AZURE PROJECT

NAME : SRIKANT BARIK

SIC :22BCSF40

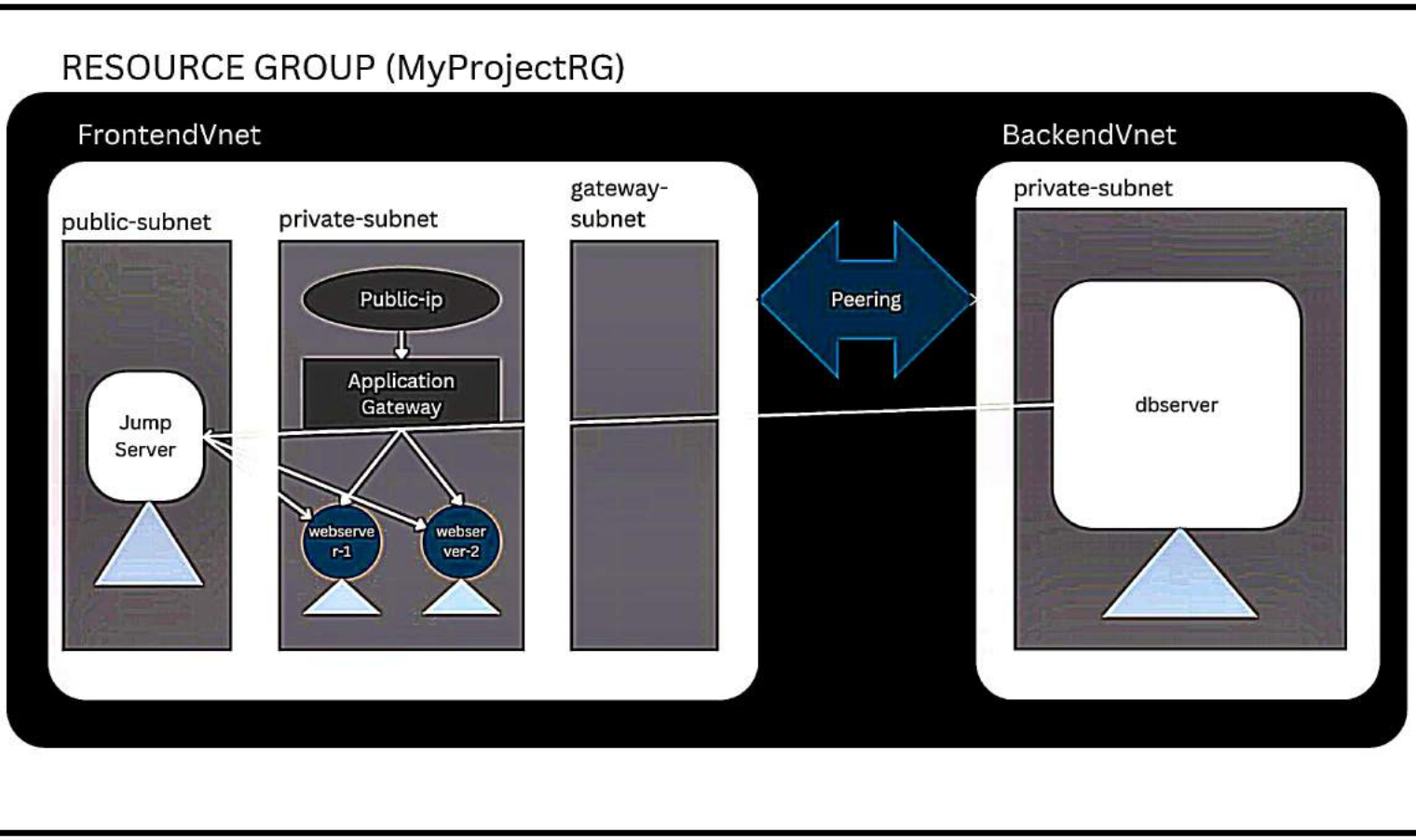
BATCH : 01

BRANCH :COMPUTER SCIENCE AND ENGINEERING

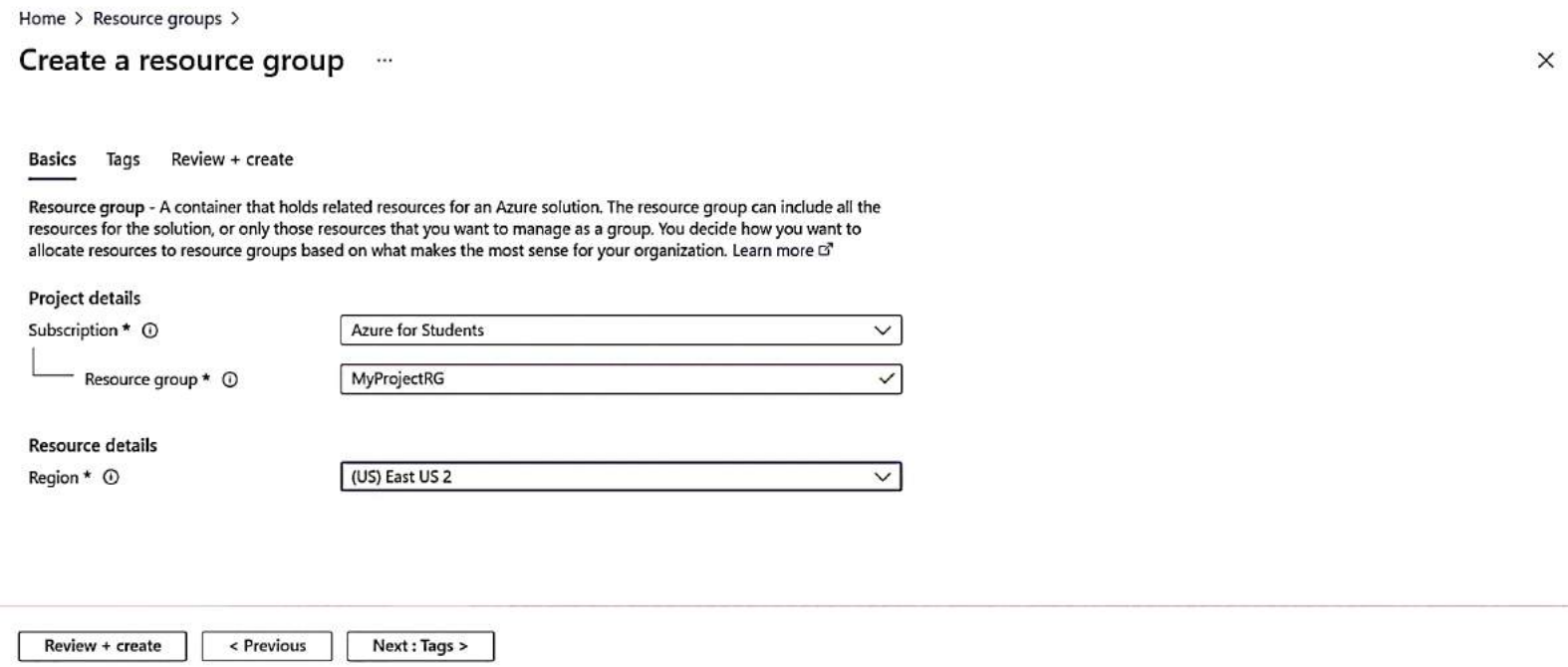
AIM OF THE PROJECT :-

- 1. To Create separate virtual networks for a database (backend) and frontend of application, respectively.
- 2. To Deploy Virtual Machines for hosting the front end of the application and database. Connect it with a jump Vm or server to make changes to the frontend or backend
- 3. To Apply load balancer to the frontend servers in the frontend network and attach public IP to load balancer only.
- 4. To Enable autoscaling for managing the traffic
- 5. To Connect to the VMs through a private path setup by the jump servers. (Use VPN)
- 6. To Deploy it with Azure Hosting service and map public IP of load balancer to the domain name
- 7. To Perform the operations from the frontend as a general user and check the results in the database
- 8. To Apply an SSL certificate to the domain while it is hosted

DIAGRAMMATIC REPRESENTATION :-


RESOURCE GROUP (MyProjectRG)
FrontendVnet
BackendVnet
public-subnet
private-subnet
gateway-subnet
private-subnet
Public-ip
Application Gateway
Jump Server
webserver-1
webserver-2
Peering
dbserver

Screen Shots of each steps of the project :-


Home > Resource groups >
Create a resource group
Basics
Tags
Review + create
Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. Learn more
Project details
Subscription *
Azure for Students
Resource group *
MyProjectRG
Resource details
Region *
(US) East US 2
Review + create
< Previous
Next : Tags >

Home > Resource groups >

Create a resource group ···

Validation passed.

Basics Tags **Review + create**

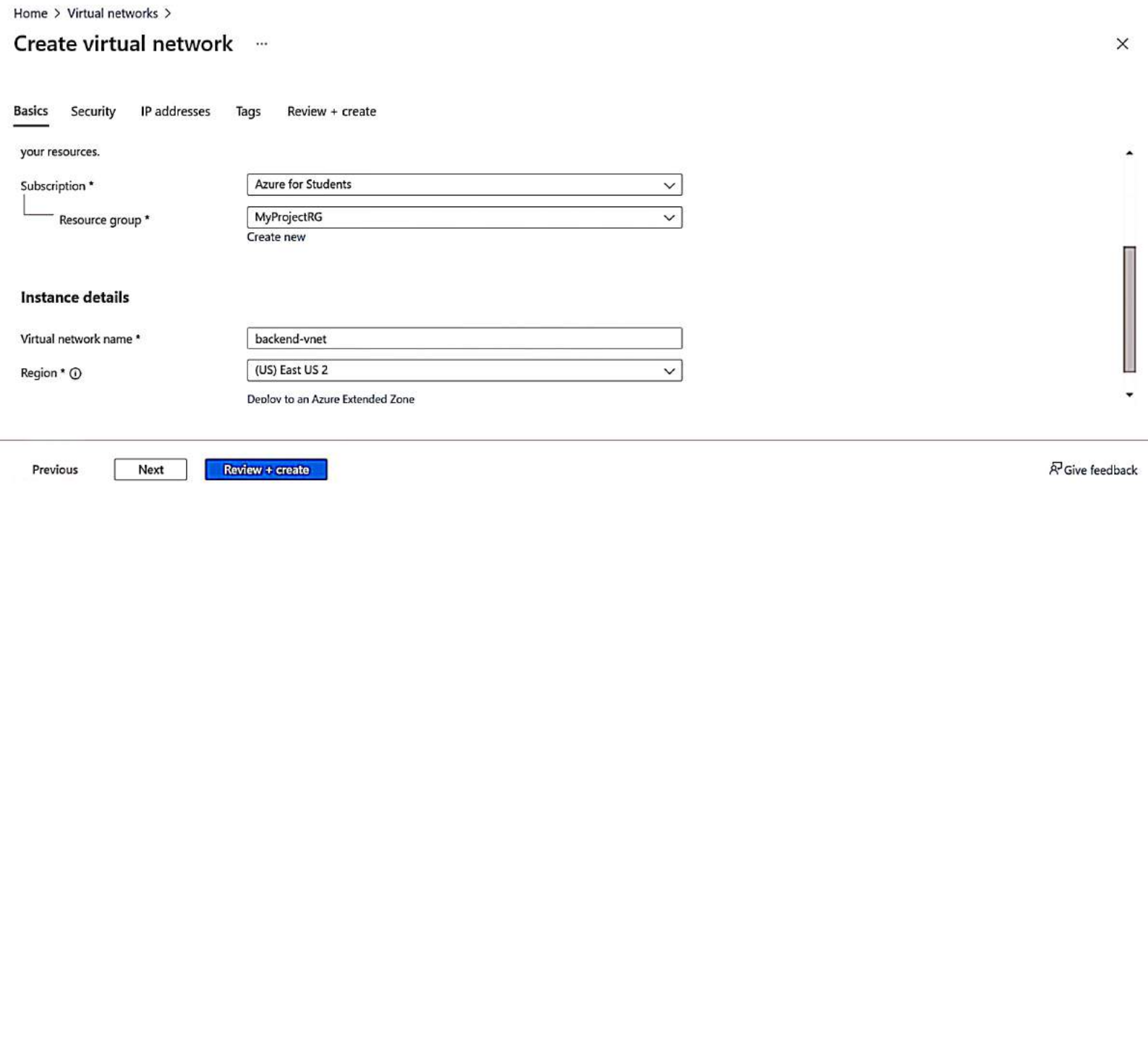
Basics

Subscription	Azure for Students
Resource group	MyProjectRG
Region	East US 2

Tags

None

Create < Previous Next > Download a template for automation


Home > Virtual networks >
Create virtual network
Basics
Security
IP addresses
Tags
Review + create
your resources.
Subscription *
Azure for Students
Resource group *
MyProjectRG
Create new
Instance details
Virtual network name *
backend-vnet
Region *
(US) East US 2
Deploy to an Azure Extended Zone
Previous
Next
Review + create
Give feedback


Home > Virtual networks >
Create virtual network
Basics
Security
IP addresses
Tags
Review + create
Add IPv4 address space
10.0.0.0/16
Delete address space
10.0.0.0
/16
10.0.0.0 - 10.0.255.255
65,536 addresses
Add a subnet
Subnets
IP address range
Size
NAT gateway
db-subnet
10.0.1.0 - 10.0.1.255
/24 (256 addresses)
-

