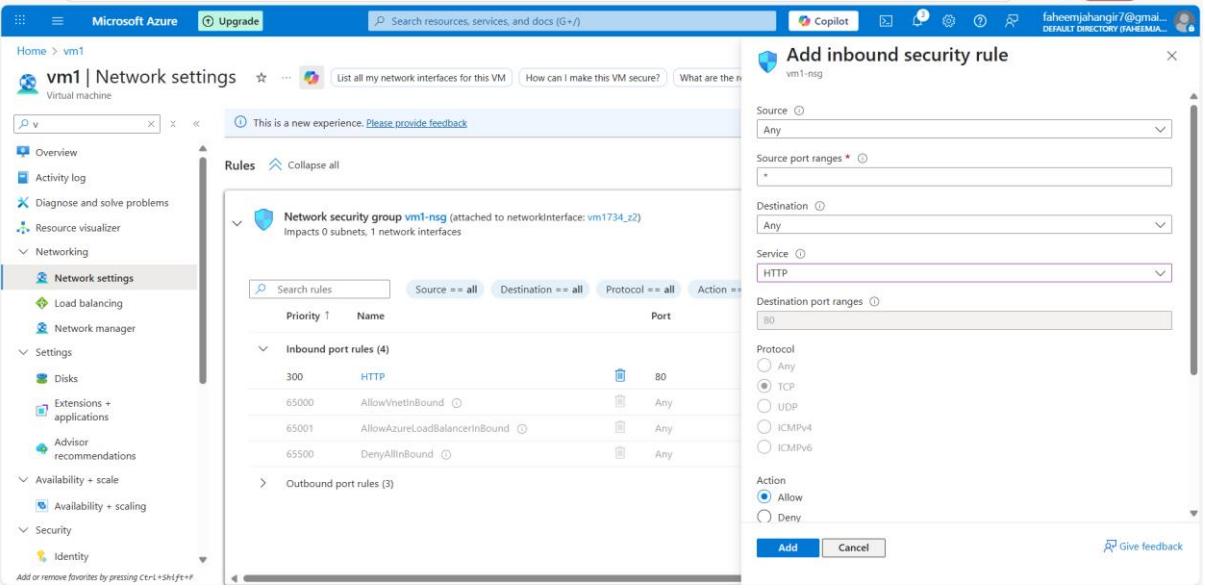
5. Test Access

- Tried RDP into VM using public IP → Connection successful (RDP rule worked).
- From another VM in the same VNet, ran ping <private_IP_of_VM1> → Ping successful (ICMP rule worked).

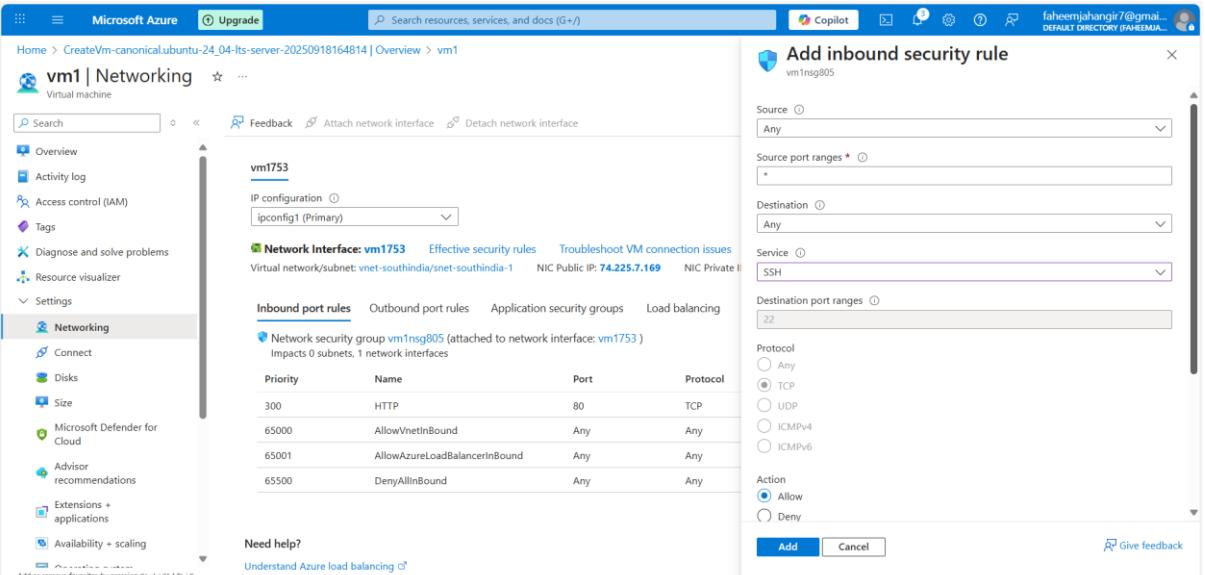
- Tried accessing blocked ports (like 80/443) → Access denied (as expected).

Errors Faced & Solutions

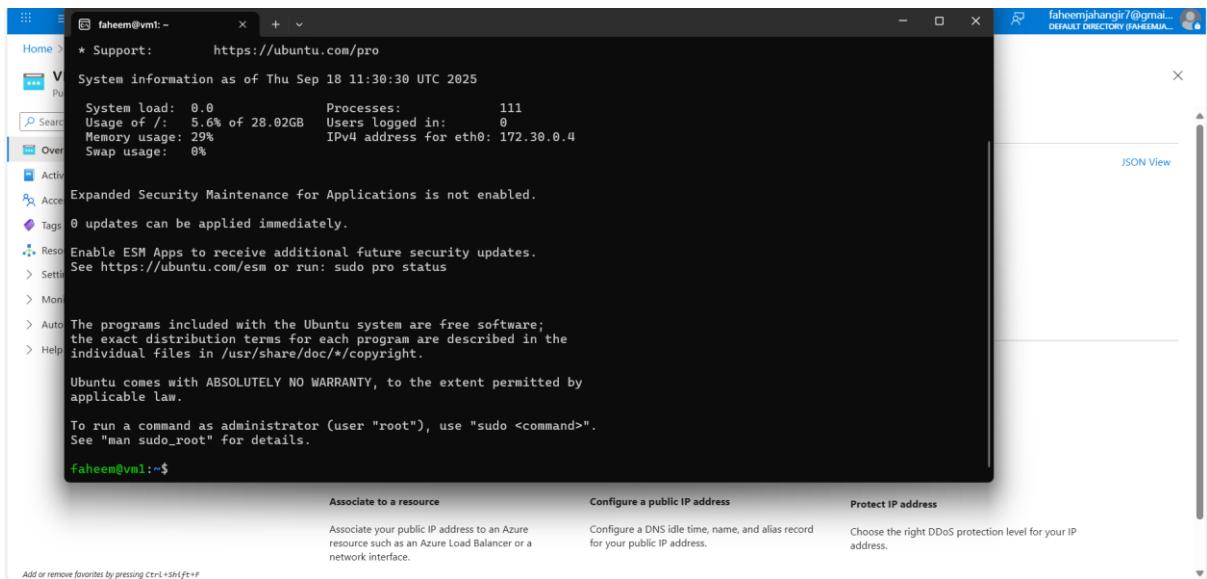
- **Error:** Unable to RDP into VM after associating NSG.
Solution: Added explicit Allow rule for port 3389 (RDP).
- **Error:** Ping test failed.
Solution: Added inbound rule for ICMP (Echo Request) and enabled Windows Firewall rule inside VM.
- **Error:** Confusion between NSG applied at Subnet vs NIC.
Solution: Tested both approaches → learned NSG can be applied either at the NIC or subnet level.



The screenshot shows the Azure portal interface for a virtual machine named 'vm1'. The left sidebar navigation bar is visible, and the main content area displays the 'Network settings' for 'vm1'. On the right, a modal window titled 'Add inbound security rule' is open, specifically for the network security group 'vm1-nsg'. The 'Source' dropdown is set to 'Any'. The 'Destination port ranges' field contains '80'. The 'Protocol' section has 'TCP' selected. The 'Action' section has 'Allow' selected. Below the modal, the main interface shows the existing inbound port rules for 'vm1-nsg', which include rules for HTTP (port 80), AllowVnetInbound (port Any), AllowAzureLoadBalancerInbound (port Any), and DenyAllInbound (port Any). The 'Outbound port rules' section is also visible.



