

Azure Capstone Project

You are assigned the task of implementing the below architecture for the company's website. There are three web pages to be deployed:

1. The home page is the default page (VM2)
2. The upload page is where you can upload the files to your Azure Blob Storage (VM1) 3. The error page for 403 and 502 errors Application Gateway has to be configured in the following manner: 1. Example.com should be pointed to the home page
2. Example.com/upload should be pointed to the upload page
3. Application Gateway's error pages should be pointed to error.html which should be hosted as a static website in Azure Containers. The error.html file is present in the GitHub repository. The term 'Example' here refers to the Traffic Manager's domain name. The client wants you to deploy them in the Central US and the West US regions such that the traffic is distributed optimally between both regions.

Storage Account has to be configured in the following manner:

1. You need to host your error.html as a static website here, and then point the application gateway's 403 and 502 errors to it.
2. Create a container named upload, this will be used by your code to upload the files.

Technical specifications for the deployments are as follows:

1. Deployments in both regions should have VMs inside VNets.
2. Clone the GitHub repo <https://github.com/azcloudberg/azproject> to all the VMs.
3. On VM1, please run vm1.sh this will deploy the upload page, on VM2 please run VM2.sh, this will install the home page.
4. For running the scripts, please run the following command inside the GitHub directory from the terminal. VM1: ./vm1.sh VM2: ./vm2.sh
5. After running the scripts, please edit the config.py file on VM1, and enter the details related to your storage account where the files will be uploaded.
6. Once done, please run the following command: sudo python3 app.py
7. Both regions should be connected to each other using VNet-VNet Peering.
8. Finally, your Traffic Manager should be pointing to the application gateway of both the regions.

Solution:

Step-1: Login into azure portal and search for virtual machines and create a resource group.

The image consists of three vertically stacked screenshots of the Microsoft Azure portal interface.

Screenshot 1: Home Page
Shows the main Azure services menu with options like Create a resource, Subscriptions, Resource groups, Storage accounts, etc. Below is a list of recent resources, including a Free Trial subscription.

Screenshot 2: Virtual Machines Page
Shows the Virtual machines blade. It includes a sidebar with options like Create a virtual machine, Azure virtual machine with preset configuration, and More VMs and related solutions. The main area shows a list of VMs with filters applied: Type equals all, Resource group equals all, Location equals all. It also shows columns for Resource group, Location, Status, Operating system, Size, and Public IP address.

Screenshot 3: Resource Groups Page
Shows the Resource groups blade. It includes a sidebar with Create a resource and Resource groups. The main area shows a list of resource groups with filters applied: Subscription equals all, Location equals all. It shows columns for Name, Subscription, and Location.

Screenshot 4: Create a Resource Group Page
Shows the 'Create a resource group' wizard. The 'Basics' step is selected. It asks for a Subscription (selected: Azure subscription 1), Resource group name (selected: capstone-), and Region (selected: (Asia Pacific) Central India).

Step-2: Create 2 virtual machines in each two of machines belongs to CENTRAL US region.

Home > Virtual machines > Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Subscription * Resource group *

Pay-As-You-Go
(New) capstone
Create new

Instance details

Virtual machine name * vm1-Centralus
Region * (US) Central US
Availability options No infrastructure redundancy required
Security type Standard

< Previous Next : Disks > Review + create

Home > Virtual machines > Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Security type Standard

Trusted launch virtual machine is required when using 1P Gallery images.

Image * Ubuntu Server 22.04 LTS - x64 Gen2
See all images | Configure VM generation
This image is compatible with additional security features. Click here to swap to the Trusted launch security type.

