

# **REPORT ON MICROSOFT AZURE FUNDAMENTALS**

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## 1)Sandbox:

### Create a Linux virtual machine and install Nginx

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

In this instance, you're going to use the Azure CLI.

#### Task 1: Create a Linux virtual machine and install Nginx

Use the following Azure CLI commands to create a Linux VM and install Nginx. After your VM is created, you'll use the Custom Script Extension to install Nginx. The Custom Script Extension is an easy way to download and run scripts on your Azure VMs. It's just one of the many ways you can configure the system after your VM is up and running.

1. From Cloud Shell, run the following `az vm create` command to create a Linux VM:

```
Azure CLI Copy  
  
az vm create \  
  --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" \  
  --name my-vm \  
  Microsoft Store
```

```
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  
  
vishaliv528 [ ~ ]$ az vm create --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --name my-vm --public-ip-sku Standard --image Ubuntu2204 --admin-username azureuser --generate-ssh-keys  
Running ..  
  
Activate Windows  
Go to Settings to activate Windows.
```

### Access your web server

#### Exercise - Configure network access

10 minutes

✓ 100 XP

#### Verify your account

Please solve this puzzle so we know you are a real person.

```
}  
vishaliv528 [ ~ ]$ az vm extension set --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --vm-name my-vm --name customScript --publisher Microsoft.Azure.Extensions --version 2.1 --settings '{"fileUri":["https://raw.githubusercontent.com/MicrosoftDocs/mslearn-welcome-to-azure/master/configure-nginx.sh"]}' --protected-settings '{"commandToExecute": "./configure-nginx.sh"}'  
{  
  "autoUpgradeMinorVersion": true,  
  "enableAutomaticUpgrade": null,  
  "forceUpdateTag": null,  
  "id": "/subscriptions/16982123-2d3c-44ce-ab2d-0c419f4ce699/resourceGroups/learn-992d4fb7-2bb3-4e70-a059-c6106706a52c/providers/Microsoft.Compute/virtualMachines/my-vm/extensions/customScript",  
  "instanceView": null,  
  "location": "westus",  
  "name": "customScript",  
  "protectedSettings": null,  
  "protectedSettingsFromKeyVault": null,  
  "provisionAfterExtensions": null,  
  "provisioningState": "Succeeded",  
  "publisher": "Microsoft.Azure.Extensions",  
  "resourceGroup": "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c",  
  "settings": {  
    "fileUri": [  
      "https://raw.githubusercontent.com/MicrosoftDocs/mslearn-welcome-to-azure/master/configure-nginx.sh"  
    ]  
  }  
}
```

## List the current network security group rules

### 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.

1. 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-992d4fb7-2bb3-4e70-a059-c6106706a52c" \
  --query '[] .name' \
  --output tsv
```

You see this output:

```
Output Copy
my-vmNSG
```

```
Azure Cloud Shell
Switch to PowerShell Restart Manage files New session
"provisioningState": "Succeeded",
"publisher": "Microsoft.Azure.Extensions",
"resourceGroup": "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c",
"settings": {
  "fileUri": [
    "https://raw.githubusercontent.com/MicrosoftDocs/mslearn-welcome-to-azure/master/configure-nginx.sh"
  ]
},
"suppressFailures": null,
"tags": null,
"type": "Microsoft.Compute/virtualMachines/extensions",
"typeHandlerVersion": "2.1",
"typePropertiesType": "customScript"
}
vishaliv528 [ ~ ]$ IPADDRESS=$(az vm list-ip-addresses --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --name my-vm --query "[].virtualMachine.network.k.publicIpAddresses[*].ipAddress" --output tsv)
vishaliv528 [ ~ ]$ curl --connect-timeout 5 http://$IPADDRESS
curl: (28) Failed to connect to 13.83.81.244 port 80 after 5002 ms: Timeout was reached
vishaliv528 [ ~ ]$ echo $IPADDRESS
13.83.81.244
vishaliv528 [ ~ ]$
```

## Create the network security rule

### Task 3: Create the network security rule

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

1. 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-992d4fb7-2bb3-4e70-a059-c6106706a52c" \
  --nsg-name my-vmNSG \
  --name allow-http \
  --protocol tcp \
  --priority 100 \
  --destination-port-range 80 \
  --access Allow
```

