

# **REPORT ON MICROSOFT AZURE FUNDAMENTALS**

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Date	10.08.2024

# 1)Sandbox:

## Create a Linux virtual machine and install Nginx

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### Exercise - Create an Azure virtual machine

10 minutes

Sandbox activated! Time remaining: 35 min

You have used 1 of 10 sandboxes for today. More sandboxes will be available tomorrow.

In this exercise, you create an Azure virtual machine (VM) and install Nginx, a popular web server.

You could use the Azure portal, the Azure CLI, Azure PowerShell, or an Azure Resource Manager (ARM) template.

Azure Cloud Shell

Switch to PowerShell Restart Manage files New session

Requesting a Cloud Shell.Succeeded.  
Connecting terminal...

Welcome to Azure Cloud Shell

Type "az" to use Azure CLI  
Type "help" to learn about Cloud Shell

srinithikak [ ~ ]\$ az vm create --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --name my-vm --public-ip-sku Standard --image Ubuntu2204 --admin-username azureuser --generate-ssh-keys  
SSH key files '/home/srinithikak/.ssh/id\_rsa' and '/home/srinithikak/.ssh/id\_rsa.pub' have been generated under ~/.ssh to allow SSH access to the VM. If using machines without permanent storage, back up your keys to a safe location.

{  
 "fqdns": "",  
 "id": "/subscriptions/f26515d9-3bc6-4a50-8192-cb816a833f54/resourceGroups/learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398/providers/Microsoft.Compute/virtualMachines/my-vm",  
 "location": "westus",  
 "macAddress": "00-0D-3A-5A-4B-42",  
 "powerState": "VM running",  
 "privateIpAddress": "10.0.0.4",  
 "publicIpAddress": "40.118.165.20",

## Access your web server

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### Task 1: Access your web server

In this procedure, you get the IP address for your VM and attempt to access your web server's home page.

- Run the following `az vm list-ip-addresses` command to get your VM's IP address and store the result as a Bash variable:

Azure CLI

Copy

```
IPADDRESS=$(az vm list-ip-addresses \
--resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" \
--name my-vm \
--query "[].virtualMachine.network.publicIpAddresses[*].ipAddress" \
--output tsv)
```

- Run the following `curl` command to download the home page:

Bash

Copy

Azure Cloud Shell

Switch to PowerShell Restart Manage files New session

```
"storageAccountType": "Premium_LRS",  
  "name": "my-vm_disk1_871584f3bc7e4ca8bbe8d9e6ba77477a",  
  "osType": "Linux",  
  "vhd": null,  
  "writeAcceleratorEnabled": null  
},  
  "tags": {},  
  "timeCreated": "2024-08-10T05:39:50.427606+00:00",  
  "type": "Microsoft.Compute/virtualMachines",  
  "userData": null,  
  "virtualMachineScaleSet": null,  
  "vmId": "d8bf78a3-d565-45ac-9bd8-01bc97de47f2",  
  "zones": null  
}  
srinithikak [ ~ ]$ IPADDRESS=$(az vm list-ip-addresses --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --name my-vm --query "[].virtualMachine.network.publicIpAddresses[*].ipAddress" --output tsv)  
srinithikak [ ~ ]$ curl --connect-timeout 5 http://$IPADDRESS  
curl: (28) Failed to connect to 40.118.165.20 port 80 after 5004 ms: Time out was reached  
srinithikak [ ~ ]$ curl: (28) Connection timed out after 5001 milliseconds  
bash: syntax error near unexpected token `28'  
srinithikak [ ~ ]$ echo $IPADDRESS
```

## List the current network security group rules

Learn

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Development languages

Topics

Training

Products

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Educator Center

Student Hub

FAQ & Help

LEVEL 8

3350 / 23599 XP

### Task 2: List the current network security group rules

Your web server wasn't accessible. To find out why, let's examine your current NSG rules.

