DVS Technologies

Dvs Technologies Azure adminstration

Compiled and Scrutinized by
Mr. Shaan Shaik
(Senior DevOps Lead)

Words To The Students

Though we have taken utmost efforts to present you this book error free, but still it may contain some errors or mistakes. Students are encouraged to bring, if there are any mistakes or errors in this document to our notice. So that it may be rectified in the next edition of this document.

"Suppressing your doubts is Hindering your growth".

We urge you to work hard and make use of the facilities we are providing to you, because there is no substitute for hard work. We wish you all the best for your future.

"The grass isn't greener on the other side; the grass is greener where you water it."

You and your suggestions are valuable to us; Help us to serve you better. In case of any suggestions, grievance, or complaints, please feel free to write us your suggestions, grievance and feedback on the following

Dvs.training@gmail.com

DVS Technologies

1 Loadbalancer(basic & std) - with vm's

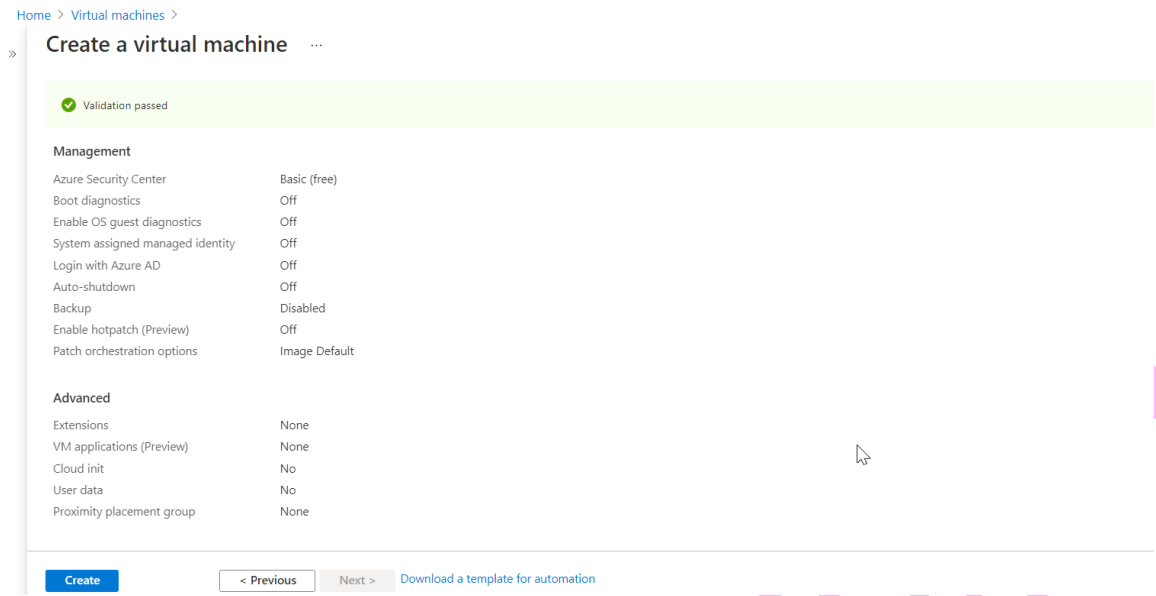
Difference between Standard & Basic:

Standard SKU	Basic SKU
Support upto 1000 instances	Support upto 100 instances
Any Virtual Machine in a Single Virtual network, including blend of Virtual Machine Availability Set, Virtual Machine Scale Set	Virtual Machine in a Single Availability Set or Virtual Machine Scale Set
TCP, HTTP, HTTPS	TCP, HTTP
TCP Connections stay Alive on instance probe down and on all Probe Down	TCP Connections Stay alive on instance probe down. All TCP Connection Terminate on all probes are down
Zone Redundant, Cross Zone load Balancing	Not Available
Most operations < 30 Seconds	60 - 90+ Seconds typically
Charged Based on number of Rules, data processed inbound and Outbound associated with Resources	No Charge

https://docs.microsoft.com/en-us/azure/load-balancer/skus

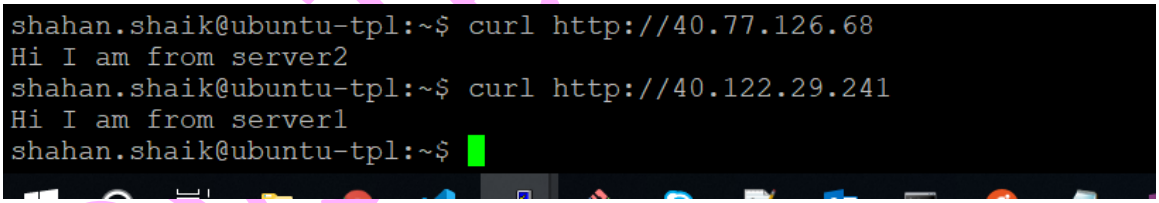
In simple terms you cannot create the individual servers and add them to the backend pools of basic load balancer. You have to either opt for scale set or you have to opt for availability sets.
Let's create our basic loadbalancer & check what happens.
Create two servers and try to add them to the basic loadbalancer with apache installed in them.

Server1:



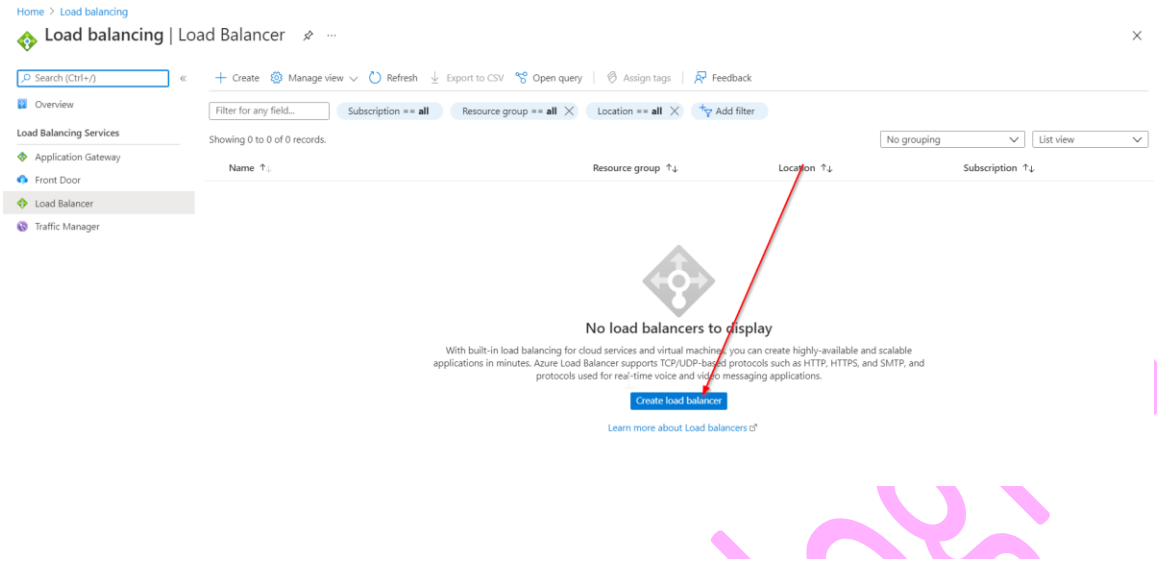
Same way create server2
Pls make sure you are enabling port 80 at NSG level

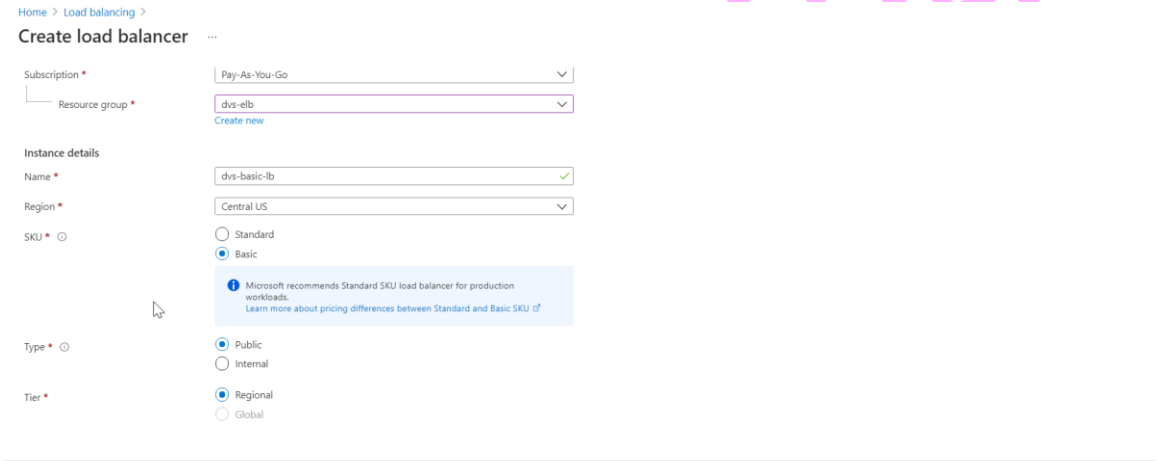
Installing apache in both servers:
yum install httpd -y
systemctl enable httpd
echo "Hi I am from server1/2" > /var/www/html/index.html
systemctl restart httpd

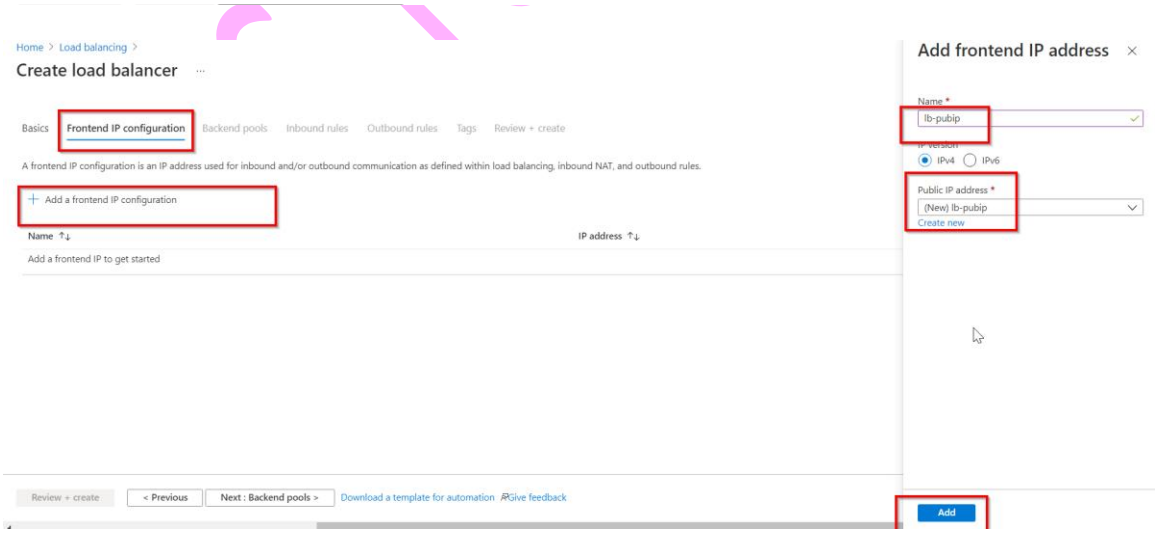


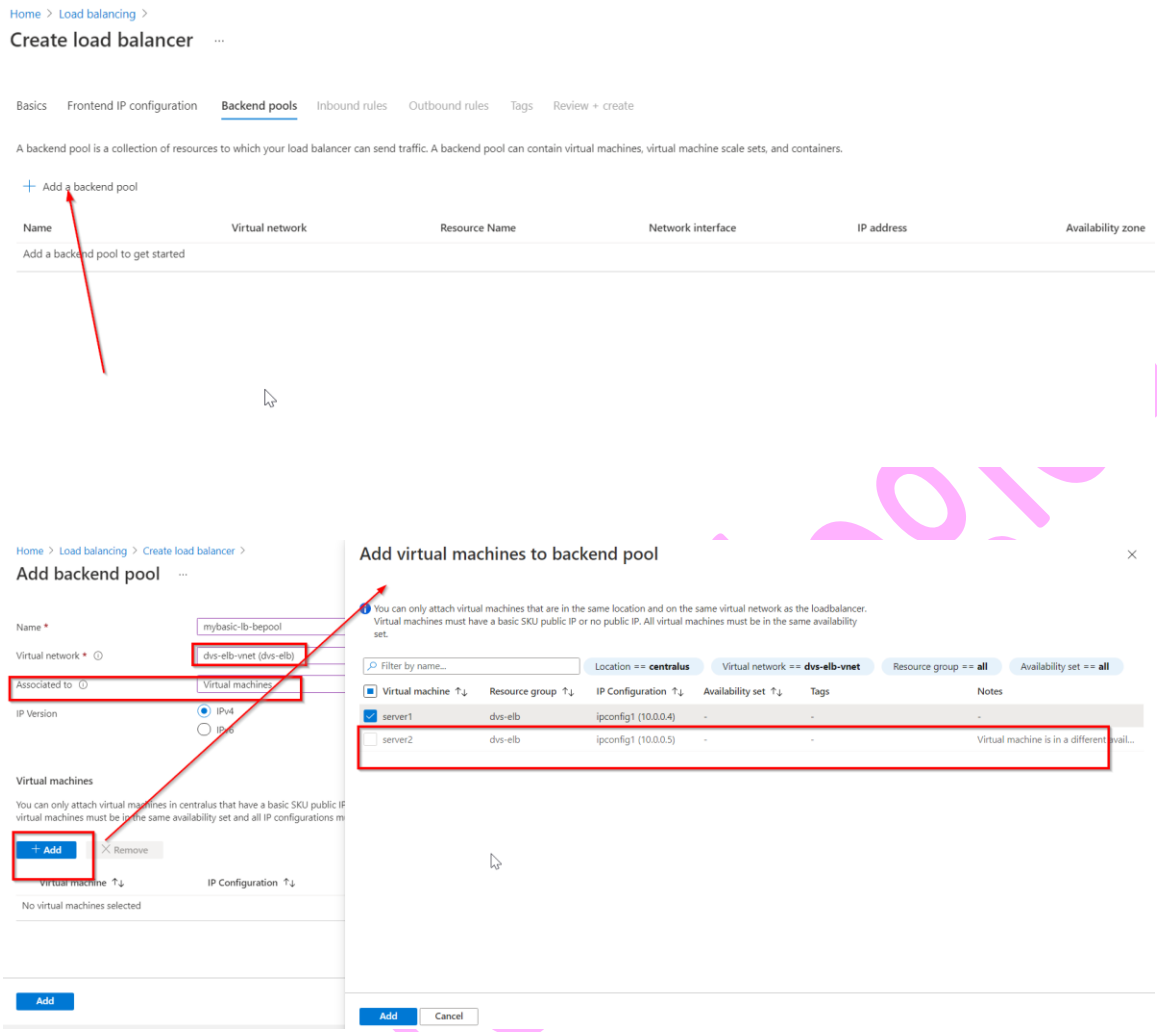
Configure the basic loadbalancer & try to configure the backend pool.

DVS Technologies


Home > Load balancing
Load balancing | Load Balancer
Search (Ctrl+/)
Overview
Load Balancing Services
Application Gateway
Front Door
Load Balancer
Traffic Manager
Create
Manage view
Refresh
Export to CSV
Open query
Assign tags
Feedback
Filter for any field...
Subscription == all
Resource group == all
Location == all
Add filter
Showing 0 to 0 of 0 records.
No grouping
List view
Name
Resource group
Location
Subscription
No load balancers to display
With built-in load balancing for cloud services and virtual machines, you can create highly-available and scalable applications in minutes. Azure Load Balancer supports TCP/UDP-based protocols such as HTTP, HTTPS, and SMTP, and protocols used for real-time voice and video messaging applications.
Create load balancer
Learn more about Load balancers

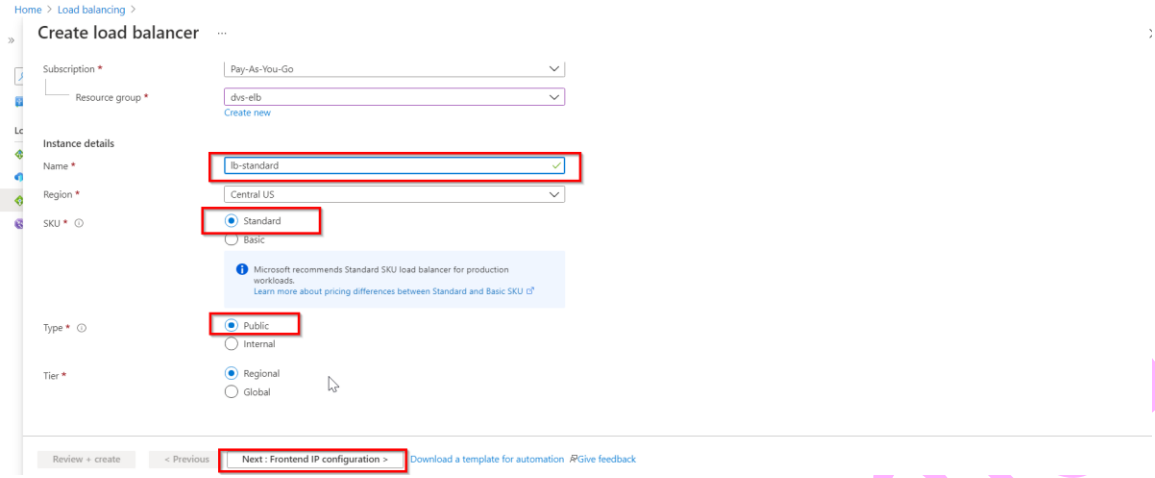

Home > Load balancing >
Create load balancer
Subscription *
Pay-As-You-Go
Resource group *
dvs-elb
Create new
Instance details
Name *
dvs-basic-lb
Region *
Central US
SKU *
Standard
Basic
Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU
Type *
Public
Internal
Tier *
Regional
Global

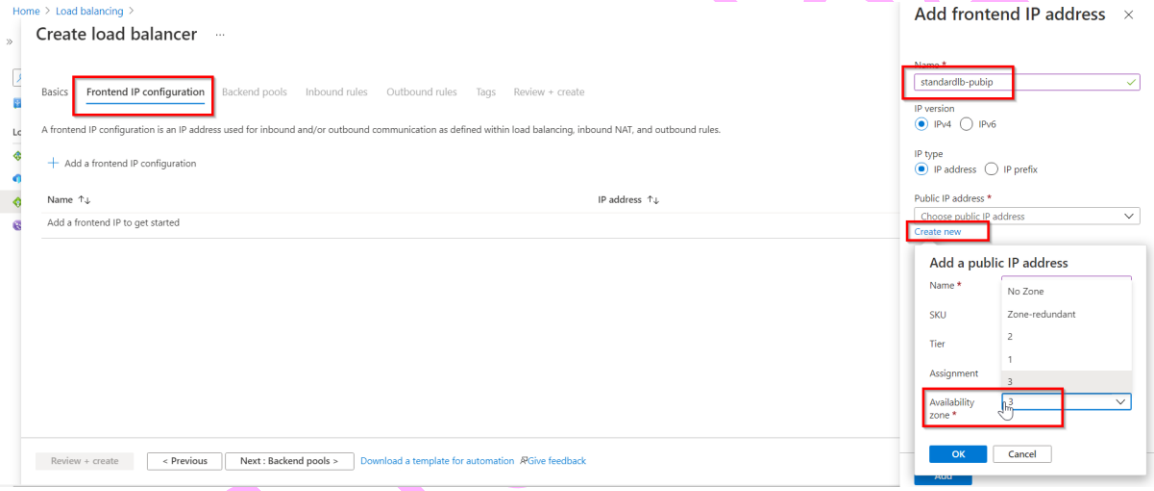

Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.
Add a frontend IP configuration
Name
IP address
Add a frontend IP to get started
Review + create
< Previous
Next : Backend pools >
Download a template for automation
Give feedback
Add frontend IP address
Name *
lb-pubip
IPv4
IPv6
Public IP address *
(New) lb-pubip
Create new
Add

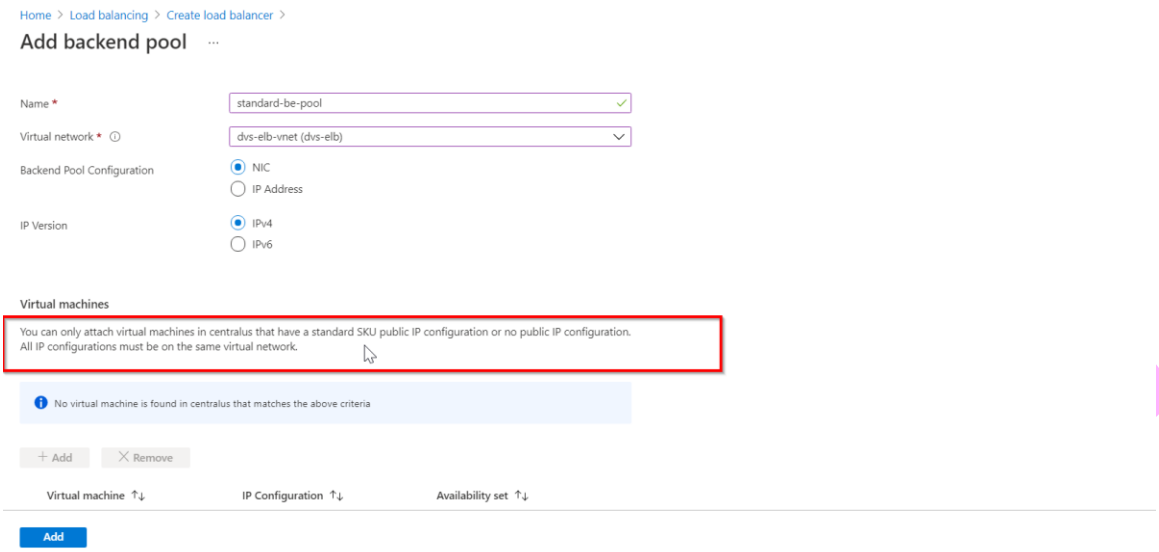


Here if you properly observe when we try to add the machines to the LB it clearly says to use the availability set as we have two servers in diff availability zones.

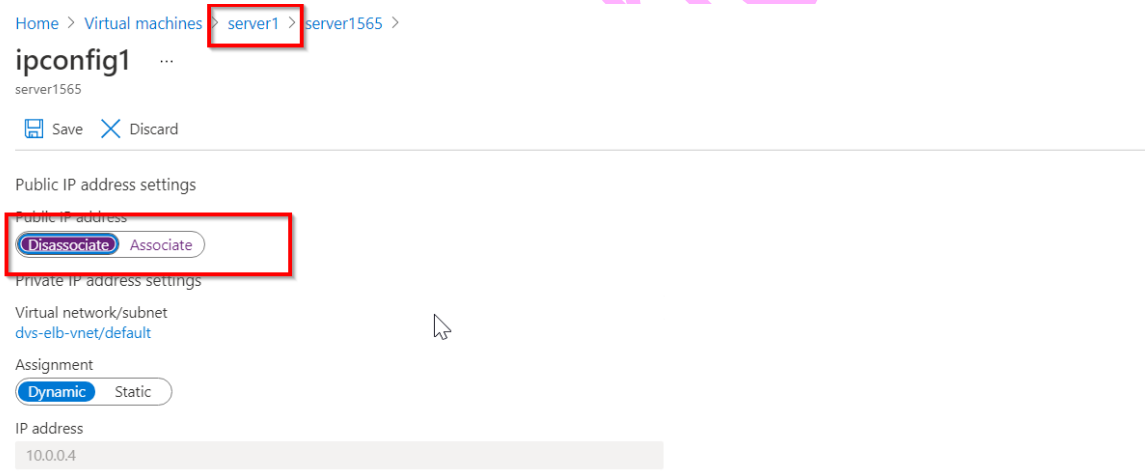
Now let's try to change the LB to standard SKU then try to add the machines & test if it accepts diff servers from diff AVZ's in the same network or not.