Previous
Next
Review + create
Give feedback

Home > Virtual networks >

Create virtual network ···

Basics Security IP addresses Tags Review + create

Name	backend-vnet
Region	East US 2

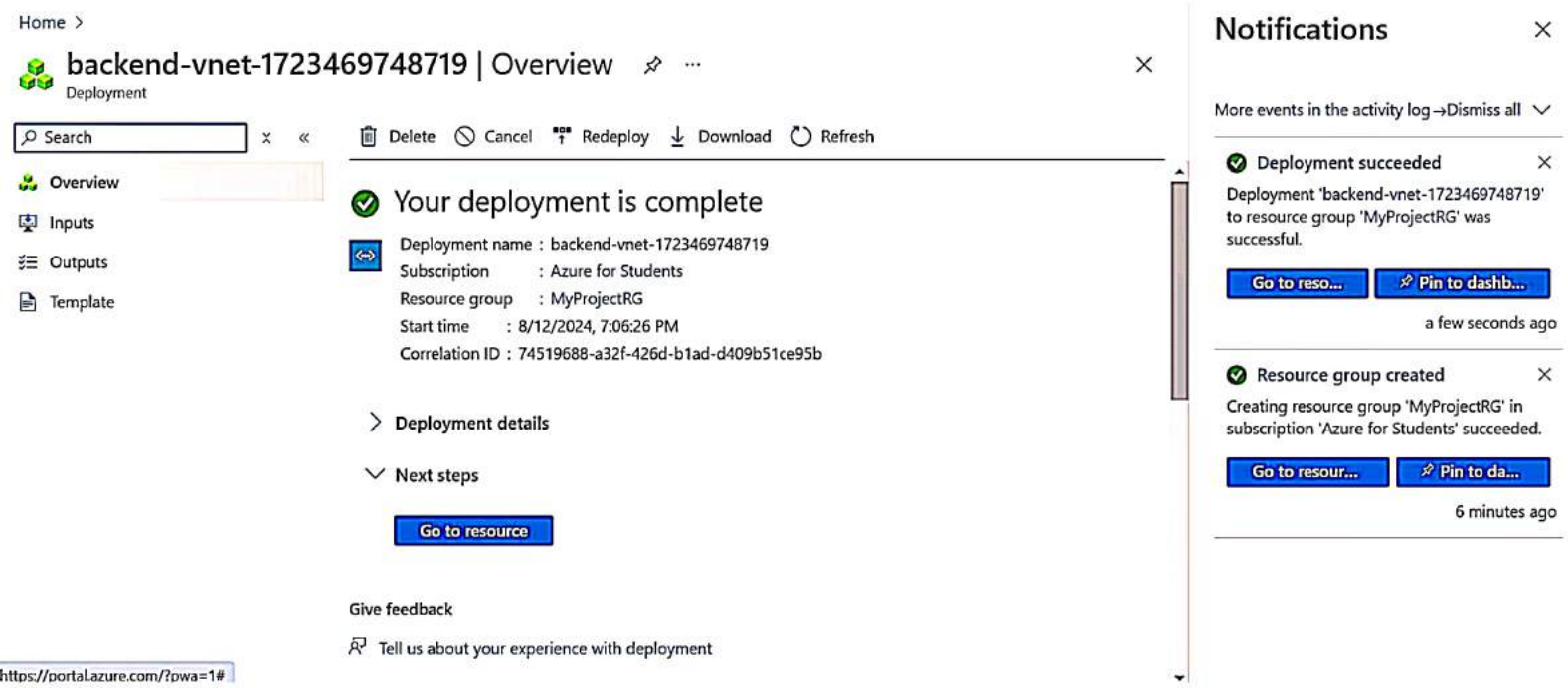
Security

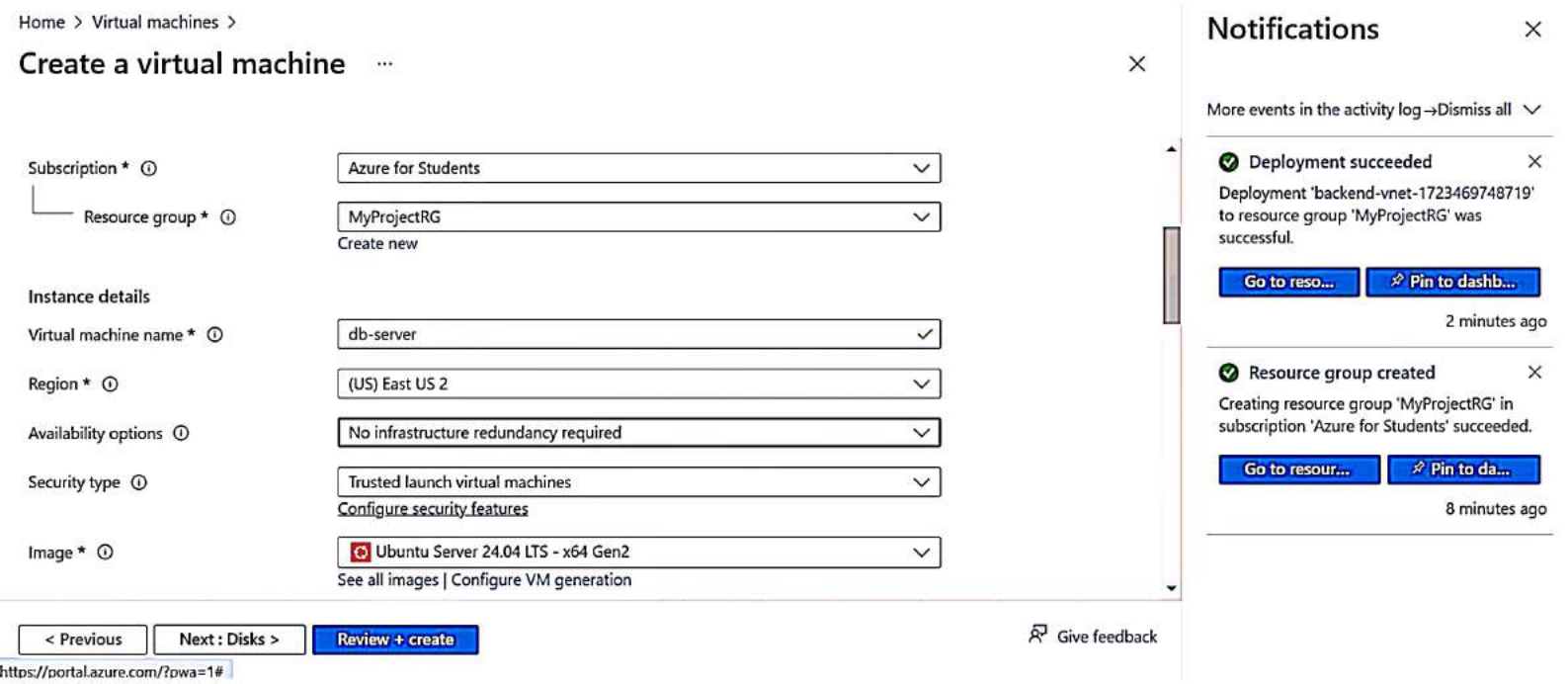
Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

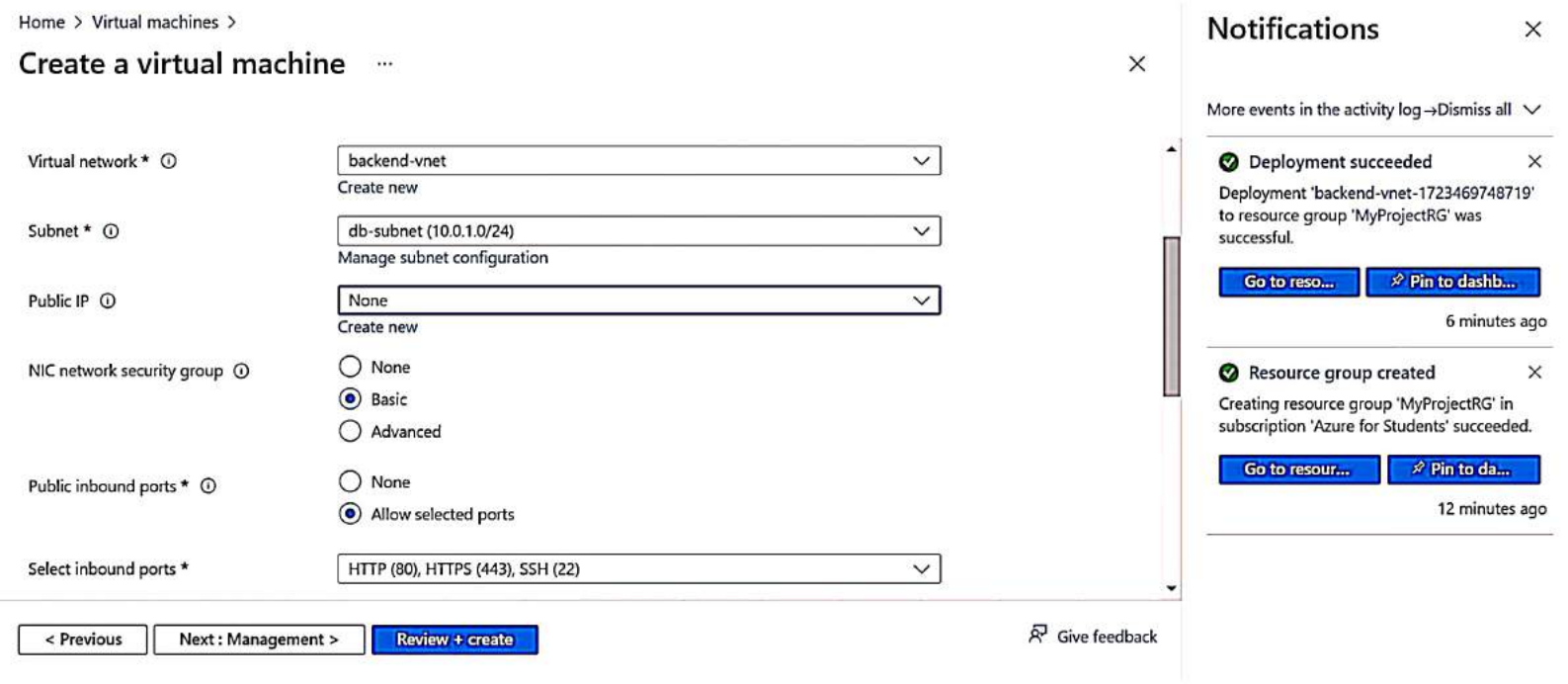
IP addresses

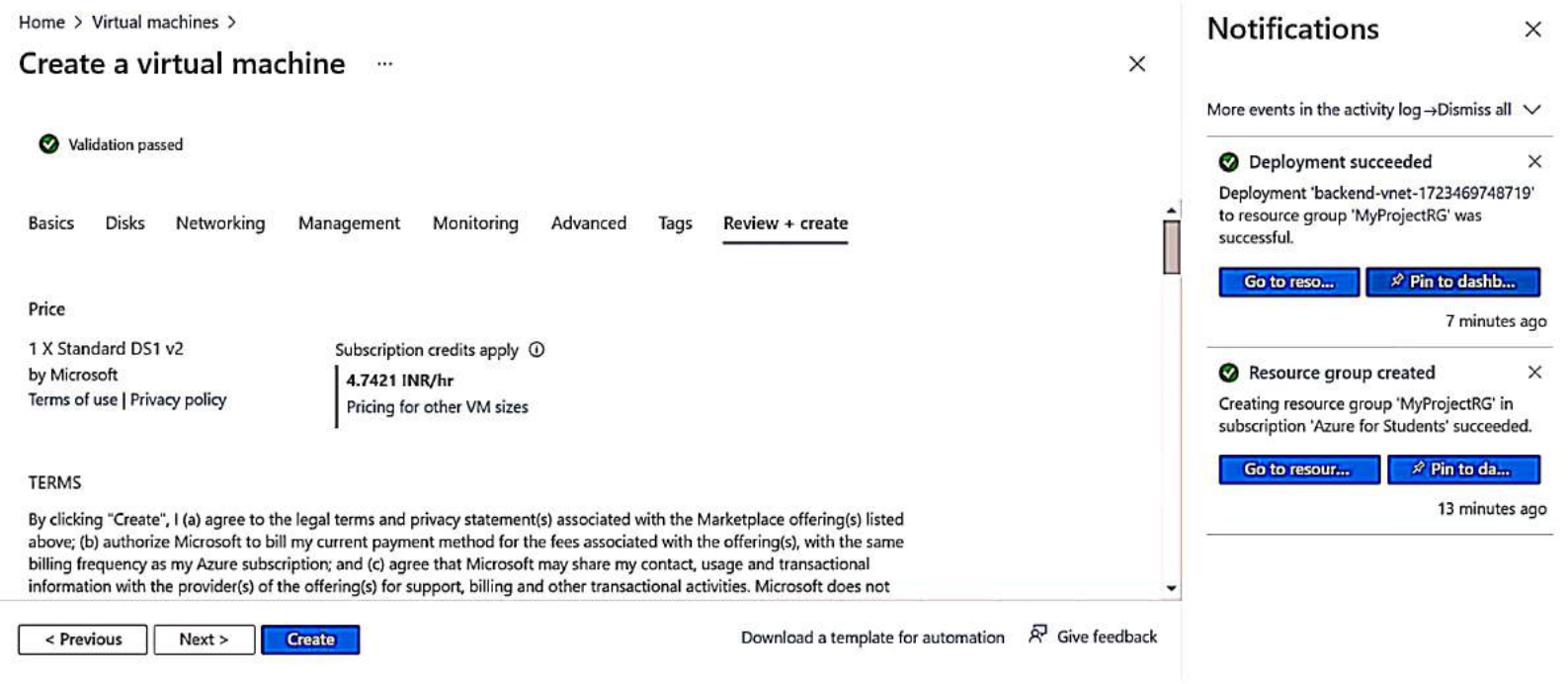
Address space	10.0.0.0/16 (65,536 addresses)
Subnet	db-subnet (10.0.1.0/24) (256 addresses)

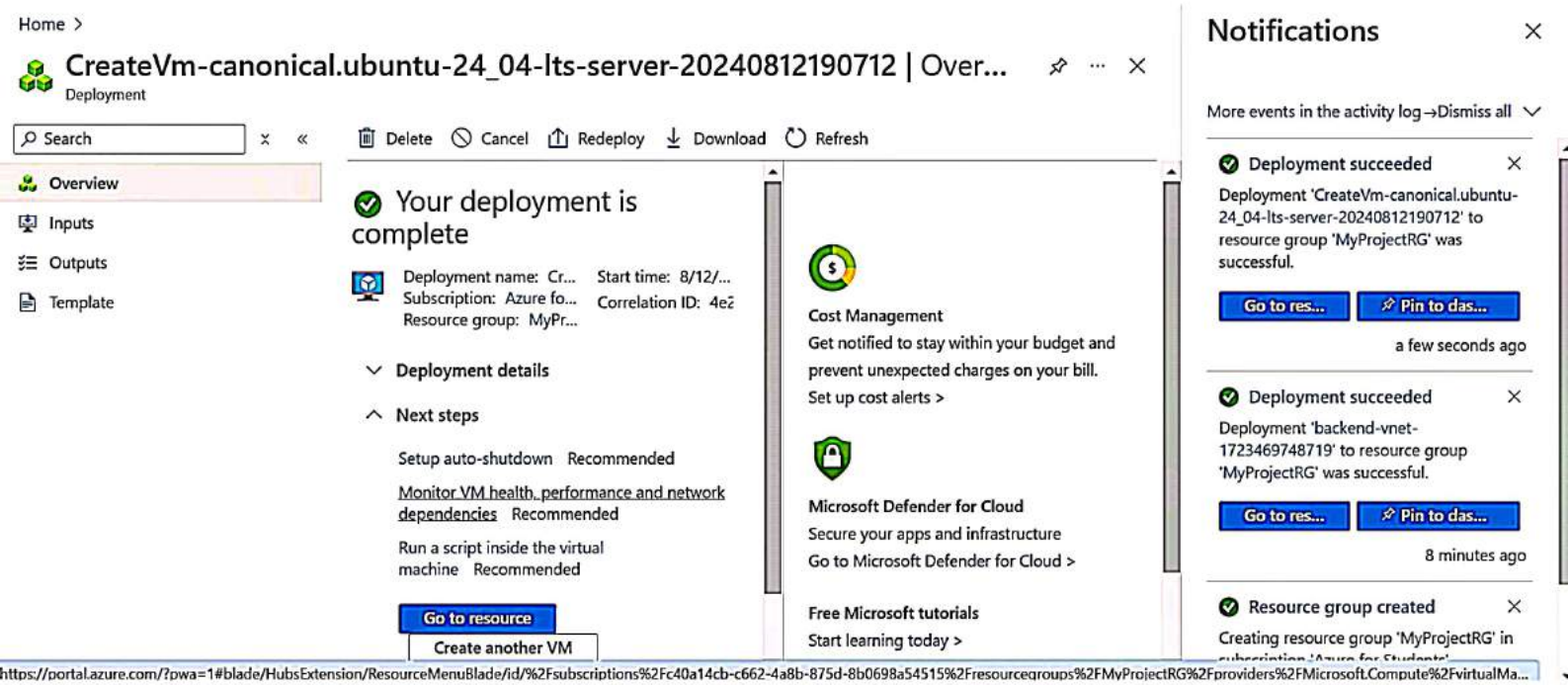
Previous Next Create Give feedback


Home >
backend-vnet-1723469748719 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : backend-vnet-1723469748719
Subscription : Azure for Students
Resource group : MyProjectRG
Start time : 8/12/2024, 7:06:26 PM
Correlation ID : 74519688-a32f-426d-b1ad-d409b51ce95b
Deployment details
Next steps
Go to resource
Give feedback
Tell us about your experience with deployment
https://portal.azure.com/?pwa=1#
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'backend-vnet-1723469748719' to resource group 'MyProjectRG' was successful.
Go to reso...
Pin to dashb...
a few seconds ago
Resource group created
Creating resource group 'MyProjectRG' in subscription 'Azure for Students' succeeded.
Go to resour...
Pin to da...
6 minutes ago