VM architecture Arm64 x64

Run with Azure Spot discount

< Previous Next : Disks > Review + create

Home > Virtual machines > Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Username * az-user1
Password * Confirm password *

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * None Allow selected ports

< Previous Next : Disks > Review + create

Home > Virtual machines > Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Basics Disks Networking Management Monitoring

Define network connectivity for your virtual machine by configuring n inbound and outbound connectivity with security group rules, or plac Learn more [?!](#)

Virtual network * (new) vnet1 Create new
Subnet * (new) default (10.0.0.2/
Public IP (new) vm1-Centralus-ip

< Previous Next : Management > Review + create OK Discard

Home > Virtual machines > Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Virtual network * (new) Vnet1 Create new
Subnet * (new) subnet1 (10.0.0.0/24)
Public IP (new) vm1-Centralus-ip Create new
NIC network security group None Basic Advanced
Public inbound ports * None Allow selected ports

< Previous Next : Management > Review + create

Create virtual network

Address space

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

Address range *	Addresses	Overlap
10.0.0.0/16	10.0.0.0 - 10.0.255.255 (65536 addresses)	None
	(0 Addresses)	None

Subnets

The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

Subnet name	Address range	Addresses
subnet1	10.0.0.0/24	10.0.0.0 - 10.0.0.255 (256 addresses)
subnet-ag	10.0.1.0/28	10.0.1.0 - 10.0.1.15 (16 addresses)
	(0 Addresses)	

OK Discard

Create public IP address

Name * ip1
SKU * Basic Standard
Assignment Static Microsoft network Internet
Routing preference Microsoft network Internet
Availability zone
Zone redundant

OK

Home > Virtual machines >
Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Virtual network * (new) Vnet1 Create new

Subnet * (new) subnet1 (10.0.0.0/24)

Public IP (new) ip1 Create new

NIC network security group None Basic Advanced

Public inbound ports * None Allow selected ports

< Previous

Home > Virtual machines >
Create a virtual machine ...

Validation passed

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Basics Disks Networking Management Monitoring Advanced Tags

Price
1 X Standard B1s by Microsoft Subscription credits apply
1.0399 INR/hr Pricing for other VM sizes

TERMS

< Previous

Microsoft Azure Copilot

Home > **CreateVm-canonical.0001-com-ubuntu-server-jammy-2-20250311121226 | Overview**

Deployment succeeded Deployment 'CreateVm-canonical.0001-com-ubuntu-server-jammy-2-20250311121226' to resource group 'capstone' was successful.

Deployment name: CreateVm-canonical.0001-com-ubuntu... Start time: 3/11/2025, 12:30:07 PM
Subscription: Pay-As-You-Go Correlation ID: 09/25/10-6a02-42f1-b9

Your deployment is complete Deployment details
Next steps
Setup auto shutdown Recommended Monitor VM health, performance and network dependencies Recommended Run a script inside the virtual machine Recommended

Go to resource Create another VM

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 >

Step-3: Create 2 virtual machines which belongs to WEST US.

Home > Virtual machines >
Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Resource group * capstone Create new

Instance details

Virtual machine name * vm1-westus

Region * (US) West US

Availability options No infrastructure redundancy required

Security type Standard

Trusted launch virtual machine is required when using 1P Gallery images.

< Previous

Home > Virtual machines >
Create a virtual machine ...

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Username Password Confirm password

Inbound port rules
Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * None Allow selected ports

Select inbound ports *

< Previous

Create a virtual machine

Address space
The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

Address range *	Addresses	Overlap
10.0.0.0/16	10.0.0.0 - 10.0.255.255 (65536 addresses)	None
	(0 Addresses)	None

Subnets
The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

Subnet name	Address range	Addresses
subnet2	10.0.0.0/24	10.0.0.0 - 10.0.0.255 (256 addresses)
subnet_ag	10.0.1.0/24	10.0.1.0 - 10.0.1.255 (256 addresses)
	(0 Addresses)	

Create a virtual machine

Virtual network * (new) vnet2 Create new

Subnet * (new) subnet2 (10.0.0.0/24)

Public IP (new) vm1-westus-ip Create new

NIC network security group None Basic Advanced

Create a virtual machine

Validation passed

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Price
1 X Standard B1s by Microsoft Terms of use | Privacy policy

Subscription credits apply 1.0316 INR/hr Pricing for other VM sizes

TERMS

< Previous Next > Create

Create public IP address

Name ip

SKU Basic Standard

Routing preference Microsoft network Internet

OK

Step-4: Create a storage account.

Storage accounts

Default Directory

+ Create ⌂ Restore ⌂ Manage view Refresh Export to CSV Open query Assign tags Delete

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter No grouping

Showing 0 to 0 of 0 records.