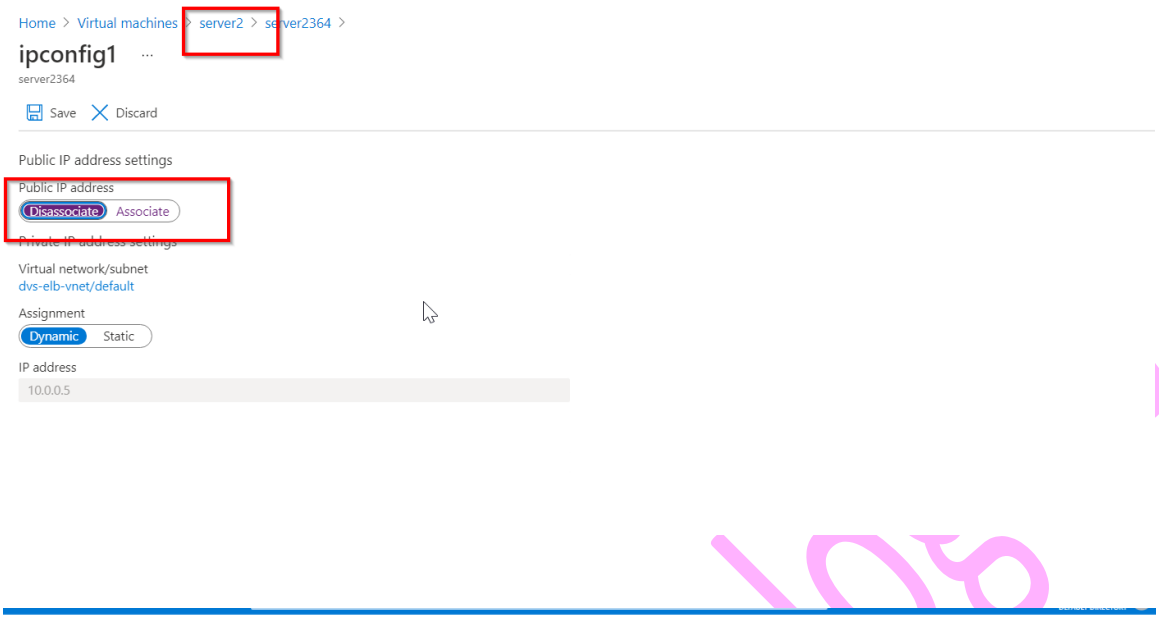

Home > Load balancing >
Create load balancer
Subscription *
Pay-As-You-Go
Resource group *
dvs-elb
Create new
Instance details
Name *
lb-standard
Region *
Central US
SKU *
Standard
Basic
Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU
Type *
Public
Internal
Tier *
Regional
Global
Review + create
< Previous
Next : Frontend IP configuration >
Download a template for automation
Give feedback

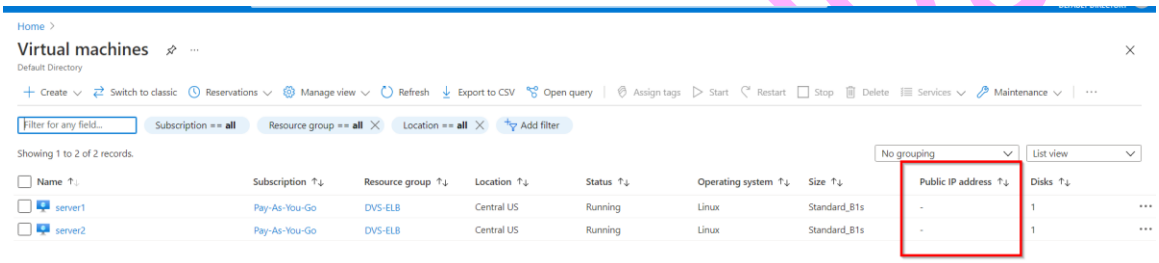

Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.
Add a frontend IP configuration
Name
IP address
Add a frontend IP to get started
Review + create
< Previous
Next : Backend pools >
Download a template for automation
Give feedback
Add frontend IP address
standardlb-pubip
IP version
IPv4
IPv6
IP type
IP address
IP prefix
Public IP address *
Choose public IP address
Create new
Add a public IP address
Name *
SKU
Zone-redundant
Tier
Assignment
Availability zone *
No Zone
2
1
3
OK
Cancel



Here it's not allowing us to add the servers & its even not displaying the server data. Let's try to remove the public ipaddress for the systems & try to add the VM's to the standard load balancer.







No public ipaddress for the servers.

Home > Load balancing > Create load balancer >

Add backend pool ...

Name * Backend pool name

Virtual network * dvs-elb-vnet (dvs-elb)

Backend Pool Configuration
- (•) NIC
- ( ) IP Address

IP Version
- (•) IPv4
- ( ) IPv6

Virtual machines

You can only attach virtual machines in centralus that have a standard SKU public IP configuration or no public IP configuration. All IP configurations must be on the same virtual network.

+ Add × Remove

Virtual machine ↑↓	IP Configuration ↑↓	Availability set ↑↓
server1	ipconfig1 (10.0.0.4)	-
server2	ipconfig1 (10.0.0.5)	-

Add

Now if you see we got option of "add" under our virtual machines

Home > Load balancing >

Create load balancer ...

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

A backend pool is a collection of resources to which your load balancer can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, and containers.

+ Add a backend pool

Name	Virtual network	Resource Name	Network interface	IP address	Availability zone
standardlb-be-pool					
standardlb-be-pool	dvs-elb-vnet	server1	server1565	10.0.0.4	-
standardlb-be-pool	dvs-elb-vnet	server2	server2364	10.0.0.5	-

Review + create | < Previous | Next : Inbound rules > | Download a template for automation | Give feedback

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

Load balancing rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. The load balancing rule uses a health probe to determine which backend instances are eligible to receive traffic.

+ Add a load balancing rule

Name	Frontend IP configuration	Backend pool	Health probe	Frontend Port	Backend port
Add a rule to get started					

Inbound NAT rule

An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.

+ Add an inbound nat rule

Name	Frontend IP configuration	Service	Target	Frontend Port
Add a rule to get started				

Review + create | < Previous | Next : Outbound rule > | Download a template for automation | Give feedback

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

Load balancing rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. The load balancing rule uses a health probe to d

+ Add a load balancing rule

Name	Frontend IP configuration	Backend pool	Health probe	Frontend Port
Add a rule to get started				

Inbound NAT rule

An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.

+ Add an inbound nat rule

Name	Frontend IP configuration	Service	Target
Add a rule to get started			

Review + create | < Previous | Next : Outbound rule > | Download a template for automation | Give feedback

Add load balancing rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Name *: allowport80

IP Version *: IPv4 / IPv6

Frontend IP address *: standardlb-pubip (To be created)

Backend pool *: standardlb-be-pool

Protocol *: TCP / UDP

Port *: 80

Add

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

Load balancing rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. The load balancing rule uses a health probe to d

+ Add a load balancing rule

Name	Frontend IP configuration	Backend pool	Health probe	Frontend Port
Add a rule to get started				

Inbound NAT rule

An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.

+ Add an inbound nat rule

Name	Frontend IP configuration	Service	Target
Add a rule to get started			

Review + create | < Previous | Next : Outbound rule > | Download a template for automation | Give feedback

Add load balancing rule

80

Health probe *

Create new

Add health probe

Name *: checkapachestatus

Protocol *: HTTP

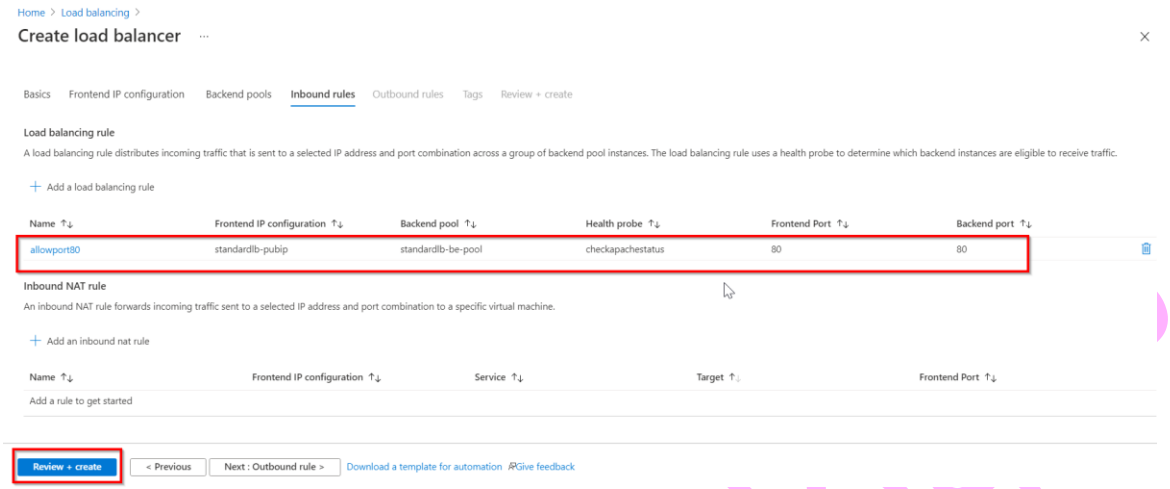
Port *: 80

Path *: /index.html

Interval *: 5 seconds

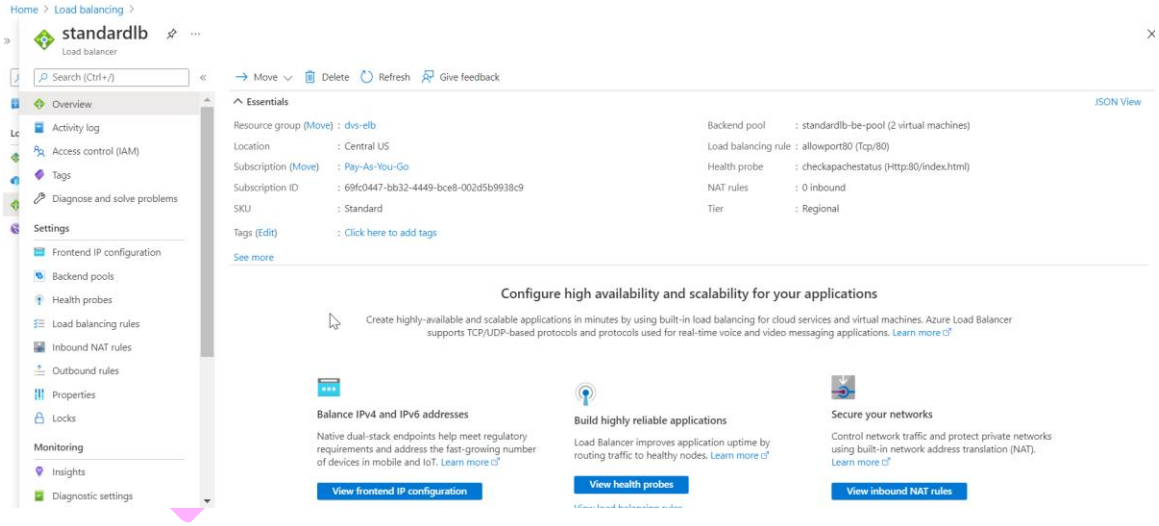
Unhealthy threshold *: 2 consecutive failures

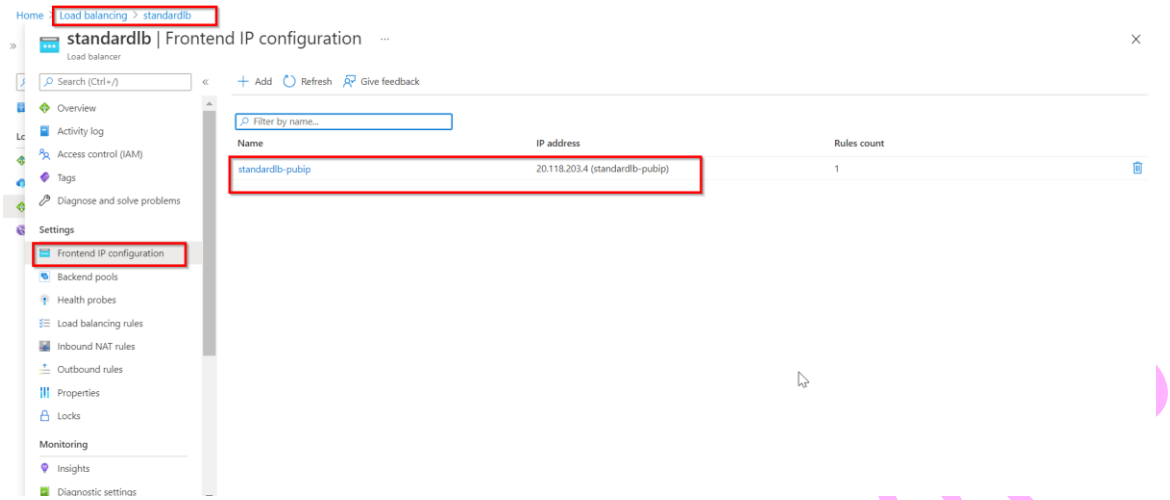
Used by: Not used

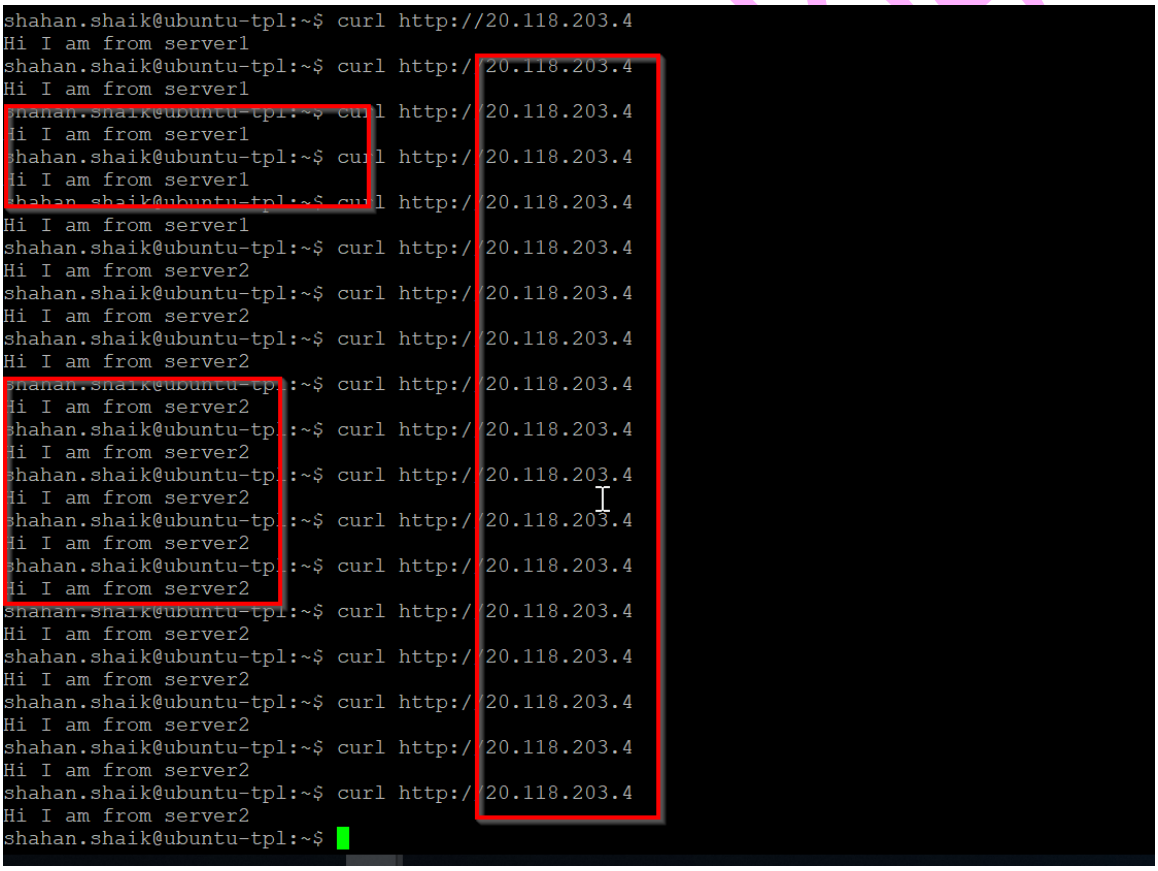


From this configuration it's crystal clear that we cannot use the individual servers from diff AVZ's with basic loadbalancer. It only supports understandard partion iff public ip's should be of same SKU.

Once the standard LB is up let's test the connectivity to our servers.







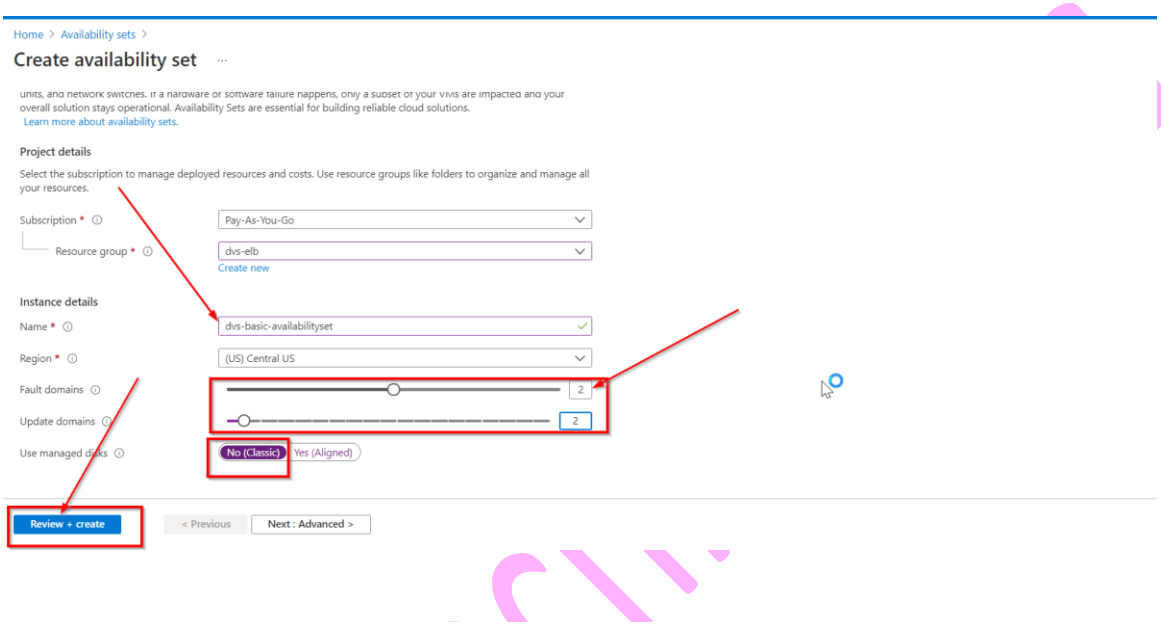
Finally we can state that our application is up & running with backend pool of 2 servers.

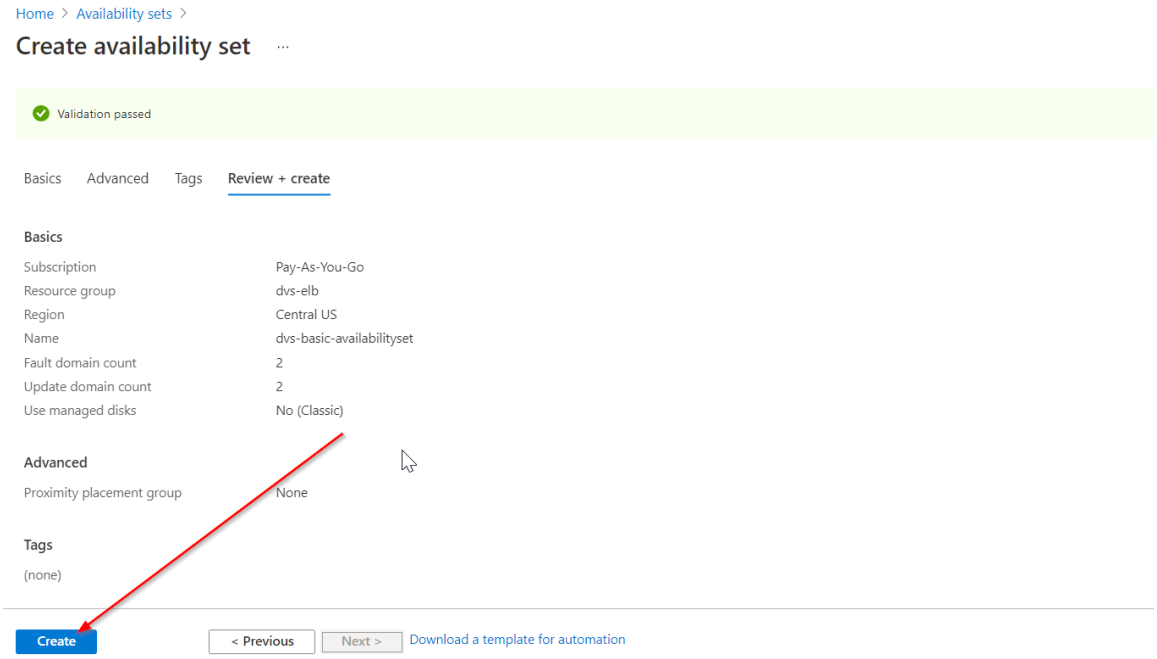
Note: standard loadbalancer support multi backend pools. It means you can add more backend pools with multiple servers inside each pool.

2 Basic LB - with availability sets

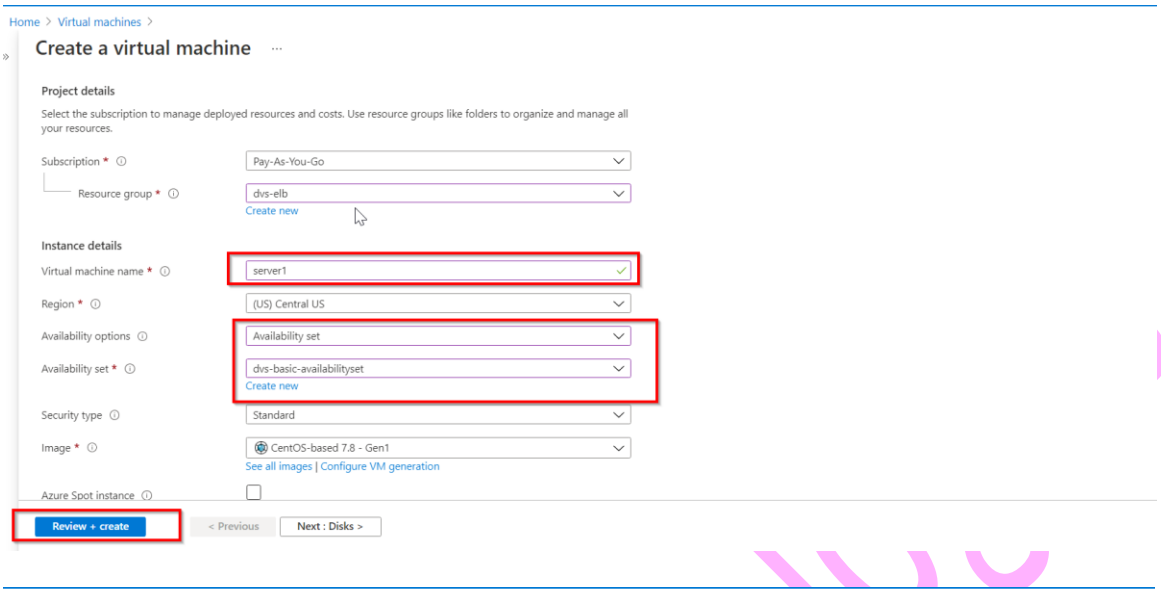
Now let's try to create availability set and add servers to it. Post that let's create the LB.