- Run the following `az network nsg list` command to list the network security groups that are associated with your VM:

Azure CLI

Copy

```
az network nsg list \
  --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" \
  --query '[] .name' \
  --output tsv
```

You see this output:

Output

Copy

```
my-vmNSG
```

Azure Cloud Shell

Switch to PowerShell

Restart

Manage files

New session

```
"destinationAddressPrefix": "*",
"destinationAddressPrefixes": [],
"destinationPortRange": "22",
"destinationPortRanges": [],
"direction": "Inbound",
"etag": "W/\"11f229b0-d879-4f3c-b990-c195ba309a5b\"",
"id": "/subscriptions/f26515d9-3bc6-4a50-8192-cb816a833f54/resourceGroups/learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/default-allow-ssh",
"name": "default-allow-ssh",
"priority": 1000,
"protocol": "Tcp",
"provisioningState": "Succeeded",
"resourceGroup": "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398",
"sourceAddressPrefix": "*",
"sourceAddressPrefixes": [],
"sourcePortRange": "*",
"sourcePortRanges": [],
"type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
srinithikak [ ~ ]$ az network nsg rule list --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --nsg-name my-vmNSG --query '[].{Name:name, Priority:priority, Port:destinationPortRange, Access:access}' --output table
table
-----
Name                                Priority  Port  Access
-----
default-allow-ssh                    1000    22    Allow
```

## Create the network security rule

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LEVEL 8

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By default, a Linux VM's NSG allows network access only on port 22. This port enables administrators to access the system. You need to also allow inbound connections on port 80, which allows access over HTTP.

### Task 3: Create the network security rule

Here, you create a network security rule that allows inbound access on port 80 (HTTP).

- Run the following `az network nsg rule create` command to create a rule called `allow-http` that allows inbound access on port 80:

Azure CLI

Copy

```
az network nsg rule create \
  --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" \
  --nsg-name my-vmNSG \
  --name allow-http \
  --protocol tcp \
  --priority 100 \
  --destination-port-range 80 \
  --access Allow
```

Azure Cloud Shell

Switch to PowerShell

Restart

Manage files

New session

```
srinithikak [ ~ ]$ az network nsg rule create --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --nsg-name my-vmNSG --name allow-http --protocol tcp --priority 100 --destination-port-range 80 --access Allow
{
  "access": "Allow",
  "destinationAddressPrefix": "*",
  "destinationAddressPrefixes": [],
  "destinationPortRange": "80",
  "destinationPortRanges": [],
  "direction": "Inbound",
  "etag": "W/\"5b6cdfd8-fa28-4c0b-9204-19b513d79823\"",
  "id": "/subscriptions/f26515d9-3bc6-4a50-8192-cb816a833f54/resourceGroups/learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/allow-http",
  "name": "allow-http",
  "priority": 100,
  "protocol": "Tcp",
  "provisioningState": "Succeeded",
  "resourceGroup": "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398",
  "sourceAddressPrefix": "*",
  "sourceAddressPrefixes": [],
  "sourcePortRange": "*",
  "sourcePortRanges": [],
  "type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
srinithikak [ ~ ]$ az network nsg rule list --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --nsg-name my-vmNSG --query '[].{Name:name, Priority:priority, Port:destinationPortRange, Access:access}' --output table
table
-----
Name                                Priority  Port  Access
-----
allow-http                          100     80    Allow
```

## Access your web server again

learn.microsoft.com/en-us/training/modules/describe-azure-compute-networking-services/9-exercise-configure-network-access

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Training Products Career Paths Browse all training Educator Center Student Hub FAQ & Help

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### Task 4: Access your web server again

Now that you configured network access to port 80, let's try to access the web server a second time.

Note

After you update the NSG, it may take a few moments before the updated rules propagate. Retry the next step, with pauses between attempts, until you get the desired results.

1. Run the same `curl` command that you ran earlier:

```
Bash
curl --connect-timeout 5 http://$IPADDRESS
```

You see this response:

Azure Cloud Shell

Switch to PowerShell Restart Manage files New session

```
"resourceGroup": "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398",
"sourceAddressPrefix": "**",
"sourceAddressPrefixes": [],
"sourcePortRange": "**",
"sourcePortRanges": [],
"type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
srinithikak [ ~ ]$ az network nsg rule list --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --nsg-name my-vmNSG --query '[].{Name:name, Priority:priority, Port:destinationPortRange, Access:access}' --output t table
Name                Priority    Port    Access
-----
default-allow-ssh    1000      22      Allow
allow-http           100       80      Allow
srinithikak [ ~ ]$ az network nsg rule list --resource-group "learn-cad62d96-b7d5-45e4-9ace-b877ef5e2398" --nsg-name my-vmNSG --query '[].{Name:name, Priority:priority, Port:destinationPortRange, Access:access}' --output t table
Name                Priority    Port    Access
-----
default-allow-ssh    1000      22      Allow
allow-http           100       80      Allow
srinithikak [ ~ ]$ ^[[200~curl --connect-timeout 5 http://$IPADDRESS~
bash: $'\E[200~curl': command not found
srinithikak [ ~ ]$ <html><body><h2>Welcome to Azure! My name is my-vm.</h2></body></html>
```

## Final output:

Not secure 40.118.165.20

Welcome to Azure! My name is my-vm.