This screenshot shows the Azure portal interface for a virtual machine named 'CreateVm-canonicalubuntu-24_04-lts-server-20250918164814'. The left sidebar navigation bar is visible, and the main content area displays the 'Networking' settings for 'vm1753'. The IP configuration is 'ipconfig1 (Primary)'. The 'Network Interface' section shows 'vm1753' attached to 'vnet-southindia/snet-southindia-1' with a NIC Public IP of '74.225.7.169'. The 'Inbound port rules' table lists four rules: HTTP (port 80, TCP), AllowVnetInbound (port Any, Any), AllowAzureLoadBalancerInbound (port Any, Any), and DenyAllInbound (port Any, Any). On the right, a modal window titled 'Add inbound security rule' is open, specifically for the network security group 'vm1nsg805'. The 'Source' dropdown is set to 'Any'. The 'Destination port ranges' field contains '22'. The 'Service' dropdown is set to 'SSH'. The 'Protocol' section has 'TCP' selected. The 'Action' section has 'Allow' selected. Below the modal, the main interface shows the existing inbound port rules for 'vm1nsg805', which include rules for HTTP (port 80, TCP), AllowVnetInbound (port Any, Any), AllowAzureLoadBalancerInbound (port Any, Any), and DenyAllInbound (port Any, Any).



Task 7: List All Azure Resources Using Cloud Shell

Step 1: Open Azure Cloud Shell

- Go to the **Azure Portal**.
- Click the **Cloud Shell icon** (top-right, looks like >_).
- Choose **Bash** (or PowerShell, but Bash is common).

Step 2: List all Azure resources

- Command:
- `az resource list --output table`
- Explanation:
 - `az resource list` → Lists all resources in your subscription.
 - `--output table` → Displays results in a readable table format.

- Without `--output table`, it shows output in **JSON format**.

Step 3: List resources in a specific Resource Group (Optional)

- Command:
- `az resource list --resource-group <ResourceGroupName> --output table`
- Replace `<ResourceGroupName>` with the actual resource group name.

Step 4: Additional useful commands

- List all VMs:
- `az vm list --output table`

- List all storage accounts:
- az storage account list --output table
-

```

Microsoft Azure [ ~ $] az resource list -o table
+-----+-----+-----+-----+-----+
| Name | ResourceGroup | Location | Type | Status |
+-----+-----+-----+-----+-----+
| fah-nsg | fah_group | centralindia | Microsoft.Network/networkSecurityGroups |          |
| fah-ip | fah_group | centralindia | Microsoft.Network/publicIPAddresses |          |
| vnet-centralindia | fah_group | centralindia | Microsoft.Network/virtualNetworks |          |
| NetworkWatcher_centralindia | NetworkWatcherRG | centralindia | Microsoft.Network/networkWatchers |          |
| fah87_z1 | fah_group | centralindia | Microsoft.Network/networkInterfaces |          |
| demo2-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| demo2-ip | fah2 | centralindia | Microsoft.Network/publicIPAddresses |          |
| vnet-centralindia-1 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| demo292_z1 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| demo2 | fah2 | centralindia | Microsoft.Compute/virtualMachines |          |
| demo2_OsDisk_1_0a36013419624bb0bf6f606c9e5254b8 | FAH0 | centralindia | Microsoft.Compute/disks |          |
| demo1_key | fah2 | centralindia | Microsoft.Compute/sshPublicKeys |          |
| demo1-ip | fah2 | centralindia | Microsoft.Network/publicIPAddresses |          |
| demo1-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-2 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| demo1778_z1 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| faheemdemo2 | blob_storage | centralindia | Microsoft.Storage/storageAccounts |          |
| nsg_fah1 | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| fah2-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-3 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| fah2767 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| fah12-nsg | fah123 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-4 | fah123 | centralindia | Microsoft.Network/virtualNetworks |          |
| fah12301_z1 | fah123 | centralindia | Microsoft.Network/networkInterfaces |          |
| fahdemo-nsg | fah123 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-5 | fah123 | centralindia | Microsoft.Network/virtualNetworks |          |
| fahdemo446 | fah123 | centralindia | Microsoft.Network/networkInterfaces |          |
| fahdemo | fah123 | centralindia | Microsoft.Compute/virtualMachines |          |
| fahdemo_disk1_65131bffd4ce4c649086654fcfe1961d | FAH123 | centralindia | Microsoft.Compute/disks |          |
| faheemstorage2 | demo | centralindia | Microsoft.Storage/storageAccounts |          |
+-----+-----+-----+-----+-----+

```

```

Microsoft Azure [ ~ $] az resource list --resource-group fah2 -o table
+-----+-----+-----+-----+-----+
| Name | ResourceGroup | Location | Type | Status |
+-----+-----+-----+-----+-----+
| demo1778_z1 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| faheemdemo2 | blob_storage | centralindia | Microsoft.Storage/storageAccounts |          |
| nsg_fah1 | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| fah2-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-3 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| fah2767 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| fah12-nsg | fah123 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-4 | fah123 | centralindia | Microsoft.Network/virtualNetworks |          |
| fah12301_z1 | fah123 | centralindia | Microsoft.Network/networkInterfaces |          |
| fahdemo-nsg | fah123 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-5 | fah123 | centralindia | Microsoft.Network/virtualNetworks |          |
| fahdemo446 | fah123 | centralindia | Microsoft.Network/networkInterfaces |          |
| fahdemo | fah123 | centralindia | Microsoft.Compute/virtualMachines |          |
| fahdemo_disk1_65131bffd4ce4c649086654fcfe1961d | FAH123 | centralindia | Microsoft.Compute/disks |          |
| faheemstorage2 | demo | centralindia | Microsoft.Storage/storageAccounts |          |
+-----+-----+-----+-----+-----+
| demo2-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| demo2-ip | fah2 | centralindia | Microsoft.Network/publicIPAddresses |          |
| vnet-centralindia-1 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| demo292_z1 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| demo2 | fah2 | centralindia | Microsoft.Compute/virtualMachines |          |
| demo2_OsDisk_1_0a36013419624bb0bf6f606c9e5254b8 | FAH2 | centralindia | Microsoft.Compute/disks |          |
| demo1_key | fah2 | centralindia | Microsoft.Compute/sshPublicKeys |          |
| demo1-ip | fah2 | centralindia | Microsoft.Network/publicIPAddresses |          |
| demo1-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-2 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| demo1778_z1 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
| nsg_fah1 | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| fah2-nsg | fah2 | centralindia | Microsoft.Network/networkSecurityGroups |          |
| vnet-centralindia-3 | fah2 | centralindia | Microsoft.Network/virtualNetworks |          |
| fah2767 | fah2 | centralindia | Microsoft.Network/networkInterfaces |          |
+-----+-----+-----+-----+-----+

```

Task 8: Automate VM Deployment Using ARM Template (Simple)

Objective: Automate the deployment of a Virtual Machine (VM) in Azure using an ARM (Azure Resource Manager) template instead of manual portal creation.