Name ↑↓	Type ↑↓	Kind ↑↓	Resource group ↑↓	Location ↑↓
---------	---------	---------	-------------------	-------------

Create a storage account

Subscription * PAY-AS-YOU-GO

Resource group * capstone Create new

Instance details

Storage account name * storagecapstonepro

Region * (US) Central US Deploy to an Azure Extended Zone

Primary service Select a primary service

Performance * Standard: Recommended for most scenarios (general-purpose v2 account)

Premium: Recommended for scenarios that require low latency.

Previous Next Review + create

Home > Storage accounts > Create a storage account

Advanced

Security
Configure security settings that impact your storage account.

- Require secure transfer for REST API operations
- Allow enabling anonymous access on individual containers
- Enable storage account key access
- Default to Microsoft Entra authorization in the Azure portal
- Minimum TLS version Version 1.2

Review + create

Create a storage account

Basics

Subscription: Pay-As-You-Go
Resource group: capstone
Location: Central US
Storage account name: storagecapstonepro
Primary service: Standard
Performance: Locally-redundant storage (LRS)

Review + create

Deployment

storagecapstonepro_1741678239547 | Overview

Your deployment is complete

Deployment name: storagecapstonepro_1741... Start time: 3/11/2025, 12:59:00 PM
Subscription: Pay-As-You-Go Correlation ID: 18a75314-267a-4523-a515-0a8c1b...

Deployment details

Next steps

Go to resource **Give feedback** **Tell us about your experience with deployment**

Step-5: Create a container and upload a file.

storagecapstonepro | Overview

Containers

New container

Name: upload
Anonymous access level: Container (anonymous read access for containers and blobs)

All container and blob data can be read by anonymous request. Clients can enumerate blobs within the container by anonymous request, but cannot enumerate containers within the storage account.

Create **Give feedback**

storagecapstonepro | Containers

Name	Last modified	Anonymous access level	Lease state
\$logs	3/11/2025, 12:59:32 PM	Private	Available

storagecapstonepro | Containers

Name	Last modified
\$logs	3/11/2025, 12:59:32 PM

Step-6: Create and enable static website for accessing the uploaded file.

Home > storagecapstonepro_1741678239547 | Overview > storagecapstonepro

storagecapstonepro | Static website

Storage account

Save Discard Give feedback

Enabling static websites on the blob service allows you to host static content. Webpages may include static content and client-side scripts. Server-side scripting is not supported. As data is replicated asynchronously from primary to secondary regions, files at the secondary endpoint may not be immediately available or in sync with files at the primary endpoint. [Learn more](#)

Static website

Disabled Enabled

Index document name:

Error document path: error.html

An Azure Storage container has been created to host your static website. \$web

Improve the page load time of your static website by using the caching features of Azure Front Door (Additional costs apply). [Azure Front Door](#)

Home > storagecapstonepro_1741678239547 | Overview > storagecapstonepro

storagecapstonepro | Static website

Storage account

Save Discard Give feedback

Enabling static websites on the blob service allows you to host static content. Webpages may include static content and client-side scripts. Server-side scripting is supported. As data is replicated asynchronously from primary to secondary regions, files at the secondary endpoint may not be immediately available or in sync with files at the primary endpoint. [Learn more](#)

Static website

Disabled Enabled

An Azure Storage container has been created to host your static website. \$web

Improve the page load time of your static website by using the caching features of Azure Front Door (Additional costs apply). [Azure Front Door](#)

Home > storagecapstonepro_1741678239547 | Overview > storagecapstonepro | Static website

\$web

Container

Search

Upload Change access level Refresh Delete Change tier Acquire lease Break lease View snapshots

Authenticity method: Access key (Switch to Microsoft Entra user account)

Location: \$web

Search blobs by prefix (case-sensitive)

Add filter

Name	Modified	Access tier	Archive status	Blob type
No results				

Open

Downloads

File name: error

Upload blob

Drag and drop files here or Browse for files

Overwrite if files already exist

Advanced

Upload

Give feedback

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

obulateddy9310@gmail.com DEFAULT DIRECTORY

Home > storagecapstonepro_1741678239547 | Overview > storagecapstonepro | Static website

\$web

Container

Search

Upload Change access level Refresh Delete

Authentication method: Access key (Switch to Microsoft Entra user account)

Location: \$web

Search blobs by prefix (case-sensitive)

Add filter

Name	Modified
No results	

Upload blob

1 file(s) selected: error.html

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

Overwrite if files already exist

Advanced

Upload

Give feedback

Step-7: Copy the primary endpoint and paste it and run in new tab.