## 2) Azure Academic Services: Azure for Students

### Badges

learn.microsoft.com/en-us/users/me/achievements#badges-section

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**SK** SRINITHIKA.K  
srinithikak@gmail.com

37 Badges 6 Trophies 0 Reputation points 0 Accepted answers 0 Following 0 Followers

LEVEL 8 51,850/72,099 XP

Activity Achievements

Have an achievement code? [Redeem your code now.](#)

Training

Plans

Challenges

Credentials

Modules Learning Paths Courses Plans Other

### Creation of resource groups

portal.azure.com/?Microsoft\_Azure\_Education\_correlationId=0f804de2-bf66-4362-8a33-b267ac755d56#@srinithikakgmail.onmicrosoft.com/resource...

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

Home > rg Resource group

Search

+ Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete

Overview

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

Resources Recommendations (1)

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

Showing 1 to 10 of 10 records. Show hidden types No grouping List view

Name	Type	Location
demo-nsg	Network security group	Central India
sri	Virtual machine	Central India
sri-ip	Public IP address	Central India
sri-nsg	Network security group	Central India
sri505_z1	Network Interface	Central India
sri_OsDisk_1_3148a5f6209945ca9749ab6fd98684ca	Disk	Central India
SRINITHIKA-nsg	Network security group	Central India

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Give feedback

# Creation of Virtual Machine

portal.azure.com/?Microsoft\_Azure\_Education\_correlationId=0f804de2-bf66-4362-8a33-b267ac755d56#@srinithikakgmail.onmicrosoft.com/resource...

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

Home > sri Virtual machine

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

Overview

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

Connect Networking Settings Availability + scale

Essentials

Resource group (move) : rg

Status : Running

Location : Central India (Zone 1)

Subscription (move) : Azure for Students

Subscription ID : 00d46bc8-d302-4b21-a1bc-cd57b0bf5b6

Availability zone : 1

Tags (edit) : Add tags

Operating system : Linux (ubuntu 24.04)

Size : Standard D2s v3 (2 vcpus, 8 GiB memory)

Public IP address : 20.235.240.181

Virtual network/subnet : SRINITHIKA-vnet/default

DNS name : Not configured

Health state : -

Time created : 10/08/2024, 04:54 UTC

JSON View

portal.azure.com/?Microsoft\_Azure\_Education\_correlationId=0f804de2-bf66-4362-8a33-b267ac755d56#@srinithikakgmail.onmicrosoft.com/resource...

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

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

Overview

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

Connect Networking Settings Availability + scale Security Backup + disaster recovery Operations Monitoring Automation Help

Properties Monitoring Capabilities (7) Recommendations Tutorials

Virtual machine

Computer name : sri

Operating system : Linux (ubuntu 24.04)

VM generation : V2

VM architecture : x64

Agent status : Ready

Agent version : 2.11.14

Hibernation : Disabled

Host group : -

Host : -

Proximity placement group : -

Colocation status : N/A

Capacity reservation group : -

Disk controller type : SCSI

Networking

Public IP address : 20.235.240.181 ( Network interface sri505\_z1 )