Home > Virtual machines >
Create a virtual machine
Subscription * Azure for Students
Resource group * MyProjectRG
Create new
Instance details
Virtual machine name * db-server
Region * (US) East US 2
Availability options No infrastructure redundancy required
Security type Trusted launch virtual machines
Configure security features
Image * Ubuntu Server 24.04 LTS - x64 Gen2
See all images | Configure VM generation
< Previous
Next : Disks >
Review + create
Give feedback
https://portal.azure.com/?pwa=1#
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'backend-vnet-1723469748719' to resource group 'MyProjectRG' was successful.
Go to reso...
Pin to dashb...
2 minutes ago
Resource group created
Creating resource group 'MyProjectRG' in subscription 'Azure for Students' succeeded.
Go to resour...
Pin to da...
8 minutes ago


Home > Virtual machines >
Create a virtual machine
Virtual network *
backend-vnet
Create new
Subnet *
db-subnet (10.0.1.0/24)
Manage subnet configuration
Public IP
None
Create new
NIC network security group
None
Basic
Advanced
Public inbound ports *
None
Allow selected ports
Select inbound ports *
HTTP (80), HTTPS (443), SSH (22)
< Previous
Next : Management >
Review + create
Give feedback
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'backend-vnet-1723469748719' to resource group 'MyProjectRG' was successful.
Go to reso...
Pin to dashb...
6 minutes ago
Resource group created
Creating resource group 'MyProjectRG' in subscription 'Azure for Students' succeeded.
Go to resour...
Pin to da...
12 minutes ago


Home > Virtual machines >
Create a virtual machine
Validation passed
Basics Disks Networking Management Monitoring Advanced Tags Review + create
Price
1 X Standard DS1 v2
by Microsoft
Terms of use | Privacy policy
Subscription credits apply
4.7421 INR/hr
Pricing for other VM sizes
TERMS
By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not
< Previous
Next >
Create
Download a template for automation
Give feedback
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'backend-vnet-1723469748719' to resource group 'MyProjectRG' was successful.
Go to reso...
Pin to dashb...
7 minutes ago
Resource group created
Creating resource group 'MyProjectRG' in subscription 'Azure for Students' succeeded.
Go to resour...
Pin to da...
13 minutes ago


Home >
CreateVm-canonical.ubuntu-24_04-lts-server-20240812190712 | Over...
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: Cr...
Subscription: Azure fo...
Resource group: MyPr...
Start time: 8/12/...
Correlation ID: 4e2
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 >
Free Microsoft tutorials
Start learning today >
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'CreateVm-canonical.ubuntu-24_04-lts-server-20240812190712' to resource group 'MyProjectRG' was successful.
Go to res...
Pin to das...
a few seconds ago
Deployment succeeded
Deployment 'backend-vnet-1723469748719' to resource group 'MyProjectRG' was successful.
Go to res...
Pin to das...
8 minutes ago
Resource group created
Creating resource group 'MyProjectRG' in
https://portal.azure.com/?pwa=1#blade/HubsExtension/ResourceMenuBlade/id/%2Fsubscriptions%2Fc40a14cb-c662-4a8b-875d-8b0698a54515%2Fresourcegroups%2FMyProjectRG%2Fproviders%2FMicrosoft.Compute%2FvirtualMa...

Home > Virtual networks >

Create virtual network ···

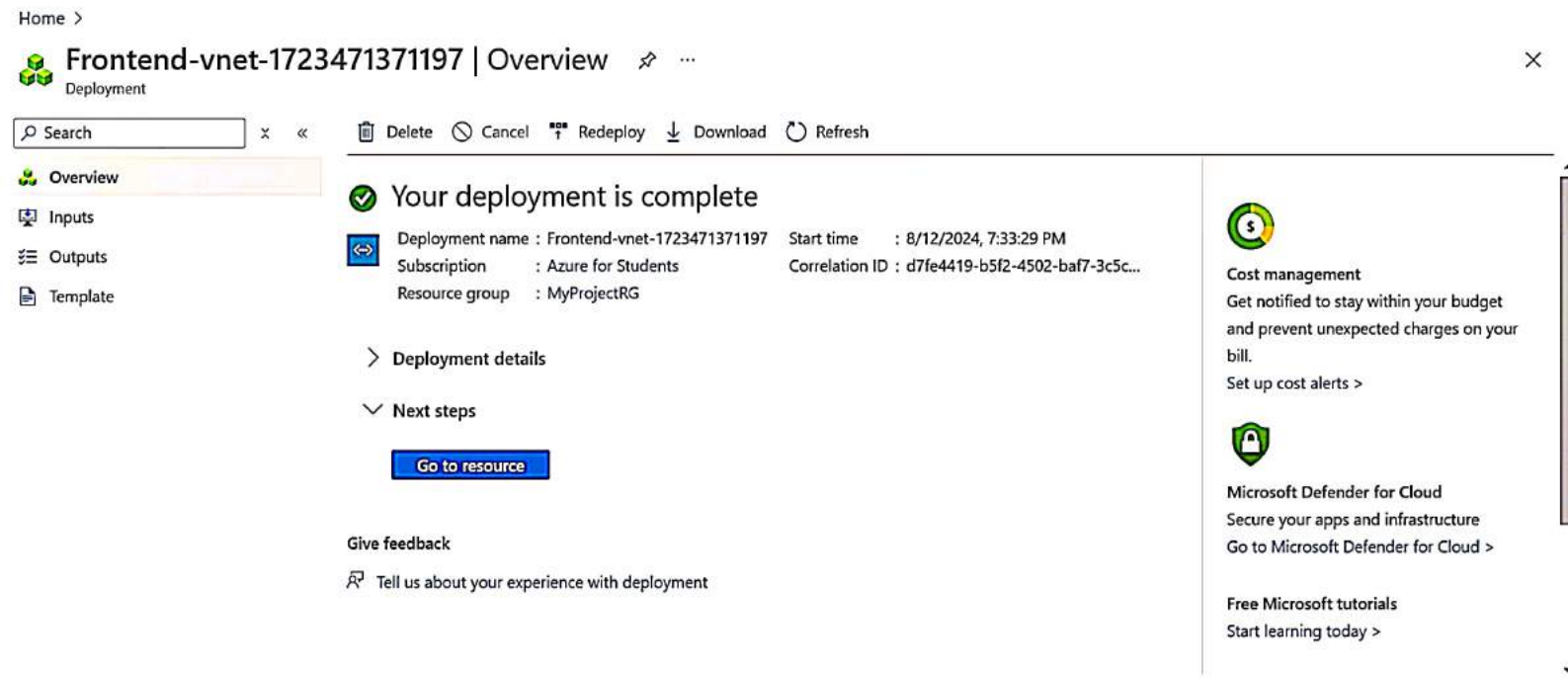
Basics Security IP addresses Tags Review + create

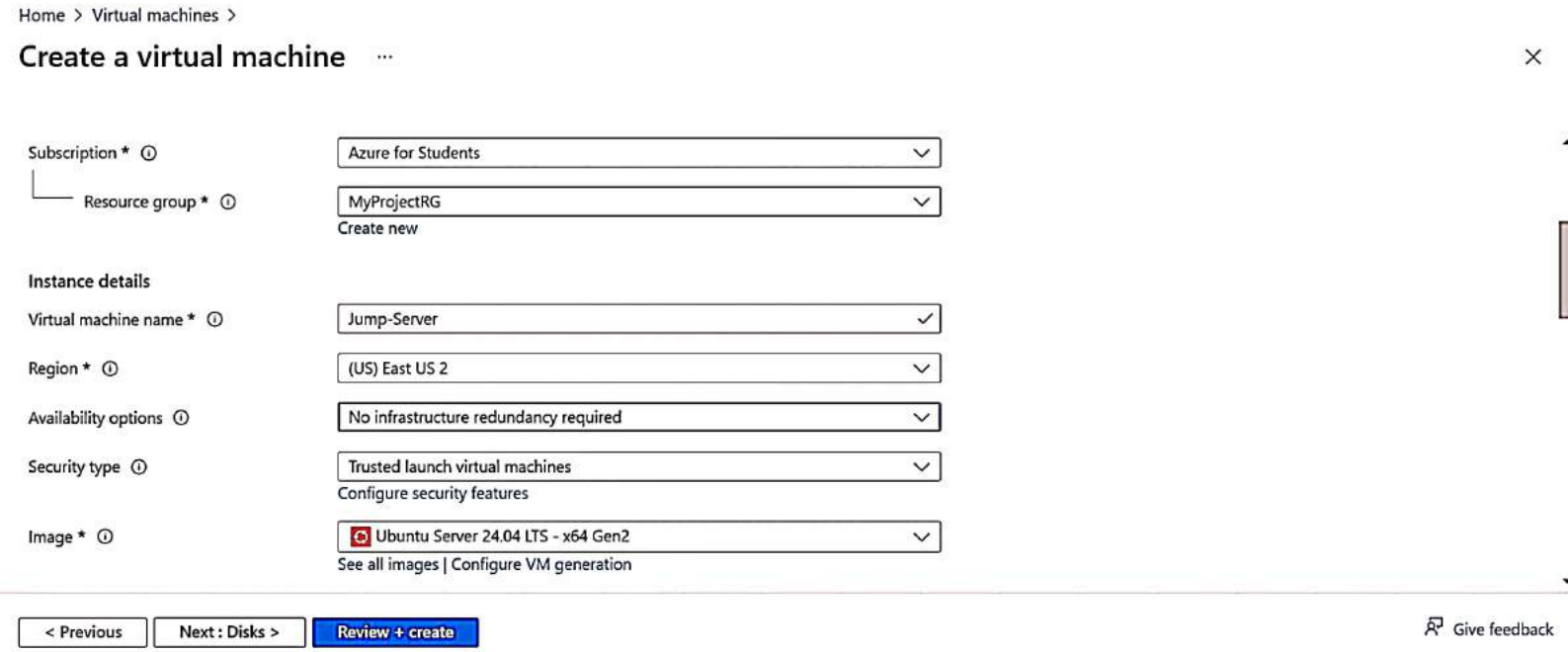
11.0.0.0 - 11.0.255.255 65,536 addresses

+ Add a subnet

Subnets	IP address range	Size	NAT gateway
Public-subnet	11.0.1.0 - 11.0.1.255	/24 (256 addresses)	-
Private-subnet	11.0.2.0 - 11.0.2.255	/24 (256 addresses)	-
Gateway-subnet	11.0.3.0 - 11.0.3.255	/24 (256 addresses)	-

Previous Next Review + create Give feedback


Home >
Frontend-vnet-1723471371197 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : Frontend-vnet-1723471371197
Subscription : Azure for Students
Resource group : MyProjectRG
Start time : 8/12/2024, 7:33:29 PM
Correlation ID : d7fe4419-b5f2-4502-baf7-3c5c...
Deployment details
Next steps
Go to resource
Give feedback
Tell us about your experience with deployment
Cost management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >


Home > Virtual machines >
Create a virtual machine ...
Subscription * Azure for Students
Resource group * MyProjectRG
Create new
Instance details
Virtual machine name * Jump-Server
Region * (US) East US 2
Availability options No infrastructure redundancy required
Security type Trusted launch virtual machines
Configure security features
Image * Ubuntu Server 24.04 LTS - x64 Gen2
See all images | Configure VM generation
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Next : Disks >
Review + create
Give feedback

Home > Virtual machines >

Create a virtual machine ···

Virtual network * ⓘ: Frontend-vnet
Create new

Subnet * ⓘ: Public-subnet (11.0.1.0/24)
Manage subnet configuration

Public IP ⓘ: (new) Jump-Server-ip
Create new

NIC network security group ⓘ
- ○ None
- ◉ Basic
- ○ Advanced

Public inbound ports * ⓘ
- ○ None
- ◉ Allow selected ports

Select inbound ports *: HTTP (80), HTTPS (443), SSH (22)