Step 1: Prepare the ARM Template

Create a JSON file named **vm-deploy.json**:

```
{
    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "vmName": {
            "type": "string",
            "defaultValue": "MySimpleVM"
        },
        "adminUsername": {
            "type": "string",
            "defaultValue": "azureuser"
        },
        "adminPassword": {
            "type": "securestring"
        },
        "location": {
            "type": "string",
            "defaultValue": "eastus"
        }
    },
    "resources": [
        {
            "type": "Microsoft.Compute/virtualMachines",
            "apiVersion": "2021-07-01",
            "name": "[parameters('vmName')]",
            "properties": {
                "osProfile": {
                    "computerName": "[parameters('vmName')]",
                    "adminUsername": "[parameters('adminUsername')]",
                    "adminPassword": "[parameters('adminPassword')]"
                },
                "hardwareProfile": {
                    "vmSize": "Standard_DS1_v2"
                },
                "storageProfile": {
                    "imageReference": {
                        "uri": "https://azuresamplescrd.blob.core.windows.net/vmimages/WindowsServer2019Datacenter-20210701.vhd",
                        "offer": "WindowsServer",
                        "publisher": "MicrosoftWindowsServer",
                        "sku": "2019-Datacenter"
                    },
                    "osDisk": {
                        "caching": "None",
                        "createOption": "FromImage"
                    }
                }
            }
        }
    ]
}
```

```
"name": "[parameters('vmName')]",  
"location": "[parameters('location')]",  
"properties": {  
    "hardwareProfile": {  
        "vmSize": "Standard_B1s"  
    },  
    "osProfile": {  
        "computerName": "[parameters('vmName')]",  
        "adminUsername": "[parameters('adminUsername')]",  
        "adminPassword": "[parameters('adminPassword')]"  
    },  
    "storageProfile": {  
        "imageReference": {  
            "publisher": "Canonical",  
            "offer": "UbuntuServer",  
            "sku": "18.04-LTS",  
            "version": "latest"  
        },  
        "osDisk": {  
            "createOption": "FromImage"  
        }  
    },  
    "networkProfile": {  
        "networkInterfaces": [  
            {  
                "id": "[resourceId('Microsoft.Network/networkInterfaces',  
concat(parameters('vmName'),'-nic'))]"  
            }  
        ]  
    }  
}
```

```
    }
}
]
}
```

Step 2: Create a Resource Group

```
az group create --name MyResourceGroup --location eastus
```

Step 3: Deploy the ARM Template

```
az deployment group create \
--resource-group MyResourceGroup \
--template-file vm-deploy.json \
--parameters adminPassword=<YourPasswordHere>
```

Step 4: Verify VM Deployment

- List VMs:
- az vm list -g MyResourceGroup -o table
- Check VM status:
- az vm get-instance-view --name MySimpleVM --resource-group MyResourceGroup --output table

Errors Encountered & Solutions

- **Error:** Template validation failed (missing NIC/network).
 - *Solution:* Ensure NIC and network resources exist or are included in the template.
- **Error:** Password complexity requirement not met.
 - *Solution:* Use a strong password (uppercase, lowercase, numbers, special characters).

Learnings from This Task

- Understood how ARM templates automate VM deployment, reducing manual errors.
- Learned ARM template structure: **parameters, resources, outputs**.
- Gained troubleshooting experience with template dependencies and password policies.
- Realized the power of **Infrastructure as Code (IaC)** for consistent, repeatable deployments.

.

```

WARNING: You're using Az version 14.3.0. The latest version of Az is 14.4.0. Upgrade your Az modules using the following commands:
Update-PSResource Az -WhatIf -- Simulate updating your Az modules.
Update-PSResource Az -- Update your Az modules.
VERBOSE: Building your Azure drive ...
PS /home/faheem> $resourceGroupName = Read-Host -Prompt "Enter the Resource Group name"
Enter the Resource Group name: rg-new123
PS /home/faheem> $location = Read-Host -Prompt "Enter the location (e.g., eastus, eastus2, centralus, southindia)"
Enter the location (e.g., eastus, eastus2, centralus, southindia): eastus2
PS /home/faheem> $adminUsername = Read-Host -Prompt "Enter the administrator username"
Enter the administrator username: faheemjahangir1
PS /home/faheem> $adminPassword = Read-Host -Prompt "Enter the administrator password" -AsSecureString
Enter the administrator password: *****
PS /home/faheem> $dnsLabelPrefix = Read-Host -Prompt "Enter a unique DNS name for the public IP (lowercase, 3-63 chars, letters/numbers/- only)"
Enter a unique DNS name for the public IP (lowercase, 3-63 chars, letters/numbers/- only): newtemplatearm123
PS /home/faheem>
PS /home/faheem> # Create Resource Group
PS /home/faheem> New-AzResourceGroup -Name $resourceGroupName -Location "$location"

ResourceGroupName : rg-new123
Location        : eastus2
ProvisioningState: Succeeded
Tags            :
ResourceId      : /subscriptions/2104388c-889b-43f7-8d31-2b5f566b7f1d/resourceGroups/rg-new123

PS /home/faheem>
PS /home/faheem> # Deploy VM with fixed size Standard_B2s
PS /home/faheem> New-AzResourceGroupDeployment `
>>   -ResourceGroupName $resourceGroupName ` 
>>   -TemplateUri "https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/quickstarts/microsoft.compute/vm-simple-windows/azuredeploy.json" ` 
>>   -adminUsername $adminUsername ` 
>>   -adminPassword $adminPassword ` 
>>   -dnsLabelPrefix $dnsLabelPrefix ` 
>>   -vmSize "Standard_B2s"

```

Name	Subscription	Resource Group	Location	Status	Operating syst...	Size	Public IP addre...	Disk
simple-vm	Azure subscript...	rg-new123	East US 2	Creating	Windows	Standard_B2s	104.46.205.192	2

Task 9: Create New Azure AD User and Assign Limited Resource Access (RBAC Demo)

Objective:

To create a new user in Azure Active Directory (AD) and assign them **role-based access control (RBAC)** permissions to access specific Azure resources.

Step-by-Step Process:

1. Access Azure AD

- Logged in to Azure Portal.
- Navigated to **Azure Active Directory → Users → + New User → Create user manually.**

2. Create a New User

- Entered the following details:
 - **Name:** TestUser
 - **Username:** testuser@<yourdomain>.onmicrosoft.com
 - **Password:** Auto-generated (or manually set a strong password)
- Selected “**Require user to change password on first sign-in**”.
- Clicked **Create**.

3. Assign RBAC Role to User

- Navigated to the resource (for example, a **Resource Group**) to which access needs to be granted.
- Clicked **Access Control (IAM) → + Add Role Assignment**.
- Selected:
 - **Role:** Reader (for view-only access) or Contributor (for limited edit access)
 - **Assign access to:** User, group, or service principal
 - **Select:** TestUser
- Clicked **Save**.

4. Verify User Access

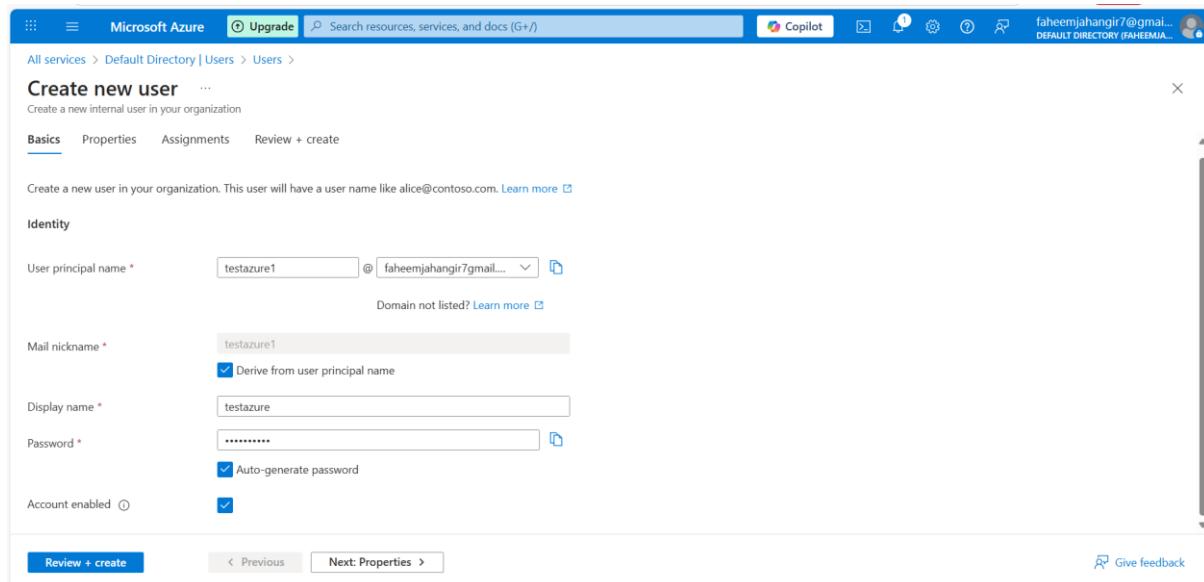
- Logged in as the new user via <https://portal.azure.com> or **Azure CLI**.
- Checked that the user **can only see or manage the resources allowed by the assigned role**.