Public IP address (IPv6) : -

Private IP address : 10.0.0.4

Private IP address (IPv6) : -

Virtual network/subnet : SRINITHIKA-vnet/default

DNS name : Configure

Size

Size : Standard D2s v3

VCPUs : 2

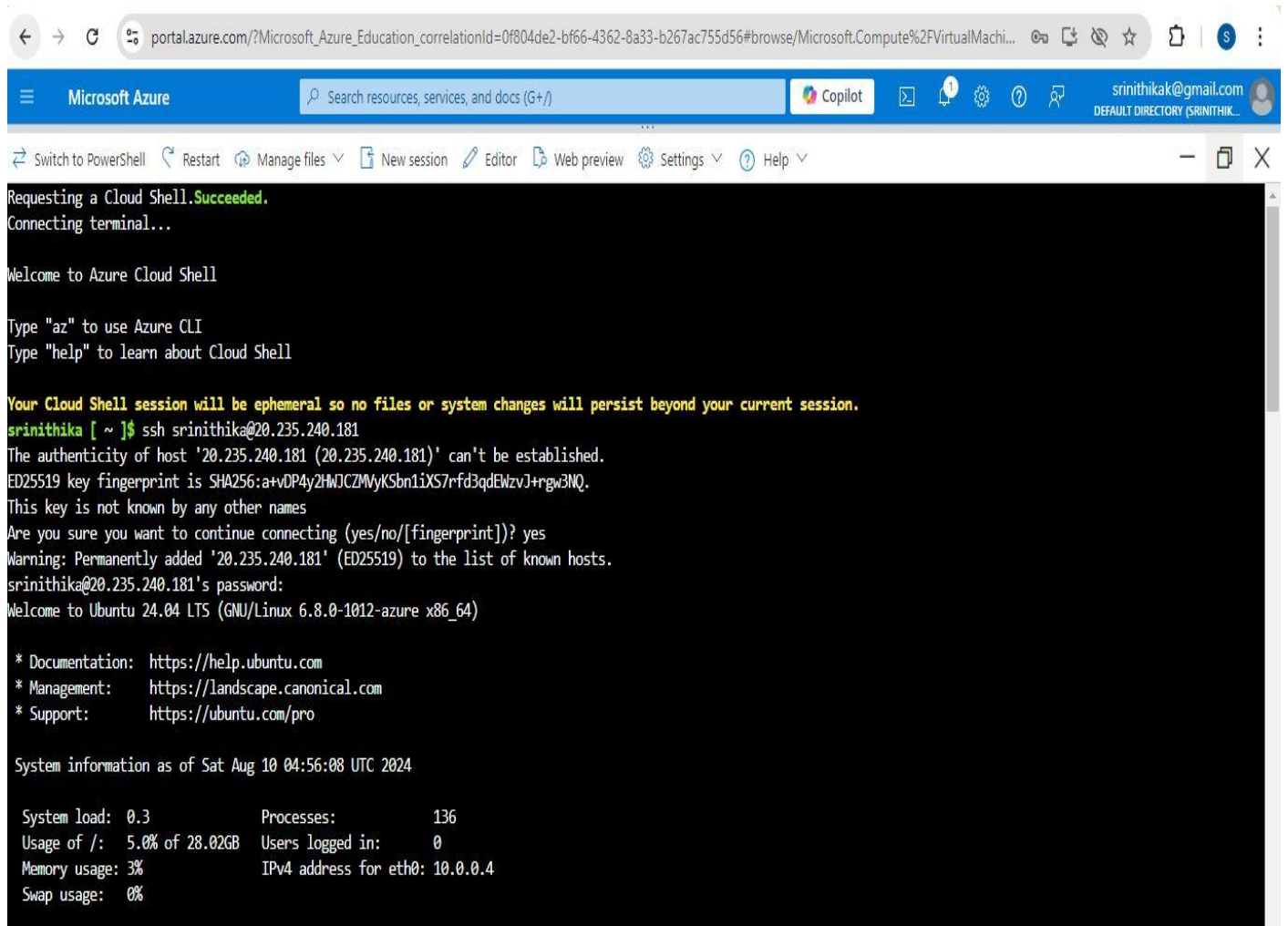
RAM : 8 GiB

Source image details

Source image publisher : canonical

Source image offer : ubuntu-24\_04-lts

## Cloud Shell



```
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Welcome to Azure Cloud Shell

Type "az" to use Azure CLI
Type "help" to learn about Cloud Shell

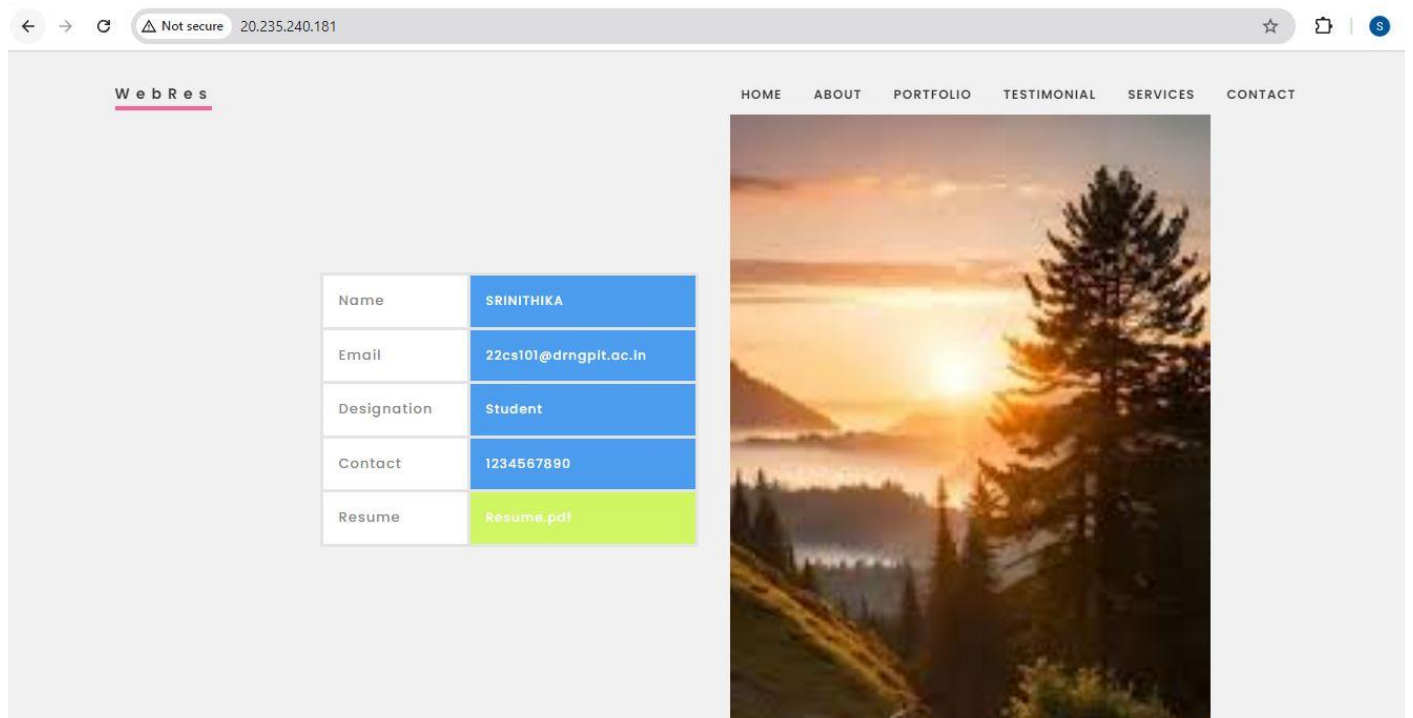
Your Cloud Shell session will be ephemeral so no files or system changes will persist beyond your current session.
srinithika [ ~ ]$ ssh srinithika@20.235.240.181
The authenticity of host '20.235.240.181 (20.235.240.181)' can't be established.
ED25519 key fingerprint is SHA256:a+vDP4y2HwJCZMvYKSbn1iXS7rfd3qdEWzVJ+rgw3NQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '20.235.240.181' (ED25519) to the list of known hosts.
srinithika@20.235.240.181's password:
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Sat Aug 10 04:56:08 UTC 2024

System load: 0.3          Processes:            136
Usage of /:  5.0% of 28.0GB Users logged in:          0
Memory usage: 3%          IPv4 address for eth0: 10.0.0.4
Swap usage:  0%
```

## Hosting my portfolio using Azure Cloud Services



### 3)Cost Management

#### Pricing calculator

Document Recovery