The screenshot shows the Azure Storage account overview page for 'storagecapstonepro'. Under 'Static website', the 'Enabled' switch is turned on. The 'Primary endpoint' is listed as <https://storagecapstonepro.z19.web.core.windows.net/>. Below this, a browser window is open to the same URL, showing an 'Error' message: 'Sorry, something went wrong. Please try again later.'

Step-8: Create two application gateways for loading/distributing the traffic with routing from backend path.

The screenshot shows the Microsoft Azure portal with a search bar containing 'application'. The main area displays 'Azure services' and 'Resources'. Under 'Services', 'Application gateways' is selected. The 'Create' button is highlighted. Below this, there are sections for 'Front Door and CDN profiles' and 'Kubernetes'. At the bottom, the 'Load balancing | Application Gateway' blade is open, showing a table with columns for 'Name', 'Public IP...', and 'Private...'. The table is currently empty, showing 'Showing 0 to 0 of 0 records.'

Home > Load balancing | Application Gateway > Create application gateway ...

Subscription * Pay-As-You-Go

Resource group * capstone

Instance details

Application gateway name * AG1

Region * Central US

Tier Standard V2

Enable autoscaling Yes No

Minimum instance count * 1

Availability zone * Zones 1, 2, 3

IP address type IPv4 only Dual stack (IPv4 & IPv6)

HTTP2 Disabled Enabled

Configure virtual network

Virtual network * Vnet1

Create new

Subnet * subnet-ag (10.0.1.0/28)

Manage subnet configuration

Home > Load balancing | Application Gateway > Create application gateway ...

Basics **Frontends** **Backends**

Traffic enters the application gateway via its private IP address, or one of each type.

Frontend IP address type

Public IPv4 address *

Add a public IP

Name * AGip1

SKU Basic Standard

Assignment Dynamic Static

Availability zone ZoneRedundant

OK **Cancel** **Add new** **OK**

Home > Load balancing | Application Gateway > Create application gateway ...

Basics **Frontends** **Backends** **Configuration** **Tags** **Review + create**

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN).

Add a backend pool

Backend pool	Targets
No results	

Add a backend pool.

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, IP addresses, domain names, or an App Service.

Name * pool1

Add backend pool without targets Yes No

Backend targets

1 item

Target type	Target
Virtual machine	vm1-centralus640 (10.0.0.4) <input type="button" value="..."/>
IP address or FQDN	

Add **Cancel**

Home > Load balancing | Application Gateway > Create application gateway ...

Basics **Frontends** **Backends** **Configuration** **Tags** **Review + create**

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN).

Add a backend pool

Backend pool	Targets
pool1	> 1 target

Add a backend pool.

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, IP addresses, domain names, or an App Service.

Name * pool2

Add backend pool without targets Yes No

Backend targets

1 item

Target type	Target
Virtual machine	vm2-centralus159 (10.0.0.5) <input type="button" value="..."/>
IP address or FQDN	

Add **Cancel**

Home > Load balancing | Application Gateway > Create application gateway ...

Basics **Frontends** **Backends** **Configuration** **Tags** **Review + create**

Create routing rules that link your frontend(s) and backend(s). You can also add more backend pools, add a second frontend IP configuration if you haven't already, or edit previous configurations.

Frontends

+ Add a frontend IP

Public: (new) AGip1

Routing rules

Add a routing rule

Backend pools

+ Add a backend pool

pool1 pool2

Create application gateway

Add a routing rule

Frontend IP * Public IPv4
 HTTP HTTPS
 Port * 80
 Basic Multi site

Custom error pages
 Show customized error pages for different response codes generated by Application Gateway. This section lets you configure Listener-specific error pages. [Learn more](#)
 Please verify that the url(s) being added here is reachable from your application gateway using the [connection troubleshoot](#) tool to prevent any deployment error.