Errors Encountered & Solutions:

1. **Error:** You do not have permission to assign roles
 - **Cause:** Current account does not have sufficient privileges (needs **Owner or User Access Administrator role**)
 - **Solution:** Logged in as a user with sufficient privileges to assign RBAC roles.
2. **Error:** User cannot access resource
 - **Cause:** Role assignment may take a few minutes to propagate.
 - **Solution:** Waited a few minutes and refreshed the portal.

Learnings from This Task:

- Learned how to **create users in Azure Active Directory** manually.
- Understood **Role-Based Access Control (RBAC)** in Azure and how it limits resource access.
- Learned the difference between **roles like Owner, Contributor, Reader**.
- Practiced verifying **effective permissions** of users.



Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7@GMAIL.COM)

All services > Default Directory | Users > Users >

Create new user

Create a new internal user in your organization

Basics

User principal name	testazure1@faheemjahangir7@gmail.onmicrosoft.com
Display name	testazure
Mail nickname	testazure1
Password	*****
Account enabled	Yes

Properties

User type	Member
-----------	--------

Assignments

Administrative units
Groups
Roles

Buttons: Create, Previous, Next, Give feedback

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7@GMAIL.COM)

Home > Users

All users

Azure Active Directory is now Microsoft Entra ID.

Display name	User principal name	User type	On-premises sync	Identities	Company name
faheem jahangir	faheemjahangir7...@onmicrosoft.com	Member	No	MicrosoftAccount	
testazure	testazure1@fahee...@onmicrosoft.com	Member	No	faheemjahangir7@gmail.o...	

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7@GMAIL.COM)

Home > Resource groups > newrg

Resource groups

You are viewing a new version of Browse experience. Click here to access the old experience.

NetworkWatcherRG
newrg
rg-new
rg-new1
rg-new123
rg-new1234
rg-new7
rg-newarm

Showing 1 - 10 of 14. Display count: auto

newrg | Access control (IAM)

Add role assignment, Add custom role, Assignments, Roles, Deny assignments, Classic administrators

My access
View my level of access to this resource.
Check access
Review the level of access a user, group, service principal, or managed identity has to this resource. Learn more

Grant access to this resource
Grant access to resources by assigning a role. Learn more
Add role assignment

View access to this resource
View the role assignments that grant access to this and other resources. Learn more
View

Add role assignment

Role Members Conditions Review + assign

Selected role Reader

Assign access to User, group, or service principal Managed identity

Members + Select members

Name	Object ID	Type
No members selected		

Description Optional

Select Close

Select members

Search by name or email address

- faheem jahangir(Guest) faheemjahangir7@gmail.com#EXT#@faheemjahangir7@gmail.onmicrosoft.com
- testazure testazure1@faheemjahangir7@gmail.onmicrosoft.com

Selected members: testazure testazure1@faheemjahangir7@gmail.onmicrosoft.com

testazure | Assigned roles

Directory roles

To assign custom roles to a user, your organization needs Microsoft Entra ID Premium P1 or P2.

Role	Description
Local Administrator	Manage all aspects of Microsoft Entra.
Exchange Administrator	Can manage all aspects of the Exchange product.
Exchange Recipient Administrator	Can create or update Exchange Online recipients within the Exchange Online organization.
Extended Directory User Administrator	Manage all aspects of external user profiles in the extended directory for Teams.
External ID User Flow Administrator	Can create and manage all aspects of user flows.
External ID User Flow Attribute Administrator	Can create and manage the attribute schema available to all user flows.
External Identity Provider Administrator	Can configure identity providers for use in direct federation.
Fabric Administrator	Can manage all aspects of Microsoft Fabric.
Global Administrator	Can manage all aspects of Microsoft Entra ID and Microsoft services that use Microsoft Entra identities.
Global Reader	Can read everything that a Global Administrator can, but not update anything.
Global Secure Access Administrator	Create and manage all aspects of Microsoft Entra Internet Access and Microsoft Entra Private Access, including managing access to public and private endpoints.
Global Secure Access Log Reader	Provides designated security personnel with read-only access to network traffic logs in Microsoft Entra Internet Access and Microsoft Entra Private Access for detailed analysis.
Groups Administrator	Members of this role can create/manage groups, create/manage groups settings like naming and expiration policies, and view groups activity and audit.

Add

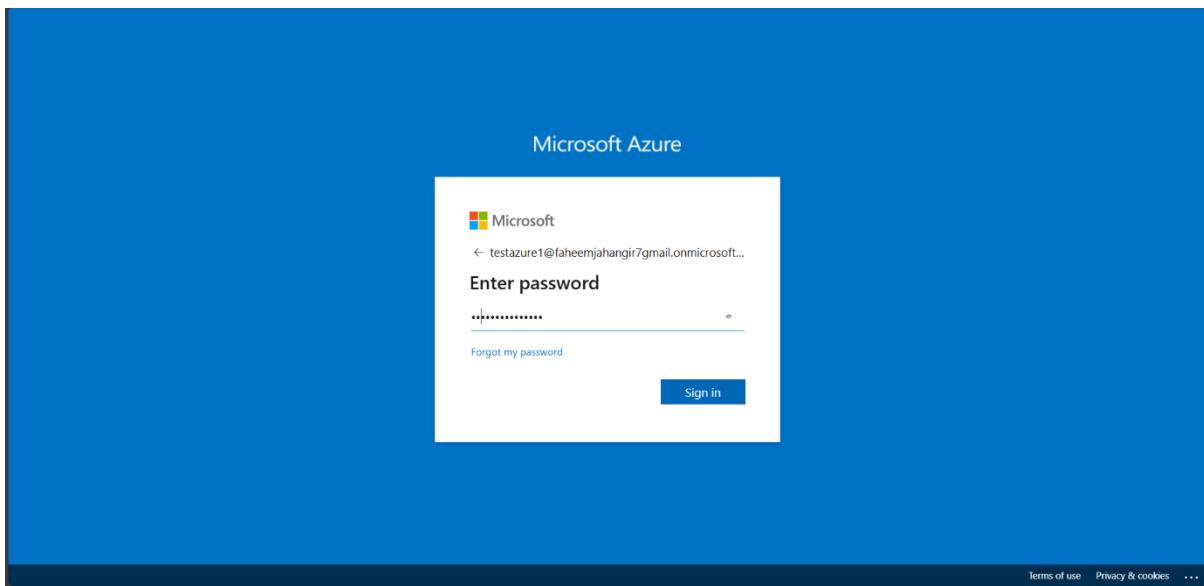
testazure | Assigned roles

Administrative roles

Administrative roles can be used to grant access to Microsoft Entra ID and other Microsoft services. [Learn more](#)

Role	Description	Resource Name	Resource Type	Assignment Path	Type
Global Administrator	Can manage all aspects of Microsoft Entra ID and Microsoft services that use Microsoft Entra identities.	Directory	Organization	Direct	Built-in

Add or remove favorites by pressing Ctrl+Shift+F



The image shows the "My Account" dashboard. On the left, there's a sidebar with options like "My Account", "My Apps", "My Staff", "My Groups", and "Give feedback". The main area features a purple circular profile picture with a white letter "T" and the name "testazure". Below it, there's an email address "testazure1@faheemjahangir7@gmail.onmicrosoft.com". To the right, there are four cards: "Security info" (with a lock icon), "Change password" (with a key icon), "Devices" (with a laptop icon), and "Organizations" (with a briefcase icon). Each card has a "View details" link below it.