< Previous | Next : Management > | Review + create

Give feedback

Home > Virtual machines >

Create a virtual machine ···

Validation passed

Basics Disks Networking Management Monitoring Advanced Tags **Review + create**

Price

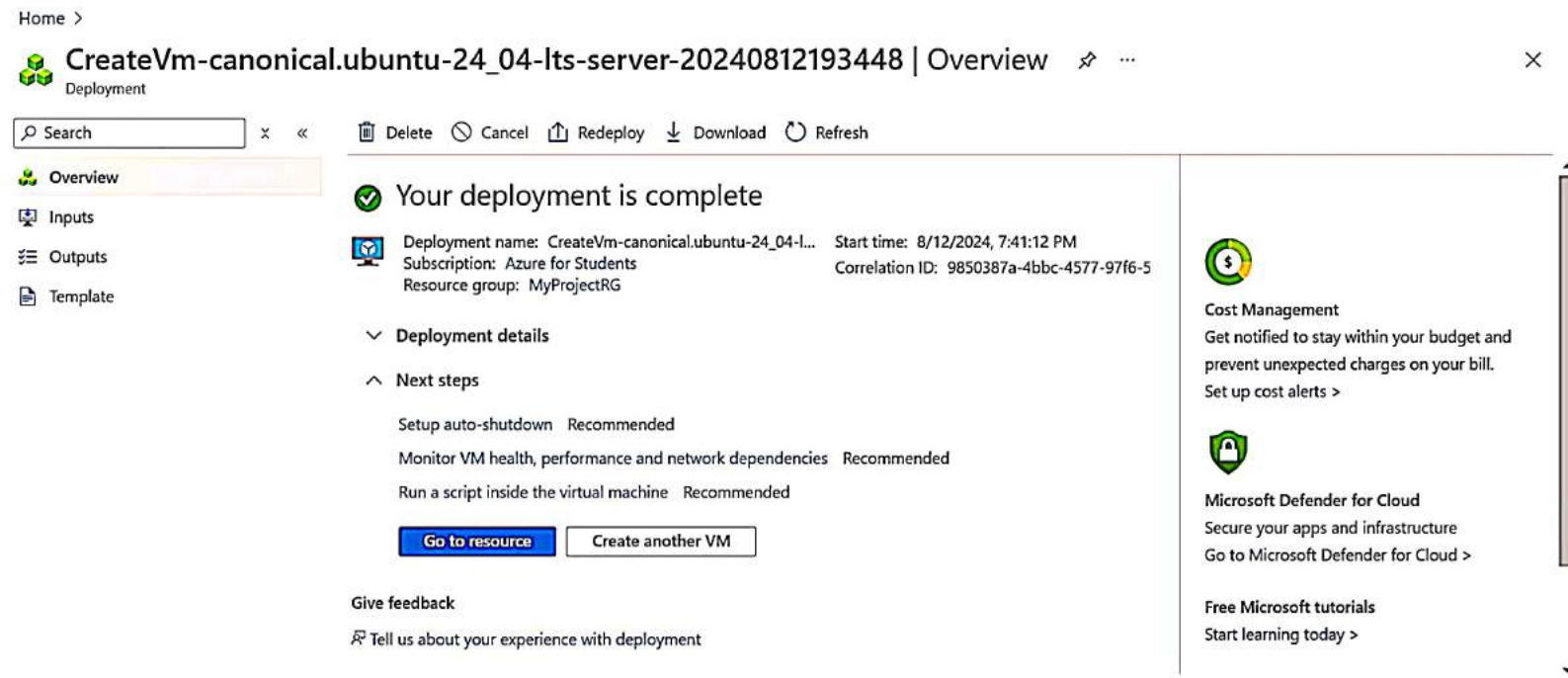
1 X Standard DS1 v2
by Microsoft
Terms of use | Privacy policy

Subscription credits apply ⓘ
4.7421 INR/hr
Pricing for other VM sizes

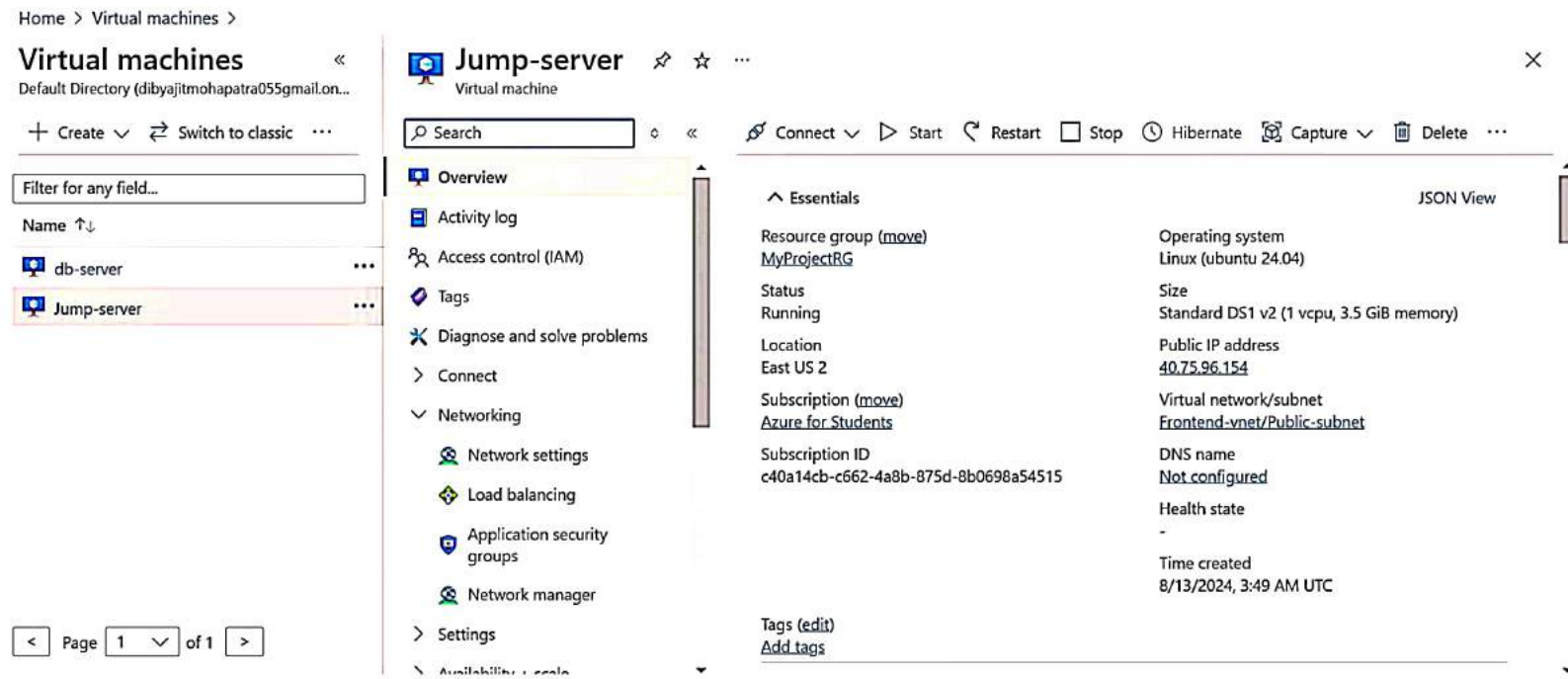
TERMS

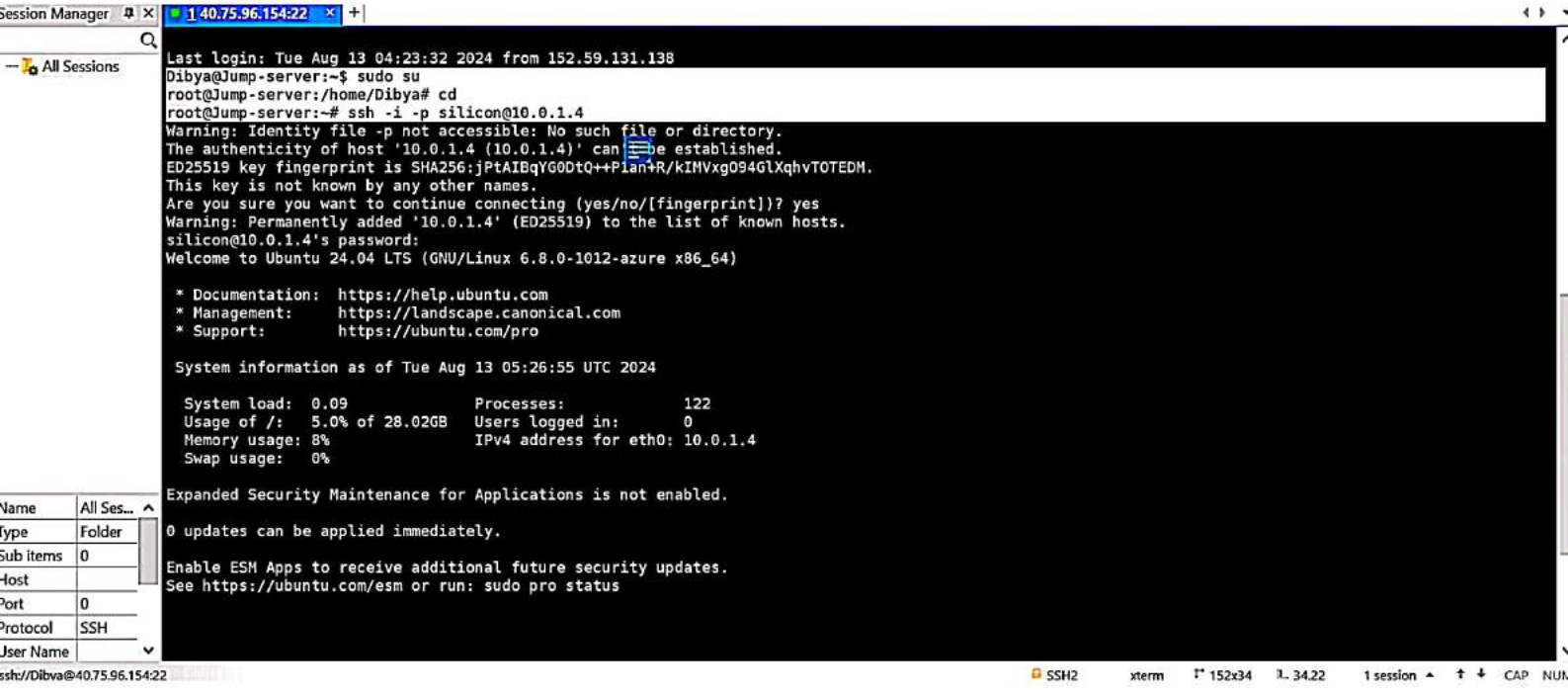
By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not

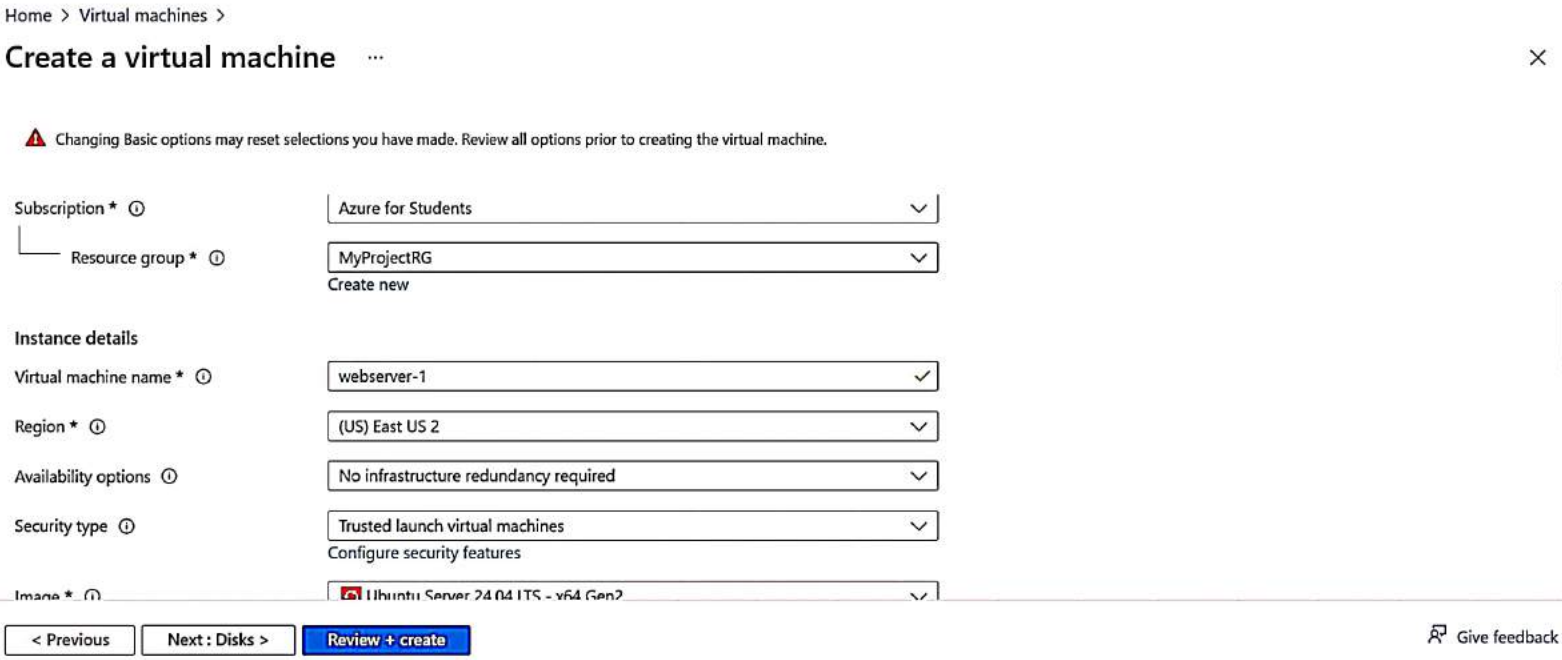
< Previous | Next > | Create | Download a template for automation | Give feedback


Home >
CreateVm-canonical.ubuntu-24_04-lts-server-20240812193448 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: CreateVm-canonical.ubuntu-24_04-l...
Subscription: Azure for Students
Resource group: MyProjectRG
Start time: 8/12/2024, 7:41:12 PM
Correlation ID: 9850387a-4bbc-4577-97f6-5
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
Give feedback
Tell us about your experience with deployment
Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >


Home > Virtual networks > backend-vnet | Peerings >
Add peering
backend-vnet
Local virtual network summary
Peering link name *
FRONTEND-TO-BACKEND
Local virtual network peering settings
Allow 'backend-vnet' to access 'Frontend-vnet'
Allow 'backend-vnet' to receive forwarded traffic from 'Frontend-vnet'
Allow gateway or route server in 'backend-vnet' to forward traffic to 'Frontend-vnet'
Enable 'backend-vnet' to use 'Frontend-vnet's' remote gateway or route server
Add
Cancel
Give feedback


Home > Virtual machines >
Virtual machines
Default Directory (dibyajitmohapatra055gmail.on...
Create
Switch to classic
Filter for any field...
Name
db-server
Jump-server
Page 1 of 1
Jump-server
Virtual machine
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Connect
Networking
Network settings
Load balancing
Application security groups
Network manager
Settings
Connect
Start
Restart
Stop
Hibernate
Capture
Delete
Essentials
JSON View
Resource group (move)
MyProjectRG
Status
Running
Location
East US 2
Subscription (move)
Azure for Students
Subscription ID
c40a14cb-c662-4a8b-875d-8b0698a54515
Operating system
Linux (ubuntu 24.04)
Size
Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Public IP address
40.75.96.154
Virtual network/subnet
Frontend-vnet/Public-subnet
DNS name
Not configured
Health state
-
Time created
8/13/2024, 3:49 AM UTC
Tags (edit)
Add tags


Session Manager
1 40.75.96.154:22
All Sessions
Last login: Tue Aug 13 04:23:32 2024 from 152.59.131.138
Dibya@Jump-server:~$ sudo su
root@Jump-server:/home/Dibya# cd
root@Jump-server:~# ssh -i -p silicon@10.0.1.4
Warning: Identity file -p not accessible: No such file or directory.
The authenticity of host '10.0.1.4 (10.0.1.4)' can't be established.
ED25519 key fingerprint is SHA256:jPtAIBqYG0DtQ++Pian+R/kIMVxgO94GlXqhvTOTEDM.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.1.4' (ED25519) to the list of known hosts.
silicon@10.0.1.4'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 Tue Aug 13 05:26:55 UTC 2024
System load: 0.09
Usage of /: 5.0% of 28.02GB
Memory usage: 8%
Swap usage: 0%
Processes: 122
Users logged in: 0
IPv4 address for eth0: 10.0.1.4
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
Name
All Ses...
Type
Folder
Sub items
0
Host
Port
0
Protocol
SSH
User Name
ssh://Dibya@40.75.96.154:22
SSH2
xterm
152x34
34,22
1 session
CAP
NUM


Home > Virtual machines >
Create a virtual machine
Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.
Subscription *
Azure for Students
Resource group *
MyProjectRG
Create new
Instance details
Virtual machine name *
webserver-1
Region *
(US) East US 2
Availability options
No infrastructure redundancy required
Security type
Trusted launch virtual machines
Configure security features
Image *
Ubuntu Server 24.04 LTS - x64 Gen2
< Previous
Next : Disks >
Review + create
Give feedback

Home > Virtual machines >

Create a virtual machine ···

⚠ Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.