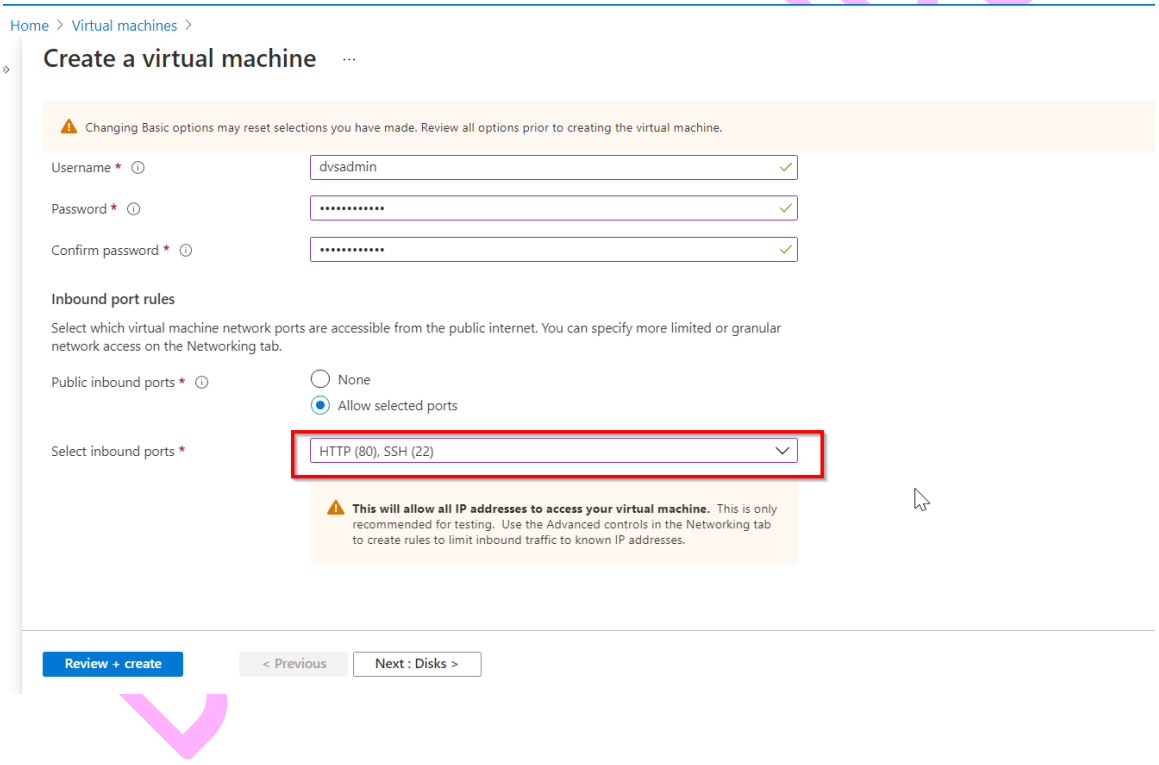
Creating Availability set:



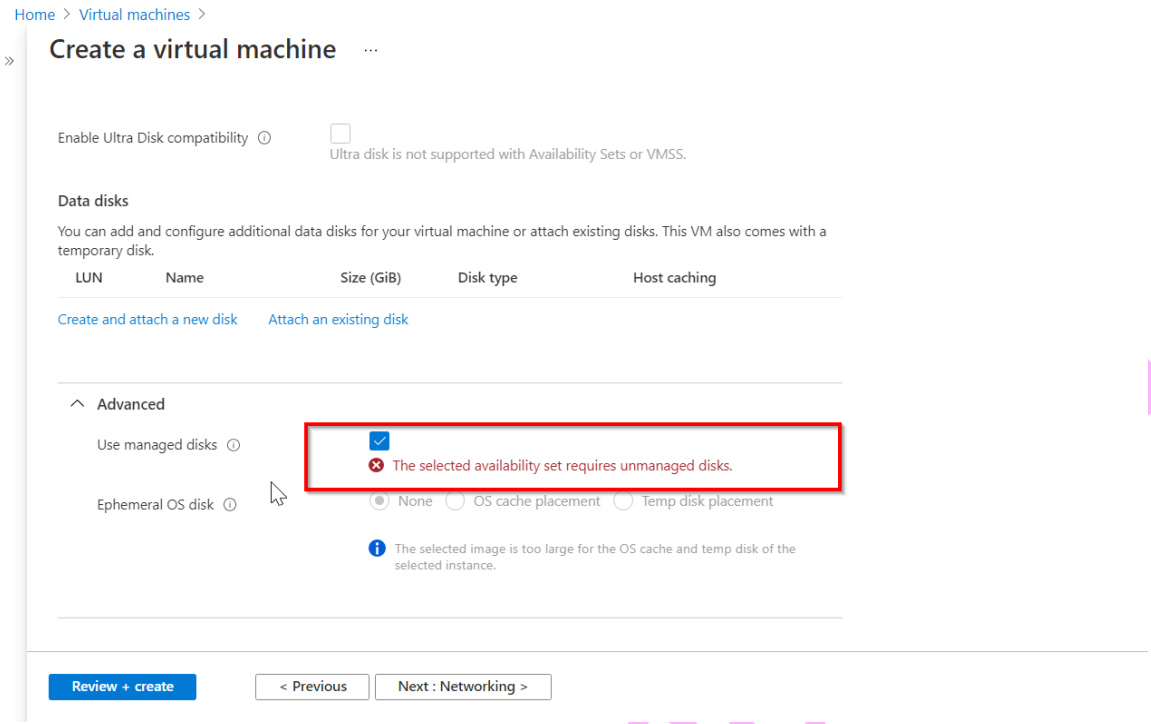


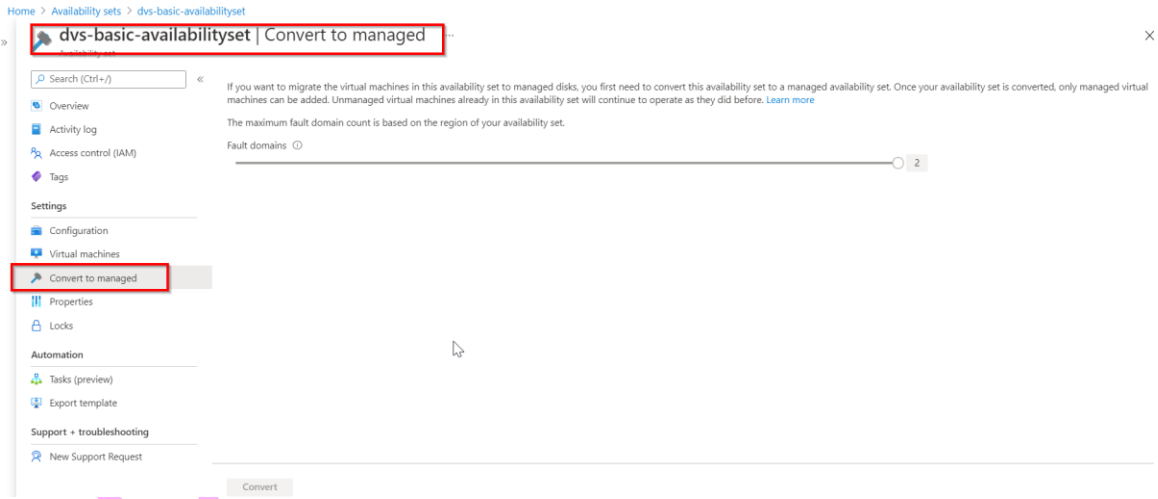
Let's create VM's & assign them to this availability set:



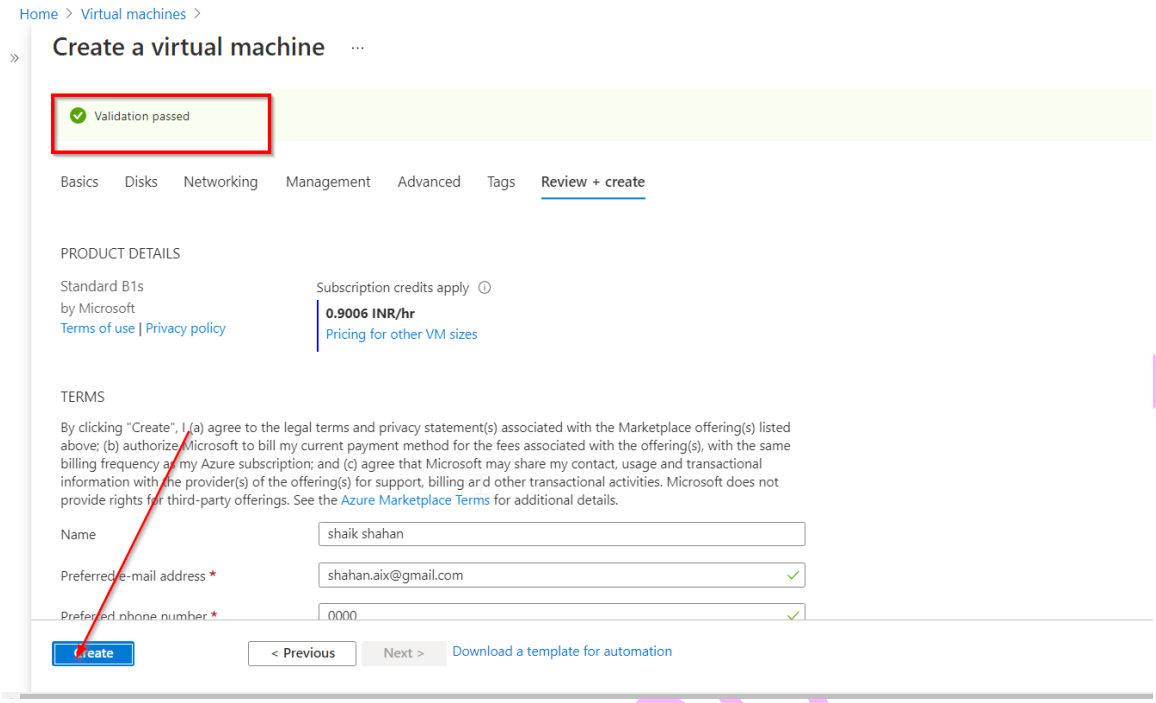


Since we created the Availability set as unmanaged it's not allowing us to go with managed disk. Hence we are converting availability set to managed.

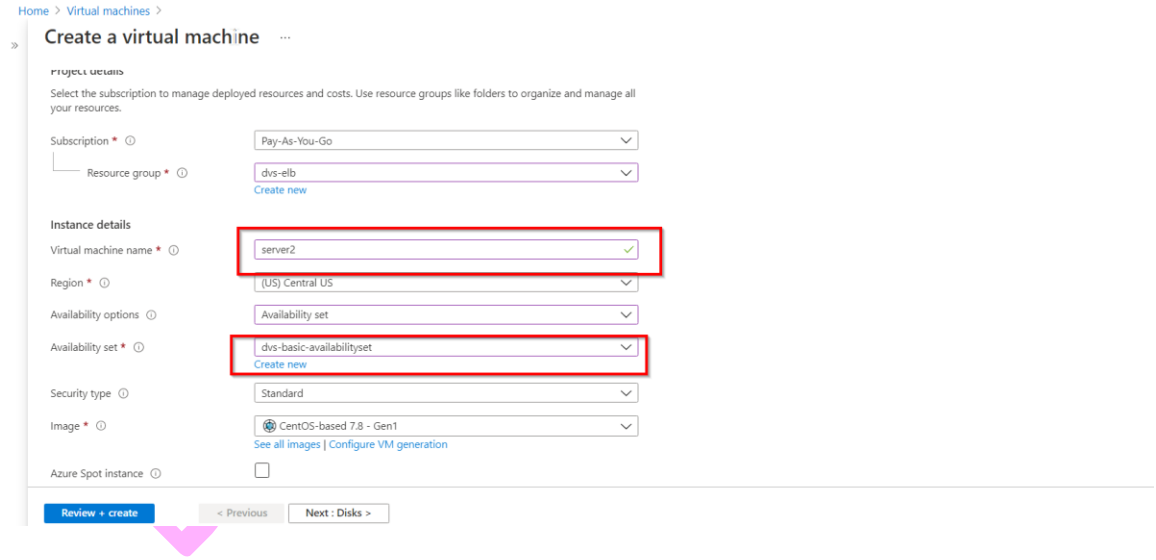




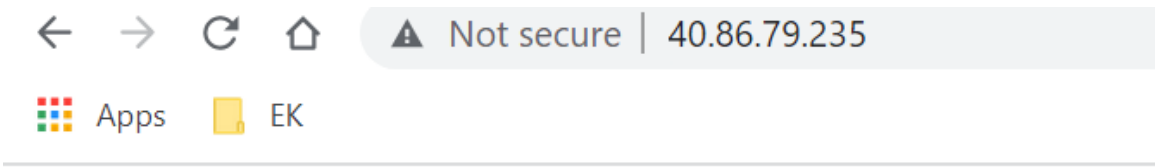
Now let's try to create servers again.

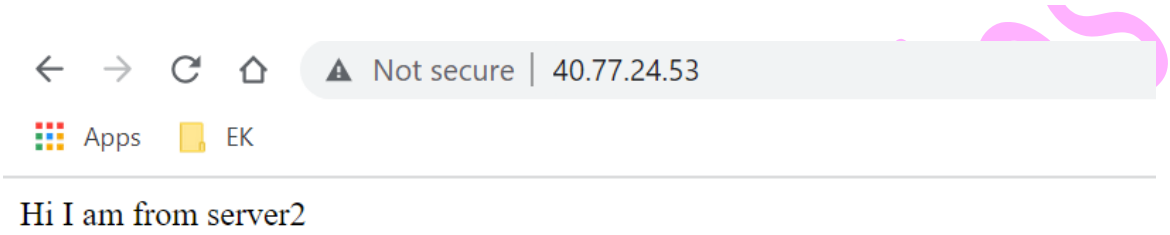


Please do the same for the second vm

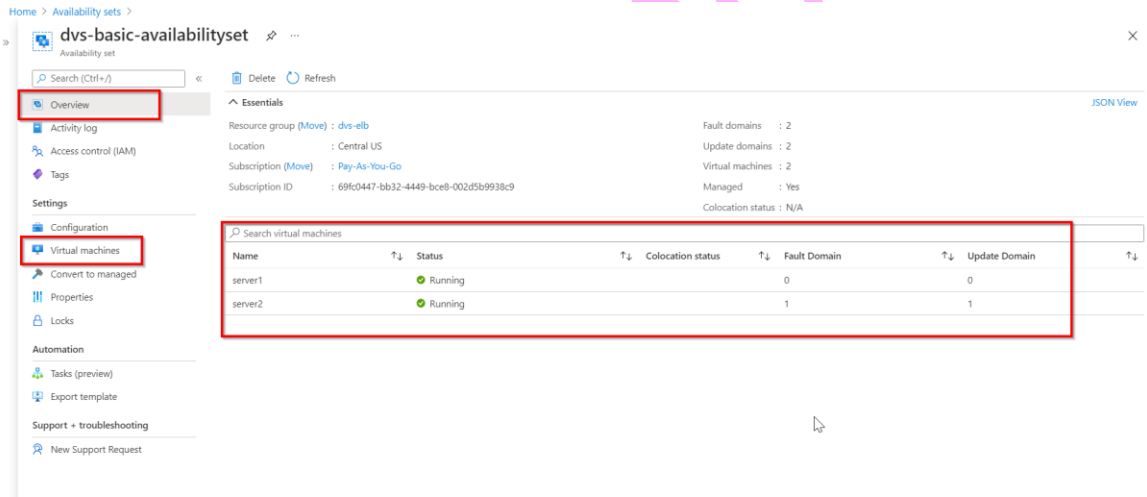


Install apache in both servers and test the application status from both machines.





Now we can see application is up & running



Let's configure the basic LB now.

Home > Load balancing >

Create load balancer

Project details

Subscription * Pay-As-You-Go

Resource group * dvs-elb

Create new

Instance details

Name * dvs-basic-lb

Region * Central US

SKU * Standard / Basic

Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU

Type * Public / Internal

Tier * Regional / Global

Review + create | < Previous | Next : Frontend IP configuration > | Download a template for automation | Give feedback

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.

+ Add a frontend IP configuration

Name	IP address
Add a frontend IP to get started	

Review + create | < Previous | Next : Backend pools > | Download a template for automation | Give feedback

Add frontend IP address

Name * basiclb-pubip

IP version IPv4 / IPv6

Public IP address * (New) basiclb-pubip

Create new

Add

Home > Load balancing > Create load balancer >

Add backend pool

Name * basiclb-be-pool

Virtual network * dvs-elb-vnet (dvs-elb)

Associated to Virtual machines

IP Version IPv4 / IPv6

Virtual machines

You can only attach virtual machines in centralus that have a basic SKU public IP
virtual machines must be in the same availability set and all IP configurations m

+ Add | Remove

Virtual machine	IP Configuration
No virtual machines selected	

Add

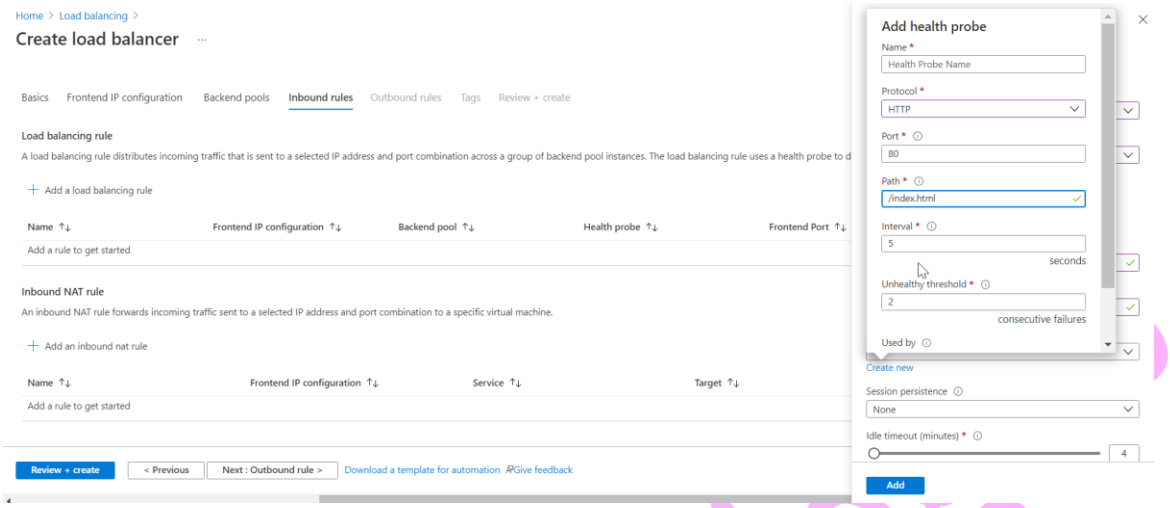
Add virtual machines to backend pool

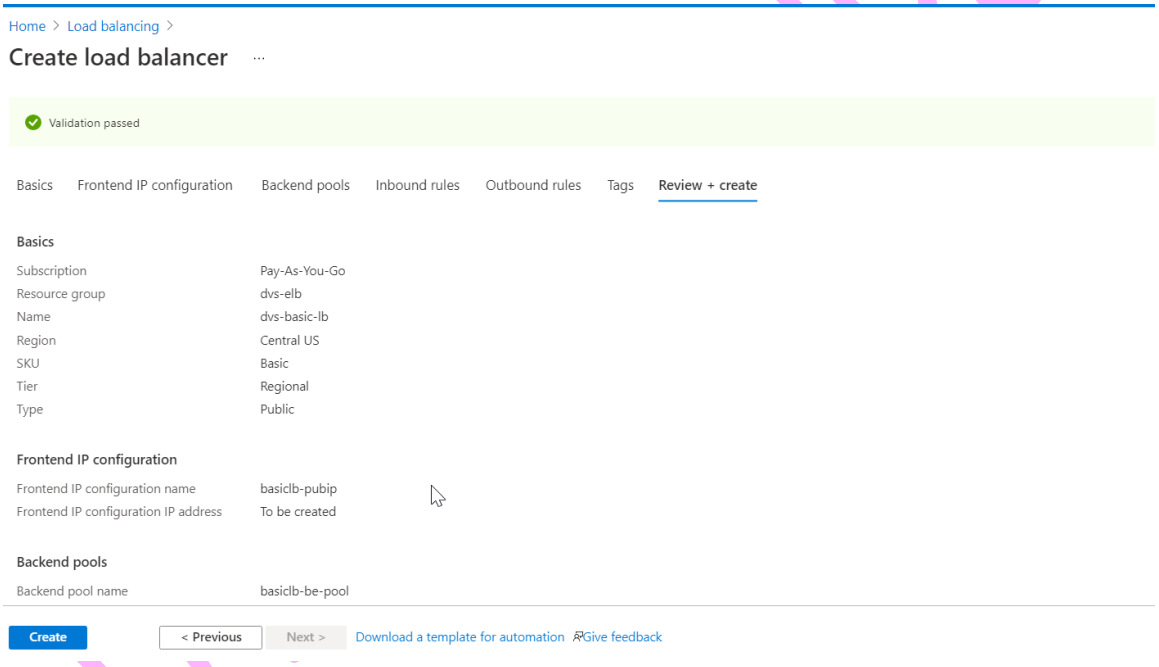
You can only attach virtual machines that are in the same location and on the same virtual network as the loadbalancer. Virtual machines must have a basic SKU public IP or no public IP. All virtual machines must be in the same availability set.

Filter by name... | Location == centralus | Virtual network == dvs-elb-vnet | Resource group == all | Availability set == all

Virtual machine	Resource group	IP Configuration	Availability set	Tags	Notes
server2	dvs-elb	ipconfig1 (10.0.0.5)	dvs-basic-availabilityset	-	-
server1	dvs-elb	ipconfig1 (10.0.0.4)	dvs-basic-availabilityset	-	-

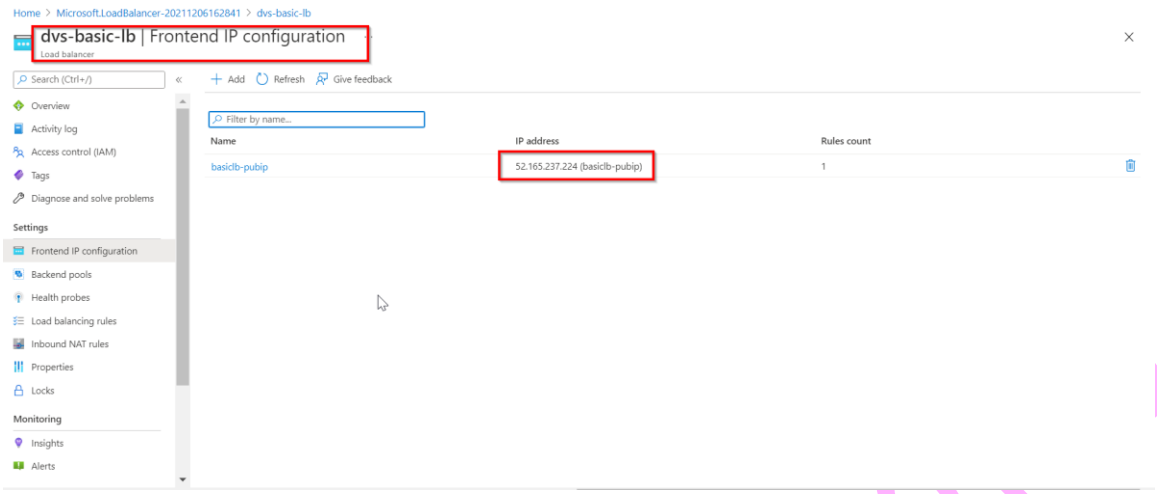
Add | Cancel





Note: Since our VM's are coming from availability sets we can add the servers to the basic LB otherwise it will not work.

Finally let's test our basic LB.