For learning purposes, here you set the priority to 100. In this case, the priority doesn't matter. You would need to consider the priority if you had

```
Azure Cloud Shell
Switch to PowerShell Restart Manage files New session
Name      Priority  Port  Access
-----
default-allow-ssh 1000    22    Allow
vishaliv528 [ ~ ]$ az network nsg rule create --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --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/\"2f937e9f-0314-4e27-82e8-eaef5a1086ad\"",
  "id": "/subscriptions/16982123-2d3c-44ce-ab2d-0c419f4ce699/resourceGroups/learn-992d4fb7-2bb3-4e70-a059-c6106706a52c/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/allow-http",
  "name": "allow-http",
  "priority": 100,
  "protocol": "Tcp",
  "provisioningState": "Succeeded",
  "resourceGroup": "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c",
  "sourceAddressPrefix": "*",
  "sourceAddressPrefixes": [],
  "type": "Microsoft.Network/networkSecurityGroups/rules"
}
```

## Access your web server again

### 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

Copy

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

You see this response:

Azure Cloud Shell

Switch to PowerShell Restart Manage files New session

```
]
vishaliv528 [ ~ ]$ az network nsg rule list --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --nsg-name my-vmNSG --query '[].(Name:name, Priority:priority, Port:destinationPortRange, Access:access)' --output table
Name                                Priority  Port  Access
-----
default-allow-ssh                  1000     22   Allow
vishaliv528 [ ~ ]$ az network nsg rule create --resource-group "learn-992d4fb7-2bb3-4e70-a059-c6106706a52c" --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/\"2f937e9f-0314-4e27-82e8-eaef5a1086ad\"",
  "id": "/subscriptions/16982123-2d3c-44ce-ab2d-0c419f4ce699/resourceGroups/learn-992d4fb7-2bb3-4e70-a059-c6106706a52c/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/allow-http",
  "name": "allow-http",
  "priority": 100,
  "protocol": "Tcp",
  "sourceAddressPrefix": "*",
  "sourceAddressPrefixes": []
}
```

Activate Windows

Go to Settings to activate Windows.

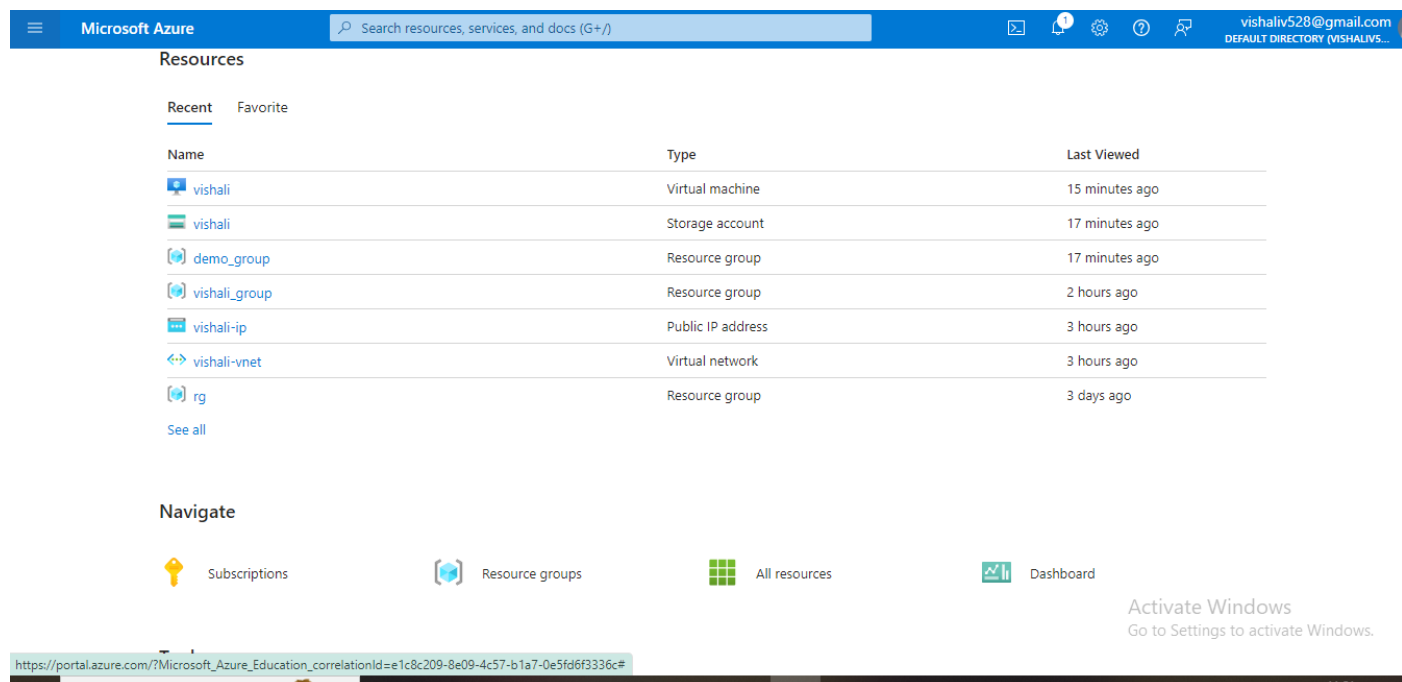
Final output:

← → ↻ ⚠ Not secure 13.83.81.244

**Welcome to Azure! My name is my-vm.**

## 2) Azure Academic Services: Azure for Students

### Creation of resource groups

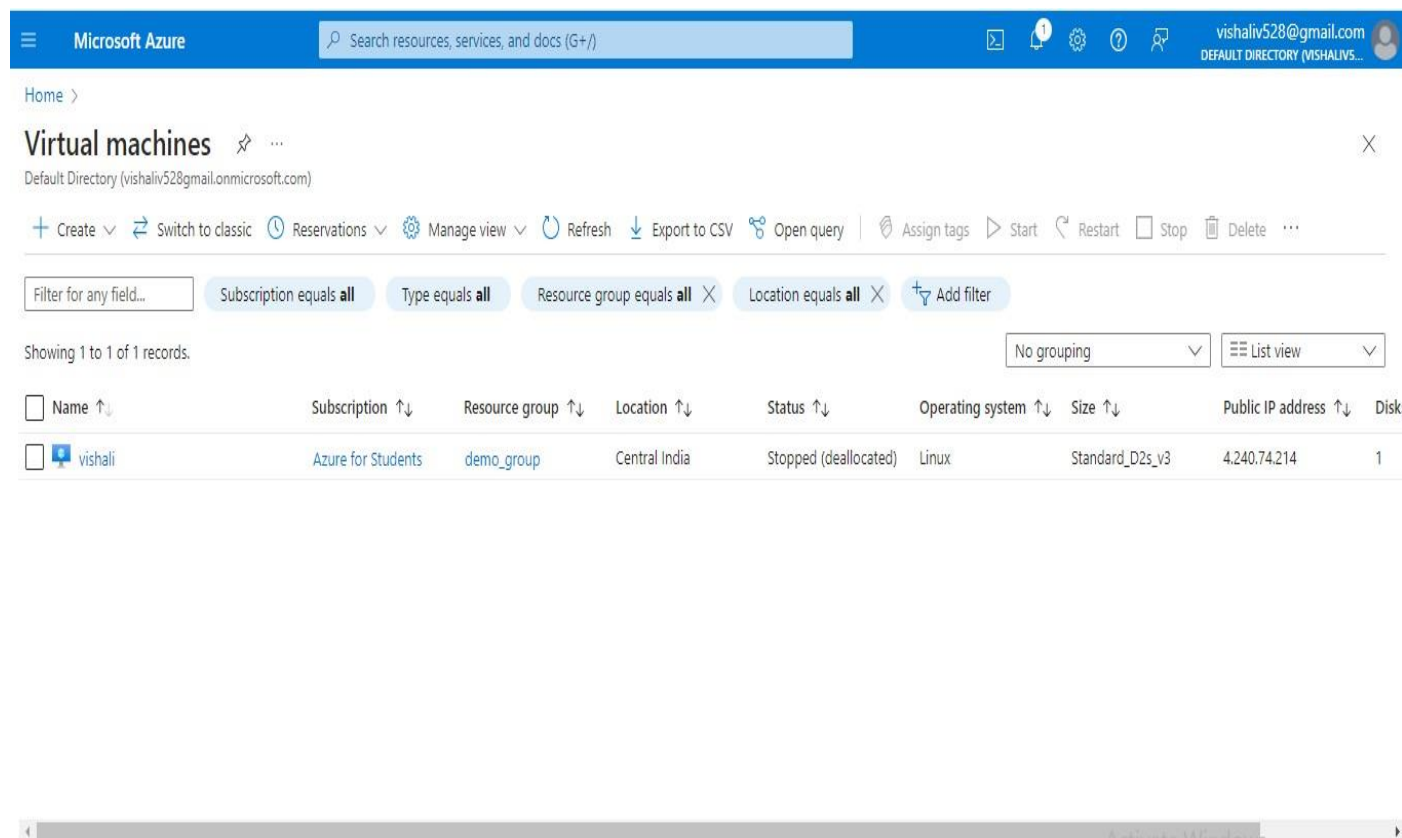


The screenshot shows the Microsoft Azure portal interface. At the top, there's a navigation bar with the Microsoft Azure logo and a search bar. Below the navigation bar, the 'Resources' section is active, displaying a list of resources. The resources are organized into two tabs: 'Recent' and 'Favorite'. The 'Recent' tab is selected, showing a table of resources. The table has three columns: 'Name', 'Type', and 'Last Viewed'. The resources listed are:

Name	Type	Last Viewed
vishali	Virtual machine	15 minutes ago
vishali	Storage account	17 minutes ago
demo_group	Resource group	17 minutes ago
vishali_group	Resource group	2 hours ago
vishali-ip	Public IP address	3 hours ago
vishali-vnet	Virtual network	3 hours ago
rg	Resource group	3 days ago

Below the table, there's a 'See all' link. At the bottom of the page, there's a 'Navigate' section with icons for Subscriptions, Resource groups, All resources, and Dashboard. The 'Resource groups' icon is highlighted. On the right side of the page, there's a 'Activate Windows' watermark.

### Creation of Virtual Machine



The screenshot shows the Microsoft Azure portal interface for the 'Virtual machines' section. The page has a navigation bar at the top with the Microsoft Azure logo and a search bar. Below the navigation bar, the 'Virtual machines' section is active, displaying a table of virtual machines. The table has columns for Name, Subscription, Resource group, Location, Status, Operating system, Size, Public IP address, and Disks. The 'vishali' virtual machine is listed in the table.

Name	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
vishali	Azure for Students	demo_group	Central India	Stopped (deallocated)	Linux	Standard_D2s_v3	4.240.74.214	1