Bad Gateway - 502
 Forbidden - 403
[Show more status codes](#)

[https://storagecapstonepro.z19.web.core.windows.net/error.html](#)
[https://storagecapstonepro.z19.web.core.windows.net/error.html](#)

Add Backend setting

Backend protocol HTTP HTTPS
 Backend port * 80
 Enable Disable
 Enable Disable
 Request time-out (seconds) * 20
 Yes No
 Yes No

Host name
 By default, the Application Gateway sends the same HTTP host header to the backend as it receives from the client. If your backend application/service requires a specific host value, you can override it using this setting.

Override with new host name
 Create custom probes

Listener **Backend targets**

Choose a backend pool to which this routing rule will send traffic. You will also need to specify a set of Backend settings that define the behavior of the routing rule.

Target type Backend pool Redirection
 Backend target * pool2
[Add new](#)
[default](#)
[Add new](#)

Path-based routing
 You can route traffic from this rule's listener to different backend targets based on the URL path of the request. You can also apply a different set of Backend settings based on the URL path.

Path based rules	Path	Target name	Backend setting name	Backend pool
Add Cancel				

Add a path

[← Discard changes and go back to routing rules](#)

Target type Backend pool Redirection
 Path * /upload
 Target name upload

 Backend settings * default

 Backend target * pool1

Add a routing rule

Backend target * pool2

 Backend settings * default

Path-based routing
 You can route traffic from this rule's listener to different backend targets based on the URL path of the request. You can also apply a different set of Backend settings based on the URL path.

Path based rules	Path	Target name	Backend setting name	Backend pool
	/upload	upload	default	pool1

Add multiple targets to create a path-based rule

Create application gateway

Validation passed

Basics

Subscription Pay-As-You-Go
 Resource group capstone
 Name AG1
 Region Central US
 Tier Standard_v2
 Enable autoscaling Enabled
 Minimum instance count 1
 Maximum instance count 5

Configuration

Review + create

Create **Previous** **Next** **Download a template for automation**

Home > Load balancing | Application Gateway > Create application gateway ...

Subscription * Pay-As-You-Go
 Resource group * capstone
 Create new

Instance details

Application gateway name * AG2
 Region * West US
 Standard V2
 Tier
 Enable autoscaling Yes
 Minimum instance count * 1
 Maximum instance count 5

Basics **Frontends** Backends Configuration Tags Review + create

Traffic enters the application gateway via its frontend IP address(es). An application gateway can use a public IP address, private IP address, or one of each type.

Frontend IP address type Public
 Public
 Private
 Both

Public IPv4 address * (New) AGip2
 Add new

Previous Next : Backends >

Home > Load balancing | Application Gateway > Create application gateway ...

Basics **Frontends** **Backends** Configuration Tags Review + create

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN).

Add a backend pool

Backend pool	Targets
No results	

Add a backend pool

Backend pool pool1
 pool2

Targets
 > 1 target
 > 1 target

Add a backend pool

Name * pool1
 Add backend pool without targets
 Backend targets
 1 item
 Target type Virtual machine
 Target vm1-westus107 (10.0.0.4)
 IP address or FQDN

Add Cancel Tags Review + create

Previous Next : Configuration > Add a routing rule

Listener name
 Frontend IP *
 Protocol
 Port *
 Listener type
 Custom error pages
 Show customized error pages for different response codes generated by Application Gateway. This section lets you configure Listener-specific error pages. Learn more

Please verify that the url(s) being added here is reachable from your application gateway using the connection troubleshoot tool to prevent any deployment error.