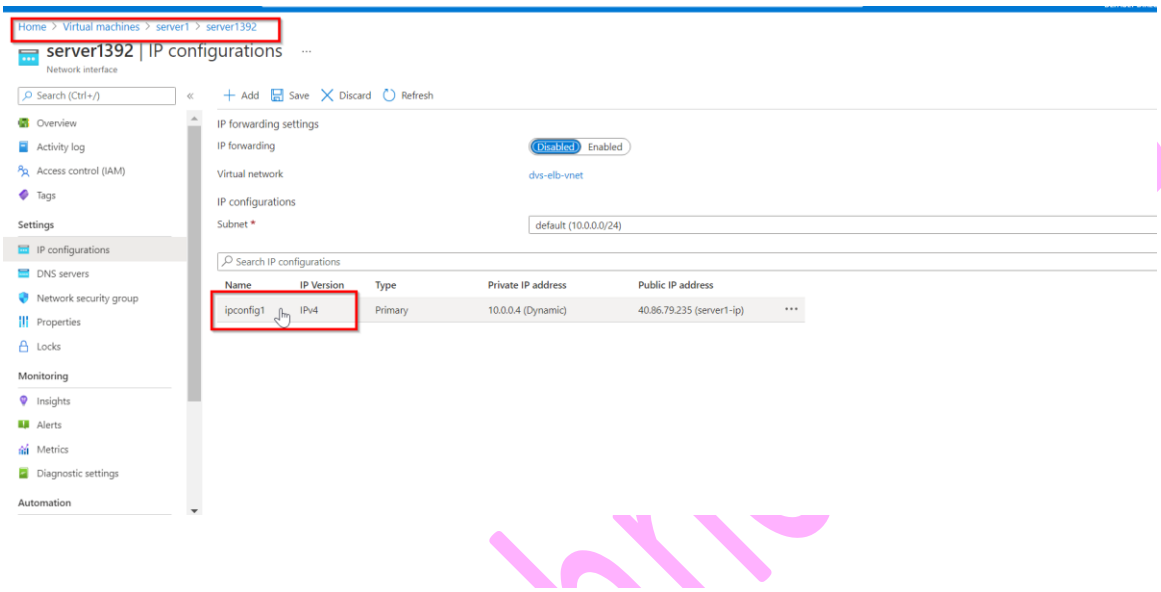


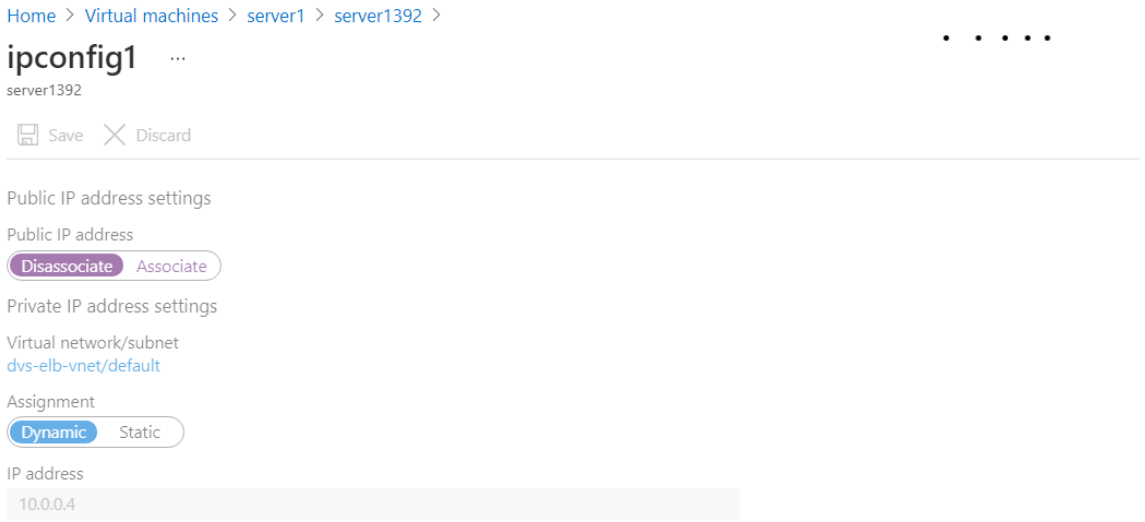

```
shahan.shaik@ubuntu-tpl:~$ while true
> do
> curl http://52.165.237.224
> sleep 4
> done
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi I am from server2
Hi Team I am from server1
Hi Team I am from server1
Hi Team I am from server1
Hi Team I am from server1
Hi Team I am from server1
```

3 Basic LB - Inbound NAT rules

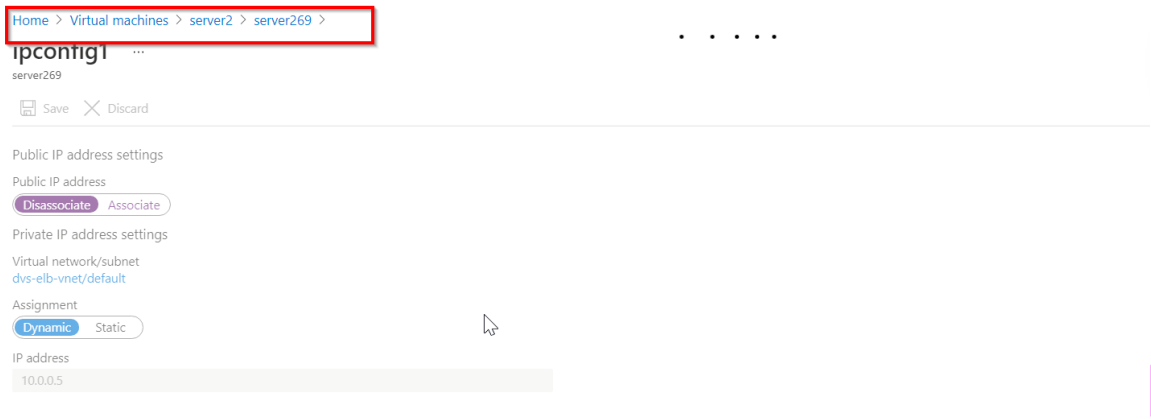
Let's release the public ip's for the servers and try to login to the server with NAT rules

Releasing public ip's for the server1 & server2

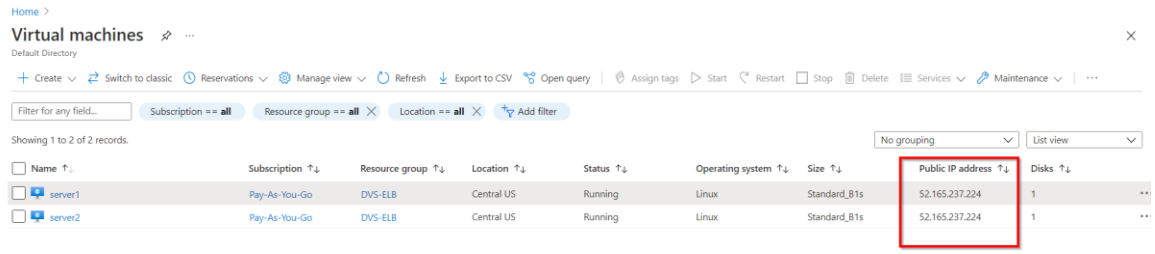


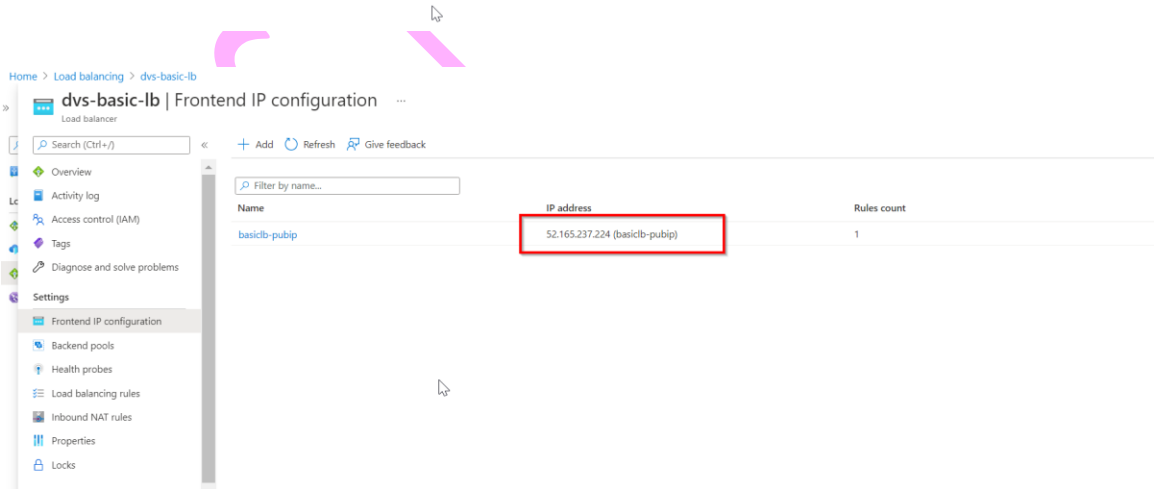


Now do the same for the other server

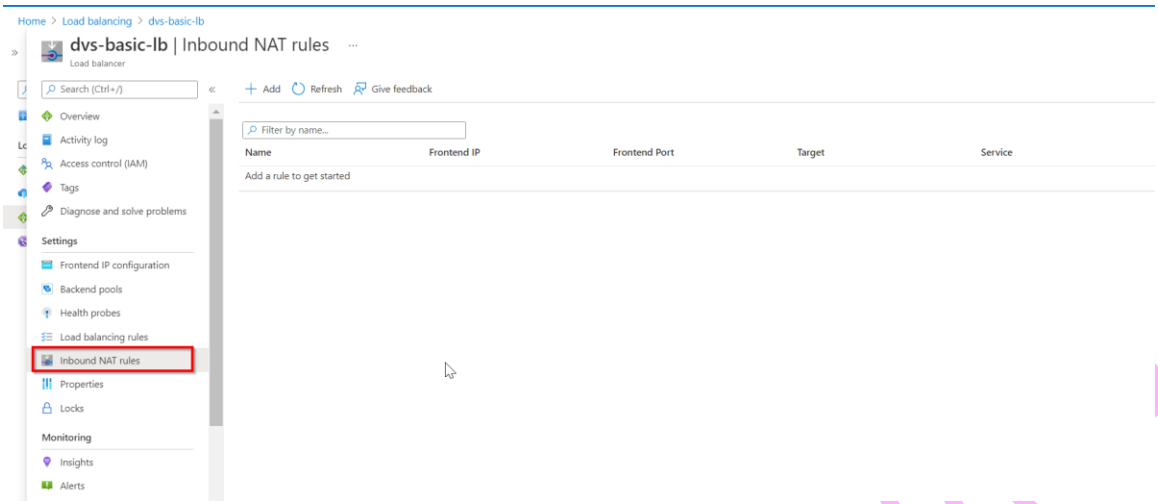


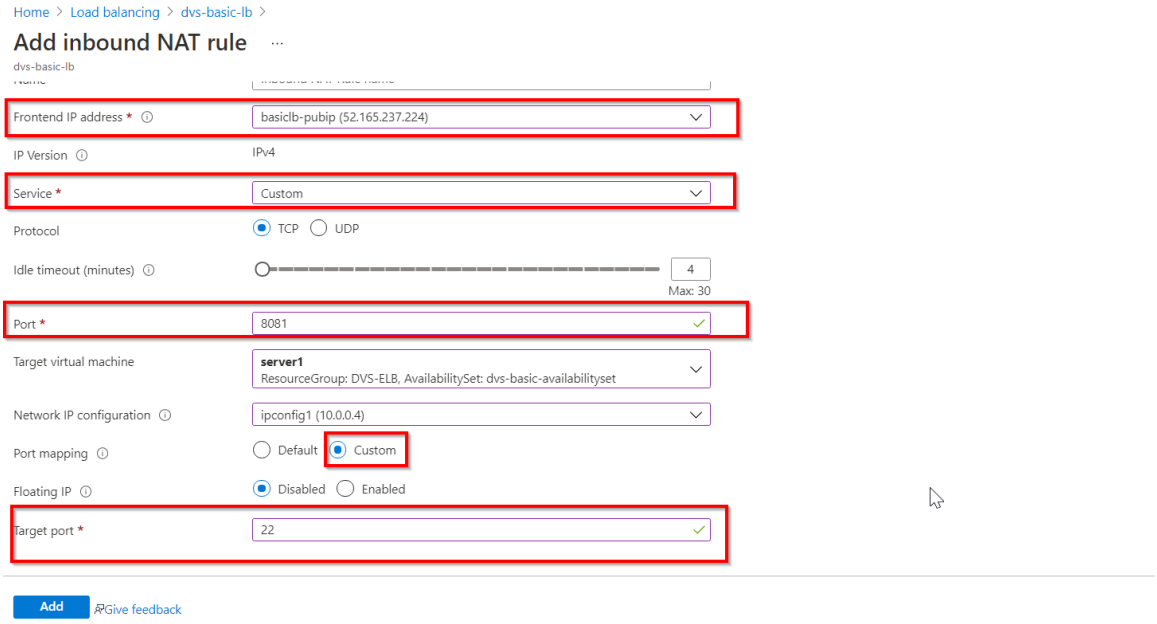
Once you release the public ip's then if you observe all the servers are going to get the public ip of load balancer



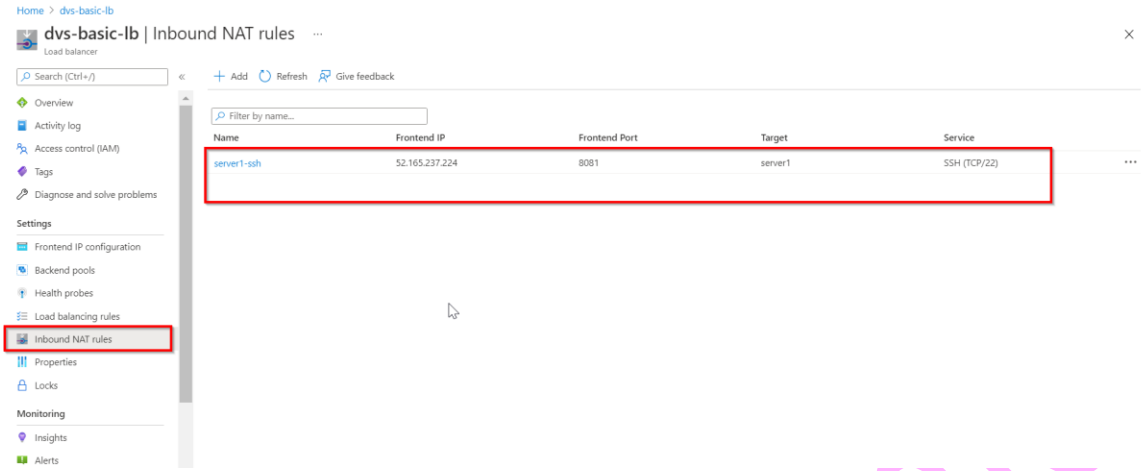


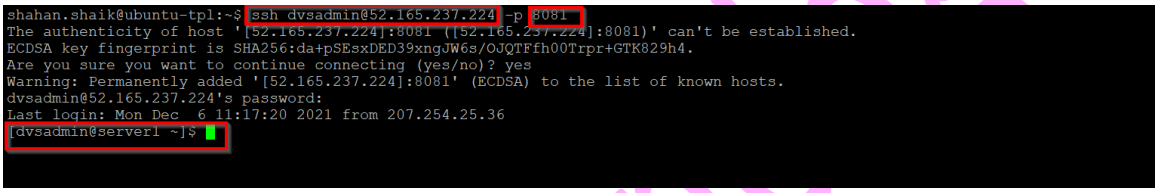
Now let's configure the NAT rules





This is our server1 port 22 forwarded to port 8081 of LB ipaddress
Now let's try to access server1 with LB public ipaddress on port 8081





Implement same for server2

4 Basic LB - with VMSS

Let's configure the LB with scale sets. As you remember we can implement the basic LB with scale sets as well.

Let us create the scale set first then we will add the scale set to the LB & try to access the application.

Creating Scaleset:

DVS Technologies

Home > Virtual machine scale sets >

Create a virtual machine scale set

Subscription * Pay-As-You-Go

Resource group * dvs-rg

Create new

Scale set details

Virtual machine scale set name * basic-lb-vmss

Region * (US) East US

Availability zone None

Orchestration

A scale set has a "scale set model" that defines the attributes of virtual machine instances (size, number of data disks, etc). As the number of instances in the scale set changes, new instances are added based on the scale set model.

Learn more about the scale set model

Orchestration mode *
- **Uniform:** optimized for large scale stateless workloads with identical instances
- **Flexible:** achieve high availability at scale with identical or multiple virtual machine types

Security type Standard

Review + create | < Previous | Next : Disks >

Home > Virtual machine scale sets >

Create a virtual machine scale set

Basics | Disks | Networking | Scaling | Management | Health | Advanced | Tags | Review + create

An Azure virtual machine scale set can automatically increase or decrease the number of VM instances that run your application. This automated and elastic behavior reduces the management overhead to monitor and optimize the performance of your application. Learn more about VMSS scaling

Initial instance count * 1

Scaling

Scaling policy
- Manual
- Custom

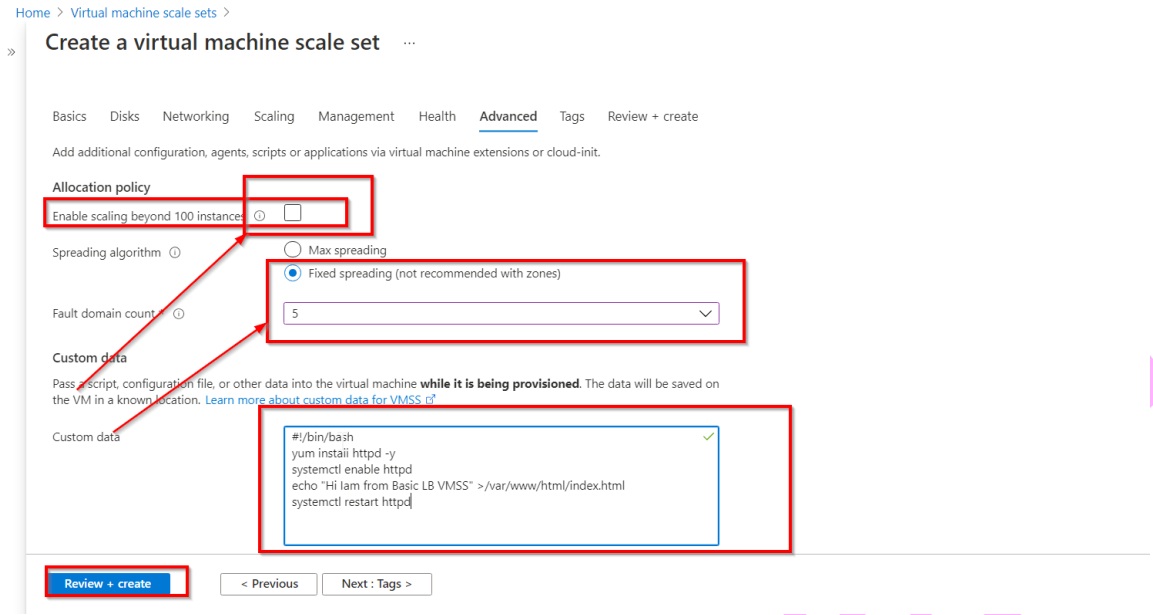
Scale-In policy

Configure the order in which virtual machines are selected for deletion during a scale-in operation.

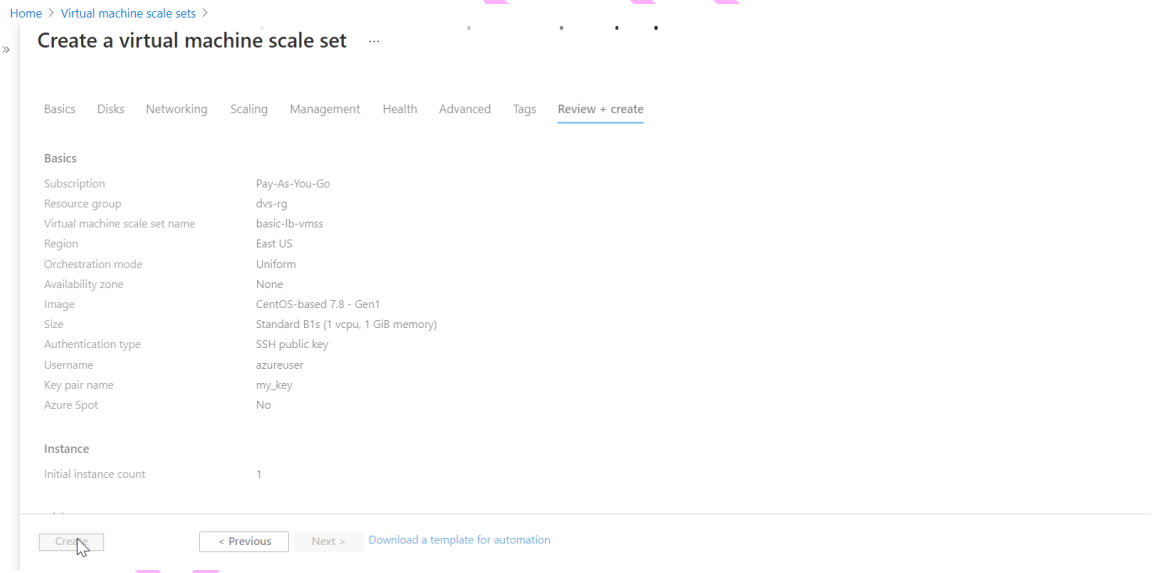
Learn more about scale-in policies.

Scale-in policy Default - Balance across availability zones and fault domains, then delete ...

Review + create | < Previous | Next : Management >



Please make sure that you are selecting as per the above otherwise you will struggle with issues.



Now let's try to create the basic LB

Home > Load balancing >

Create load balancer

Project details

Subscription * Pay-As-You-Go

Resource group * dvs-rg

Create new

Instance details

Name * basic-lb-vmss

Region * East US

SKU * Standard / Gateway / Basic

Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU

Type * Public / Internal

Tier * Regional

Review + create | < Previous | Next : Frontend IP configuration > | Download a template for automation | Give feedback

Microsoft Azure | Search resources, services, and docs (G+/) | shahan.aix@gmail.com DEFAULT DIRECTORY

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.

+ Add a frontend IP configuration

Name	IP address
Add a frontend IP to get started	

Review + create | < Previous | Next : Backend pools > | Download a template for automation | Give feedback

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.

+ Add a frontend IP configuration

Name	IP address
Add a frontend IP to get started	

Review + create | < Previous | Next : Backend pools > | Download a template for automation | Give feedback

Add frontend IP address

Name * basiclbvmss-pubip

IP version IPv4 / IPv6

Public IP address *

Choose public IP address

Create new

Add a public IP address

Name * basiclbvmss-pubip

SKU Basic / Standard

Tier Regional / Global

Assignment * Dynamic / Static

OK | Cancel

Add

Home > Load balancing >

Create load balancer

Basics | Frontend IP configuration | Backend pools | Inbound rules | Outbound rules | Tags | Review + create

A backend pool is a collection of resources to which your load balancer can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, and containers.