The image shows the "Resource groups" page in Microsoft Azure. At the top, there are search, Copilot, and filter icons. Below that is a header with "Resource groups" and a note about viewing a new version. There are buttons for "Create", "Manage view", "Refresh", "Export to CSV", "Open query", and "Assign tags". A message bar says "You are viewing a new version of Browse experience. Click here to access the old experience." Below this is a table with columns for "Name", "Subscription", and "Location". One row is visible, showing "demo-rg", "Azure subscription 1", and "East Asia". At the bottom, there's a footer with "Showing 1 - 1 of 1. Display count: auto" and a "Give feedback" link.

Microsoft Azure

Home > Groups | All groups > new group

Add members

Try changing or adding filters if you don't see what you're looking for.

Search:

102 results found

All Users Groups Devices Enterprise applications

Name	Type	Details
AA	AAD App Management	Enterprise ap...
FJ	faheem jahangir	User
NG	new group	Group
AR	AAD Request Verification Service - PI	Enterprise ap...
T	testazure	User

Select

Selected (0)

No items selected

Reset

Microsoft Azure

Home > demo-rg | Access control (IAM) >

Add role assignment

Role Members Conditions Review + assign

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#)

Copilot can help pick a role

Job function roles Privileged administrator roles

Grant access to Azure resources based on job function, such as the ability to create virtual machines.

Name	Description	Type	Category	Details
Advisor Recommendations Contributor	View assessment recommendations, accepted review recommendations, and manage the recommendation...	BuiltInRole	None	View
Advisor Reviews Contributor	View reviews for a workload and triage recommendations linked to them.	BuiltInRole	None	View
AgFood Platform Sensor Partner Contrib...	Provides contribute access to manage sensor related entities in AgFood Platform Service	BuiltInRole	None	View
AgFood Platform Service Contributor	Provides contribute access to AgFood Platform Service	BuiltInRole	AI + Machine Learning	View
API Management Service Contributor	Can manage service and the APIs	BuiltInRole	Integration	View
API Management Workspace Contributor	Can manage the workspace and view, but not modify its members. This role should be assigned on the w...	BuiltInRole	None	View

Review + assign Previous Next Feedback

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com
DEFAULT DIRECTORY (FAHEEMJAHANGIR7)

Home > demo-rg | Access control (IAM) > Add role assignment

Role **Members*** Conditions Review + assign

Selected role: Advisor Recommendations Contributor (Assessments and Reviews)

Assign access to: User, group, or service principal Managed identity

Members: + Select members

Name	Object ID	Type
No members selected		

Description: Optional

Select members dialog:

Search bar: Search by name or email address

- faheem jahangir(Guest)
faheemjahangir7@gmail.com#EXT#@faheemjahangir7@gmail.onmicrosoft.com
- new group
cloud intern
- testazure
testazure1@faheemjahangir7@gmail.onmicrosoft.com

Selected members: testazure
testazure1@faheemjahangir7@gmail.onmicrosoft.com

Buttons: Review + assign, Previous, Next, Select, Close

Microsoft Azure

Sign in to continue to Microsoft Azure

testazure1@faheemjahangir7@gmail.onmicrosoft.com

No account? Create one!

Can't access your account?

Next

Sign in with GitHub

Sign-in options

Microsoft Azure Search resources, services, and docs (G+)

faheemjahangir7@gmail.com
DEFAULT DIRECTORY (FAHEEMJAHANGIR7)

Home > demo-rg

Resource group

Search

+ Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Group by none

Overview Activity log Access control (IAM) Tags Resource visualizer Events Settings Cost Management Monitoring Automation Help

What are the best practices for managing this resource group? How do I monitor this resource group? How do I troubleshoot issues with this resource group?

Essentials

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Name ↑	Type	Location
demoaccount	Storage account	East Asia

Add or remove favorites by pressing Ctrl+Shift+F

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7)

Home > Groups | Overview > New Group ...

Got feedback?

Group type * Security

Group name * cloud interns

Group description this group is for demo

Membership type Assigned

Owners
No owners selected

Members
No members selected

Create

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7)

Home > Groups | Overview > New Group ...

Got feedback?

Group type * Security

Group name * cloud interns

Group description this group is for demo

Membership type Assigned

Owners
1 owner selected

Members
1 member selected

Add members

Try changing or adding filters if you don't see what you're looking for.

Search testazure

101 results found

All Users Groups Devices Enterprise applications

	Name	Type	Details
<input type="checkbox"/>	AA	AAD App Management	Enterprise ap... f0ae4899-d877-4d3c-ae25-679e38eea492
<input type="checkbox"/>	FJ	faheem jahangir	User faheemjahangir7@gmail.com
<input type="checkbox"/>	AR	AAD Request Verification Service - Pl	Enterprise ap... c728155f-7b2a-4502-a08b-b8af9b269319
<input checked="" type="checkbox"/>	T	testazure	User testazure1@faheemjahangir7@gmail.onmicro...
<input type="checkbox"/>	A	AADReporting	Enterprise ap... 1b912ec3-a9dd-4c4d-a53e-76aa7adb28d7

Select

Microsoft Azure Upgrade Search resources, services, and docs (G+)

faheemjahangir7@gmail.com DEFAULT DIRECTORY (FAHEEMJAHANGIR7)

Home > Resource groups > demo-rg | Access control (IAM) > Add role assignment ...

Role Members Conditions Review + assign

Selected role Advisor Recommendations Contributor (Assessments and Reviews)

Assign access to User, group, or service principal Managed identity

Members + Select members

Name	Object ID	Type
testazure	77384beb-8d20-47e7-984b-3f21c27d0b...	User
cloud interns	471e93e3-80ae-401d-9041-215da6020...	Group

Description Optional

Review + assign Previous Next Feedback

<https://portal.azure.com/#>

Microsoft Azure

Home > Groups

Groups | All groups

Default Directory

New group Download groups Refresh Manage view Delete Got feedback?

Overview All groups Deleted groups Diagnose and solve problems Settings Activity Troubleshooting + Support

Microsoft Entra has a simpler, integrated experience for managing all your Identity and Access Management needs. Try the new Microsoft Entra admin center!

Search Add filter

Search mode Contains

1 group found

Name	Object Id	Group type	Membership type
cloud interns	471e93e3-80ae-401d-9041-215da6020b58	Security	Assigned

Microsoft Azure

Home > cloud interns

cloud interns | Members

Group

Add members Bulk operations Refresh Manage view Remove Got feedback?

Overview Diagnose and solve problems Manage Properties Members Owners Roles and administrators Administrative units Group memberships Applications Licenses Azure role assignments Activity Troubleshooting + Support

Direct members All members

Search Add filter

2 group members found

Name	Type	Email	User type
faheem jahangir	User		Member b
testazure	User		Member 7

Task 10: Deploy Azure SQL Database, Create Table, Insert/Query Data

Objective:

To deploy an **Azure SQL Database**, create a table, insert data into it, and query the data using **SQL Server Management Studio (SSMS)** or Azure Portal query editor.

Step-by-Step Process:

1. Create Azure SQL Database

- Logged in to Azure Portal.
- Navigated to **SQL Databases** → **+ Create**.
- Selected:
 - **Subscription & Resource Group:** MyResourceGroup
 - **Database Name:** StudentDB
 - **Server:** Created new server (example: myserverfaheem)
 - **Admin login:** adminuser
 - **Password:** Strong password
 - **Compute & Storage:** Basic tier (for learning/demo purposes)
- Clicked **Review + Create** → **Create**.

2. Configure Firewall Rule

- To allow access from local machine:
 - Went to the SQL server → **Networking** → **Add client IP** → Save.

3. Connect to SQL Database

- Opened **SQL Server Management Studio (SSMS)**.
- Connected using:
 - **Server Name:** myserverfaheem.database.windows.net
 - **Authentication:** SQL Server Authentication
 - **Login:** adminuser
 - **Password:** <yourpassword>

4. Create a Table

Opened a new query window and ran:

```
CREATE TABLE Students (
```

```
    StudentID INT PRIMARY KEY,
```

```
Name NVARCHAR(50),  
Class NVARCHAR(50)  
);
```

Verified table creation with:

```
SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME = 'Students';
```

5. Insert Data

Inserted sample data:

```
INSERT INTO Students (StudentID, Name, Class)  
VALUES  
(1, 'Faheem', 'BCA Final'),  
(2, 'Ali', 'BCA Third'),  
(3, 'Sara', 'BCA Final');
```

6. Query Data

Checked inserted data:

```
SELECT * FROM Students;
```

Output displayed all inserted records with StudentID, Name, and Class.