At the bottom of the page, there's a 'Create' button and a 'Switch to classic' link. The 'vishali' virtual machine is highlighted in the table.



```
Switch to PowerShell Restart Manage files New session Editor Web preview Settings Help
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Your Cloud Shell session will be ephemeral so no files or system changes will persist beyond your current session.
vishali [ ~ ]$ ssh vishali@4.240.74.214
The authenticity of host '4.240.74.214 (4.240.74.214)' can't be established.
ED25519 key fingerprint is SHA256:uefAMT1QAg6BHfKQUFFSOPbRMLXtt06CJ0GKMkDP895I.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '4.240.74.214' (ED25519) to the list of known hosts.
vishali@4.240.74.214'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 04:13:07 UTC 2024

System load:  0.31          Processes:            133
Usage of /:   5.0% of 28.02GB Users logged in:        0
Memory usage: 3%           IPv4 address for eth0: 10.2.0.5
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

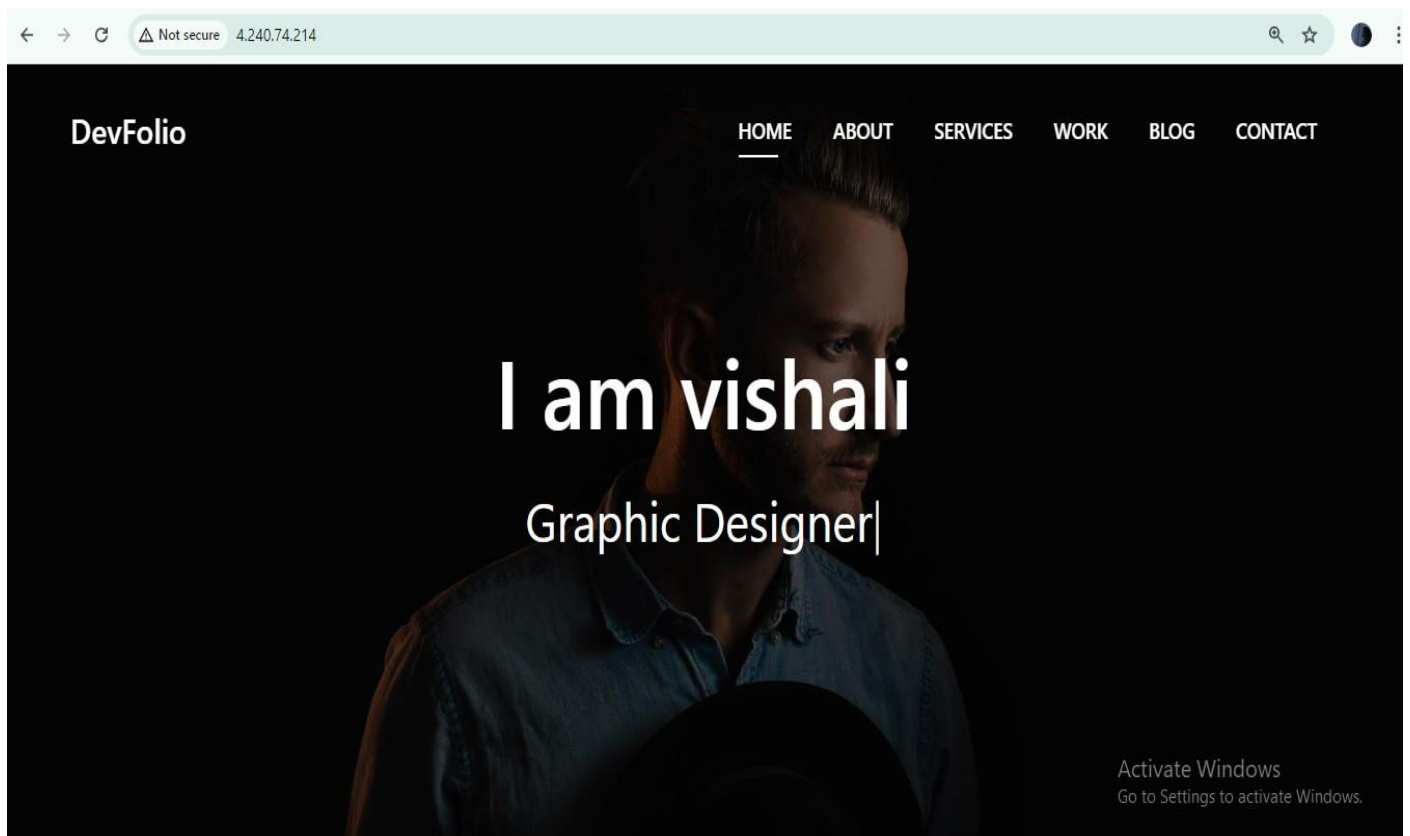
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

vishali@vishali:~$ sudo apt update
Hit:1 http://azure.archive.ubuntu.com/ubuntu noble InRelease
```