+ Add a backend pool

Name	Virtual network	Resource Name	Network interface	IP address	Availability zone
Add a backend pool to get started					

Review + create | < Previous | Next : Inbound rules > | Download a template for automation | Give feedback

Microsoft Azure | Search resources, services, and docs (G+/) | shahan.aix@gm DEFAULT D

Home > Load balancing > Create load balancer >

Add backend pool

Name * basiclb-pool1

Virtual network * dvsrgvnet991 (dvs-rg)

Associated to Virtual machine scale set

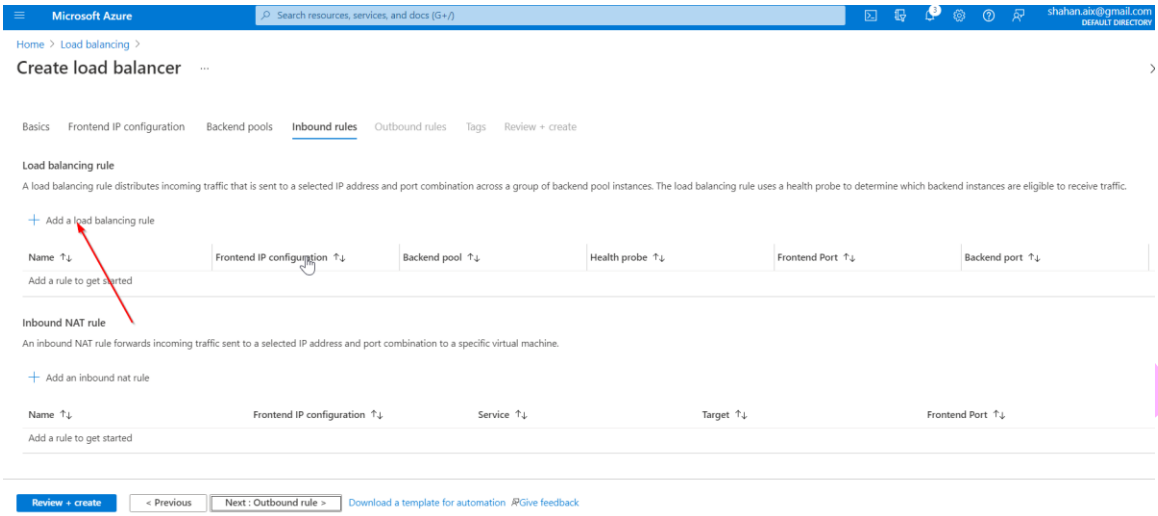
IP Version IPv4 / IPv6

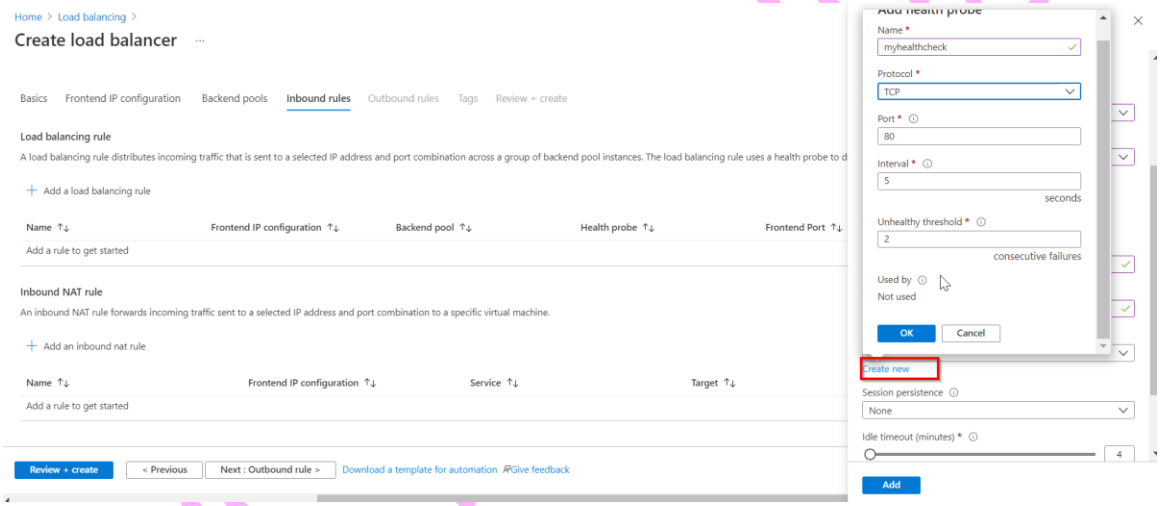
Virtual machine scale sets

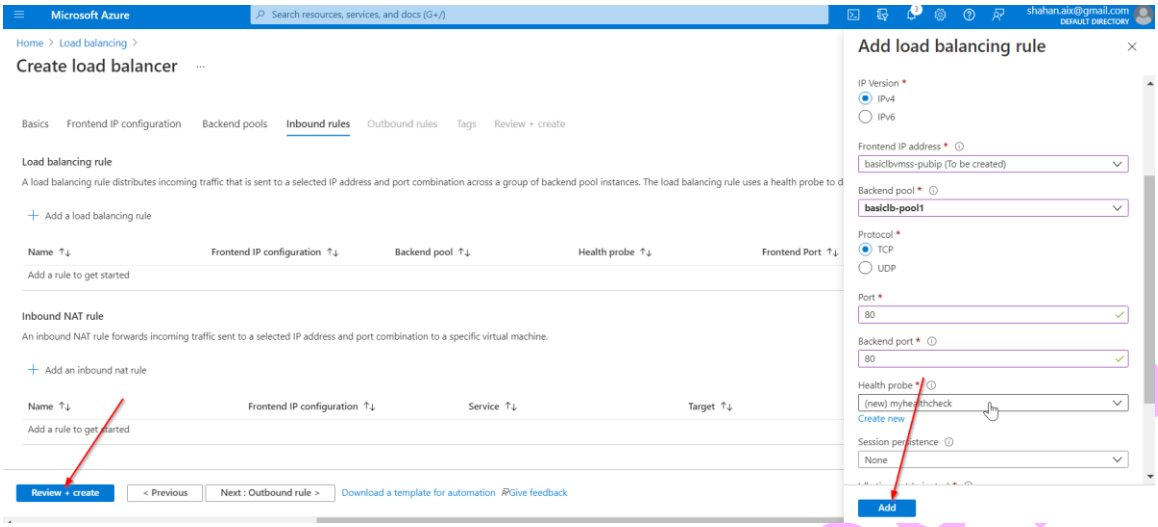
Virtual Machine Scale Sets must be in same location as Load Balancer. Only IP configurations that have the same SKU (Basic/Standard) as the Load Balancer can be selected. All of the IP configurations have to be in the same Virtual Network.

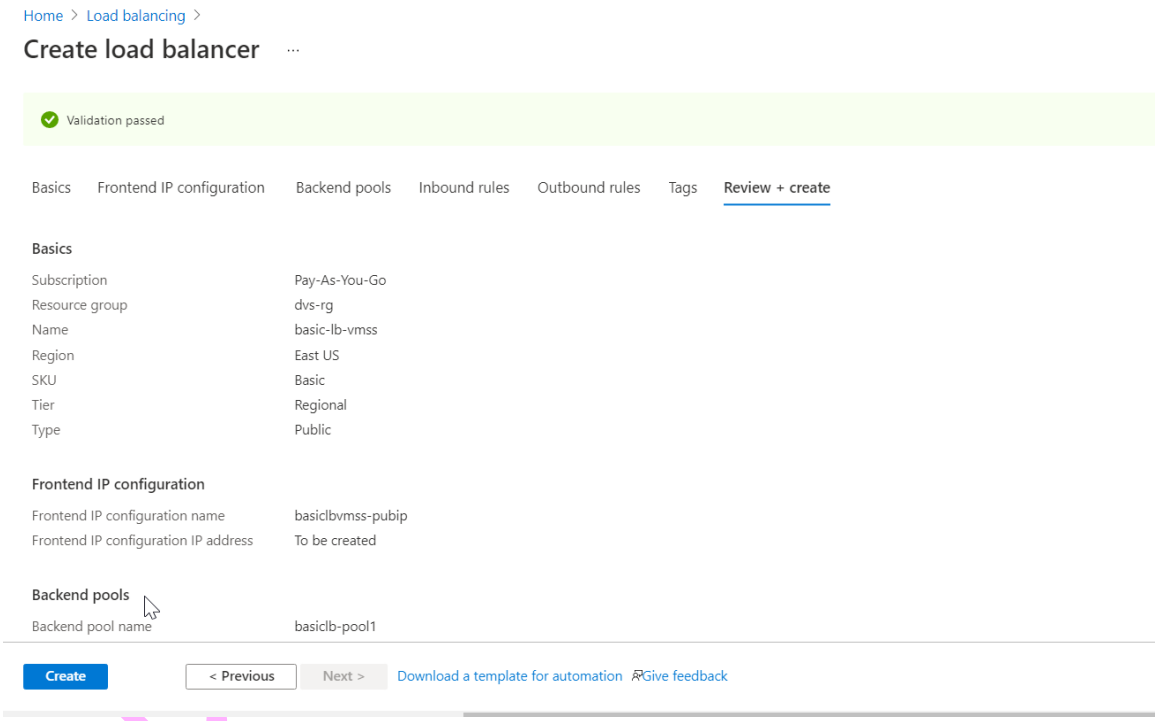
Virtual machine scale set	IP address
basic-lb-vmss	dvsrgvnet991-nic01-defaultIpConfiguration

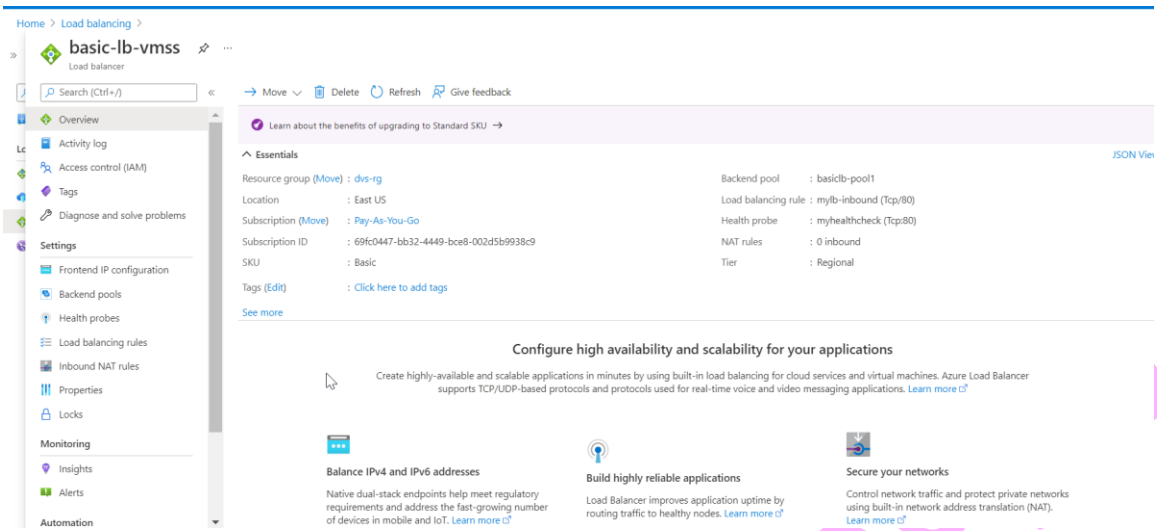
Add


Microsoft Azure
Search resources, services, and docs (G+/)
shahan.aix@gmail.com
DEFAULT DIRECTORY
Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
Load balancing rule
A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. The load balancing rule uses a health probe to determine which backend instances are eligible to receive traffic.
Add a load balancing rule
Name
Frontend IP configuration
Backend pool
Health probe
Frontend Port
Backend port
Add a rule to get started
Inbound NAT rule
An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.
Add an inbound nat rule
Name
Frontend IP configuration
Service
Target
Frontend Port
Add a rule to get started
Review + create
< Previous
Next : Outbound rule >
Download a template for automation
Give feedback

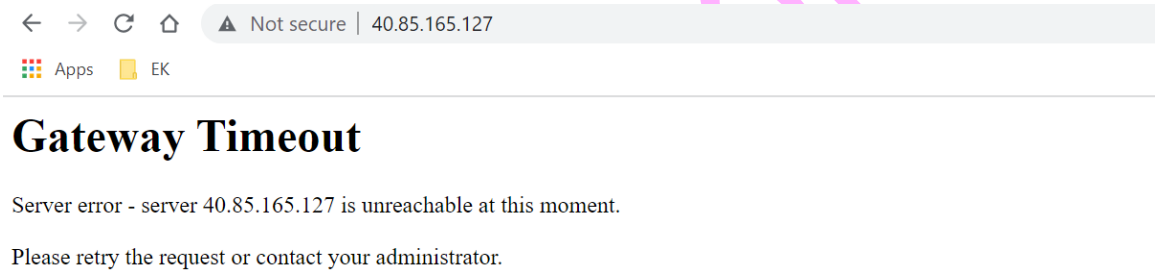

Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
Load balancing rule
Add a load balancing rule
Name
Frontend IP configuration
Backend pool
Health probe
Frontend Port
Add a rule to get started
Inbound NAT rule
An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.
Add an inbound nat rule
Name
Frontend IP configuration
Service
Target
Add a rule to get started
Review + create
< Previous
Next : Outbound rule >
Download a template for automation
Give feedback
Name *
myhealthcheck
Protocol *
TCP
Port *
80
Interval *
5
seconds
Unhealthy threshold *
2
consecutive failures
Used by
Not used
OK
Cancel
Create new
Session persistence
None
Idle timeout (minutes) *
4
Add


Microsoft Azure
Search resources, services, and docs (G+/)
shahan.aix@gmail.com
DEFAULT DIRECTORY
Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
Load balancing rule
A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. The load balancing rule uses a health probe to d
Add a load balancing rule
Name
Frontend IP configuration
Backend pool
Health probe
Frontend Port
Add a rule to get started
Inbound NAT rule
An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.
Add an inbound nat rule
Name
Frontend IP configuration
Service
Target
Add a rule to get started
Review + create
< Previous
Next : Outbound rule >
Download a template for automation
Give feedback
Add load balancing rule
IP Version *
IPv4
IPv6
Frontend IP address *
basiclbvmss-pubip (To be created)
Backend pool *
basiclb-pool1
Protocol *
TCP
UDP
Port *
80
Backend port *
80
Health probe *
(new) myhealthcheck
Create new
Session persistence
None
Add

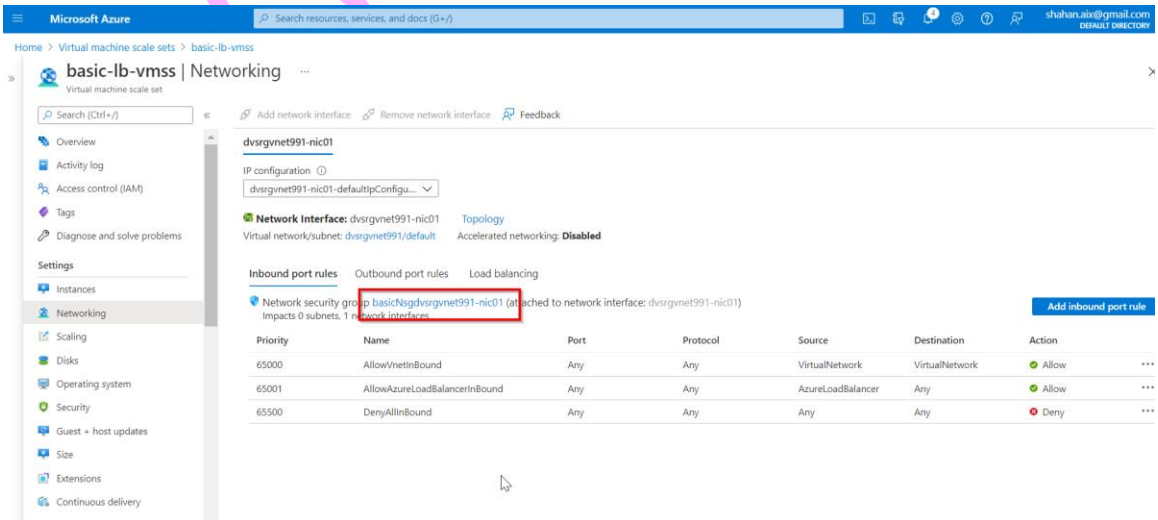

Home > Load balancing >
Create load balancer
Validation passed
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
Basics
Subscription
Pay-As-You-Go
Resource group
dvs-rg
Name
basic-lb-vmss
Region
East US
SKU
Basic
Tier
Regional
Type
Public
Frontend IP configuration
Frontend IP configuration name
basiclbvmss-pubip
Frontend IP configuration IP address
To be created
Backend pools
Backend pool name
basiclb-pool1
Create
< Previous
Next >
Download a template for automation
Give feedback



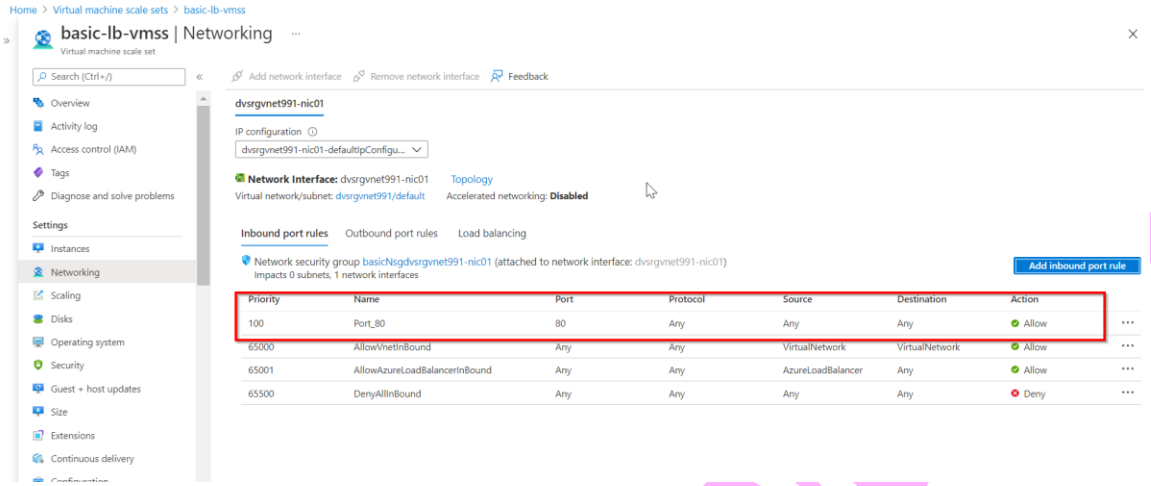
Now we are done with the configuration. Let's test our LB by hitting on port 80.

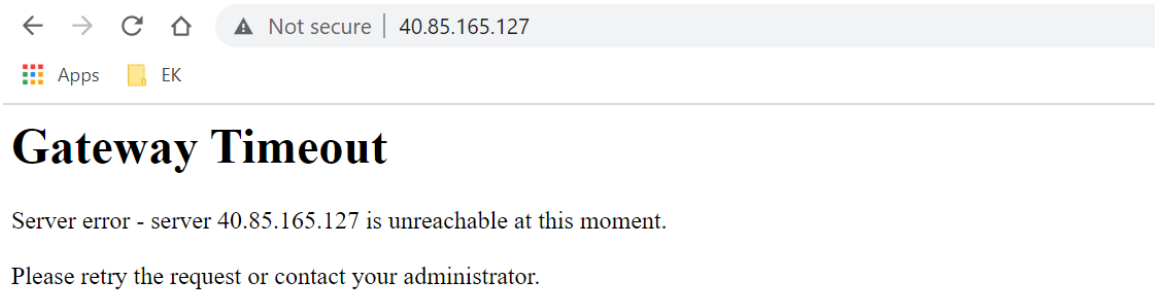


Now let's check the security group



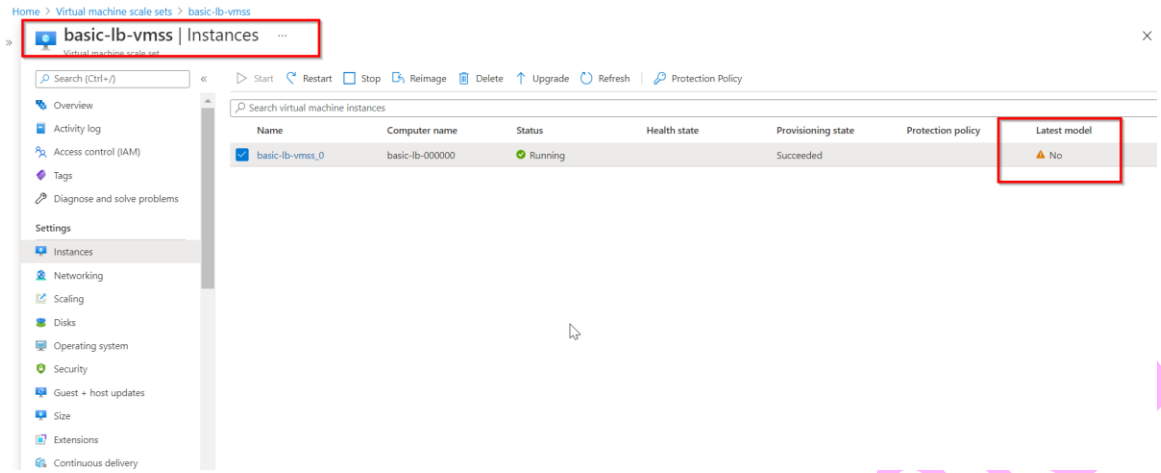
Let's open the port 80



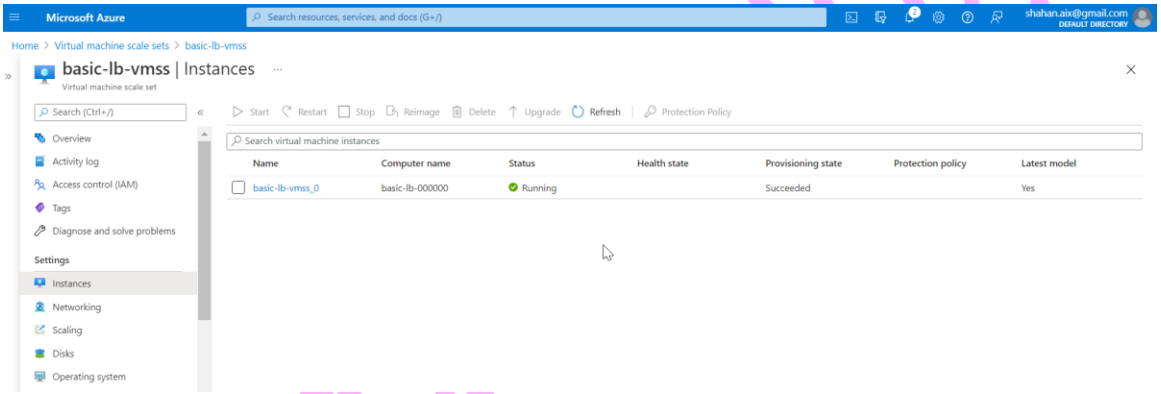


Now issue is we still see that application is not up. Let's login to server in VMSS & verify what's happening.