Username * ⓘ webserver ✓

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 * HTTP (80), HTTPS (443), SSH (22) ⌄

< Previous | Next : Disks > | Review + create

Give feedback

Home > Virtual machines >

Create a virtual machine ···

When creating a virtual machine, a network interface will be created for you.

Virtual network * ⓘ: Frontend-vnet
Create new

Subnet * ⓘ: Private-subnet (11.0.2.0/24)
Manage subnet configuration

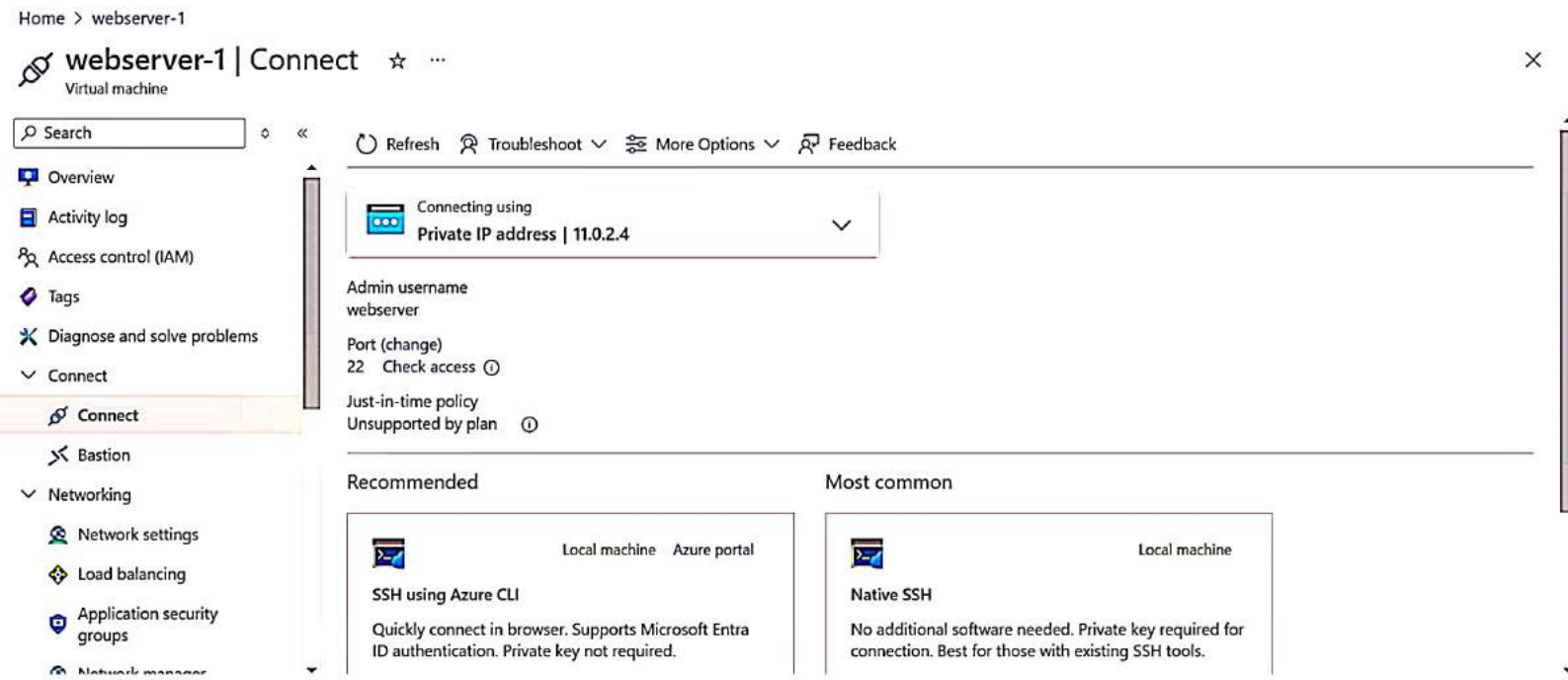
Public IP ⓘ: None
Create new

NIC network security group ⓘ
- ○ None
- ◉ Basic
- ○ Advanced

Public inbound ports * ⓘ
- ○ None
- ◉ Allow selected ports

< Previous | Next : Management > | Review + create

Give feedback


Home > webserver-1
webserver-1 | Connect
Virtual machine
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Connect
Connect
Bastion
Networking
Network settings
Load balancing
Application security groups
Refresh
Troubleshoot
More Options
Feedback
Connecting using
Private IP address | 11.0.2.4
Admin username
webserver
Port (change)
22 Check access
Just-in-time policy
Unsupported by plan
Recommended
Local machine Azure portal
SSH using Azure CLI
Quickly connect in browser. Supports Microsoft Entra ID authentication. Private key not required.
Most common
Local machine
Native SSH
No additional software needed. Private key required for connection. Best for those with existing SSH tools.

Home > Virtual machines >

Create a virtual machine ...

Username * webvm

Password * ••••••••••••••••

Confirm password * ••••••••••••••••

Inbound port rules

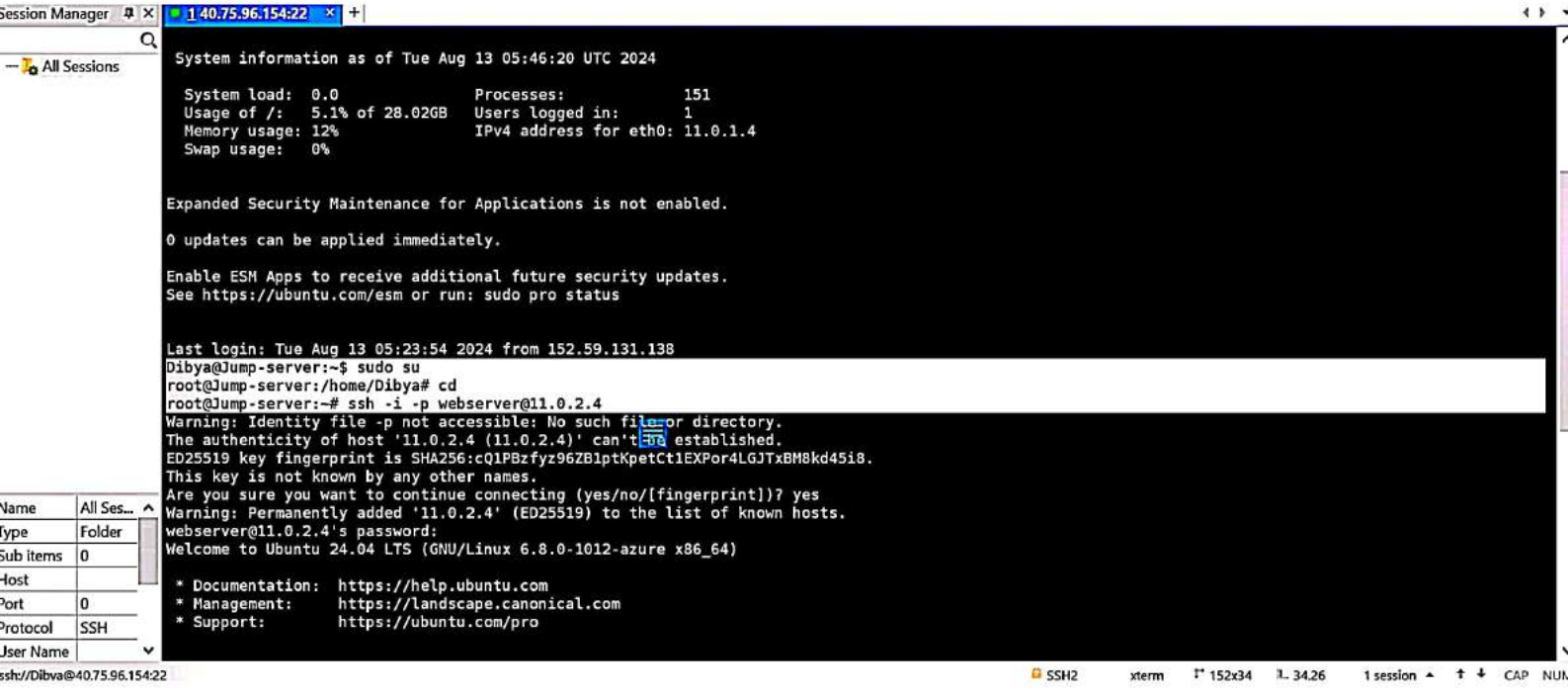
Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

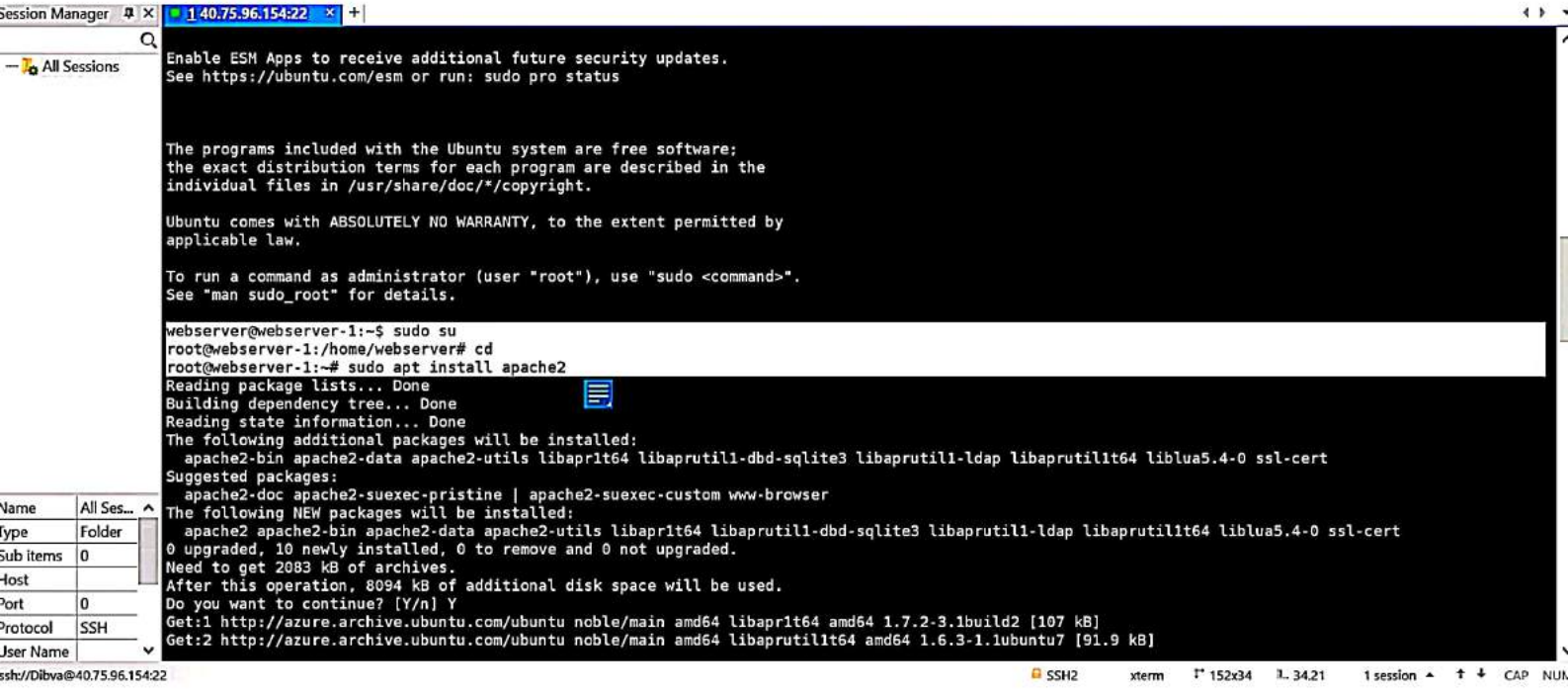
Public inbound ports * ○ None ◉ Allow selected ports

Select inbound ports * HTTP (80), HTTPS (443), SSH (22)

All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

< Previous | Next : Disks > | Review + create | Give feedback


Session Manager
1 40.75.96.154:22
All Sessions
System information as of Tue Aug 13 05:46:20 UTC 2024
System load: 0.0
Usage of /: 5.1% of 28.02GB
Memory usage: 12%
Swap usage: 0%
Processes: 151
Users logged in: 1
IPv4 address for eth0: 11.0.1.4
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
Last login: Tue Aug 13 05:23:54 2024 from 152.59.131.138
Dibya@Jump-server:~$ sudo su
root@Jump-server:/home/Dibya# cd
root@Jump-server:~# ssh -i -p webserver@11.0.2.4
Warning: Identity file -p not accessible: No such file or directory.
The authenticity of host '11.0.2.4 (11.0.2.4)' can't be established.
ED25519 key fingerprint is SHA256:cQ1PBzfyz96ZB1ptKpetCt1EXPor4LGJTxBM8kd45i8.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '11.0.2.4' (ED25519) to the list of known hosts.
webserver@11.0.2.4'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
Name
All Ses...
Type
Folder
Sub items
0
Host
Port
0
Protocol
SSH
User Name
ssh://Dibya@40.75.96.154:22
SSH2
xterm
152x34
34,26
1 session
CAP
NUM


Session Manager
All Sessions
1 40.75.96.154:22
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.
webserver@webserver-1:~$ sudo su
root@webserver-1:/home/webserver# cd
root@webserver-1:~# sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
Suggested packages:
apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
apache2 apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
0 upgraded, 10 newly installed, 0 to remove and 0 not upgraded.
Need to get 2083 kB of archives.
After this operation, 8094 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://azure.archive.ubuntu.com/ubuntu noble/main amd64 libapr1t64 amd64 1.7.2-3.1build2 [107 kB]
Get:2 http://azure.archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1t64 amd64 1.6.3-1.1ubuntu7 [91.9 kB]
Name
All Ses...
Type
Folder
Sub items
0
Host
Port
0
Protocol
SSH
User Name
ssh://Dibva@40.75.96.154:22
SSH2
xterm
152x34
34,21
1 session
CAP
NUM

