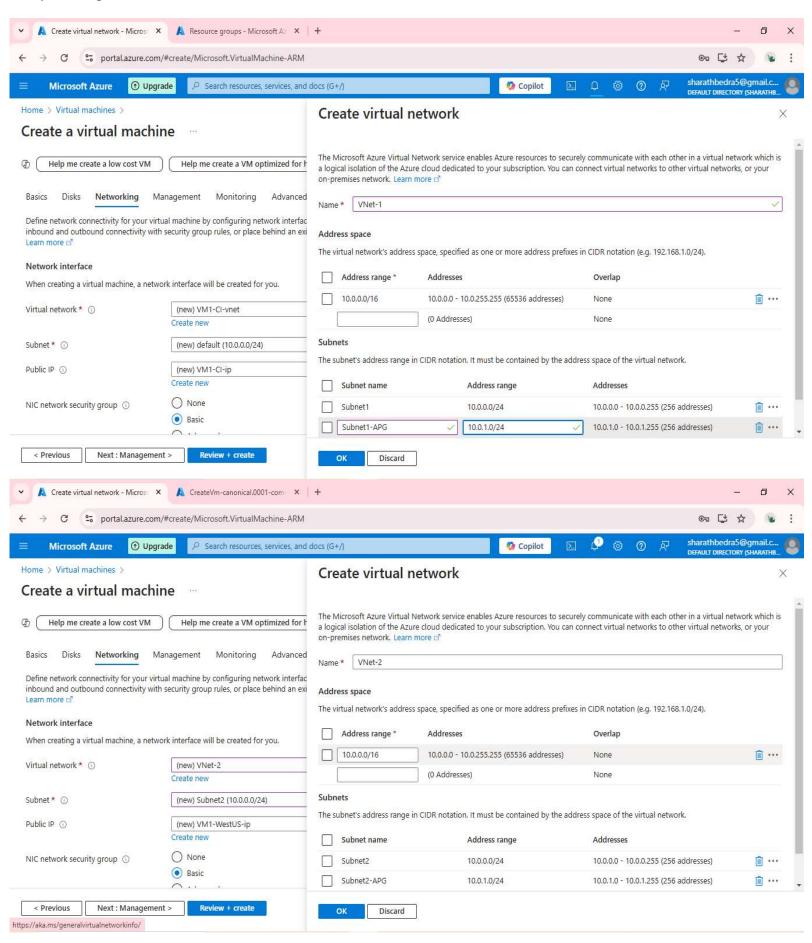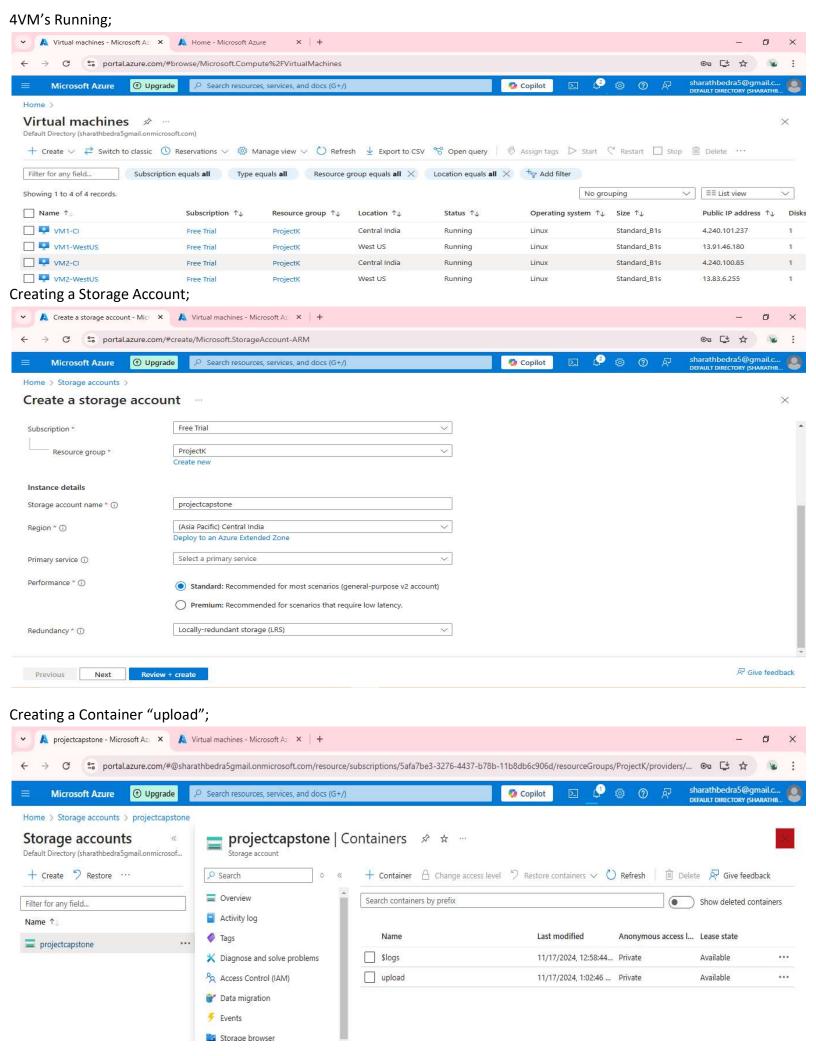