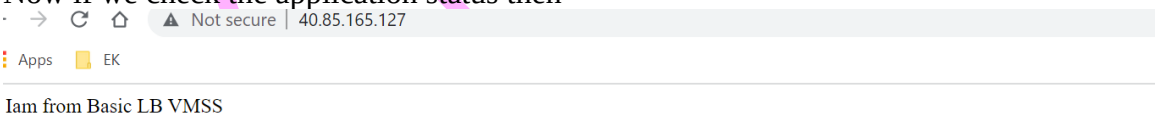
Then go the VMSS then verify the server status



Please click on upgrade then the status will get changed to "yes"



Now if we check the application status then

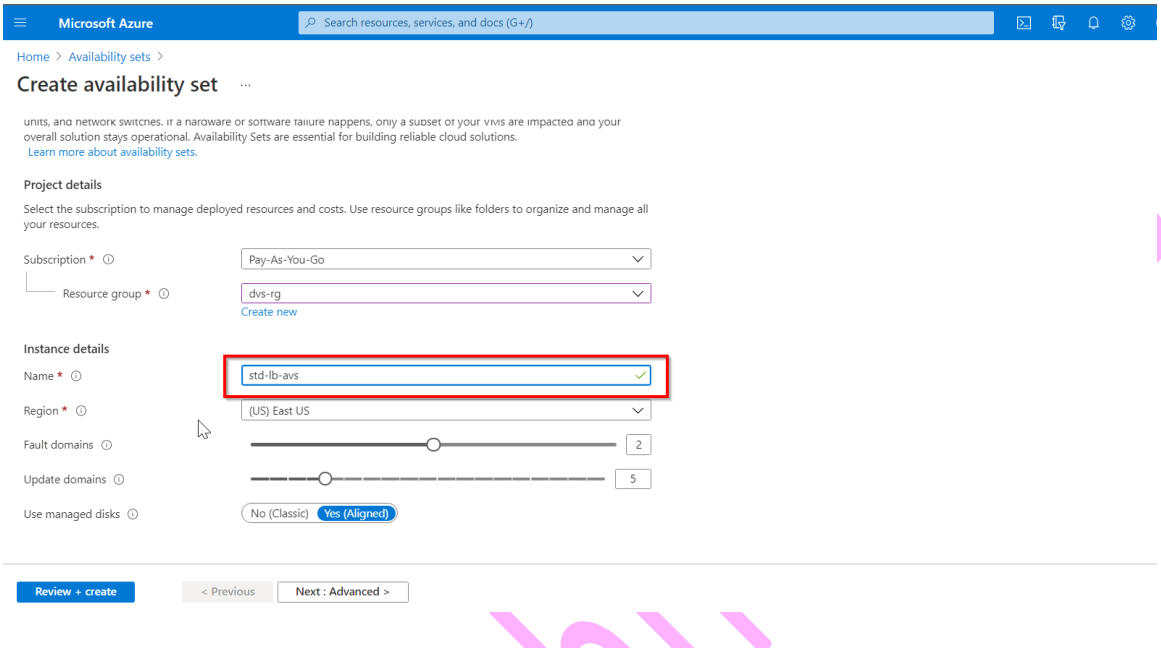


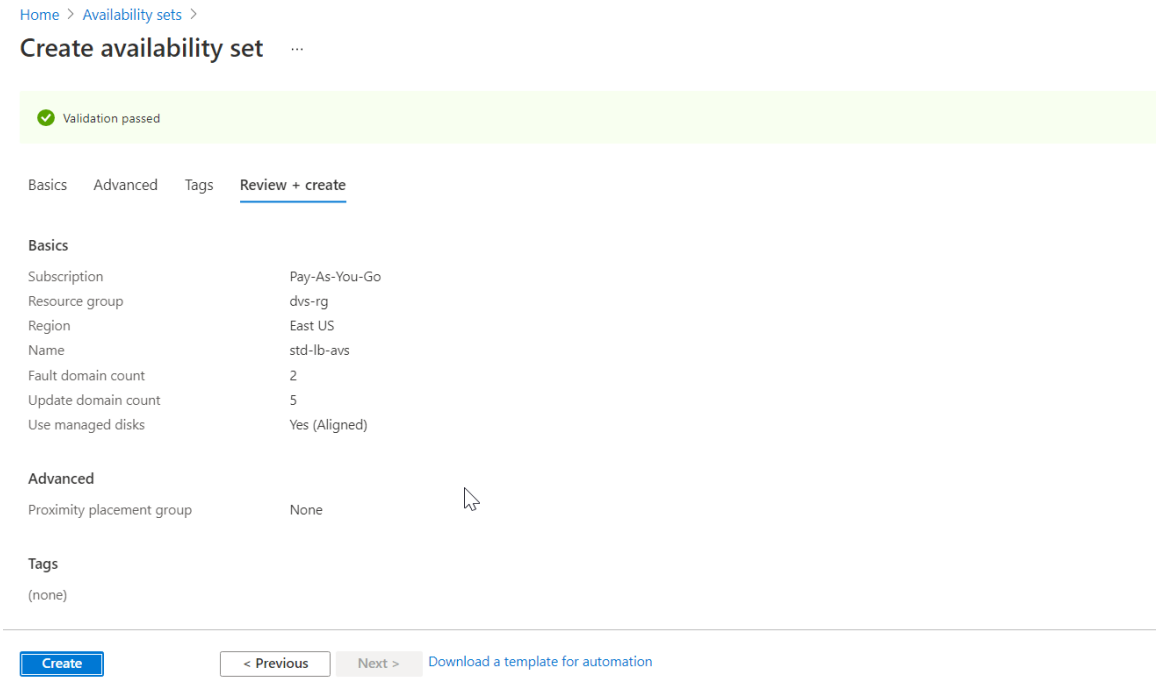
Iam from Basic LB VMSS

Like this we will perform the LB with scalesets ….

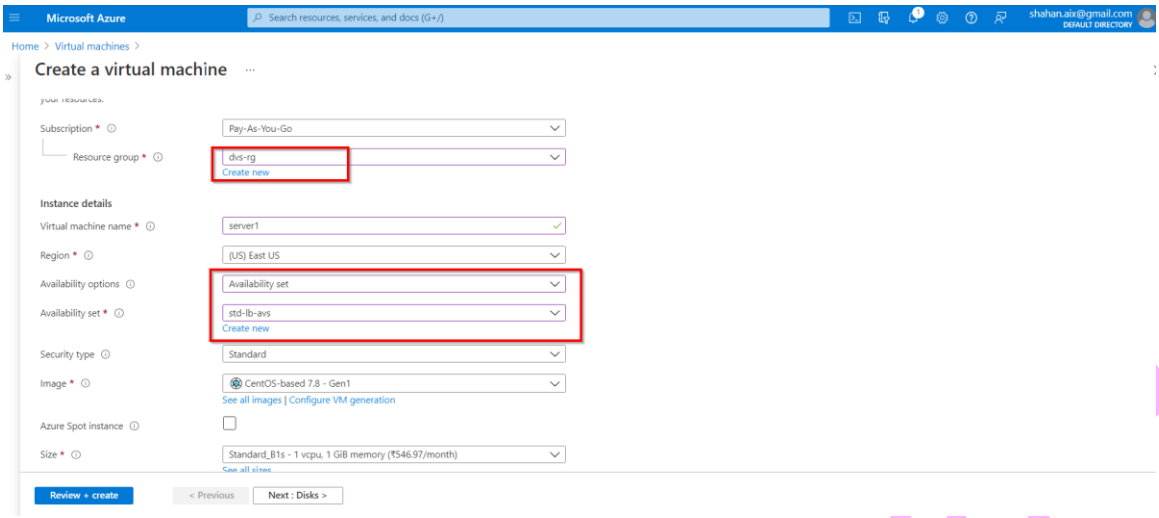
5 Standard LB - with AVS

Let's try to spin up the environment with standard LB with availability sets.



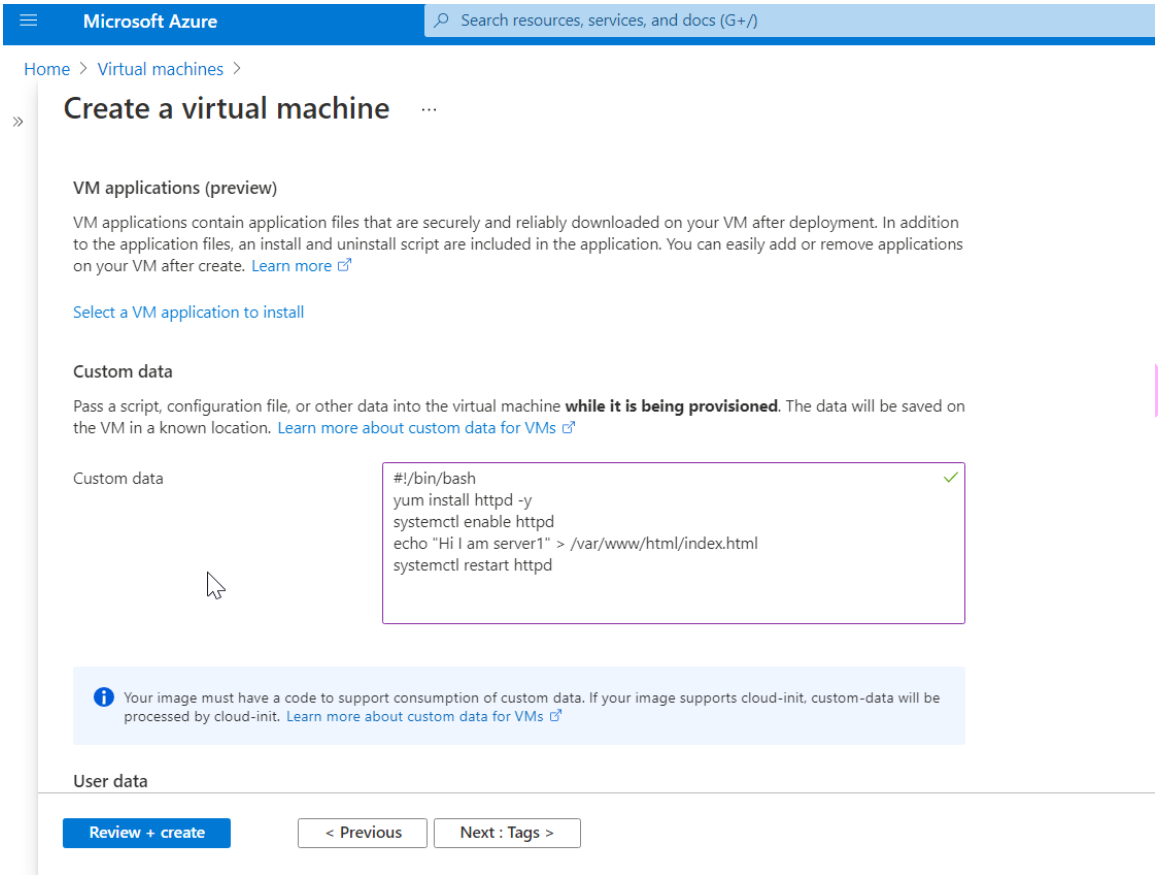


Now let's create the servers in this AVS




```
#!/bin/bash
yum install httpd -y
systemctl enable httpd
echo "Hi I am server1" > /var/www/html/index.html
systemctl restart httpd
```

DVS Technologies

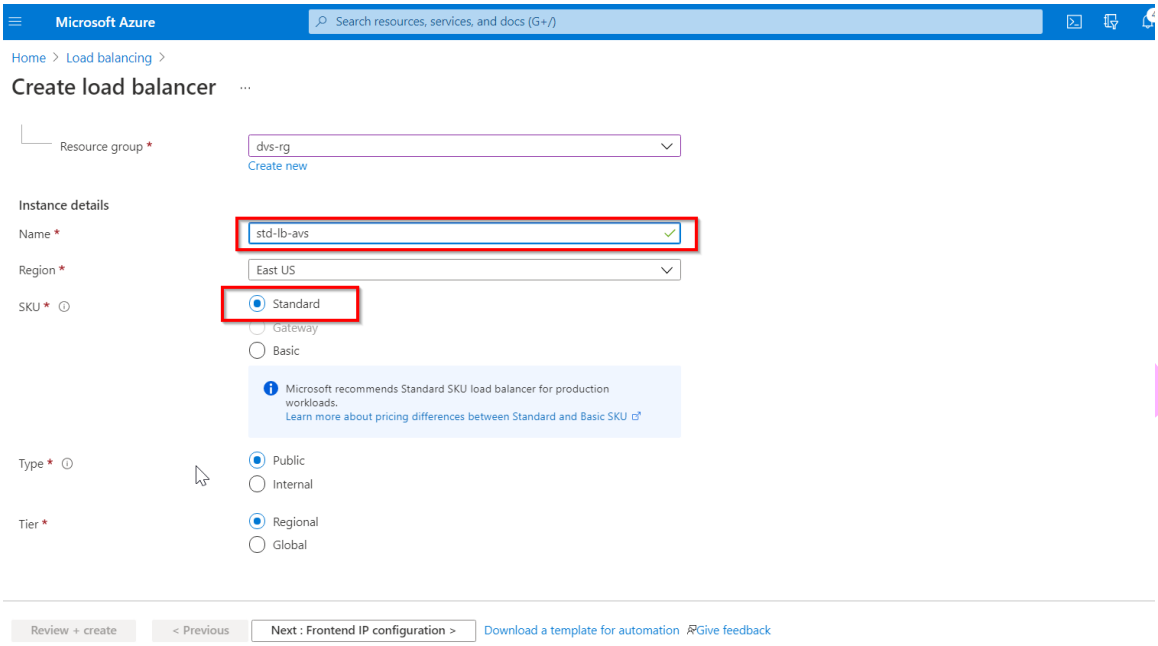


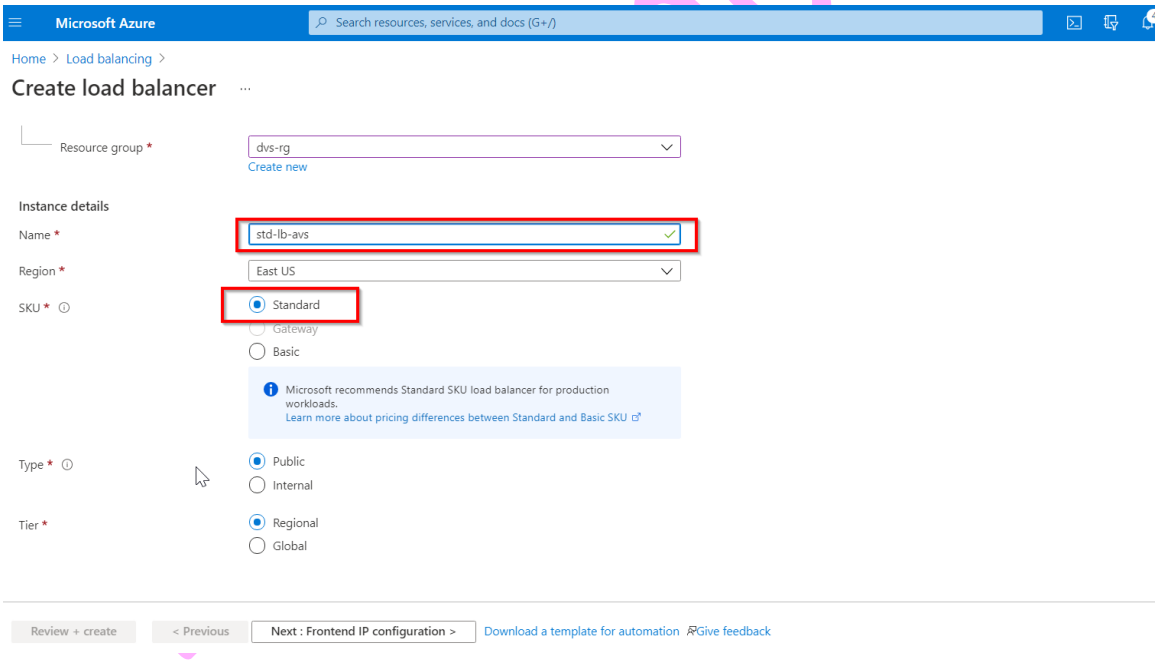
Pls do the same for other server. Once done with the setup now let's test the application from servers.

Note: Please make sure port 80 is allowed in sec group

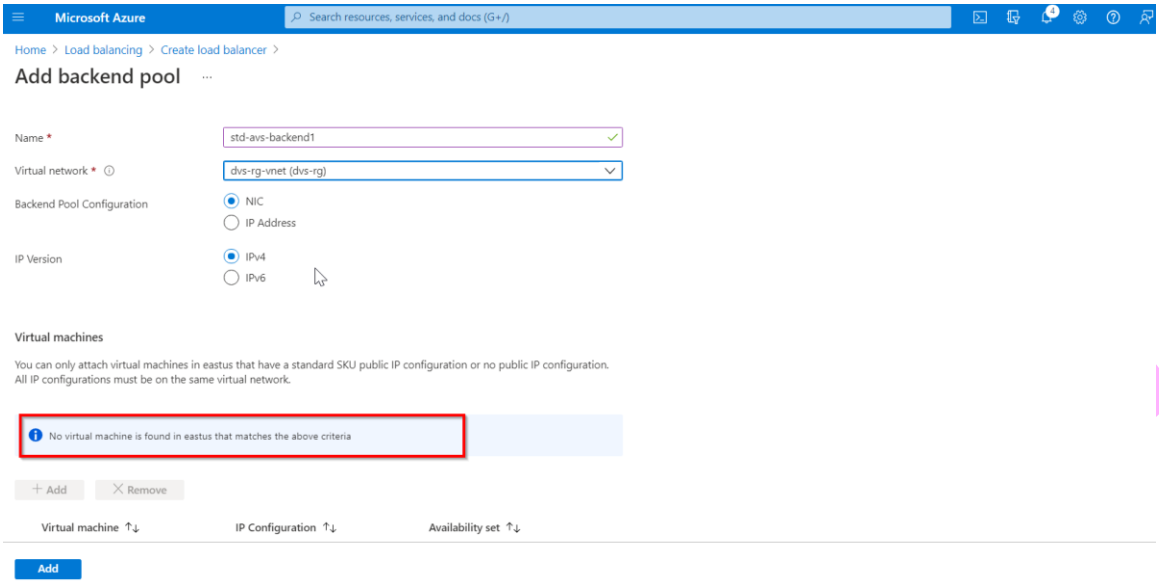
```
shahan.shaik@ubuntu-tpl:~$ curl http://13.90.112.92
Hi I am server1
shahan.shaik@ubuntu-tpl:~$ curl http://20.124.118.121
Hi I am server2
shahan.shaik@ubuntu-tpl:~$
```

Now let's create the LB

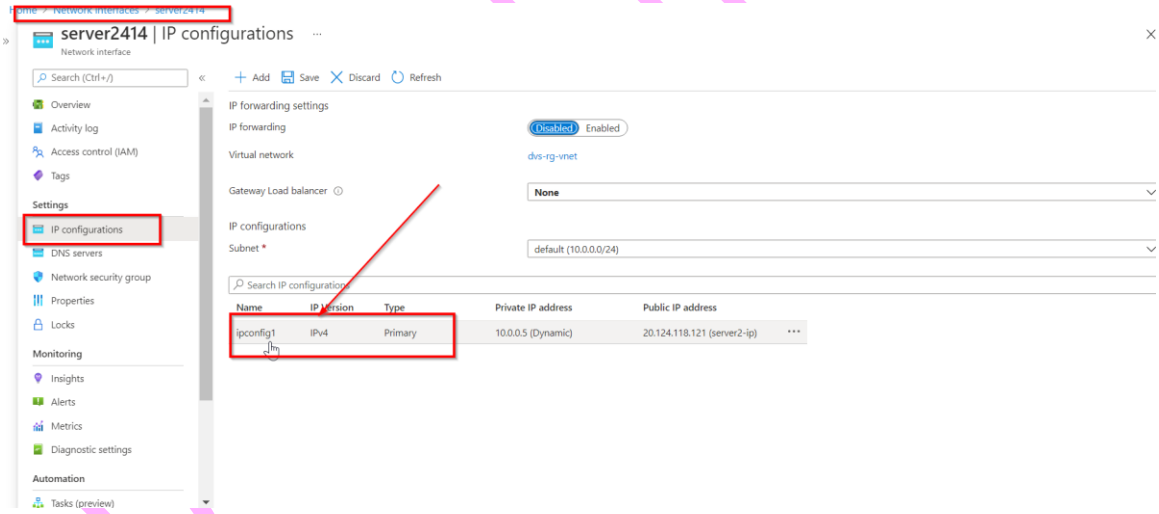




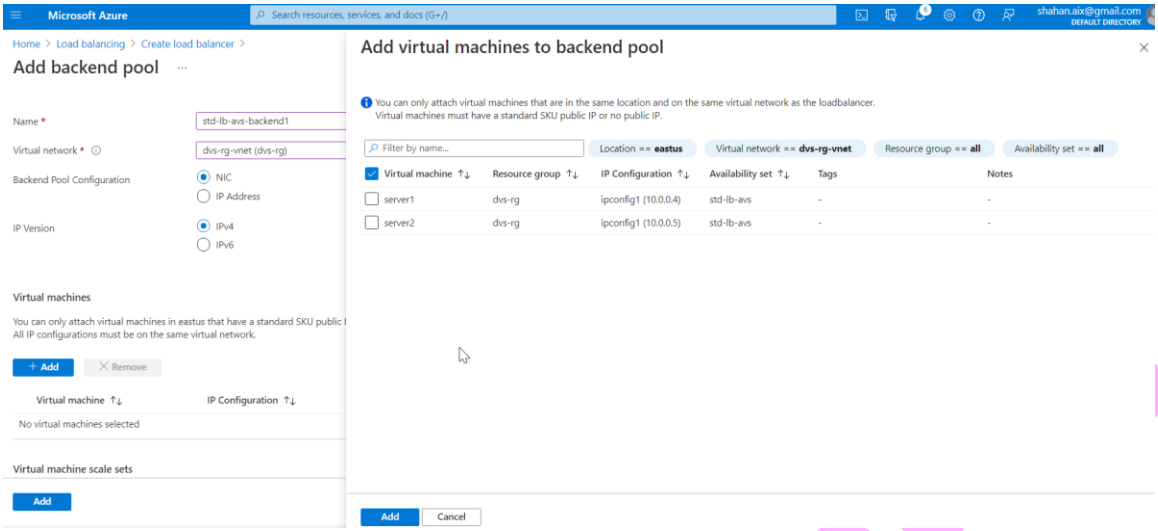
Note: No zone ip

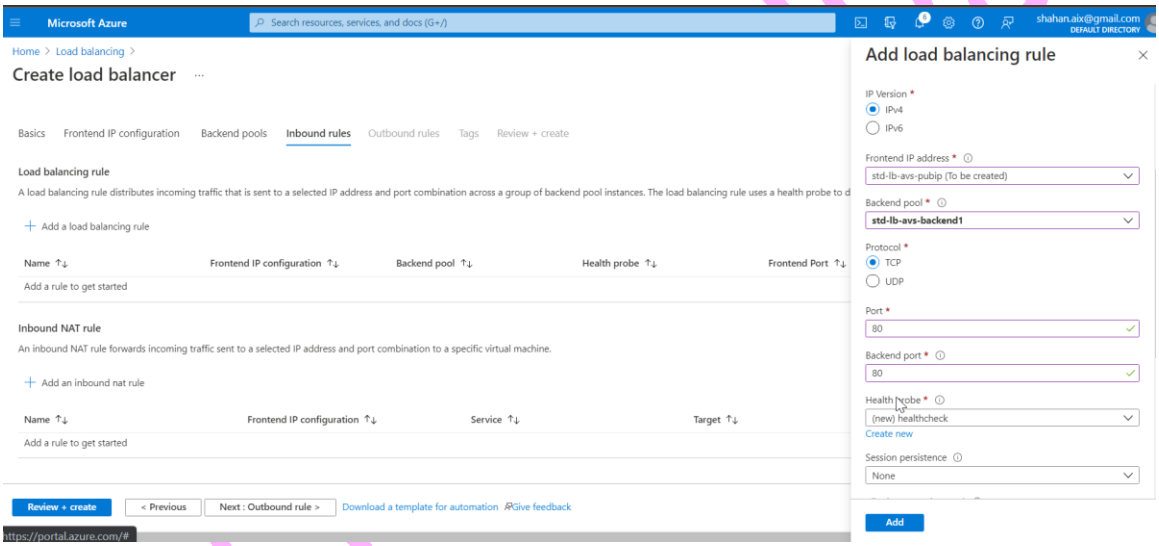


You see this error because you have public ip's for your VM's. Just remove them from the VM's then try again creating std-lb

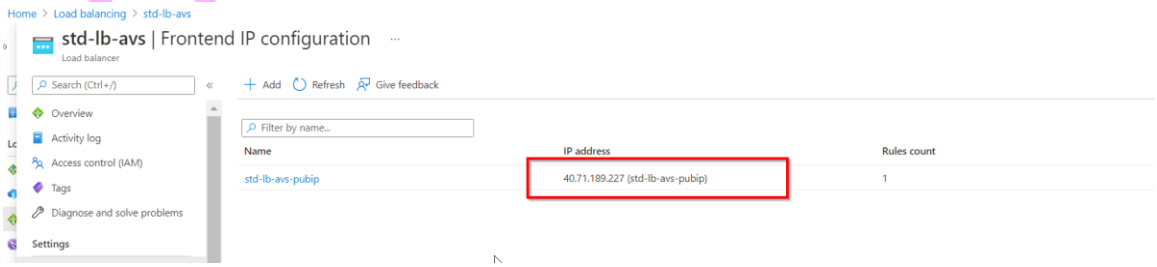


Once we released the public ipaddress then you see the servers.