Session Manager

All Sessions

Name	All Ses...
Type	Folder
Sub items	0
Host	
Port	0
Protocol	SSH
User Name	

1 40.75.96.154:22

```
root@webserver-1:~# cd /var/www/html
root@webserver-1:/var/www/html# wget https://www.free-css.com/assets/files/free-css-templates/download/page296/carvilla.zip
--2024-08-13 05:59:11--  https://www.free-css.com/assets/files/free-css-templates/download/page296/carvilla.zip
Resolving www.free-css.com (www.free-css.com)... 217.160.0.242, 2001:8d8:100f:f000::28f
Connecting to www.free-css.com (www.free-css.com)|217.160.0.242|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2204120 (2.1M) [application/zip]
Saving to: 'carvilla.zip'

carvilla.zip                        100%[===================================================================>]   2.10M  3.14MB/s    in 0.7s

2024-08-13 05:59:12 (3.14 MB/s) - 'carvilla.zip' saved [2204120/2204120]

root@webserver-1:/var/www/html# sudo apt install unzip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  zip
The following NEW packages will be installed:
  unzip
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 175 kB of archives.
After this operation, 384 kB of additional disk space will be used.
Get:1 http://azure.archive.ubuntu.com/ubuntu noble/main amd64 unzip amd64 6.0-28ubuntu4 [175 kB]
Fetched 175 kB in 0s (4468 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 65248 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-28ubuntu4_amd64.deb ...
Unpacking unzip (6.0-28ubuntu4) ...
Setting up unzip (6.0-28ubuntu4) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...
```

Session Manager

All Sessions

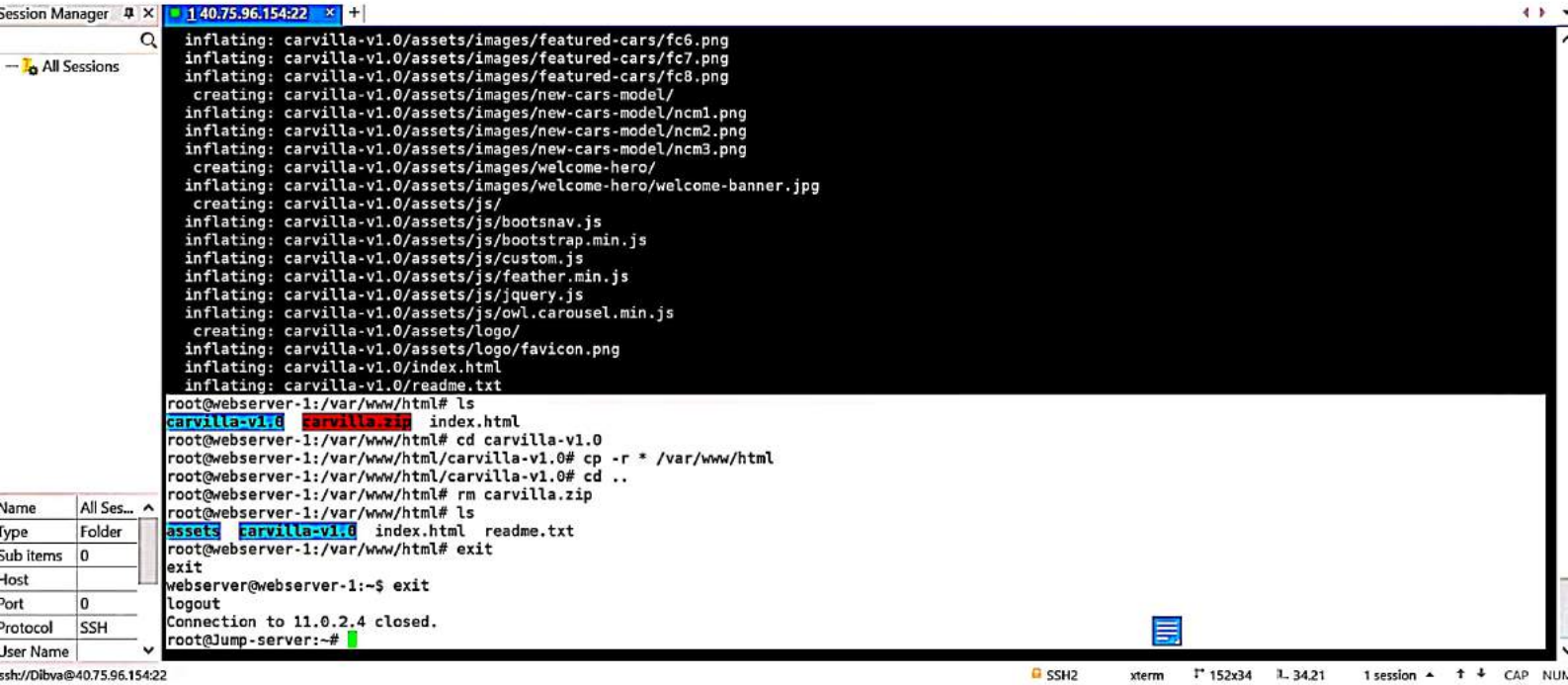
Name	All Ses...
Type	Folder
Sub items	0
Host	
Port	0
Protocol	SSH
User Name	

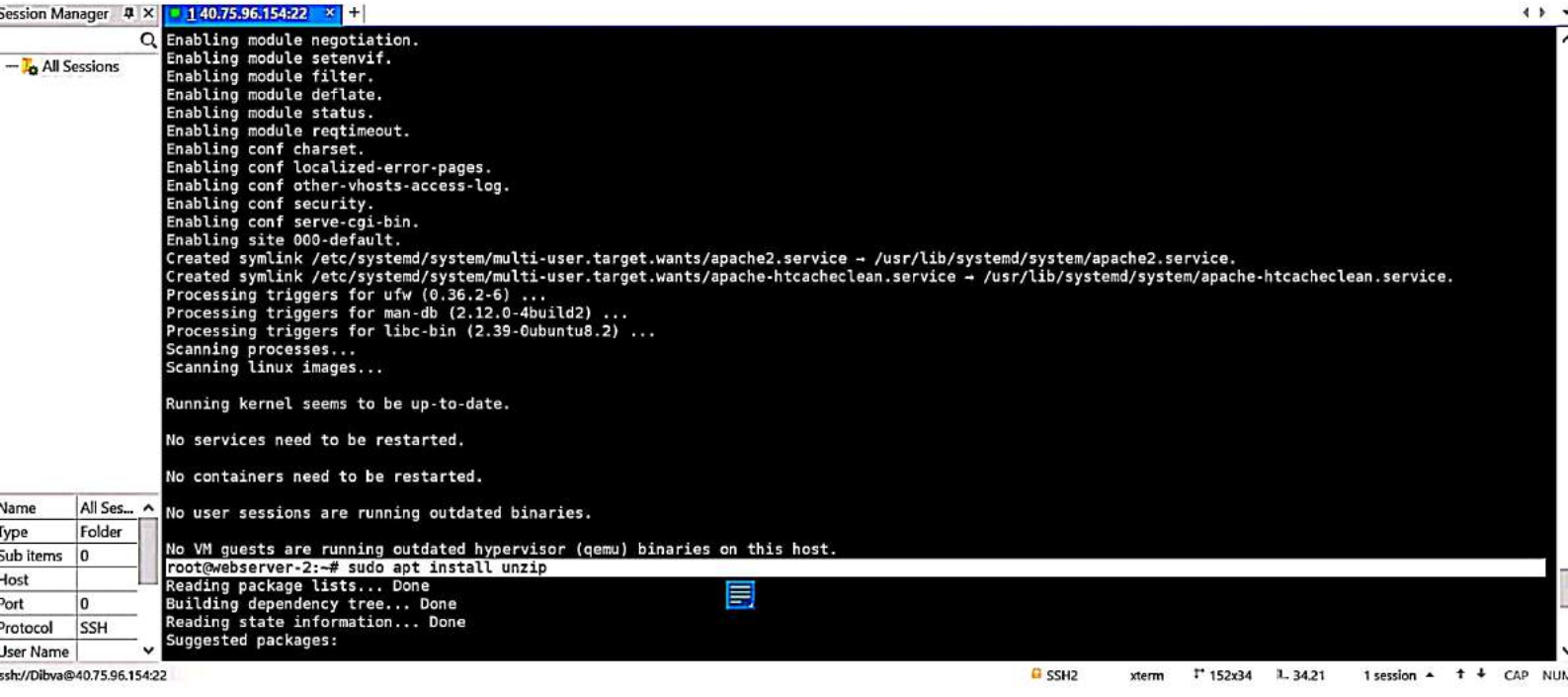
ssh://Dibva@40.75.96.154:22

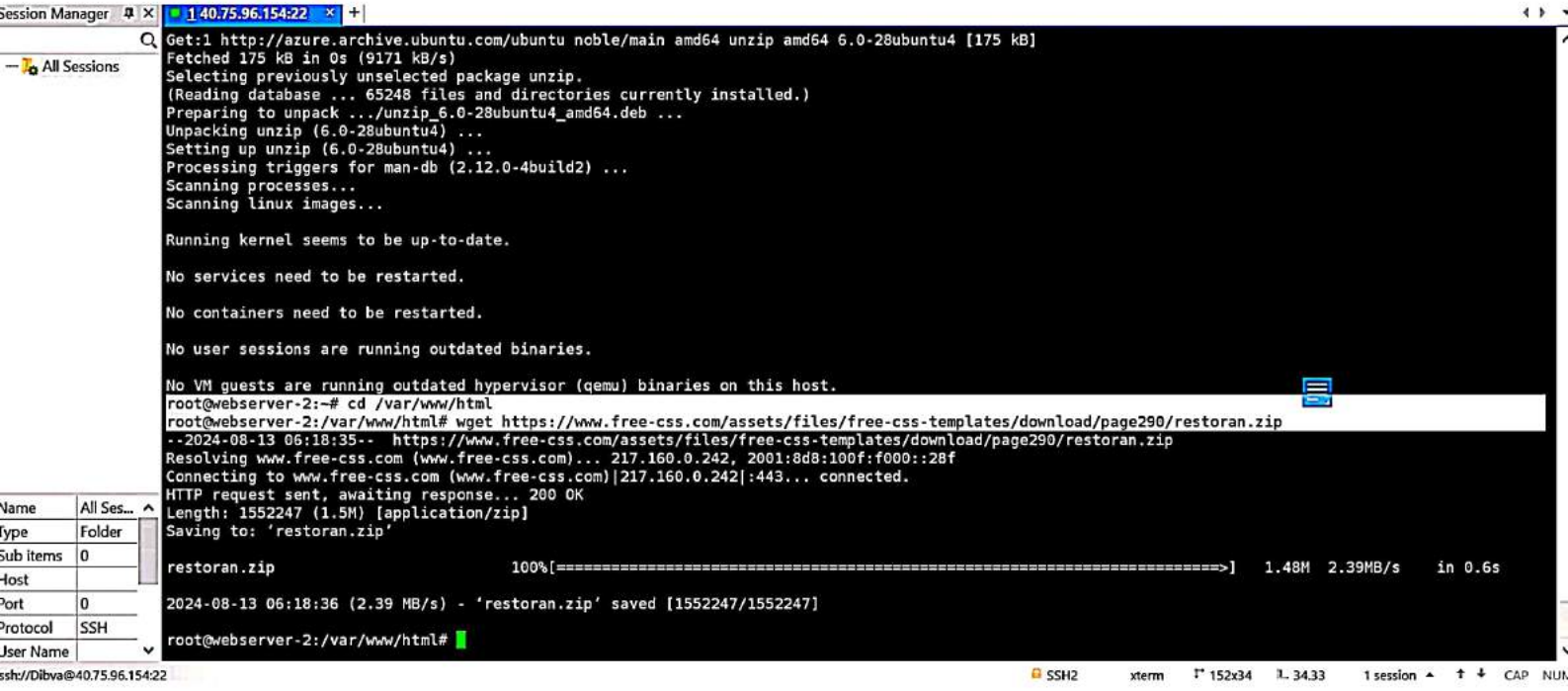
1 40.75.96.154:22

```
Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@webserver-1:/var/www/html# ls
carvilla.zip  index.html
root@webserver-1:/var/www/html# unzip carvilla.zip
Archive:  carvilla.zip
   creating: carvilla-v1.0/assets/
   creating: carvilla-v1.0/assets/css/
  inflating: carvilla-v1.0/assets/css/animate.css
  inflating: carvilla-v1.0/assets/css/bootsnav.css
  inflating: carvilla-v1.0/assets/css/bootstrap.min.css
  inflating: carvilla-v1.0/assets/css/flaticon.css
  inflating: carvilla-v1.0/assets/css/font-awesome.min.css
  inflating: carvilla-v1.0/assets/css/linearicons.css
  inflating: carvilla-v1.0/assets/css/owl.carousel.min.css
  inflating: carvilla-v1.0/assets/css/owl.theme.default.min.css
  inflating: carvilla-v1.0/assets/css/responsive.css
  inflating: carvilla-v1.0/assets/css/style.css
   creating: carvilla-v1.0/assets/fonts/
  inflating: carvilla-v1.0/assets/fonts/Flaticon.eot
  inflating: carvilla-v1.0/assets/fonts/Flaticon.svg
  inflating: carvilla-v1.0/assets/fonts/Flaticon.ttf
  inflating: carvilla-v1.0/assets/fonts/Flaticon.woff
  inflating: carvilla-v1.0/assets/fonts/FontAwesome.otf
  inflating: carvilla-v1.0/assets/fonts/fontawesome-webfont.eot
  inflating: carvilla-v1.0/assets/fonts/fontawesome-webfont.svg
```