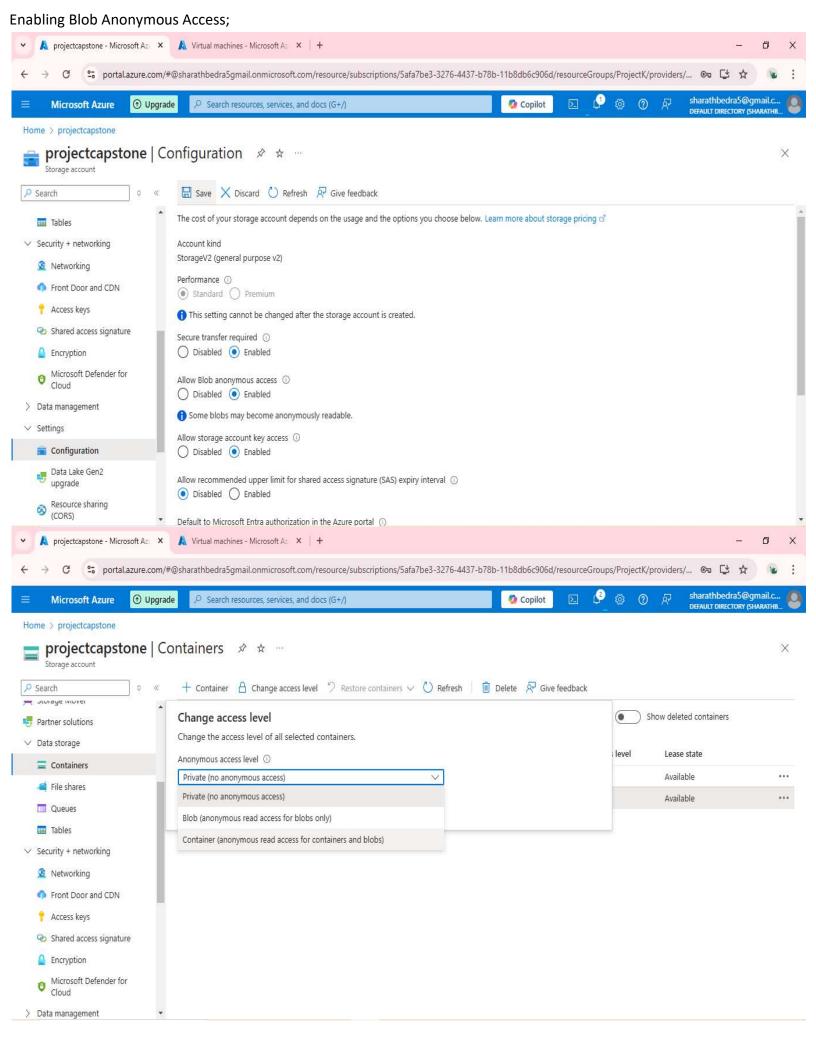# Azure Capstone Project:

Note*: I have taken my 1st V-Net region as Central India because Central US region was not available for me.

Firstly creating 2 subnets inside VNet-1 & VNet-2
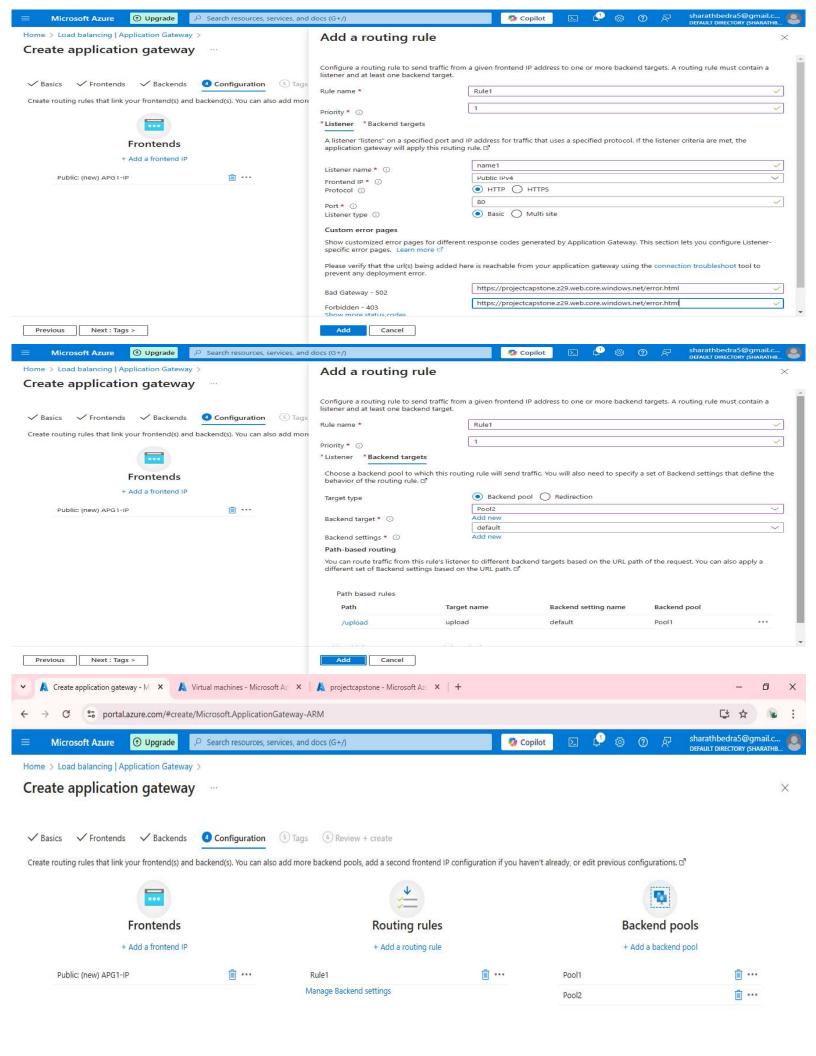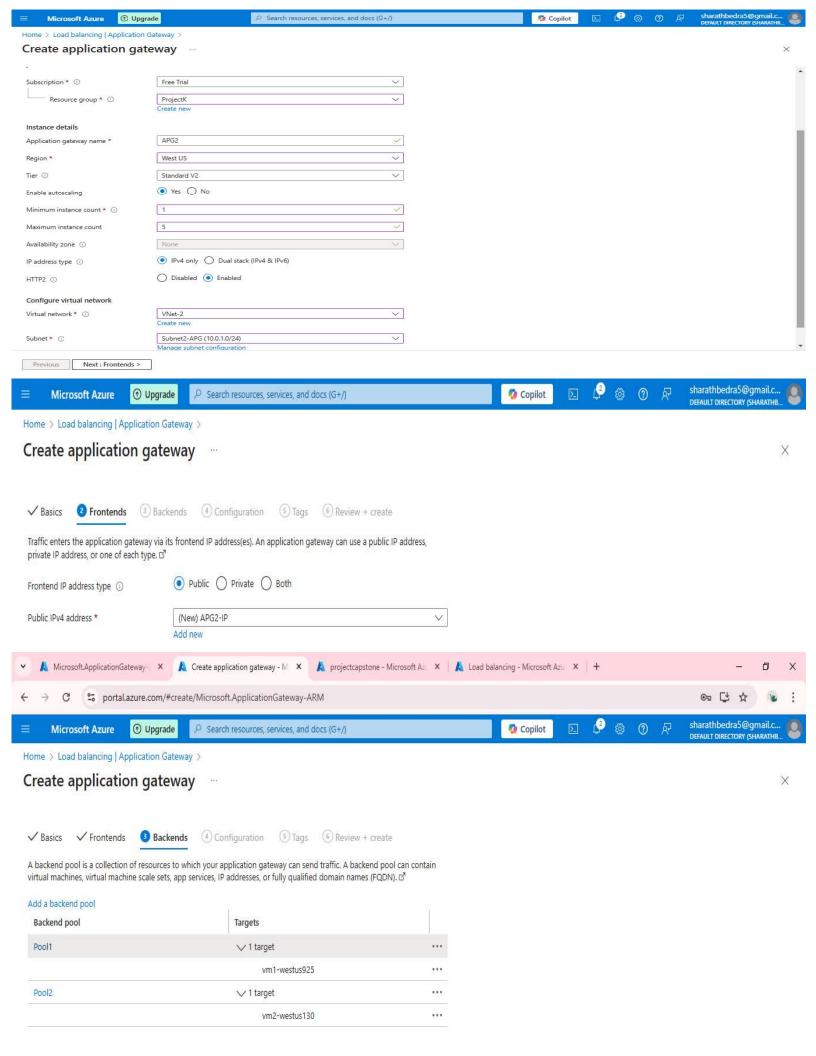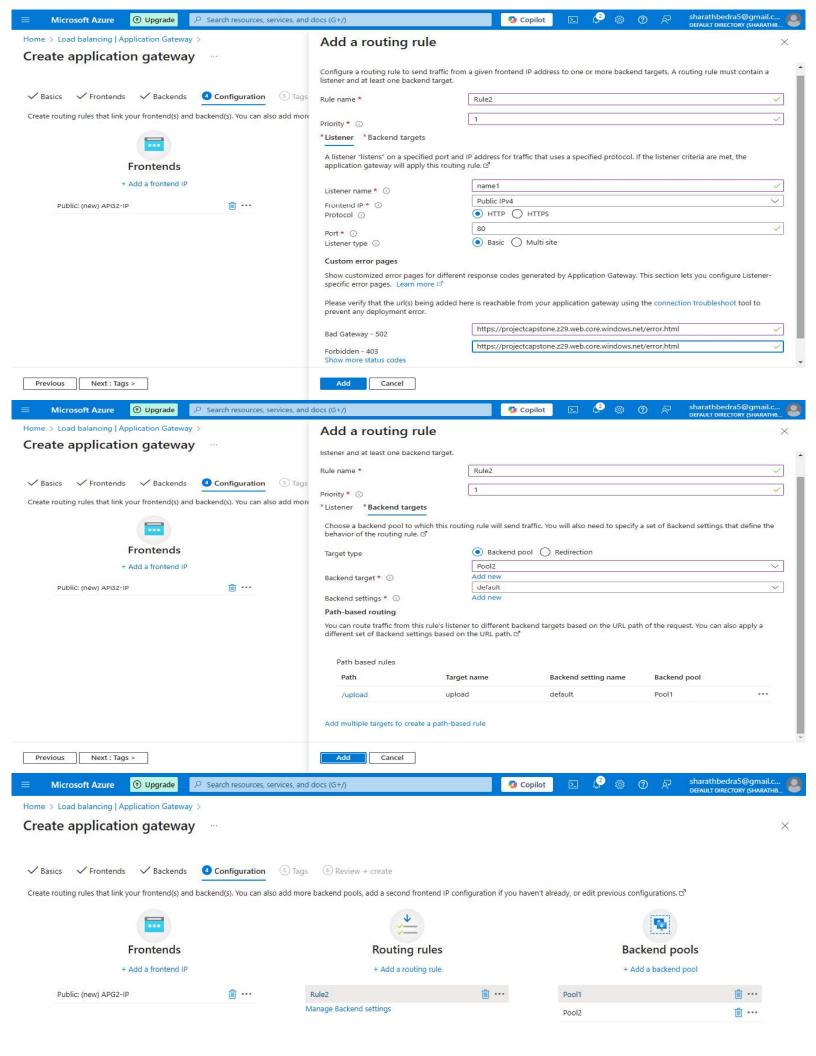
4VM's Running;