Bad Gateway - 502
 Forbidden - 403
 Show more status codes

Public IPv4
 HTTP
 HTTPS
 80
 Basic
 Multi site

https://storagecapstonepro.z19.web.core.windows.net/error.html
 https://storagecapstonepro.z19.web.core.windows.net/error.html

Add Cancel

← Discard changes and go back to routing rules

Add a path

Target type Backend pool
 Backend pool
 Redirection

Path * /upload
 upload
 default
 Add new
 Backend settings *
 Backend target *

Backend pool pool1
 Add new

Add Cancel

Step-9: Connect all four virtual machines and update the machines.

```

obul [ ~]$ az ssh vm --resource-group CAPSTONE --vm-name VM2-WESTUS --subscription e7b24fe4-d32d-4ac9-a22a-fb6cbc7bd1d7
OpenSSH_8.9p1, OpenSSL 1.1.1k FIPS 25 Mar 2021
The authenticity of host '52.137.187.175 (52.137.187.175)' can't be established.
ED25519 key fingerprint is SHA256:nd62Ys1SJyWv5k/L2AFX/kGB4jDPWVmSyPHtV1PLjQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint]): yes
Warning: Permanently added '52.137.187.175' (ED25519) to the list of known hosts.
Learned new hostkey: ECDSA SHA256:C98PN2HFzJDioilladSKq2UAN/rHwATALMsKuZAsGi0
Adding new key for 52.137.187.175 to /home/obul/.ssh/known_hosts: ec
dsa-sha2-nistp256 SHA256:C98PN2HFzJDioilladSKq2UAN/rHwATALMsKuZAsGi0

Broadcast message from root@vm2-westus (Tue 2025-02-11 08:22:58 UTC):
obulareddy9310@gmail.com@vm2-westus:~$ sudo apt update
Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Hit:3 http://azure.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu focal-security InRelease
Hit:5 https://packages.microsoft.com/repos/microsoft-ubuntu-focal-prod focal InRelease
Get:6 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [3810 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1257 kB]
Fetched 5194 kB in 2s (2411 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done

```

Step-10: Clone into the git-Hub repository to all virtual machines.

```

obulareddy9310@gmail.com@vm2-westus:~$ git clone https://github.com/azcloudberg/azproject.git
Cloning into 'azproject'...
remote: Enumerating objects: 229, done.
remote: Counting objects: 100% (26/26), done.
remote: Compressing objects: 100% (12/12), done.
remote: Total 229 (delta 21), reused 14 (delta 14), pack-reused 203 (from 1)
Receiving objects: 100% (229/229), 52.16 KiB | 1.41 MiB/s, done.
Resolving deltas: 100% (108/108), done.
obulareddy9310@gmail.com@vm2-westus:~$ 
obulareddy9310@gmail.com@vm2-westus:~$ ls
azproject
obulareddy9310@gmail.com@vm2-westus:~$ cd azproject
obulareddy9310@gmail.com@vm2-westus:~/azproject$ ls
README.md app.py config.py error.html index.html templates vm1.sh vm2.sh
obulareddy9310@gmail.com@vm2-westus:~/azproject$ 

```

Step-11: On VM1, please run vm1.sh this will deploy the upload page. VM1: ./vm1.sh

```
obulareddy9310@gmail.com@vm1-Centralus:~$ sudo apt update
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease
Get:5 https://packages.microsoft.com/repos/microsoft-ubuntu-jammy-prod jammy InRelease [3631 B]
Get:6 https://packages.microsoft.com/repos/microsoft-ubuntu-jammy-prod jammy/main amd64 Packages [187 kB]
Fetched 191 kB in 1s (208 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
obulareddy9310@gmail.com@vm1-Centralus:~$ git clone https://github.com/azcloudberg/azproject.git
cloning into 'azproject'...
remote: Enumerating objects: 229, done.
remote: Counting objects: 100% (26/26), done.
remote: Compressing objects: 100% (12/12), done.
remote: Total 229 (delta 21), reused 14 (delta 14), pack-reused 203 (from 1)
Receiving objects: 100% (229/229), 52.16 KiB | 1007.00 KiB/s, done.
Resolving deltas: 100% (108/108), done.
obulareddy9310@gmail.com@vm1-Centralus:~$ ls
azproject
obulareddy9310@gmail.com@vm1-Centralus:~$ cd azproject
obulareddy9310@gmail.com@vm1-Centralus:~/azproject$ ls
README.md app.py config.py error.html index.html templates vm1.sh vm2.sh
obulareddy9310@gmail.com@vm1-Centralus:~/azproject$ ./vm1.sh
Rules updated
Rules updated (v6)
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease
Hit:5 https://packages.microsoft.com/repos/microsoft-ubuntu-jammy-prod jammy InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.10.6-1~22.04.1).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

Step-12: After running the scripts, please edit the config.py file on VM1, and enter the details related to your storage account where the files will be uploaded.

The screenshot shows two windows side-by-side. On the left is the Azure Storage Accounts blade, displaying a list of storage accounts under the 'storagecapstonepro' resource group. One account, 'storagecapstonepro', is selected. On the right is a terminal window showing the contents of the config.py file.

config.py