SSH2 xterm 152x34 34,21 1 session CAP NUM


Session Manager
1 40.75.96.154:22
All Sessions
inflating: carvilla-v1.0/assets/images/featured-cars/fc6.png
inflating: carvilla-v1.0/assets/images/featured-cars/fc7.png
inflating: carvilla-v1.0/assets/images/featured-cars/fc8.png
creating: carvilla-v1.0/assets/images/new-cars-model/
inflating: carvilla-v1.0/assets/images/new-cars-model/ncm1.png
inflating: carvilla-v1.0/assets/images/new-cars-model/ncm2.png
inflating: carvilla-v1.0/assets/images/new-cars-model/ncm3.png
creating: carvilla-v1.0/assets/images/welcome-hero/
inflating: carvilla-v1.0/assets/images/welcome-hero/welcome-banner.jpg
creating: carvilla-v1.0/assets/js/
inflating: carvilla-v1.0/assets/js/bootsnav.js
inflating: carvilla-v1.0/assets/js/bootstrap.min.js
inflating: carvilla-v1.0/assets/js/custom.js
inflating: carvilla-v1.0/assets/js/feather.min.js
inflating: carvilla-v1.0/assets/js/jquery.js
inflating: carvilla-v1.0/assets/js/owl.carousel.min.js
creating: carvilla-v1.0/assets/logo/
inflating: carvilla-v1.0/assets/logo/favicon.png
inflating: carvilla-v1.0/index.html
inflating: carvilla-v1.0/readme.txt
root@webserver-1:/var/www/html# ls
carvilla-v1.0 carvilla.zip index.html
root@webserver-1:/var/www/html# cd carvilla-v1.0
root@webserver-1:/var/www/html/carvilla-v1.0# cp -r * /var/www/html
root@webserver-1:/var/www/html/carvilla-v1.0# cd ..
root@webserver-1:/var/www/html# rm carvilla.zip
root@webserver-1:/var/www/html# ls
assets carvilla-v1.0 index.html readme.txt
root@webserver-1:/var/www/html# exit
exit
webserver@webserver-1:~$ exit
logout
Connection to 11.0.2.4 closed.
root@Jump-server:~#
Name All Ses...
Type Folder
Sub items 0
Host
Port 0
Protocol SSH
User Name
ssh://Dibva@40.75.96.154:22
SSH2
xterm
152x34
34,21
1 session
CAP
NUM


Session Manager
All Sessions
1 40.75.96.154:22
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning linux images...
Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@webserver-2:~# sudo apt install unzip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
Name
All Ses...
Type
Folder
Sub items
0
Host
Port
0
Protocol
SSH
User Name
ssh://Dibva@40.75.96.154:22
SSH2
xterm
152x34
34,21
1 session
CAP
NUM


Session Manager
1 40.75.96.154:22
All Sessions
Get:1 http://azure.archive.ubuntu.com/ubuntu noble/main amd64 unzip amd64 6.0-28ubuntu4 [175 kB]
Fetched 175 kB in 0s (9171 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 65248 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-28ubuntu4_amd64.deb ...
Unpacking unzip (6.0-28ubuntu4) ...
Setting up unzip (6.0-28ubuntu4) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...
Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@webserver-2:~# cd /var/www/html
root@webserver-2:/var/www/html# wget https://www.free-css.com/assets/files/free-css-templates/download/page290/restoran.zip
--2024-08-13 06:18:35-- https://www.free-css.com/assets/files/free-css-templates/download/page290/restoran.zip
Resolving www.free-css.com (www.free-css.com)... 217.160.0.242, 2001:8d8:100f:f000::28f
Connecting to www.free-css.com (www.free-css.com)|217.160.0.242|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1552247 (1.5M) [application/zip]
Saving to: 'restoran.zip'
restoran.zip 100%[=>] 1.48M 2.39MB/s in 0.6s
2024-08-13 06:18:36 (2.39 MB/s) - 'restoran.zip' saved [1552247/1552247]
root@webserver-2:/var/www/html#
Name All Ses...
Type Folder
Sub items 0
Host
Port 0
Protocol SSH
User Name
ssh://Dibva@40.75.96.154:22
SSH2
xterm
152x34
34,33
1 session
CAP
NUM

Home > Load balancing | Application Gateway >

Create application gateway ···

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ: Azure for Students

Resource group * ⓘ: MyProjectRG
Create new

Instance details

Application gateway name *: MY-GATEWAY

Region *: East US 2

Tier ⓘ: Standard V2

Enable autoscaling: (•) Yes ( ) No

Minimum instance count * ⓘ: 0

Previous | Next : Frontends >

Home > Load balancing | Application Gateway >

Create application gateway ···

Minimum instance count * 1

Maximum instance count 10

Availability zone * Zones 1, 2, 3

HTTP2 ○ Disabled ◉ Enabled

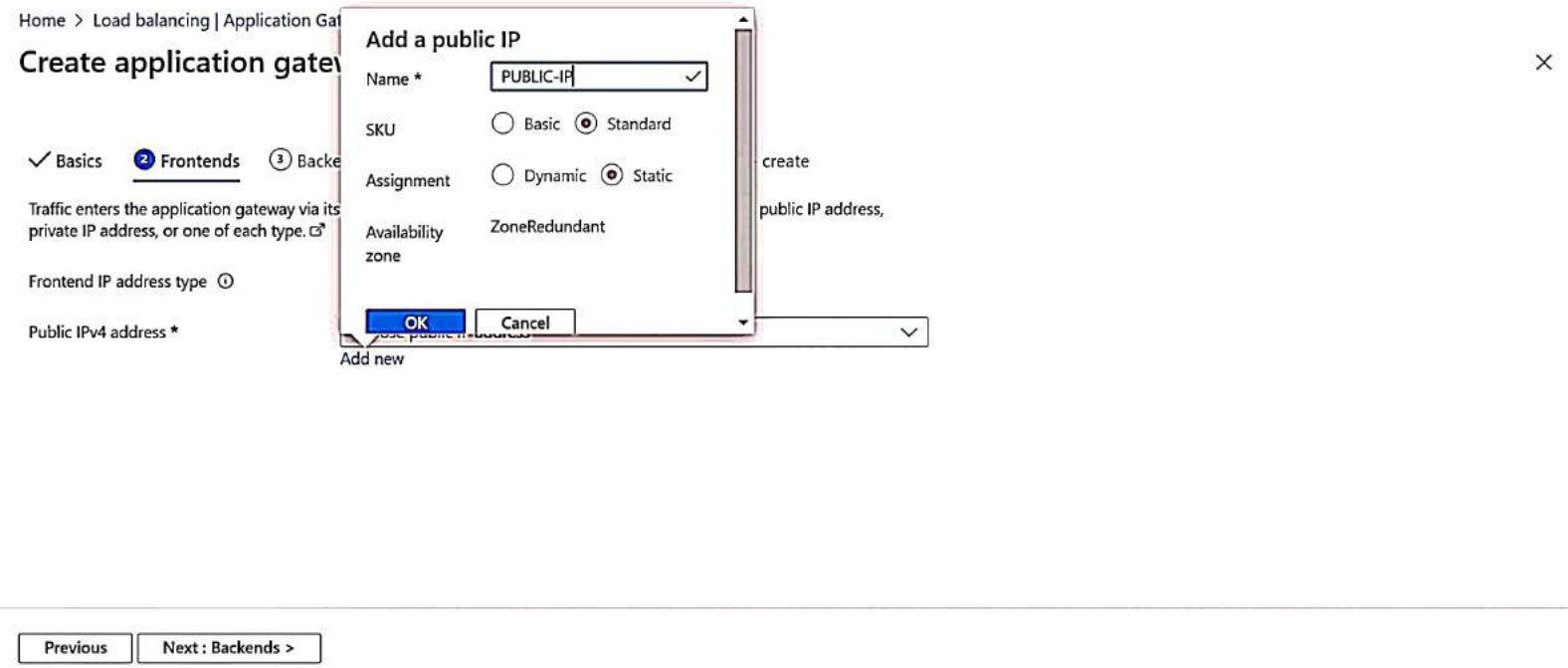
IP address type ◉ IPv4 only ○ Dual stack (IPv4 & IPv6)

Configure virtual network

Virtual network * Frontend-vnet
Create new

Subnet * Gateway-subnet (11.0.3.0/24)
Manage subnet configuration

Previous | Next : Frontends >


Home > Load balancing | Application Gat
Create application gatev
Basics
2 Frontends
3 Backe
create
Traffic enters the application gateway via its
private IP address, or one of each type.
public IP address,
Frontend IP address type
Public IPv4 address *
Add new
Add a public IP
Name *
PUBLIC-IP
SKU
Basic
Standard
Assignment
Dynamic
Static
Availability zone
ZoneRedundant
OK
Cancel
Previous
Next : Backends >

Home > Load balancing | Application Gateway >

Create application gateway ...