Creating a Storage Account;

Creating a Container "upload";

Enabling Blob Anonymous Access;

Creating a Static Website;

Upload error.html file inside $web container;

Verifying the error page;

Creating 2 Application Gateways;

Microsoft Azure   ⊕ Upgrade   Search resources, services, and docs (G+/)   Copilot   sharathbedra5@gmail.c...
DEFAULT DIRECTORY (SHARATHB...

Home > Load balancing | Application Gateway >

Create application gateway   ···

Subscription * ⓘ   Free Trial

    Resource group * ⓘ   ProjectK
      Create new

Instance details

Application gateway name *   APG1

Region *   Central India

Tier ⓘ   Standard V2

Enable autoscaling   ● Yes   ○ No

Minimum instance count * ⓘ   1

Maximum instance count   5

Availability zone * ⓘ   Zones 1, 2, 3

IP address type ⓘ   ● IPv4 only   ○ Dual stack (IPv4 & IPv6)

HTTP2 ⓘ   ○ Disabled   ● Enabled

Configure virtual network

Virtual network * ⓘ   VNet-1
    Create new

Subnet * ⓘ   Subnet1-APG (10.0.1.0/24)
    Manage subnet configuration

Previous   Next : Frontends >

Create application gateway - M × Virtual machines - Microsoft A × projectcapstone - Microsoft A × Module 5 Assignment × +

← → C   portal.azure.com/#create/Microsoft.ApplicationGateway-ARM

Microsoft Azure   ⊕ Upgrade   Search resources, services, and docs (G+/)   Copilot   sharathbedra5@gmail.c...
DEFAULT DIRECTORY (SHARATHB...

Home > Load balancing | Application Gateway >

Create application gateway   ···

✓ Basics   ② Frontends   ③ Backends   ④ Configuration   ⑤ Tags   ⑥ 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   ○ Private   ○ Both

Public IPv4 address *   (New) APG1-IP
    Add new

Create application gateway - M × Virtual machines - Microsoft A × projectcapstone - Microsoft A × Module 5 Assignment × +

← → C   portal.azure.com/#create/Microsoft.ApplicationGateway-ARM

Microsoft Azure   ⊕ Upgrade   Search resources, services, and docs (G+/)   Copilot   sharathbedra5@gmail.c...
DEFAULT DIRECTORY (SHARATHB...

Home > Load balancing | Application Gateway >

Create application gateway   ···

✓ Basics   ✓ Frontends   ③ Backends   ④ Configuration   ⑤ Tags   ⑥ 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	···
	vm1-ci423_z1	···
Pool2	⌄ 1 target	···
	vm2-ci708_z1	···

Create application gateway

✓ Basics   ✓ Frontends   ✓ Backends   **4 Configuration**   ⑤ Tags

Create routing rules that link your frontend(s) and backend(s). You can also add more

Frontends

+ Add a frontend IP

Public: (new) APG1-IP

Add a routing rule

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name *   Rule1

Priority * ⓘ   1

*Listener   *Backend targets

A listener "listens" on a specified port and IP address for traffic that uses a specified protocol. If the listener criteria are met, the application gateway will apply this routing rule. ⬚

Listener name * ⓘ   name1

Frontend IP * ⓘ   Public IPv4

Protocol ⓘ   ● HTTP   ○ HTTPS

Port * ⓘ   80

Listener type ⓘ   ● 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   https://projectcapstone.z29.web.core.windows.net/error.html

Forbidden - 403   https://projectcapstone.z29.web.core.windows.net/error.html
Show more status codes

Previous   Next : Tags >   Add   Cancel

Create application gateway

✓ Basics   ✓ Frontends   ✓ Backends   **4 Configuration**   ⑤ Tags

Create routing rules that link your frontend(s) and backend(s). You can also add more

Frontends

+ Add a frontend IP

Public: (new) APG1-IP

Add a routing rule

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name *   Rule1

Priority * ⓘ   1

*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

                             Pool2

Backend target * ⓘ   Add new
                             default

Backend settings * ⓘ   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	
/upload	upload	default	Pool1	...

Previous   Next : Tags >   **Add**   Cancel

A Create application gateway - M ✕   A Virtual machines - Microsoft Az ✕   A projectcapstone - Microsoft Az ✕   +

← → C   portal.azure.com/#create/Microsoft.ApplicationGateway-ARM

Create application gateway

✓ Basics   ✓ Frontends   ✓ Backends   **4 Configuration**   ⑤ Tags   ⑥ 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) APG1-IP

Routing rules

+ Add a routing rule

Rule1

Manage Backend settings

Backend pools

+ Add a backend pool

Pool1

Pool2

Home > Load balancing | Application Gateway >

Create application gateway ...