Errors Encountered & Solutions:

1. **Error:** Cannot connect to server
 - o **Cause:** Firewall rules blocking client IP.
 - o **Solution:** Added local IP address to SQL server firewall.
2. **Error:** CREATE TABLE permission denied
 - o **Cause:** Logged in as a user without admin privileges.
 - o **Solution:** Used the server admin account created during SQL server setup.

Learnings from This Task:

- Learned how to **deploy an Azure SQL Database** and configure access.
- Practiced **creating tables, inserting data, and querying data** using SQL commands.
- Understood **firewall rules and authentication for Azure SQL**.
- Gained confidence in managing **Azure PaaS services** via both portal and SSMS.

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Home > Flexible server

Subscription: Azure subscription 1
Resource group: demo-rg
Server name: sqldemodatabase
Administrator login: faheem
Location: East Asia
Availability zone: No preference
High availability: Disabled
MySQL version: 8.0
Workload type: Dev/Test
Compute + storage: Burstable, B1ms, 1 vCores, 2 GiB RAM, 20 GiB storage, Auto scale IOPS
Backup redundancy: Geo-redundant
Zonal Resiliency: No

Tags

If you need to modify the default settings, please click on [Advanced Create](#)

Create [Previous : Tags](#) [Download a template for this configuration](#) [Start](#)

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Home > MySQLFlexibleServer_4b8e44d0977811f0af239b273a42fbc | Overview

sqldemodatabase MySQL Database for MySQL flexible server

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Learning center
- Resource visualizer
- Settings
- Power Platform
- Security
- Monitoring
- Automation
- Help

Azure Database for MySQL – Live Webinar series: Learn about the latest updates (with demos) and interact directly with product group on the 2nd Wednesday of every month! [Subscribe to our YouTube channel](#) today!

Essentials

Subscription (move)	: Azure subscription 1	Server name	: sqldemodatabase.mysql.database.azure.com
Subscription ID	: 2104388c-889b-43f7-8d31-2b5f566b7f1d	Administrator login	: faheem
Resource group (move)	: demo-rg	Configuration	: Burstable_B1ms_1vCores_2GiB RAM_20 storage_360 IOPS
Status	: Ready	MySQL version	: 8.0 Upgrade
Location	: East Asia	Availability zone	: 3
Tags (edit)	: Add tags	Created on	: 2025-09-22 05:52:52.8680346 UTC

Getting started [Properties](#) [Recommendations](#) [Monitoring](#) [Tutorials](#)

We've prepared a checklist to get you started

Add or remove favorites by pressing **Ctrl+Shift+F**

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Home > Azure SQL | SQL databases > Create SQL Database >

Create SQL Database Server

Authentication

Azure Active Directory (Azure AD) is now Microsoft Entra ID. [Learn more](#)

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Microsoft Entra authentication [Learn more](#), or using an existing Microsoft Entra user, group, or application as Microsoft Entra admin [Learn more](#), or select both SQL and Microsoft Entra authentication.

Authentication method

- Use Microsoft Entra-only authentication
- Use both SQL and Microsoft Entra authentication
- Use SQL authentication

Server admin login *: demo

Password *:

Confirm password *:

OK Feedback

Create SQL Database

Subscription * Azure subscription 1

Resource group * demo-rg

Database details

Enter required settings for this database, including picking a logical server and configuring the compute and storage resources

Database name *

Server * Create new

Want to use SQL elastic pool? Yes No

Workload environment Development Production

Default settings provided for Development workloads. Configurations can be changed later.

Create SQL Database

Configure network access and connectivity for your server. The configuration selected below will apply to the selected server 'sqldemo12' and all databases it manages. [Learn more](#)

Network connectivity

Choose an option for configuring connectivity to your server via public endpoint or private endpoint. Choosing no access creates with defaults and you can configure connection method after server creation. [Learn more](#)

Connectivity method * No access Public endpoint Private endpoint

Firewall rules

Setting 'Allow Azure services and resources to access this server' to Yes allows communications from all resources inside the Azure boundary, that may or may not be part of your subscription. [Learn more](#)

Setting 'Add current client IP address' to Yes will add an entry for your client IP address to the server firewall.

Allow Azure services and resources to access this server * No Yes

Add current client IP address * No Yes

Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. Learn more about serverless billing.

Microsoft.SQLDatabase.newDatabaseNewServer_f922b392c0ee4927955cd | Overview

Deployment

Overview

Your deployment is complete

Deployment name : Microsoft.SQLDatabase.newDatabaseNe... Start time : 9/22/2025, 12:16:38 PM

Subscription : Azure subscription 1 Correlation ID : 86882263-16a0-4f89-9c81-b2189183e99a

Resource group : demo-rg

Deployment details

Next steps

Add or remove favorites by pressing Ctrl+Shift+F

Deployment succeeded

Deployment 'Microsoft.SQLDatabase.newDatabaseNewServer_f922...' to resource group 'demo-rg' was successful.

Cost management

Get notified to stay within your budget and prevent unexpected charges on your bill. [Set up cost alerts >](#)

Microsoft Defender for Cloud

Secure your apps and infrastructure. [Go to Microsoft Defender for Cloud >](#)

Free Microsoft tutorials

Start learning today >

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support. [Find an Azure expert >](#)

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Microsoft.SQLDatabase.newDatabaseNewServer_f922b392c0ee4927955cd | Overview > sqldemo (sqldemo12/sqldemo)

sqldemo (sqldemo12/sqldemo) | Query editor (preview)

SQL database

Search Login New Query Open query Feedback Getting started

Diagnose and solve problems

Query editor (preview)

- Mirror database in Fabric (preview)
- Resource visualizer
- Settings
- Data management
 - Replicas
 - Sync to other databases
 - Integrations
 - Power Platform
 - Security
 - Intelligent performance
 - Monitoring
 - Automation
 - Help

Welcome to SQL Database Query Editor

SQL server authentication

Login * demo

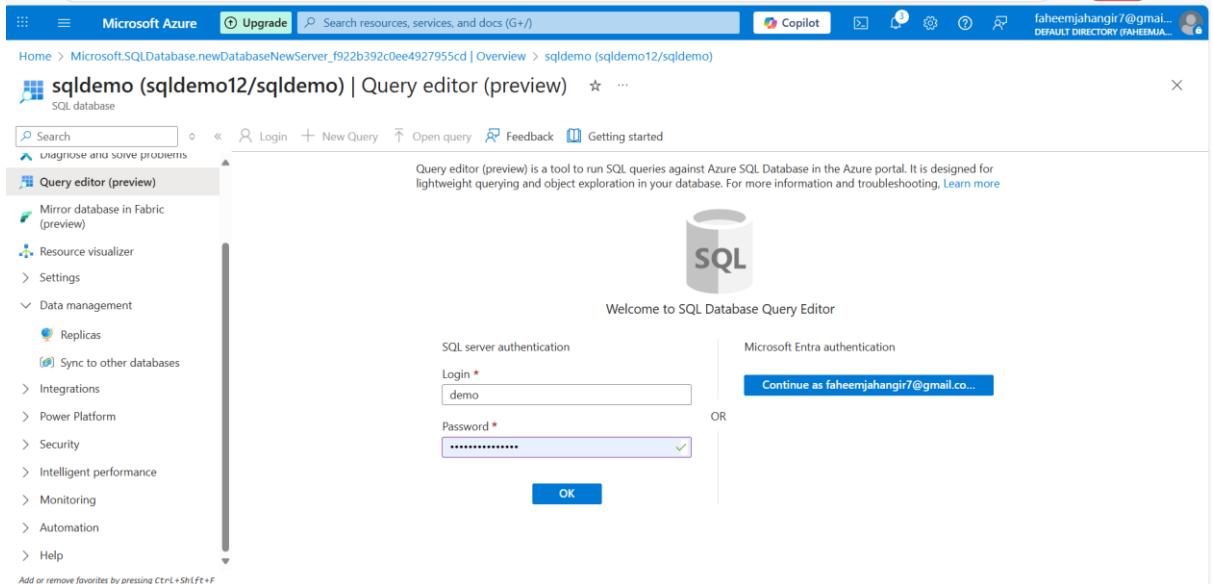
Password *

OK

Microsoft Entra authentication

Continue as faheemjahangir7@gmail.co...