✓ Basics ✓ Frontends ✓ Backends 4 Configuratic

Create routing rules that link your frontend(s) and backend(s). You car

Frontends

+ Add a frontend IP

Public: (new) PUBLIC-IP

Previous | Next : Tags >

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 * MY-RULE

Priority * 100

*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

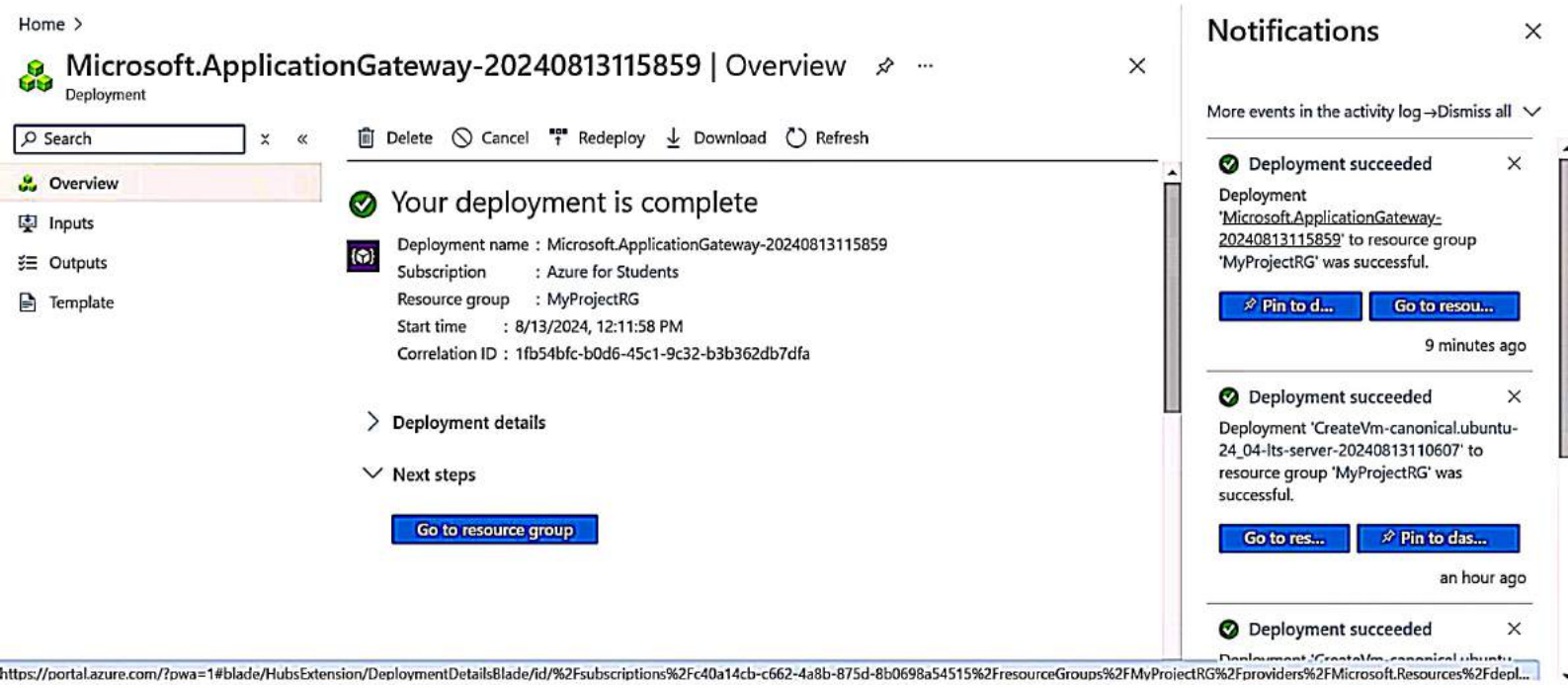
Backend target * BACKEND-POOL
Add new

Backend settings * Mybackendsetting
Add new

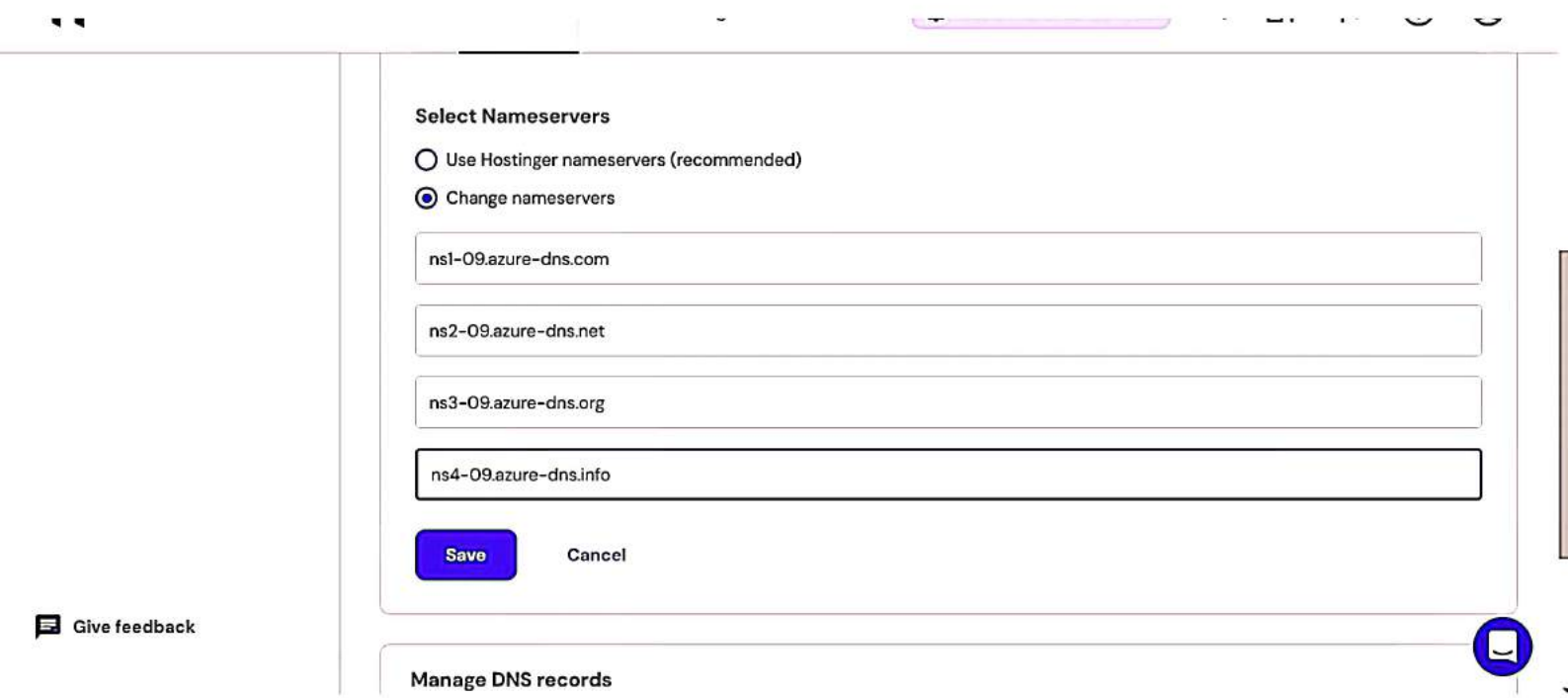
Path-based routing

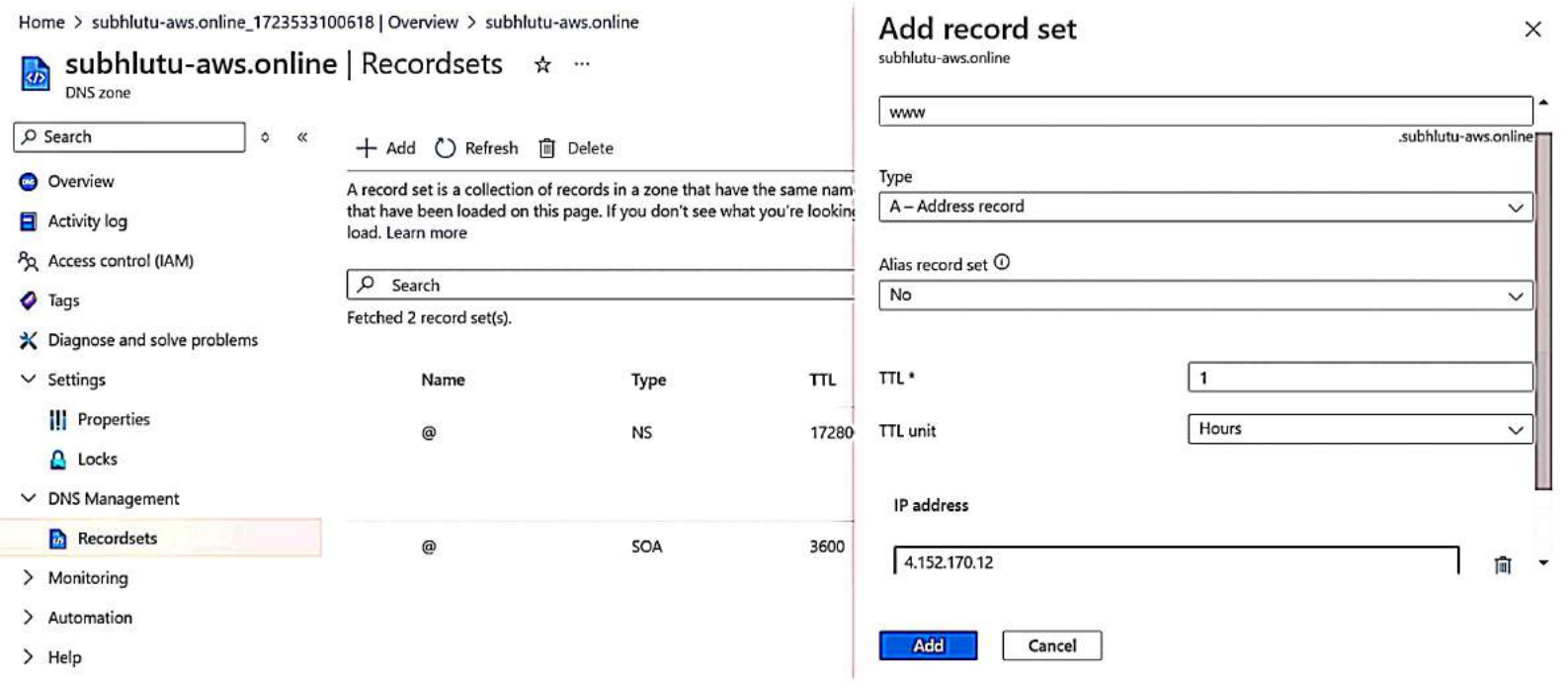
You can route traffic from this rule's listener to different backend targets based on the URL path of the request. You can also apply a different set of Backend settings based on the URL path

Add | Cancel


Home >
Microsoft.ApplicationGateway-20240813115859 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : Microsoft.ApplicationGateway-20240813115859
Subscription : Azure for Students
Resource group : MyProjectRG
Start time : 8/13/2024, 12:11:58 PM
Correlation ID : 1fb54bfc-b0d6-45c1-9c32-b3b362db7dfa
Deployment details
Next steps
Go to resource group
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'Microsoft.ApplicationGateway-20240813115859' to resource group 'MyProjectRG' was successful.
Pin to d...
Go to resou...
9 minutes ago
Deployment succeeded
Deployment 'CreateVm-canonical.ubuntu-24_04-lts-server-20240813110607' to resource group 'MyProjectRG' was successful.
Go to res...
Pin to das...
an hour ago
Deployment succeeded
https://portal.azure.com/?pwa=1#blade/HubsExtension/DeploymentDetailsBlade/id/%2Fsubscriptions%2Fc40a14cb-c662-4a8b-875d-8b0698a54515%2FresourceGroups%2FMyProjectRG%2Fproviders%2FMicrosoft.Resources%2Fdepl...


Home > DNS zones >
Create a DNS Zone
Validation passed
Basics
DNS Zone Editor
Tags
Review + Create
View automation template
Basics
Subscription
Azure for Students
Resource group
MyProjectRG
Resource group location
East US 2
Name
subhlutu-aws.online
DNS Zone Record Set(s)
Number of record sets
0 record set(s)
Create
< Previous
Next >
Notifications
More events in the activity log → Dismiss all
Deployment succeeded
Deployment 'Microsoft.ApplicationGateway-20240813115859' to resource group 'MyProjectRG' was successful.
Pin to d...
Go to resou...
24 minutes ago
Deployment succeeded
Deployment 'CreateVm-canonical.ubuntu-24_04-lts-server-20240813110607' to resource group 'MyProjectRG' was successful.
Go to res...
Pin to das...
an hour ago
Deployment succeeded
Deployment 'CreateVm-canonical.ubuntu-


Select Nameservers
Use Hostinger nameservers (recommended)
Change nameservers
ns1-09.azure-dns.com
ns2-09.azure-dns.net
ns3-09.azure-dns.org
ns4-09.azure-dns.info
Save
Cancel
Give feedback
Manage DNS records


Home > subhlutu-aws.online_1723533100618 | Overview > subhlutu-aws.online
subhlutu-aws.online | Recordsets
DNS zone
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Properties
Locks
DNS Management
Recordsets
Monitoring
Automation
Help
Add
Refresh
Delete
A record set is a collection of records in a zone that have the same nam
that have been loaded on this page. If you don't see what you're lookin
load. Learn more
Search
Fetched 2 record set(s).
Name
Type
TTL
@
NS
17280
@
SOA
3600
Add record set
subhlutu-aws.online
www
.subhlutu-aws.online
Type
A – Address record
Alias record set
No
TTL *
1
TTL unit
Hours
IP address
4.152.170.12
Add
Cancel

Restoran

HOME ABOUT SERVICE MENU PAGES CONTACT BOOK A TABLE

Enjoy Our Delicious Meal

Tempor erat elitr rebum at clita. Diam dolor diam ipsum sit. Aliqu diam amet diam et eos. Clita erat ipsum et lorem et sit, sed stet lorem sit clita duo justo magna dolore erat amet

BOOK A TABLE

Type here to search

Nift...

2:04 PM
8/13/2024

TERMINOLOGIES USED IN THE PROJECT

- Azure Resource Group
- Frontend VNet
- Backend VNet
- Azure Virtual Machine (VM)
- Subnets
- Data Server
- Web Server
- Public Subnet
- Private Subnet
- Gateway Subnet
- Public IP
- Private IP
- Jump Server
- VNet Peering
- Azure Application Gateway
- Frontends in Application Gateway
- Backend Pools in Application Gateway
- Routing Rule in Application Gateway
- Autoscaling
- SSL Certificate
- DNS Zone

1. Azure Resource Group

- Definition: An Azure Resource Group is a container that holds related resources for an Azure solution. All resources in a resource group share the same lifecycle, meaning they can be deployed, managed, and deleted together.

2. Frontend VNet

- Definition: A Frontend Virtual Network (VNet) is a dedicated virtual network in Azure where the frontend components of an application, such as web servers or application gateways, are hosted. It typically has access to the internet and is connected to other VNets or on-premises networks.

3. Backend VNet

- Definition: A Backend Virtual Network (VNet) is a virtual network that hosts the backend components of an application, such as databases and internal services. This network is usually isolated from direct internet access and is connected to the frontend VNet or other networks via secure connections.

4. Azure Virtual Machine (VM)

- Definition: An Azure Virtual Machine (VM) is a computing resource that provides scalable virtualized hardware in the Azure cloud. VMs can run various operating systems and applications and are used to host applications, databases, and services.

5. Subnets

- Definition: Subnets are segments of a virtual network (VNet) in Azure. They allow you to divide the VNet into smaller, manageable sections, each with its own range of IP addresses. Subnets enable you to isolate resources and apply specific security and routing rules.

6. Data Server

- Definition: A Data Server in Azure refers to a VM or managed database service that hosts a database. It is typically located in the backend VNet and stores data for applications, such as SQL databases, NoSQL databases, or other types of data storage systems.

7. Web Server

- Definition: A Web Server in Azure is a VM or managed service that hosts the frontend of an application, typically handling HTTP/S requests. Web servers are usually placed in the frontend VNet and may be connected to backend services or databases.

8. Public Subnet

- Definition: A Public Subnet is a subnet within a VNet that is associated with a public IP address. Resources placed in a public subnet can be accessed from the internet or other external networks, often used for web servers or load balancers.

9. Private Subnet

- Definition: A Private Subnet is a subnet within a VNet that is not associated with a public IP address and is accessible only within the VNet or connected networks. Resources in private subnets are typically backend services like databases, which do not require direct internet access.

10. Gateway Subnet

- Definition: A Gateway Subnet is a special subnet within a VNet that is used to host the VPN gateway or ExpressRoute gateway. This subnet is critical for enabling secure connections between Azure VNets and on-premises networks.

11. Public IP

- Definition: A Public IP in Azure is an IP address that is assigned to Azure resources to enable communication with the internet. It allows resources like VMs, load balancers, or application gateways to be accessed from outside the Azure network.

12. Private IP

- Definition: A Private IP in Azure is an IP address that is assigned to resources within a VNet. It enables communication within the VNet and connected networks, without exposing the resource to the internet.

13. Jump Server

- Definition: A Jump Server, also known as a Bastion Host, is a secure VM used to access and manage VMs in private subnets or VNets. It acts as an intermediary, providing a secure entry point for administrative tasks.

14. VNet Peering

- Definition: VNet Peering in Azure allows two VNets to be connected, enabling resources in different VNets to communicate with each other as if they are in the same network. Peering provides low-latency, high-bandwidth connectivity between VNets.

15. Azure Application Gateway

- Definition: Azure Application Gateway is a web traffic load balancer that enables you to manage and route traffic to your web applications. It offers features such as SSL termination, URL-based routing, and WAF (Web Application Firewall).

16. Frontends in Application Gateway

- Definition: Frontends in Azure Application Gateway refer to the entry points (typically public or private IPs) where the gateway receives incoming traffic. The frontend can be configured to accept traffic on specific ports and protocols

17. Backend Pools in Application Gateway

- Definition: Backend Pools in Azure Application Gateway consist of backend servers or services that receive traffic from the gateway. The backend pool can include VMs, App Services, or other endpoints that process the traffic.

18. Routing Rule in Application Gateway

- Definition: A Routing Rule in Azure Application Gateway defines how incoming traffic should be routed to the backend pool. It specifies the criteria, such as URL paths, hostnames, and protocols, to direct traffic to the appropriate backend servers.

19. Autoscaling

- Definition: Autoscaling in Azure is a feature that automatically adjusts the number of VM instances or resources based on predefined rules and metrics, such as CPU utilization or network traffic. It ensures that applications can handle varying loads efficiently.

20. SSL Certificate

- Definition: An SSL Certificate in Azure is a digital certificate used to encrypt communication between clients and servers. It ensures that data transferred over the internet is secure and that the identity of the website or service is authenticated.

21. DNS Zone

- Definition: A DNS Zone in Azure is a container for DNS records associated with a domain. It allows you to manage and host DNS records, such as A, CNAME, and MX records, for a specific domain, enabling domain name resolution to IP addresses within Azure.

Summary

The architecture is designed to provide a secure, scalable, and efficient environment for hosting a web application on Azure. Users access the application through the Application Gateway, which routes requests to the Web Server(s) hosted in the Frontend VNet. The Web Server processes the requests, interacting with the Data Server in the Backend VNet to retrieve or store data. Administrators securely manage the infrastructure through the Jump Server, which provides controlled access to the VMs. Autoscaling and SSL certificates enhance the performance and security of the application, while the DNS Zone ensures that users can easily access the application using a custom domain name.

The best practices for setting up cloud-based application on Azure:

1. Security Best Practices

- Separate Networks: Keep your frontend (web server) and backend (database) in different networks. This makes it harder for attackers to get to sensitive parts of your system.
- Limit Access: Give users and services only the access they absolutely need. This way, if something goes wrong, the damage is minimized.
- Use a Jump Server: Instead of accessing your servers directly, use a special server called a Jump Server. It adds an extra layer of security.
- Encrypt Data: Always use SSL certificates to protect data that's being sent over the internet, especially sensitive information.

2. Scalability and Performance

- Automatic Scaling: Set up your system to automatically add or remove servers based on traffic. This ensures your application can handle high traffic without wasting resources during low traffic times.
- Distribute Traffic: Use load balancers to evenly distribute user traffic across multiple servers. This prevents any single server from getting overloaded and helps keep your site running smoothly.
- Optimize Resources: Regularly check how much resources (like CPU, memory) your servers are using and adjust them to avoid paying for more than you need.

3. Reliability and Redundancy

- Deploy in Multiple Regions: To ensure your application is always available, even if something goes wrong in one region, consider setting it up in multiple Azure regions.
- Backup Regularly: Make sure you regularly back up your data. This way, if something happens to your database, you can recover it easily.
- Monitor Health: Set up monitoring to keep an eye on your system's performance and get alerts if something goes wrong.

4. Cost Management

- Reserved Instances: If you know you'll need certain resources for a long time, consider reserving them. This can save you money compared to pay-as-you-go options.
- Tag Resources: Label your resources to keep track of where your money is going. This helps you manage costs better.
- Choose the Right Storage: Use cheaper storage options for data you don't need to access often. This helps keep storage costs down.

5. Compliance and Governance

- Follow the Rules: Make sure your setup follows all the necessary regulations (like GDPR for data protection). Use Azure's built-in tools to enforce these rules.
- Set Up Rules for Management: Define clear rules and processes for who can do what with your resources. This helps avoid confusion and ensures everything runs smoothly.

6. Documentation and Automation

- Document Everything: Keep clear documentation of your setup and processes. This makes it easier to manage and troubleshoot later.
- Automate Deployments: Use tools to automate setting up and managing your infrastructure. This reduces errors and makes it easier to update your system.

--THANKYOU--

THE END