Once done then try to hit the loadbalancer ipaddress

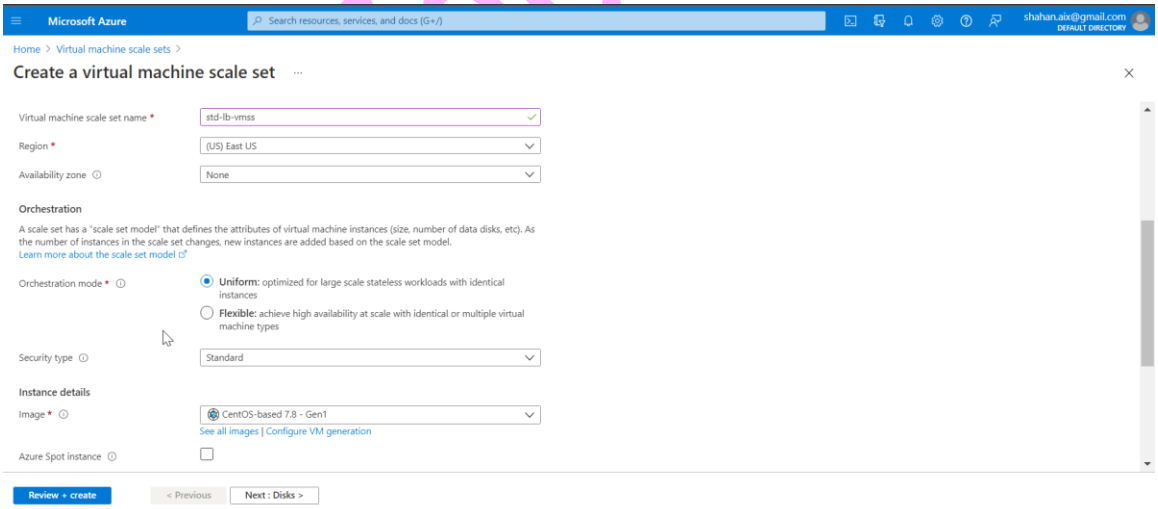


```
shahan.shaik@ubuntu-tpl:~$ while true; do curl http://40.71.189.227;done
Hi I am server2
Hi I am server2
Hi I am server2
Hi I am server2
Hi I am server2
Hi I am server2
Hi I am server2
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
Hi I am server1
```

6 Standard LB - with VMSS

Let's create the std-lb with vm scale sets

Create the scale set



Home > Virtual machine scale sets >

Create a virtual machine scale set ...

Basics | Disks | Networking | Scaling | Management | Health | Advanced | Tags | Review + create

An Azure virtual machine scale set can automatically increase or decrease the number of VM instances that run your application. This automated and elastic behavior reduces the management overhead to monitor and optimize the performance of your application. Learn more about VMSS scaling

Initial instance count * 1

Scaling

Scaling policy: Manual / Custom

Scale-In policy

Configure the order in which virtual machines are selected for deletion during a scale-in operation.
Learn more about scale-in policies.

Scale-in policy: Default - Balance across availability zones and fault domains, then delete ...

Review + create | < Previous | Next : Management >

Home > Virtual machine scale sets >

Create a virtual machine scale set ...

Spreading algorithm: Max spreading / Fixed spreading (not recommended with zones)

Custom data

Pass a script, configuration file, or other data into the virtual machine **while it is being provisioned**. The data will be saved on the VM in a known location. Learn more about custom data for VMSS

Custom data:

```
#!/bin/bash
yum install httpd -y
systemctl enable httpd
echo "Hi welcome to STD-LB-VMSS" > /var/www/html/index.html
systemctl restart httpd
```

Your image must have a code to support consumption of custom data. If your image supports cloud-init, custom-data will be processed by cloud-init. Learn more about custom data for VMSS

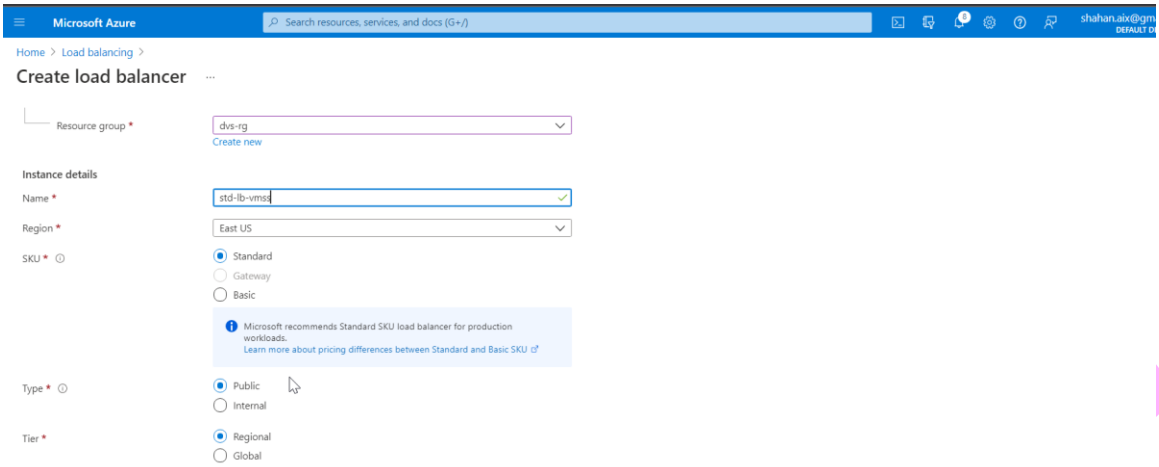
User data

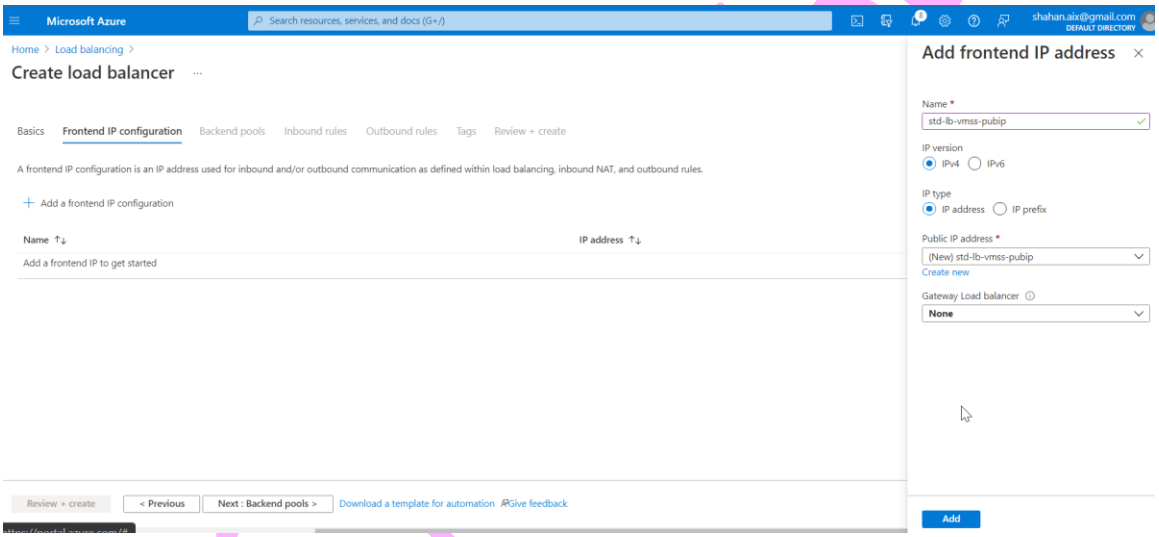
Pass a script, configuration file, or other data that will be accessible to your applications **throughout the lifetime of the virtual machine**. Don't use user data for storing your secrets or passwords. Learn more about user data for VMs

Enable user data

Review + create | < Previous | Next : Tags >

Let's create the std-lb now with VMSS


Microsoft Azure
Search resources, services, and docs (G+/)
Home > Load balancing >
Create load balancer
Resource group *
dvs-rg
Create new
Instance details
Name *
std-lb-vmss
Region *
East US
SKU *
Standard
Gateway
Basic
Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU
Type *
Public
Internal
Tier *
Regional
Global


Microsoft Azure
Search resources, services, and docs (G+/)
shahan.aix@gmail.com
DEFAULT DIRECTORY
Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and outbound rules.
Add a frontend IP configuration
Name
IP address
Add a frontend IP to get started
Review + create
< Previous
Next : Backend pools >
Download a template for automation
Give feedback
Add frontend IP address
Name *
std-lb-vmss-pubip
IP version
IPv4
IPv6
IP type
IP address
IP prefix
Public IP address *
(New) std-lb-vmss-pubip
Create new
Gateway Load balancer
None
Add

Microsoft Azure

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

Home > Load balancing > Create load balancer >

Add backend pool

Name * std-lb-vmss-backend1

Virtual network * std-lb-vmss-vnet (dvs-rg)

Backend Pool Configuration
- NIC
- IP Address

IP Version
- IPv4
- IPv6

Virtual machines

You can only attach virtual machines in eastus that have a standard SKU public IP configuration or no public IP configuration. All IP configurations must be on the same virtual network.

No virtual machine is found in eastus that matches the above criteria

+ Add X Remove

Virtual machine	IP Configuration	Availability set

Add

Microsoft Azure

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

Home > Load balancing > Create load balancer >

Add backend pool

Virtual machines

You can only attach virtual machines in eastus that have a standard SKU public IP configuration or no public IP configuration. All IP configurations must be on the same virtual network.

No virtual machine is found in eastus that matches the above criteria

+ Add X Remove

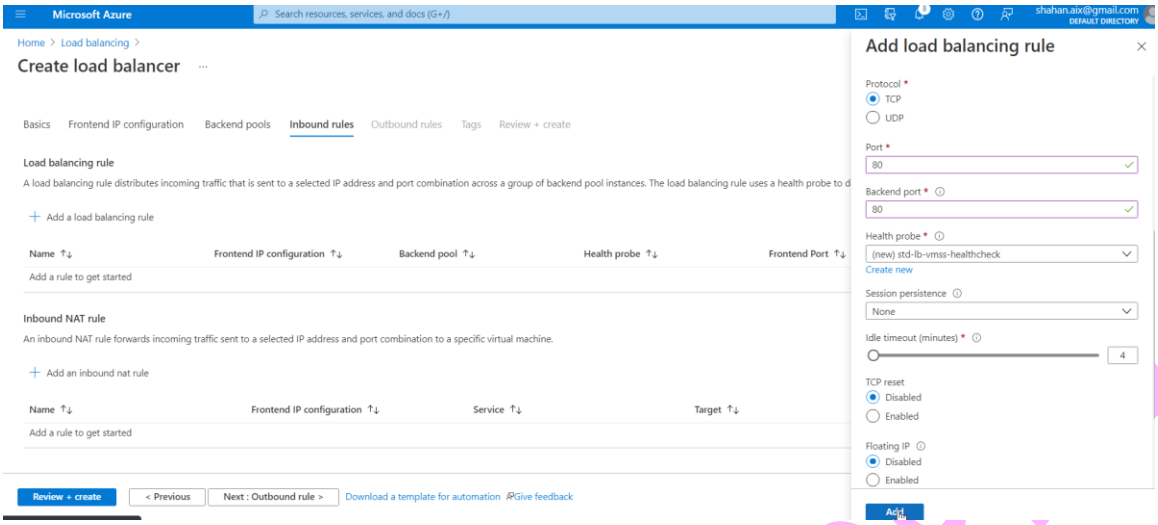
Virtual machine	IP Configuration	Availability set
No virtual machines selected		

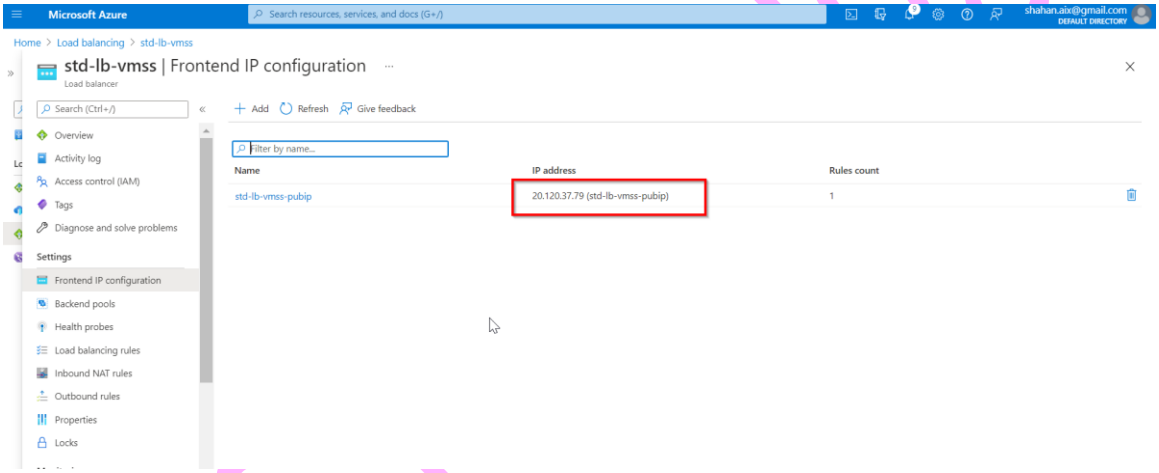
Virtual machine scale sets

Virtual Machine Scale Sets must be in same location as Load Balancer. Only IP configurations that have the same SKU (Basic/Standard) as the Load Balancer can be selected. All of the IP configurations have to be in the same Virtual Network.

Virtual machine scale set	IP address
std-lb-vmss	std-lb-vmss-vnet-nic01-defaultIpConfiguration

Add



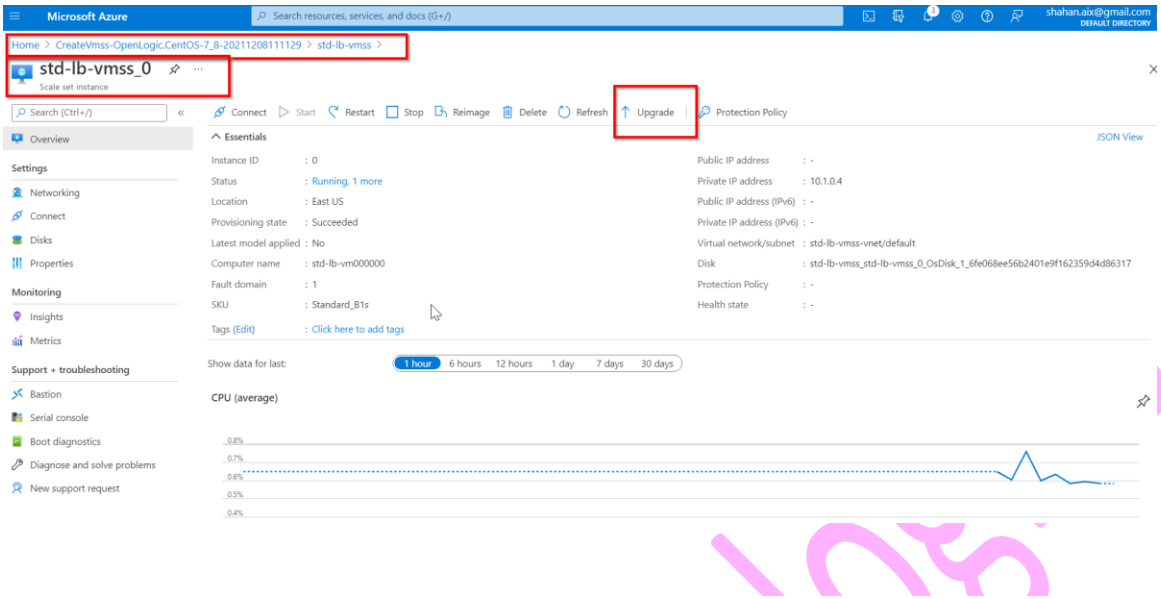


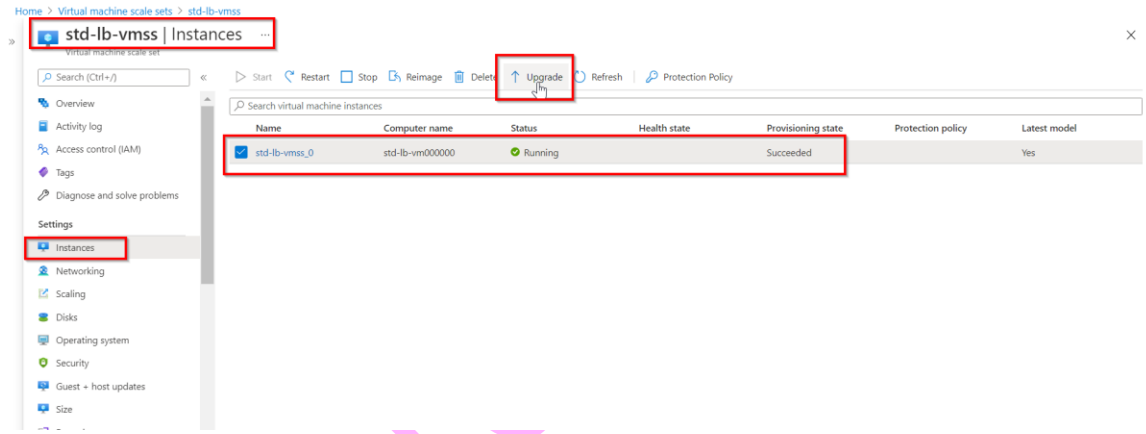
Note: Make sure that you are opening port 80 in the ASG

When we try to access the application it's still not working

```
shahan.shaik@ubuntu-tpl:~$ curl http://20.120.37.79
^C
shahan.shaik@ubuntu-tpl:~$ curl http://20.120.37.79
```

Now let's upgrade the instances

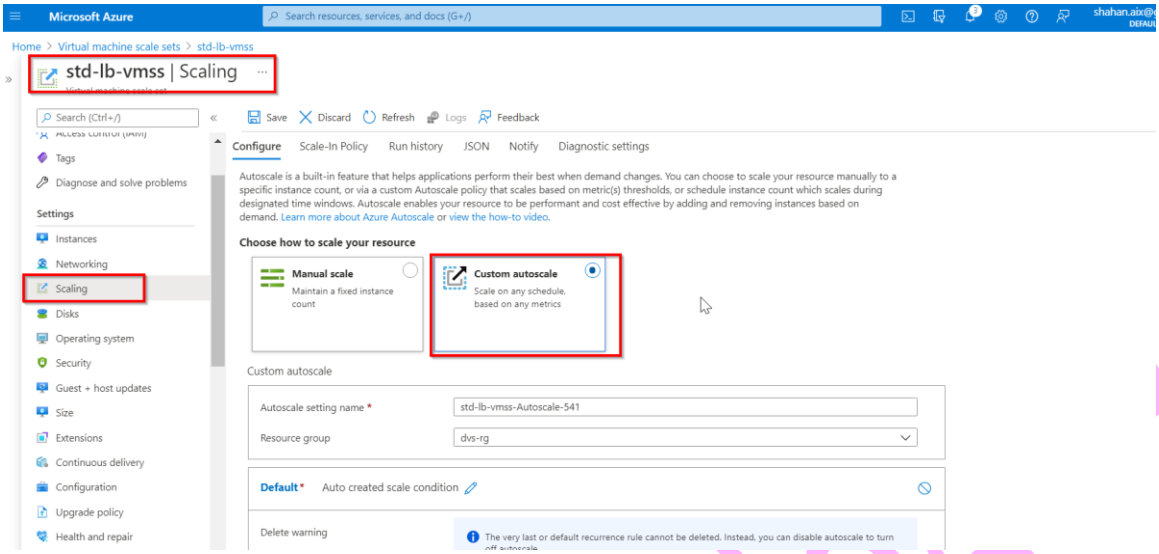





```
shahan.shaik@ubuntu-tpl:~$ curl http://20.120.37.79
Hi welcome to STD-LB-VMSS
shahan.shaik@ubuntu-tpl:~$ curl http://20.120.37.79
Hi welcome to STD-LB-VMSS
shahan.shaik@ubuntu-tpl:~$ curl http://20.120.37.79
Hi welcome to STD-LB-VMSS
shahan.shaik@ubuntu-tpl:~$
```

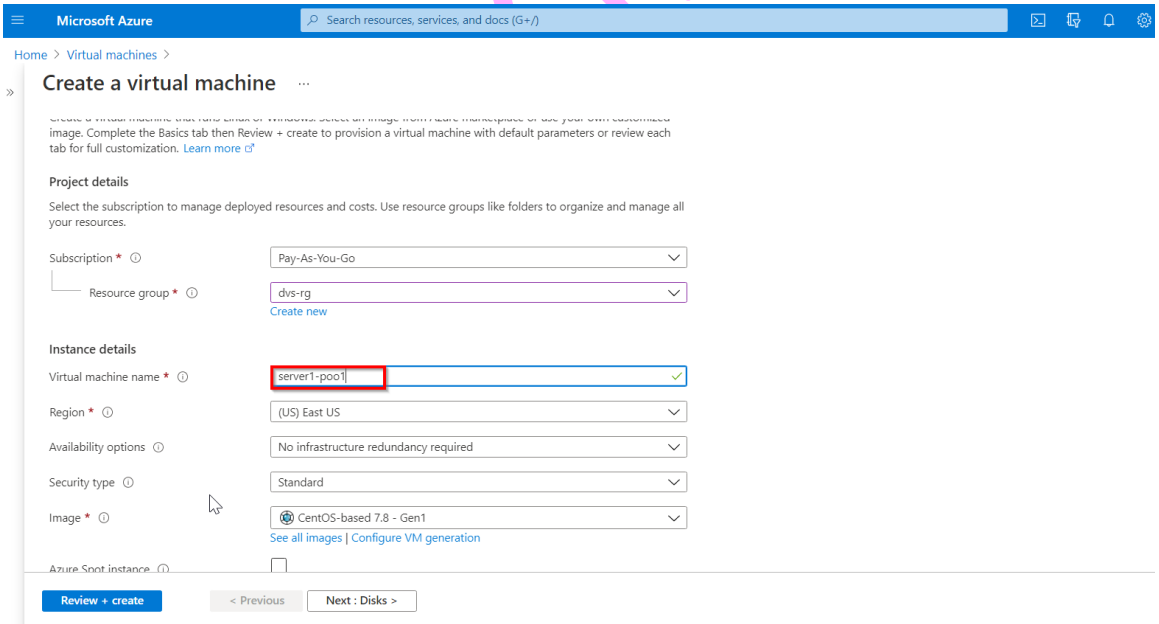
Now everything fine & as expected.

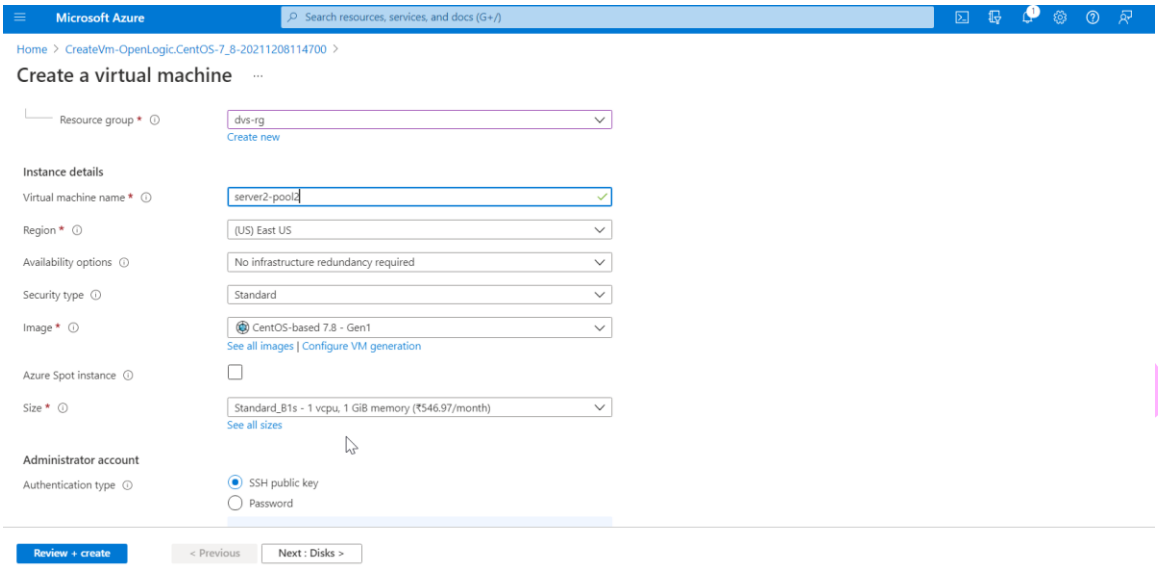
If you want to change the scaling then you can do it via below.