Subscription * ⓘ | Free Trial
Resource group * ⓘ | ProjectK
Create new

Instance details

Application gateway name * | APG2
Region * | West US
Tier ⓘ | Standard V2
Enable autoscaling | ● Yes ○ No
Minimum instance count * ⓘ | 1
Maximum instance count | 5
Availability zone ⓘ | None
IP address type ⓘ | ● IPv4 only ○ Dual stack (IPv4 & IPv6)
HTTP2 ⓘ | ○ Disabled ● Enabled

Configure virtual network

Virtual network * ⓘ | VNet-2
Create new
Subnet * ⓘ | Subnet2-APG (10.0.1.0/24)
Manage subnet configuration

Previous | Next : Frontends >

Home > Load balancing | Application Gateway >

Create application gateway ...

✓ Basics | ② Frontends | ③ Backends | ④ Configuration | ⑤ Tags | ⑥ 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 ○ Private ○ Both

Public IPv4 address * | (New) APG2-IP
Add new

Home > Load balancing | Application Gateway >

Create application gateway ...

✓ Basics | ✓ Frontends | ③ Backends | ④ Configuration | ⑤ Tags | ⑥ 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	•••
	vm1-westus925	•••
Pool2	∨ 1 target	•••
	vm2-westus130	•••

Home > Load balancing | Application Gateway >

Create application gateway ...

✓ Basics ✓ Frontends ✓ Backends **4 Configuration** ⑤ Tags

Create routing rules that link your frontend(s) and backend(s). You can also add more

Frontends

+ Add a frontend IP

Public: (new) APG2-IP 🗑 ...

Add a routing rule ✕

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name * `Rule2`

Priority * ⓘ `1`

*Listener ***Backend targets**

A listener "listens" on a specified port and IP address for traffic that uses a specified protocol. If the listener criteria are met, the application gateway will apply this routing rule. ⧉

Listener name * ⓘ `name1`

Frontend IP * ⓘ `Public IPv4`

Protocol ⓘ ● HTTP ○ HTTPS

Port * ⓘ `80`

Listener type ⓘ ● 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 `https://projectcapstone.z29.web.core.windows.net/error.html`

Forbidden - 403 `https://projectcapstone.z29.web.core.windows.net/error.html`

Show more status codes

Previous | Next : Tags >

Add **Cancel**

Home > Load balancing | Application Gateway >

Create application gateway ...

✓ Basics ✓ Frontends ✓ Backends **4 Configuration** ⑤ Tags

Create routing rules that link your frontend(s) and backend(s). You can also add more

Frontends

+ Add a frontend IP

Public: (new) APG2-IP 🗑 ...

Add a routing rule ✕

listener and at least one backend target.

Rule name * `Rule2`

Priority * ⓘ `1`

*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

`Pool2`

Backend target * ⓘ Add new
`default`

Backend settings * ⓘ 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	
/upload	upload	default	Pool1	...

Add multiple targets to create a path-based rule

Previous | Next : Tags >

Add **Cancel**

Home > Load balancing | Application Gateway >

Create application gateway ... ✕

✓ Basics ✓ Frontends ✓ Backends **4 Configuration** ⑤ Tags ⑥ 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) APG2-IP 🗑 ...

Routing rules

+ Add a routing rule

Rule2 🗑 ...
Manage Backend settings

Backend pools

+ Add a backend pool

Pool1 🗑 ...

Pool2 🗑 ...

Git Clonning in all the VM's;


```
user123@VM1-CI:~$ 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 | 293.00 KiB/s, done.
Resolving deltas: 100% (108/108), done.
user123@VM1-CI:~$ ls
azproject
user123@VM1-CI:~$ cd azproject/
user123@VM1-CI:~/azproject$ ls
README.md  app.py  config.py  error.html  index.html  templates  vm1.sh  vm2.sh
user123@VM1-CI:~/azproject$
```

```
user123@VM1-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 | 875.00 KiB/s, done.
Resolving deltas: 100% (108/108), done.
user123@VM1-WestUS:~$ cd azproject/
user123@VM1-WestUS:~/azproject$ ls
README.md  app.py  config.py  error.html  index.html  templates  vm1.sh  vm2.sh
user123@VM1-WestUS:~/azproject$
```

```
user123@VM2-CI:~$ 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 | 3.26 MiB/s, done.
Resolving deltas: 100% (108/108), done.
user123@VM2-CI:~$ cd azproject/
user123@VM2-CI:~/azproject$ ls
README.md  app.py  config.py  error.html  index.html  templates  vm1.sh  vm2.sh
user123@VM2-CI:~/azproject$
```

```
user123@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 | 821.00 KiB/s, done.
Resolving deltas: 100% (108/108), done.
user123@VM2-WestUS:~$ ls
azproject
user123@VM2-WestUS:~$ cd azproject/
user123@VM2-WestUS:~/azproject$ ls
README.md  app.py  config.py  error.html  index.html  templates  vm1.sh  vm2.sh
user123@VM2-WestUS:~/azproject$
```