Add or remove favorites by pressing Ctrl+Shift+F



Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > demo1 (sqldemo12/demo1)

demo1 (sqldemo12/demo1) | 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)

Resource visualizer

Settings

Data management

- Replicas
- Sync to other databases
- Integrations
- Power Platform
- Security

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

demo1 (faheemjahangir7@gmail.com)

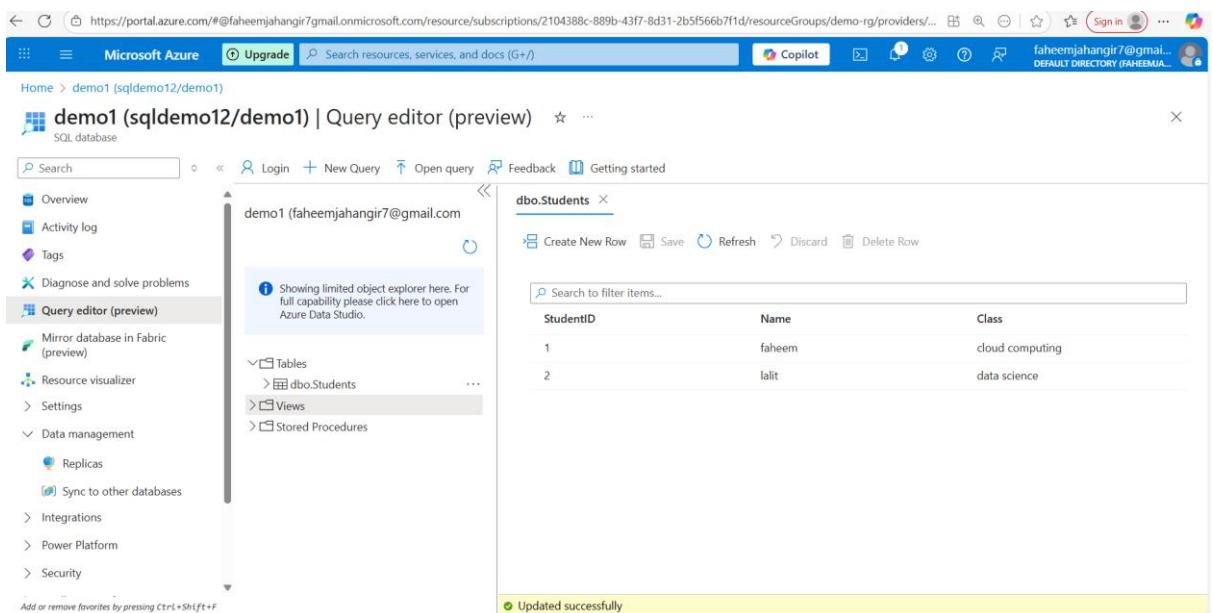
dbo.Students

Create New Row Save Refresh Discard Delete Row

Search to filter items...

StudentID	Name	Class
1	faheem	cloud computing
2	lalit	data science

Updated successfully



The screenshot shows the SSMS interface with the following details:

- Object Explorer:** Shows the connection to `sqldemo12.database.windows.net` (SQL Server 12.0.2000.8) and the database `master`.
- SQLQuery1... (demo (98))**: A query window containing the following SQL code:

```
1 CREATE TABLE Students (
2     StudentID INT PRIMARY KEY,
3     Name NVARCHAR(50),
4     Class NVARCHAR(20)
5 );
6
```
- Messages:** Displays the execution results:

```
Commands completed successfully.  
Completion time: 2025-09-22T16:24:39.5668819+05:30
```
- Status Bar:** Shows "Query executed successfully." and the session information: `sqldemo12.database.windows... | demo (98) | master | 00:00:00 | 0 rows`.

The screenshot shows the SSMS interface with the following details:

- Object Explorer:** Shows the connection to `sqldemo12.database.windows.net` (SQL Server 12.0.2000.8) and the database `demo1`.
- SQLQuery4.s... (demo (89))**: A query window containing the following SQL code:

```
1 DROP TABLE IF EXISTS Students;
2
3 CREATE TABLE Students (
4     StudentID INT IDENTITY(1,1) PRIMARY KEY,
5     Name NVARCHAR(100) NOT NULL,
6     Class NVARCHAR(50) NOT NULL
7 );
8
```
- Messages:** Displays the execution results:

```
Commands completed successfully.  
Completion time: 2025-09-22T17:09:41.3887481+05:30
```
- Status Bar:** Shows "Query executed successfully." and the session information: `sqldemo12.database.windows... | demo (89) | demo1 | 00:00:00 | 0 rows`.

SQl Server Management Studio (SSMS) screenshot showing the execution of an INSERT query.

Object Explorer:

- Connected to: sqldemo12.database.windows.net (SQL Server 12.0.2000.8)
- Databases: demo1
- Tables: dbo.Students, dbo.Table_1

SQL Query Editor:

```
1 ✓ INSERT INTO Students (Name, Class)
2   VALUES
3     ('Faheem', 'BCA Final'),
4     ('Rahul', 'BCA Final'),
5     ('Priya', 'BCA Second');
```

Messages:

(3 rows affected)
Completion time: 2025-09-22T17:10:44.6424820+05:30

Status Bar:

Query executed successfully.
sqldemo12.database.windows... demo (79) demo1 00:00:00 0 rows

SQl Server Management Studio (SSMS) screenshot showing the execution of a SELECT query.

Object Explorer:

- Connected to: sqldemo12.database.windows.net (SQL Server 12.0.2000.8)
- Databases: demo1
- Tables: dbo.Students, dbo.Table_1

SQL Query Editor:

```
1 -- Show all rows
2 ✓ SELECT * FROM Students;
3
4 -- Show only Name and Class
5 SELECT Name, Class FROM Students;
6
7 -- Find one student by ID
8 SELECT * FROM Students WHERE StudentID = 1;
```

Results Grid:

StudentID	Name	Class
1	Faheem	BCA Final
2	Rahul	BCA Final
3	Priya	BCA Second
4	Faheem	BCA Final
5	Rahul	BCA Final
6	Priya	BCA Second

Results Grid:

Name	Class
Faheem	BCA Final
Rahul	BCA Final
Priya	BCA Second
Faheem	BCA Final
Rahul	BCA Final
Priya	BCA Second

Status Bar:

Query executed successfully.
sqldemo12.database.windows... demo (97) demo1 00:00:00 13 rows

Task 11: Enable Monitoring and Alerts for Existing Azure Resources

Objective:

To enable **monitoring and alerts** for existing Azure resources (like VMs, Storage Accounts, SQL Databases) to get notifications on critical conditions or metrics.

Step-by-Step Process:

1. Access Azure Monitor

- Logged in to Azure Portal.
- Navigated to **Monitor** → **Alerts** → **+ Create** → **Alert Rule**.

2. Select Target Resource

- Clicked **Select Resource**.
- Chose the resource to monitor (e.g., MyVM for CPU usage, StudentDB for DTU consumption).

3. Define Condition

- Clicked **Add Condition**.
- Selected a signal (metric or log):
 - Example for VM: **Percentage CPU > 80%**
 - Example for Storage: **Total Requests > 1000**
- Configured threshold and aggregation type (Average, Maximum, etc.).

4. Configure Action

- Clicked **Add Action Group** → **Create action group**.
- Provided:
 - **Action Group Name:** EmailAlertsGroup
 - **Action Type:** Email/SMS/Push/Voice
 - **Email:** Entered recipient email.
- Saved the action group.