## Hosting my portfolio using Azure Cloud Services



## Pricing calculator

ExportedEstimate.xlsx [Protected View] - Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do... Sign in Share

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

	A	B	C	D	E	F	
1	Microsoft Azure Estimate						
2	Your Estimate						
3	Service category	Service type	Custom name	Region	Description	cost	Estimated u
4	Compute	Virtual Machines		West US	2 D2 v3 (2 vCPUs, 8 GB RAM) x 730 Hours (Pay as you go), Windows (License included), OS Only; 0 managed disks – S4; Inter Region transfer type, 5 GB outbound data transfer from West US to East Asia	\$305.14	\$0.00
5	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 License (Pay as you go), RA-GRS GB Storage, 0 GB Backup Storage, 0 x 5 GB Long Term Retention	\$1,567.39	\$0.00
6	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	\$0.00
7	Support			Support		\$0.00	\$0.00
8				Licensing Program	Microsoft Customer Agreement (MCA)		
9				Billing Account			
10				Billing Profile			
11				Total		\$2,078.56	\$0.00
12							
13	Disclaimer						

Activate Windows  
Go to Settings to activate Windows.

Your Estimate

## Total Cost of Ownership (TCO) Calculator

**Total Cost of Ownership (TCO) Calculator**  
Estimate the cost savings you can realize by migrating your workloads to Azure

1 Define your workloads 2 Adjust assumptions 3 View report

My saved reports Sign In

**View report**

Timeframe ⓘ 3 Years Region ⓘ North Europe Licensing program ⓘ Microsoft Online Services Program Show Dev/Test Pricing ⓘ ☐

Over 3 year(s) with Microsoft Azure, your estimated cost savings could be as much as **\$6,48,536**

Activate Windows  
Go to Settings to activate Windows.

## Creation of container

☰

Microsoft Azure

Search resources, services, and docs (G+ /)

▶

🔔

⚙️

❓

🗨️

vishaliv528@gmail.com

DEFAULT DIRECTORY (VISHALI.V...

All services > vishali\_1723269782597 | Overview > vishali

vishali | Containers

Storage account

🔍 Search

◁

◁

+ Container

🔒 Change access level

🔄 Restore containers

🔄 Refresh

🗑️ Delete

🗨️ Give feedback

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage browser

Storage Mover

Partner solutions

Data storage

**Containers**

File shares

Queues

Tables

🔍 Search containers by prefix

✓

☐ Show deleted containers

Name	Last modified	Anonymous access level	Lease state	
<input type="checkbox"/> \$logs	10/8/2024, 11:33:55 am	Private	Available	⋮

Activate Windows

Go to Settings to activate Windows.

The screenshot shows the Microsoft Azure portal interface. At the top, there's a navigation bar with the Microsoft Azure logo, a search bar containing "Search resources, services, and docs (G+/I)", and user information for "vishaliv528@gmail.com". Below the navigation bar, the page title is "Virtual machines" under the "Default Directory (vishaliv528gmail.onmicrosoft.com)". A toolbar contains various actions like "Create", "Switch to classic", "Reservations", "Manage view", "Refresh", "Export to CSV", "Open query", "Assign tags", "Start", "Restart", "Stop", "Delete", and more. There are also filter buttons: "Subscription equals all", "Type equals all", "Resource group equals all", and "Location equals all", along with an "Add filter" button. The main content area displays a table of virtual machines. The first row shows a VM named "vishali" with details: Subscription "Azure for Students", Resource group "demo\_group", Location "Central India", Status "Stopped (deallocated)", Operating system "Linux", Size "Standard\_D2s\_v3", Public IP address "4.240.74.214", and Disks "1".

Name ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓	Operating system ↑↓	Size ↑↓	Public IP address ↑↓	Disks
vishali	Azure for Students	demo_group	Central India	Stopped (deallocated)	Linux	Standard_D2s_v3	4.240.74.214	1