```
GNU nano 6.2
[DEFAULT]
# Account name
account =projectsg16
# Azure Storage account access key
key =10cthiqNfjVNv0UpJkGY3X/Q4ouBd9hWxCjfWpkq0/SrUTSCoXHOfgH01CrzDhoqQZf3HqlAAagF+AStYb1MwW==
# Container name
container =upload
```

Storage accounts

storagecapstonepro

Overview

- Access Control (IAM)
- Security + networking
 - Access keys
 - Shared access signature
 - Encryption
- Data management
 - Lifecycle management
- Settings
 - Configuration

Essentials

Resource group (move)	Performance Standard
capstone	Replication Locally-redundant storage (LRS)
Location centralus	Account kind StorageV2 (general purpose v2)
Subscription (move) Pay As You Go	Provisioning state Succeeded
Subscription ID e7b24fe4-d32d-4ac9-a22a-fb6cbc7bd1d7	Created 3/11/2025, 12:59:05 PM
Disk state Available	
Tags (edit) Add tags	

Page 1 of 1

GNU nano 6.2 config.py *

```
[DEFAULT]
# Account name
account =storagecapstonepro
# Azure Storage account access key
key =9CMs0b0N00eJ00a0Yn9E0/a21+od3TaqTv/4FZfiyZ+FYz9VJx04s+ZE1PfPGYCZn1l9wl3/nd6H+AStbmPhlg=#
# Container name
container =upload
```

Step-13: Once done, please run the following command: sudo python3 app.py.