5. Define Alert Details

- Gave alert a name: HighCPU_Alert_VM
- Severity: Sev 2 (Warning)
- Enabled the alert rule.

6. Test the Alert

- For VM: Used **stress testing** or temporarily increased CPU usage to trigger the alert.
- Verified the **email notification** or action triggered by the alert.

Repeat for Other Resources

- Added alerts for Storage Account (e.g., **Blob Capacity**), SQL Database (e.g., **DTU percentage**).

Errors Encountered & Solutions:

1. Error: No metrics found for this resource

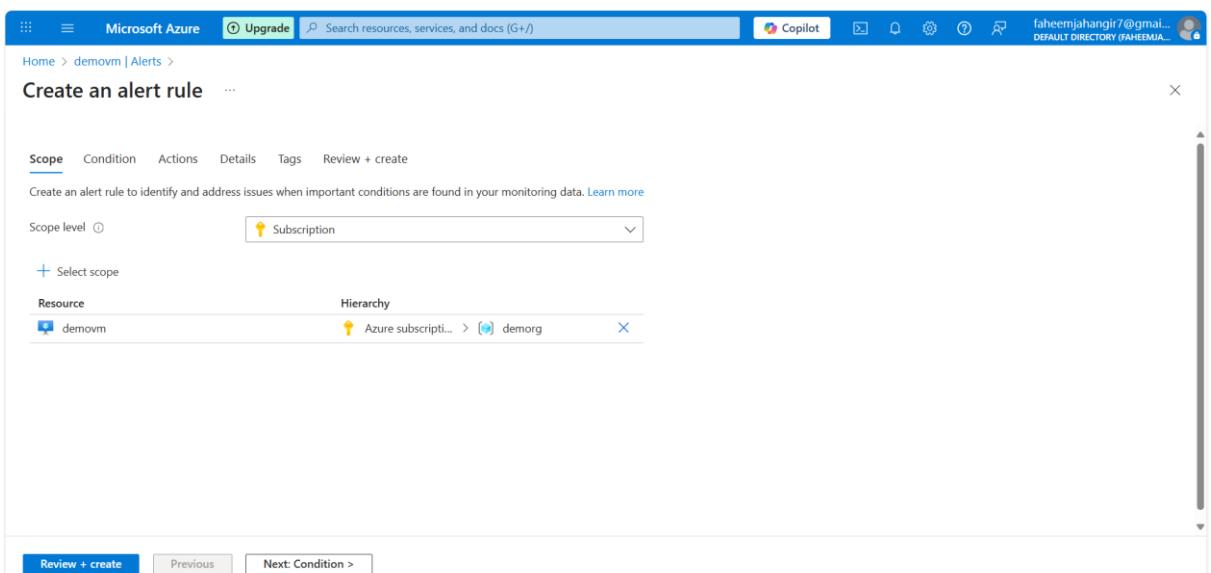
- **Cause:** Resource may not have diagnostics enabled.
- **Solution:** Enabled **Diagnostics Settings** for the resource and selected **Send metrics to Log Analytics**.

2. Error: Alerts not triggering

- **Cause:** Threshold set incorrectly or test load not sufficient.
- **Solution:** Adjusted threshold to a realistic level or simulated conditions to test alerts.

Learnings from This Task:

- Learned how **Azure Monitor** can track metrics and logs for resources.
- Understood **creating alerts** and linking them with **action groups** for notifications.
- Learned how to **test and troubleshoot alert rules** to ensure proper notification.
- Realized the importance of monitoring to **prevent downtime and detect issues early**.



The screenshot shows the Azure portal interface for creating an alert rule. The top navigation bar includes 'Microsoft Azure', 'Upgrade', a search bar, and user information. The main title is 'Create an alert rule'. Below it, there are tabs for 'Scope', 'Condition', 'Actions', 'Details', 'Tags', and 'Review + create'. The 'Scope' tab is active, showing 'Subscription' selected under 'Scope level'. A 'Select scope' button is available. The 'Resource' section lists a single resource named 'demovm'. The 'Hierarchy' section shows the resource's parent subscription and group. At the bottom, there are navigation buttons: 'Review + create' (highlighted in blue), 'Previous', and 'Next: Condition >'. The URL in the address bar is 'Home > demovm | Alerts > Create an alert rule'.

Create an alert rule

Alert logic

We have set the condition configuration automatically based on popular settings for this metric. Please review and make changes as needed.

Threshold type: Static Dynamic

Aggregation type: Average

Value is: Greater than

Threshold *: 80 %

When to evaluate

Check every: 1 minute

Lookback period: 5 minutes

Preview

\$0.10 USD/month

Whenever the average Percentage CPU is greater than 80%

Preview time range: Over the last 6 hours Time series: Aggregate

Percentage CPU (Avg), demovm | 2.33%

+ Add condition

Review + create **Previous** **Next: Actions >**

Create action group

Basics **Notifications** **Actions** **Tags** **Review + create**

Choose how to get notified when the action group is triggered. This step is optional.

Notification type: Email/SMS message... **Name**: codered

Please configure the notification by clicking the edit button.

Email/SMS message/Push/Voice

Email: faheemjahangir7@gmail.com

SMS (Carrier charges may apply)
Country code: 91
Phone number: 8825493228

Azure mobile app notification
Azure account email: faheemjahangir7@gmail.com
Make sure recipients are signed in to the mobile app with this email.
Scan a QR code to download the app

Voice
Country code: 91
Phone number: 8825493228

Enable the common alert schema. [Learn more](#)
Yes **No**

OK

Create action group

Basics **Notifications** **Actions** **Tags** **Review + create**

This is a summary of your action group. Please review to ensure the information is correct and consider [Azure Monitoring Pricing](#) and the [Azure Privacy Statement](#).

Basics

Subscription	Azure subscription 1
Resource group	demorg
Region	global
Action group name	demoaction
Display name	demo

Notifications

Notification type	Name	Selected
Email/SMS message/Push/Voice	codered	Email, SMS message, Push, Voice

Actions

Microsoft Azure Upgrade Search resources, services, and docs (G+)

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Home > Compute infrastructure | Virtual machines > demovm

demovm | Metrics

Virtual machine

Search + New chart Refresh Share Local Time: 9/23 3:52 AM - 9/24 3:52 AM (Auto...)

Identity Microsoft Defender for Cloud

Backup + disaster recovery Operations

Monitoring Insights Alerts Metrics

- Diagnostic settings
- Logs
- Workbooks

Automation Tasks Export template Help

Add or remove favorites by pressing Ctrl+Shift+F Give Feedback

Avg CPU Credits Consumed for demovm

+ Add metric * Add filter Apply splitting Line chart Drill into Logs New alert rule Save to dashboard ...

demovm, CPU Credits Consumed, Avg

CPU Credits Consumed (Avg), demovm | 0.02

6 AM 12 PM 6 PM Wed 24 UTC+0530

https://mail.google.com/mail/u/0/?hl=en_G8#inbox/IMfcg2QcpwknwtXKCgJCTmlnCmngzk

Gmail Search mail

Compose

Inbox 109

- Starred
- Snoozed
- Sent
- Drafts 2
- More

Labels +

Microsoft Azure <azure-noreply@microsoft.com> Unsubscribe to me 15:57 (4 minutes ago)

Microsoft Azure

Your Azure Monitor alert was triggered

Azure monitor alert rule codeder was triggered for demovm at September 23, 2025 10:26 UTC.

Rule ID	/subscriptions/2104388c-889b-43f7-8d31-2b5f566b7f1/resourceGroups/demorg/providers/microsoft.insights/metricAlerts/codeder	View Rule >
Resource ID	/subscriptions/2104388c-889b-43f7-8d31-2b5f566b7f1/resourceGroups/demorg/providers/Microsoft.Compute/virtualMachines/demovm	View Resource >

Enable desktop notifications for Gmail. OK No, thanks

Alert Activated Because:



+1 425-215-0904

Washington State ⚙️

Reply with message