Running vm1.sh on Both 1ˢᵗ VMs;

```
user123@VM1-CI:~/azproject$ ls
README.md  app.py  config.py  error.html  index.html  templates  vm1.sh  vm2.sh
user123@VM1-CI:~/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
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.
The following packages were automatically installed and are no longer required:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.3-0 ssl-cert
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 18 not upgraded.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.3-0 ssl-cert
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  build-essential cpp cpp-11 dpkg-dev fakeroot fontconfig-config fonts-dejavu-core g++ g++-11 gcc gcc-11 gcc-11-base javascript-common libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan6 libatomic1 libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libdeflate0 libdpkg-perl
  libexpat1-dev libfakeroot libfile-fcntllock-perl libfontconfig1 libgcc-11-dev libgd3 libgomp1 libisl23 libitm1 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery
```



```
user123@VM1-WestUS:~/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
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 18 not upgraded.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  build-essential bzip2 cpp cpp-11 dpkg-dev fakeroot fontconfig-config fonts-dejavu-core g++ g++-11 gcc gcc-11 gcc-11-base javascript-common libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan6 libatomic1 libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libdeflate0 libdpkg-perl
  libexpat1-dev libfakeroot libfile-fcntllock-perl libfontconfig1 libgcc-11-dev libgd3 libgomp1 libisl23 libitm1 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery
  libjs-sphinxdoc libjs-underscore liblsan0 libmpc3 libnsl-dev libpython3-dev libpython3.10-dev libquadmath0 libstdc++-11-dev libtiff5 libtirpc-dev libtsan0 libubsan1
  libwebp7 libxpm4 linux-libc-dev lto-disabled-list make manpages-dev python3-dev python3-wheel python3.10-dev rpcsvc-proto zlib1g-dev
Suggested packages:
  bzip2-doc cpp-doc gcc-11-locales debian-keyring g++-multilib g++-11-multilib gcc-11-doc gcc-multilib autoconf automake libtool flex bison gdb gcc-doc
  gcc-11-multilib apache2 | lighttpd | httpd glibc-doc bzr libgd-tools libstdc++-11-doc make-doc
The following NEW packages will be installed:
  build-essential bzip2 cpp cpp-11 dpkg-dev fakeroot fontconfig-config fonts-dejavu-core g++ g++-11 gcc gcc-11 gcc-11-base javascript-common libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan6 libatomic1 libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libdeflate0 libdpkg-perl
```

Running vm2.sh on Both 2st VMs;

Modifying the Storage Account Details;

Running "sudo python3 app.py" command;

Creating a Traffic Manager;

Configuring the DNS name for both the Application Gateways;

Adding Endpoints to Traffic Manager;
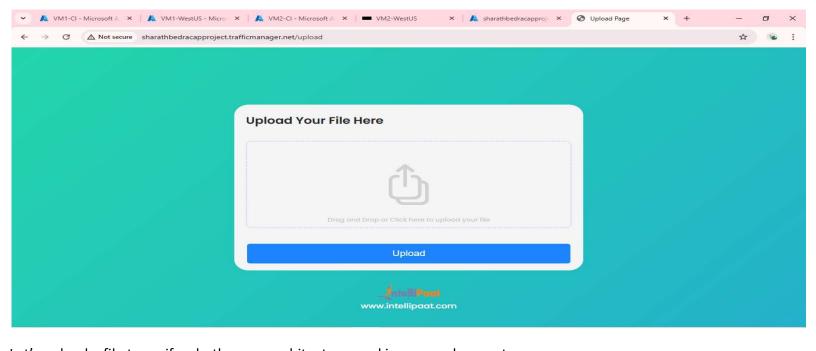
Verifying the DNS Name (Home Page & Upload Page);

Let's upload a file to verify whether our architecture working properly or not;