```
obulareddy9310@gmail.com@vm1-Centralus:~/azproject$ sudo nano config.py
obulareddy9310@gmail.com@vm1-Centralus:~/azproject$ sudo python3 app.py
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:80
* Running on http://10.0.0.4:80
Press CTRL+C to quit
10.0.1.5 - - [11/Mar/2025 08:56:45] "GET / HTTP/1.1" 200 -
10.0.1.7 - - [11/Mar/2025 08:56:45] "GET / HTTP/1.1" 200 -

```

Step-14: Create traffic manager for pointing the application gateway of both regions.

The screenshot shows the Azure portal interface for creating a Traffic Manager profile. The top navigation bar includes 'Home', 'Load balancing', and 'Load balancing | Traffic Manager'. The left sidebar lists 'Overview', 'Load Balancing Services' (with 'Application Gateway' selected), 'Front Door and CDN profiles', 'Load Balancer', and 'Traffic Manager' (which is highlighted). The main content area displays a search bar, filter options ('Subscription equals all', 'Resource group equals all', 'Location equals all'), and sorting columns ('Name', 'Status', 'Routin...', 'Resource group', 'Subscription'). Below this, a large 'Create' button is visible. The central part of the screen shows the 'Create Traffic Manager profile' wizard. The first step, 'Basics', is selected. It requires a 'Resource group' (set to 'capstone') and a 'Name' (set to 'azure-104.trafficmanager.net'). Other fields include 'Routing method' (set to 'Performance') and 'Resource group location' (set to '(US) Central US'). The second step, 'Review + Create', is shown below with a 'Validation passed' message. It lists the configuration details: Subscription (Pay-As-You-Go), Resource group (capstone), Resource group location (Central US), Name (azure-104), and Routing method (Performance). Navigation buttons at the bottom include 'Create', '< Previous', and 'Next >'.

Home > Load balancing | Application Gateway >

AG1 Application gateway

Search Delete Refresh Feedback

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- > Settings
- > Monitoring
- > Automation
- > Help

Essentials

Resource group ([move](#)) **capstone** Copy to clipboard

Location Central US (Zone 1, 2, 3) [Edit](#)

Subscription ([move](#)) **Pay-As-You-Go**

Subscription ID e7b24fe4-d32d-4ac9-a22a-fb6cbc7bd1d7

Tags ([edit](#)) [Add tags](#)

Virtual network/subnet **Vnet1/subnet-ag**

Frontend public IP address **132.196.105.5 (AGip1)**

Frontend private IP address -

Tier Standard V2

Availability zone 1, 2, 3

Home > Load balancing | Application Gateway > AG1 >

AGip1 Public IP address

Search Associate Dissociate Delete Move Refresh Open in mobile Give feedback

Overview

- Activity log
- Access control (IAM)
- Tags
- > Settings
- Configuration**
- Properties
- Locks

Essentials

Resource group ([move](#)) **capstone**

Location Central US

Subscription ([move](#)) **Pay-As-You-Go**

Subscription ID e7b24fe4-d32d-4ac9-a22a-fb6cbc7bd1d7

SKU Standard

Tier Regional

IP address 132.196.105.5

DNS name -

Domain name label scope -

Home > Load balancing | Application Gateway > AG1 > AGip1

AGip1 | Configuration Public IP address

Save Discard Refresh

IP address assignment Static

IP address 132.196.105.5

Idle timeout (minutes) 4

DNS name label (optional) applicationgw

.centralus.cloudapp.azure.com

1 You can use the IP address as your 'A' DNS record or DNS label as your 'CNAME' record. [Learn more about adding a custom domain to this IP address](#)

Home > Load balancing | Application Gateway > AG2 > AGip2

AGip2 | Configuration Public IP address

Save Discard Refresh

IP address assignment Static

IP address 57.154.181.49

Idle timeout (minutes) 4

DNS name label (optional) applicationgw2

.westus.cloudapp

✖ DNS name label not available. Try using a different label.

1 You can use the IP address as your 'A' DNS record or DNS label as your 'CNAME' record. [Learn more about adding a custom domain to this IP address](#)

azure-104 | Endpoints

Add endpoint

Type *

Name *

Enable Endpoint

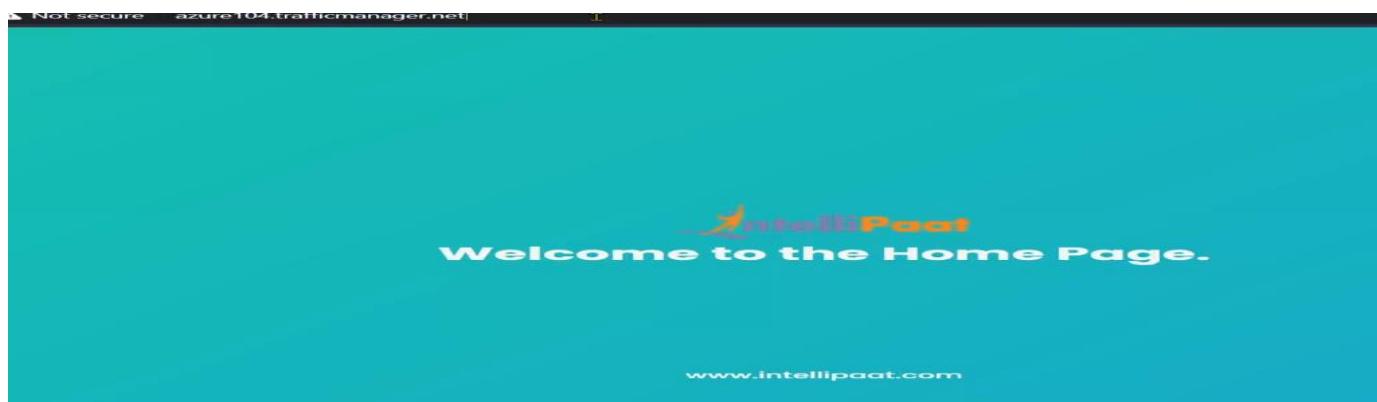
Target resource type *

Target resource *

Custom Header settings

Add Cancel

Step-15: Copy the endpoint and paste it and run in new page it will give the home page.



Step-16: Add /upload at the end of the endpoint link and run. It shows the file upload page here and upload the files and check in container for uploaded files.