Excel has recovered the following files. Save the ones you wish to keep.

Available Files

Book1 (version 1).xlsx [Aut...]

Version created from the l...

19-07-2024 09:27

Microsoft Azure Estimate

Service category	Service type	Custom name	Region	Description	Estimate
Compute	Virtual Machines		West US	2 D2 v3 (2 vCPUs, 8 GB RAM) x 730 Hours (Pay as you go), Windows (Licence included), OS only; 0 managed disks – S4; Inter-region transfer type, 5 GB outbound data transfer from West US to East Asia	\$305.14
Databases	Azure SQL Database		West US	Single Database, vCore, General Purpose, Provisioned, Standard-series (Gen 5), Primary or Geo replica Disaster Recovery, Locally Redundant, 1 - 8 vCore Database(s) x 730 Hours, 32 GB Storage, SQL Licence (Pay as you go), RA-GRS Back up Storage Redundancy, 0 GB Point-In-Time Restore, 0 x 5 GB Long Term Retention	\$1,567.3
Networking	Application Gateway		West US	Web Application Firewall tier, Medium Instance size: 2 Gateway hours instance(s) x 730 Hours, 1 TB Data processed unit(s), 5 GB Zone unit(s)	\$206.04
Support			Support		\$0.00
			Licensing Program	Microsoft Customer Agreement (MCA)	
			Billing Account		
			Billing Profile		
			Total		\$2,078
Disclaimer					
All prices shown are in United States – Dollar (\$) USD. This is a summary estimate, not a quote. For up to date pricing information please visit <a href="https://azure.microsoft.com/pricing">https://azure.microsoft.com/pricing</a>					

#### Total Cost of Ownership (TCO) Calculator

← → ↻ 🌐 azure.microsoft.com/en-gb/pricing/tco/calculator/ 🔍 ☆ 📌 ⬇️ 💰 ⋮

Contact Sales

Try Azure for free

US\$1,319,436

Cost over 3 year(s)

US\$655,780

Cost over 3 year(s)

On-premises cost breakdown summary

Azure cost breakdown summary

Category	Cost
Compute	US\$903,106.08
Hardware	US\$632,224.00
Software	US\$123,100.00
Electricity	US\$42,166.08
Virtualisation	US\$105,616.00
Data centre	US\$68,917.56
Networking	US\$213,237.39
Storage	US\$19,174.40
IT labour	US\$115,000.23
Total	US\$1,319,436.00

Category	Cost
Compute	US\$364,284.00
Data centre	US\$0.00
Networking	US\$27,639.00
Storage	US\$148,856.83
IT labour	US\$115,000.23
Total	US\$655,780.00



## 4)Blob

### Creation of container

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the 'Microsoft Azure' logo, a search bar, and user information for 'srinithikak@gmail.com'. The breadcrumb trail indicates the path: Home > srinithika\_1723270869318 | Overview > srinithika. The main heading is 'srinithika | Containers', with 'Storage account' below it. A left-hand sidebar lists various services: Overview, Activity log, Tags, Diagnose and solve problems, Access Control (IAM), Data migration, Events, Storage browser, Storage Mover, Data storage, Containers (selected), File shares, Queues, Tables, and Security + networking. The main content area features a search bar, a '+ Container' button, and links for 'Change access level', 'Restore containers', 'Refresh', 'Delete', and 'Give feedback'. Below these is a table of containers:

Name	Last modified	Anonymous access level	Lease state
<input type="checkbox"/> \$logs	10/08/2024, 11:52:03	Private	Available
<input type="checkbox"/> srinithika	10/08/2024, 11:53:09	Private	Available

The screenshot shows the Microsoft Azure portal interface for a specific container. The top navigation bar is consistent with the previous screenshot. The breadcrumb trail is: Home > srinithika\_1723270869318 | Overview >. The main heading is 'srinithika', with 'Container' below it. The left-hand sidebar lists: Overview (selected), Diagnose and solve problems, Access Control (IAM), and Settings. The main content area includes a search bar, an 'Upload' button, and links for 'Change access level', 'Refresh', 'Delete', 'Change tier', 'Acquire lease', 'Break lease', 'View snapshots', and 'Create snapshot'. Below these is a section for 'Authentication method: Access key (Switch to Microsoft Entra user account)' and 'Location: srinithika'. A search bar for blobs is present, followed by an 'Add filter' button. Below is a table of blobs:

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
<input type="checkbox"/> DATA8.jpg	10/08/2024, 11:54:33	Hot (Inferred)		Block blob	12.12 KiB	Available





This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
▼<Error>
  <Code>ResourceNotFound</Code>
  <Message>The specified resource does not exist. RequestId:cc406230-401e-0095-13ee-ea04d3000000 Time:2024-08-10T06:26:19.8626204Z</Message>
</Error>
```



# Recent

Manage view Refresh Export to CSV Clear Assign tags Group by none

<input type="checkbox"/>	Name ↑	Type	Location	Resource Group	Subscription	Last accessed
<input type="checkbox"/>	 learn-cad62d96-b7d5-45e4-9ace-b877ef5e2... 	Resource group	West US	learn-cad62d96-b7d5-45e...	Concierge Subscription	25 seconds ago
<input type="checkbox"/>	 srinithika 	Storage account		learn-cad62d96-b7d5-45e...	Concierge Subscription	34 seconds ago