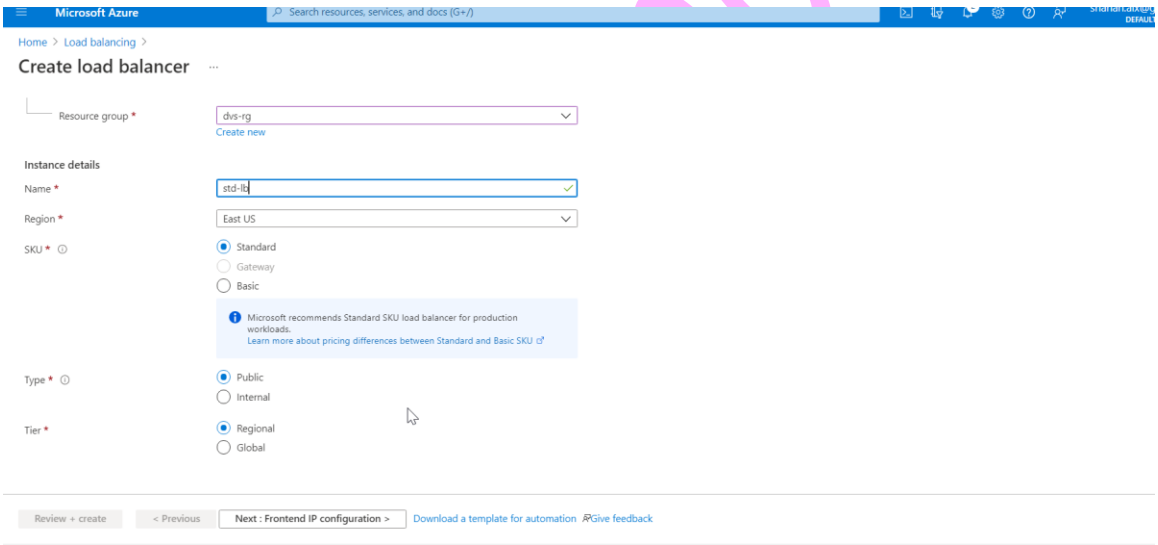
7 Standard LB - with multiple BE pool

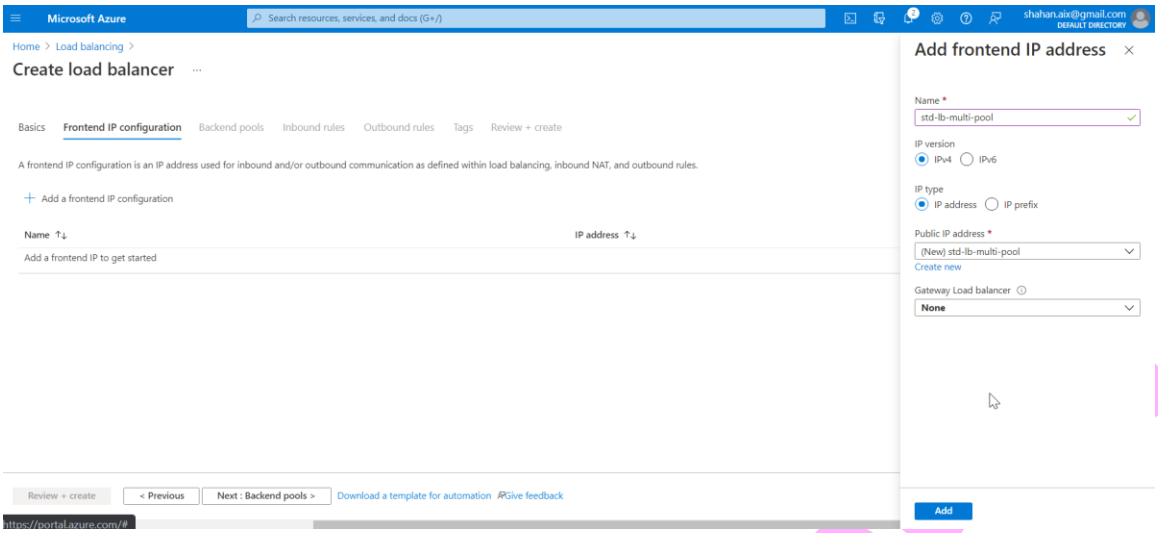
Let's create two servers and assign these two servers with diff pools then will try to add them to the standard LB

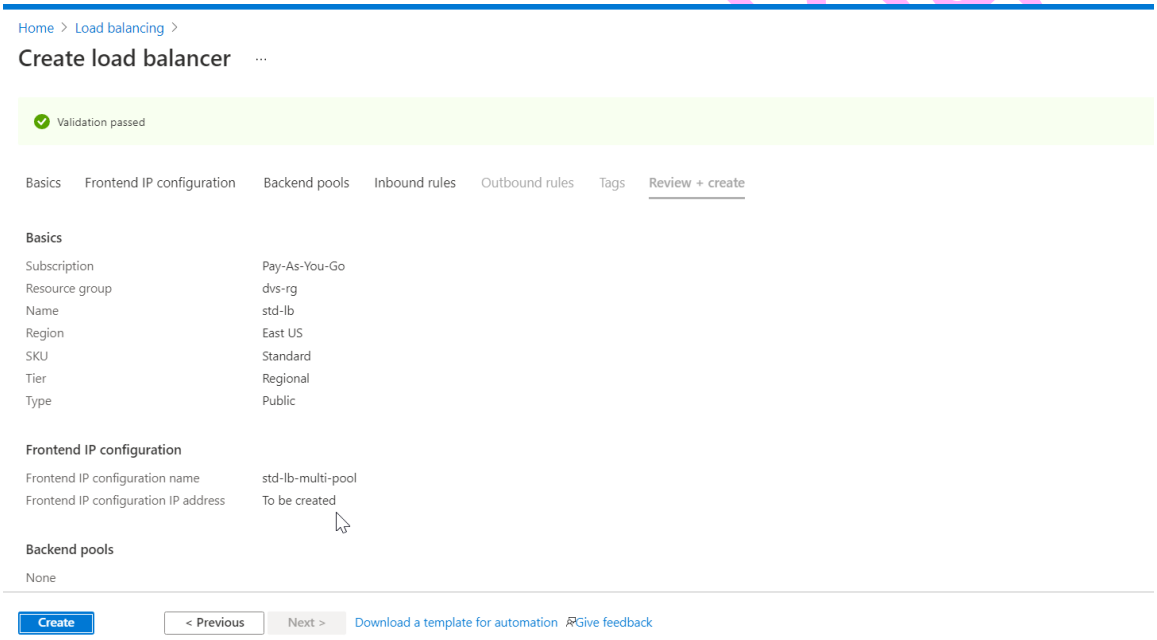




Create the STD-LB:







Will add backend pools & inbound rules post creation

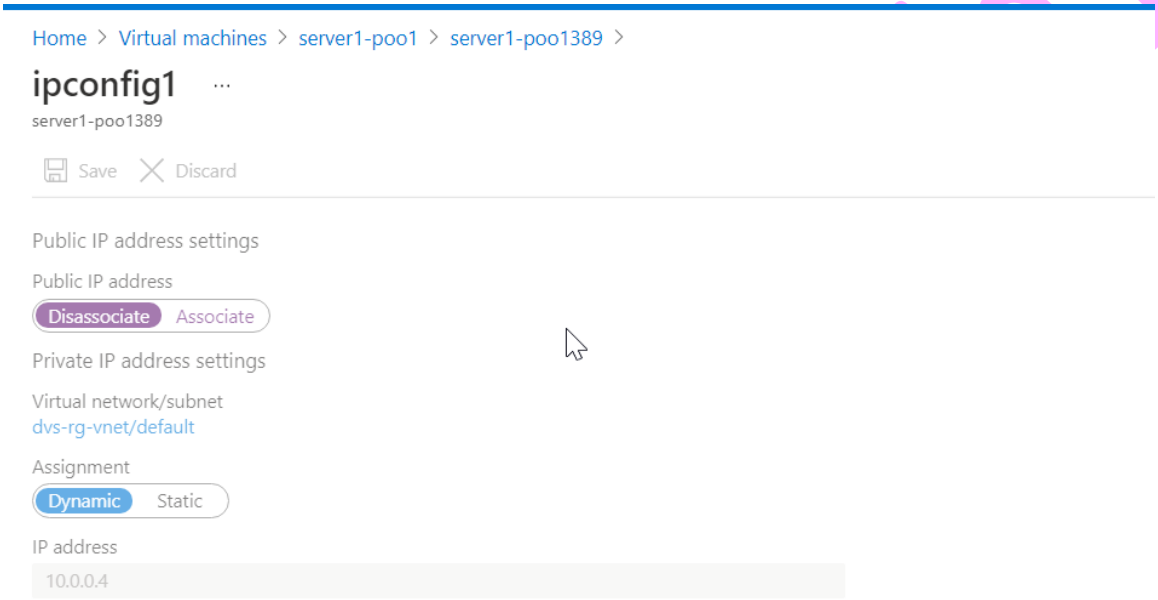
Let's install the application in server1 & server2 then remove the public ipaddress

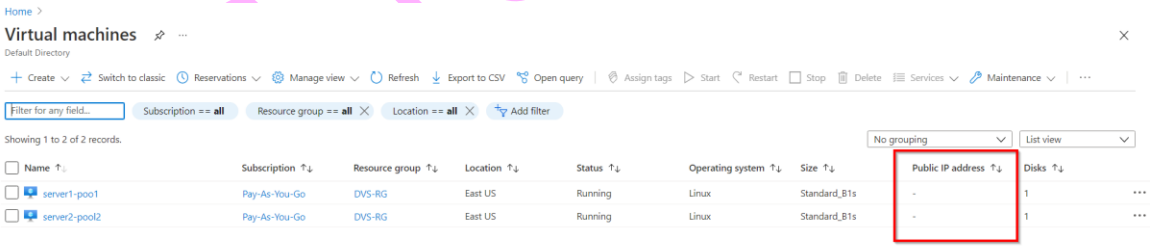
Server1:

```
#!/bin/bash
yum install httpd -y
systemctl enable httpd
echo "Hi I am Pool1" > /var/www/html/index.html
systemctl restart httpd
```

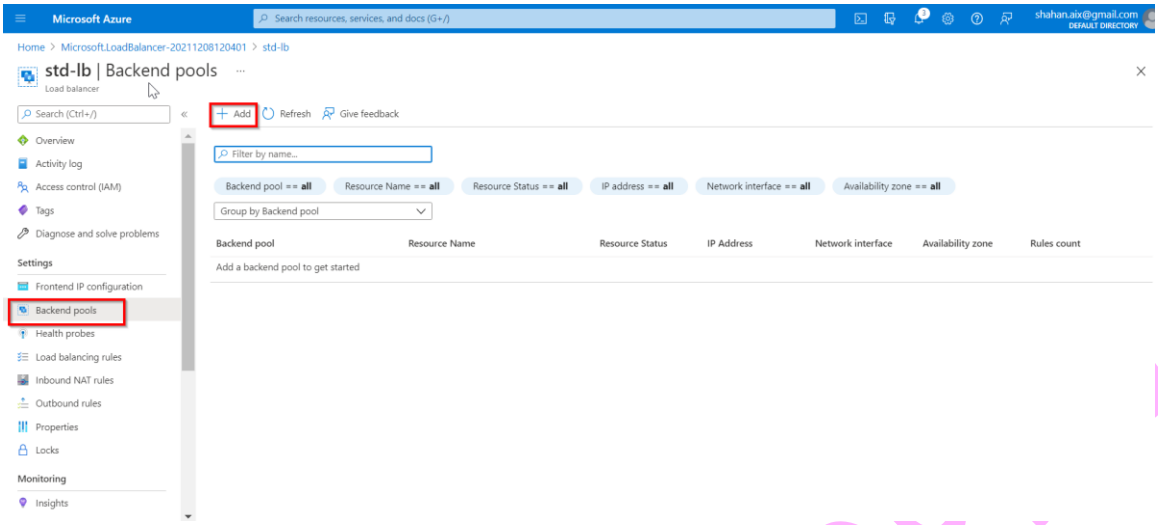
Server2:
#!/bin/bash
yum install httpd -y
systemctl enable httpd
echo "Hi I am Pool2" > /var/www/html/index.html
systemctl restart httpd

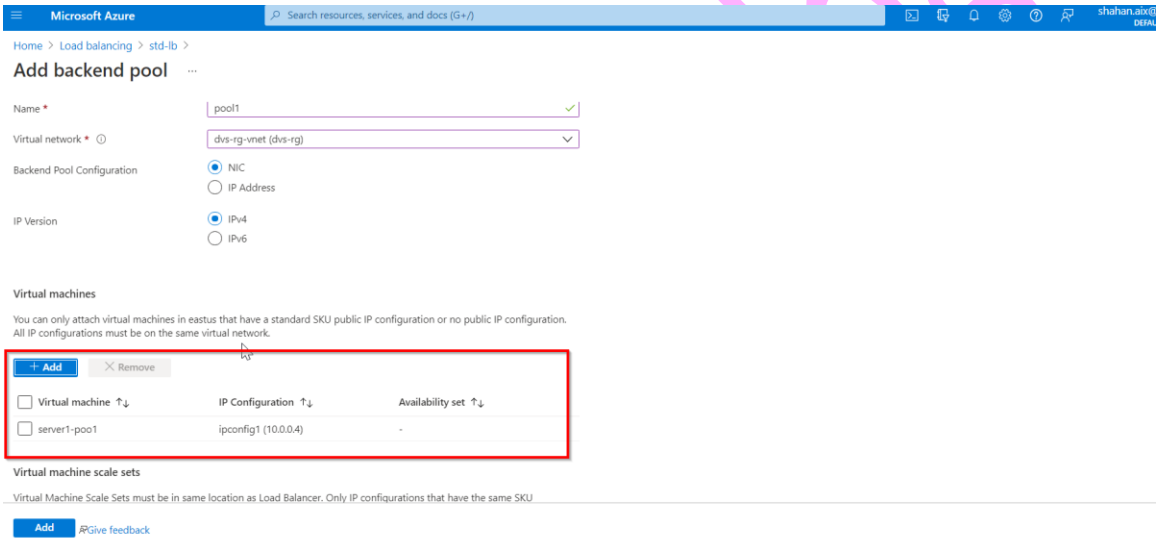
Once done please remove the public ipaddress for the VM's



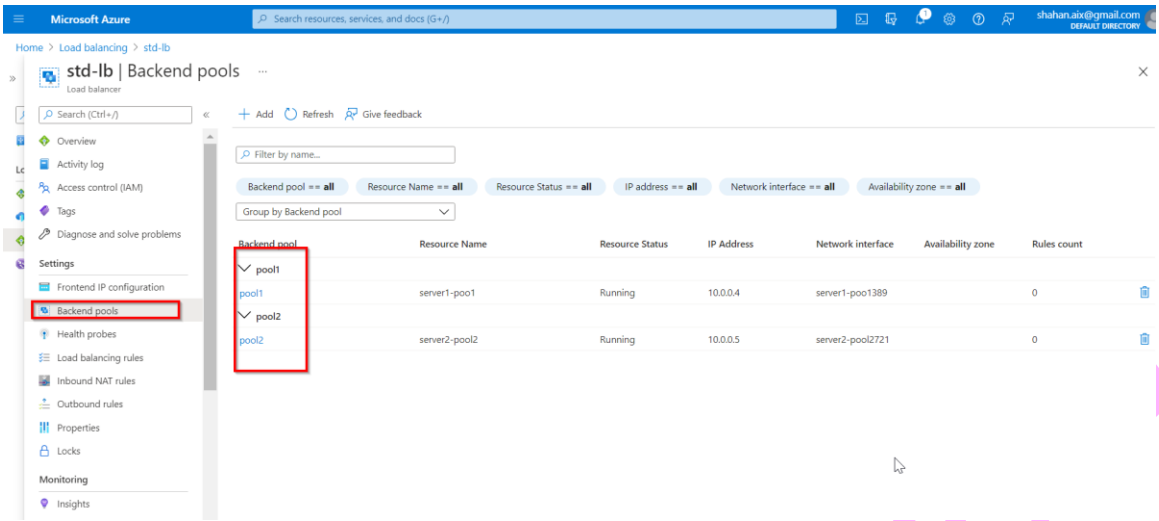


Let's try to add the backend pools to this LB

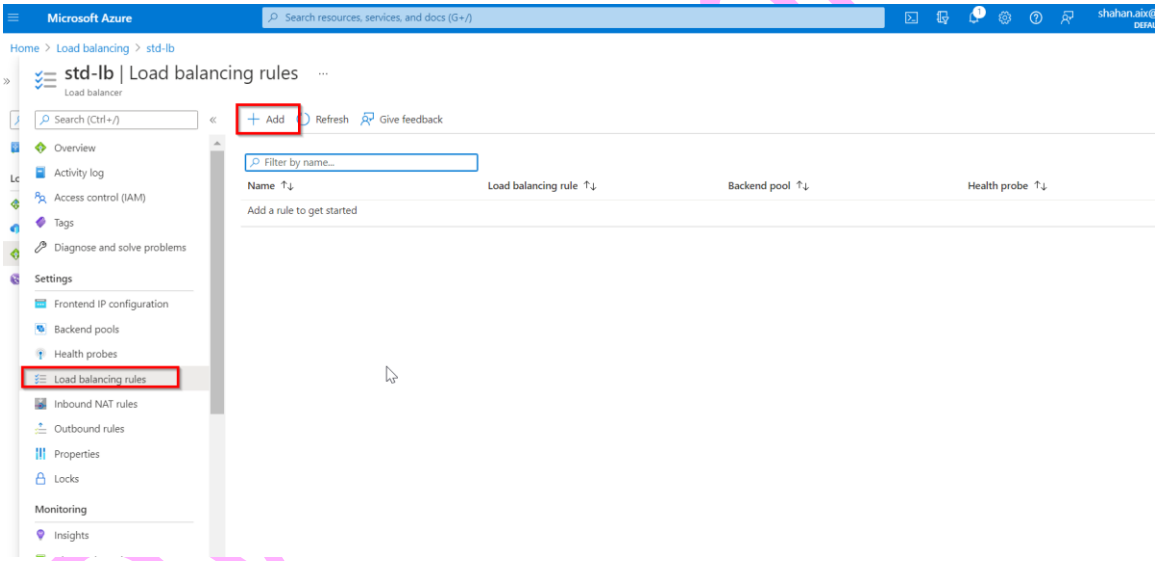


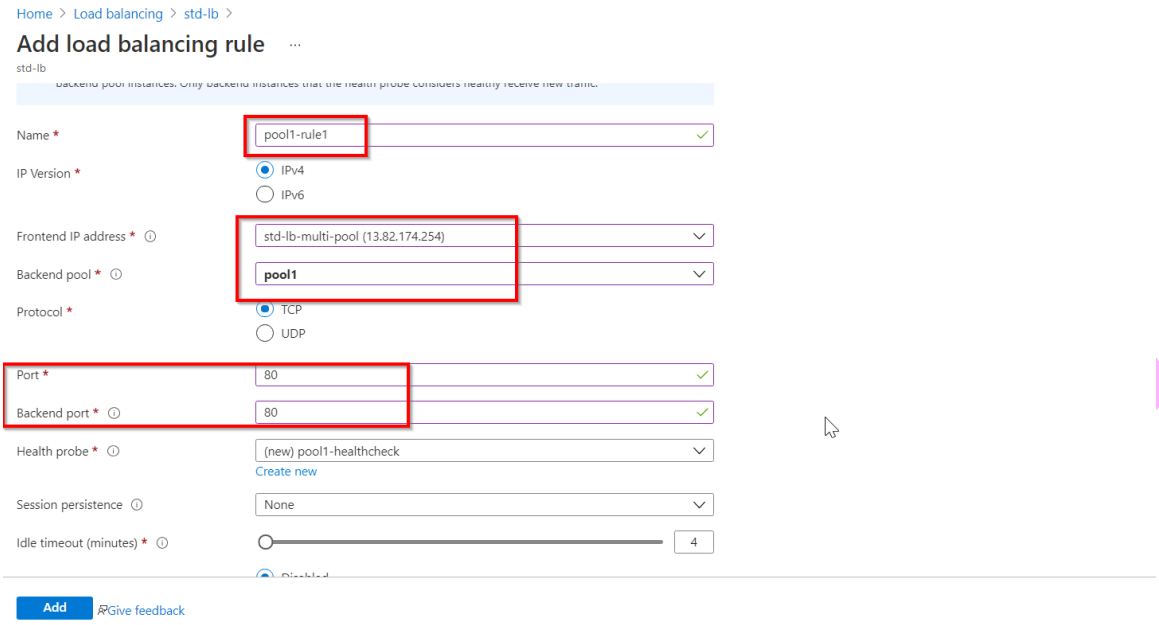


Perform same for pool2



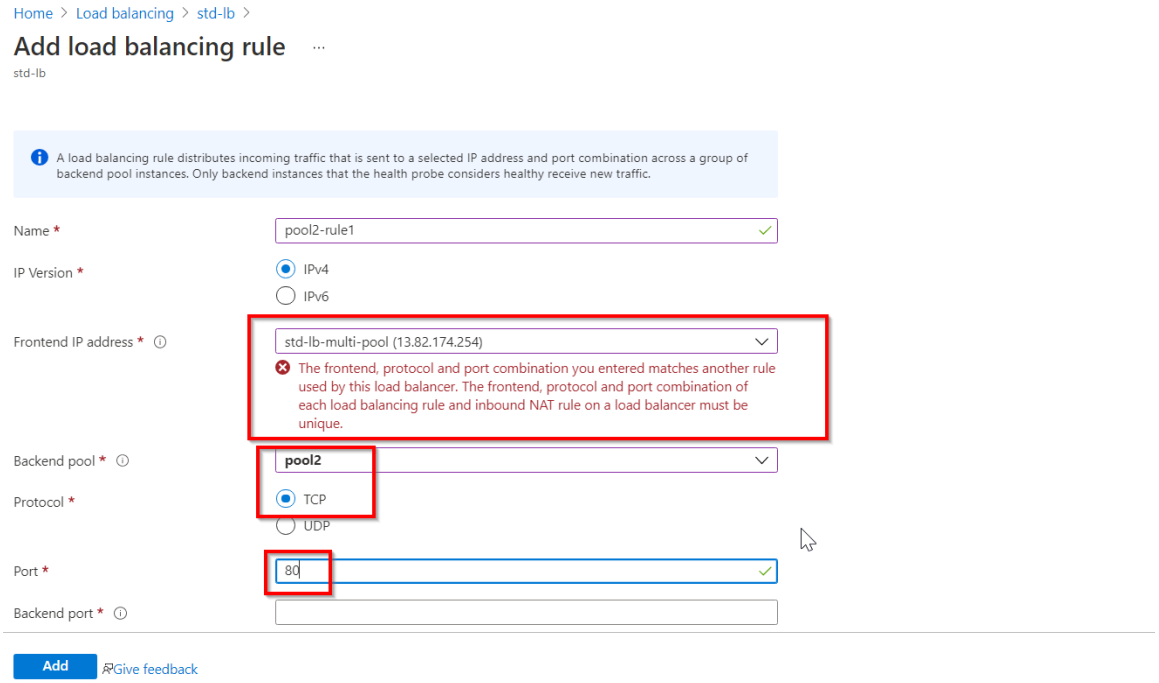
Now let's try to configure the inbound rule



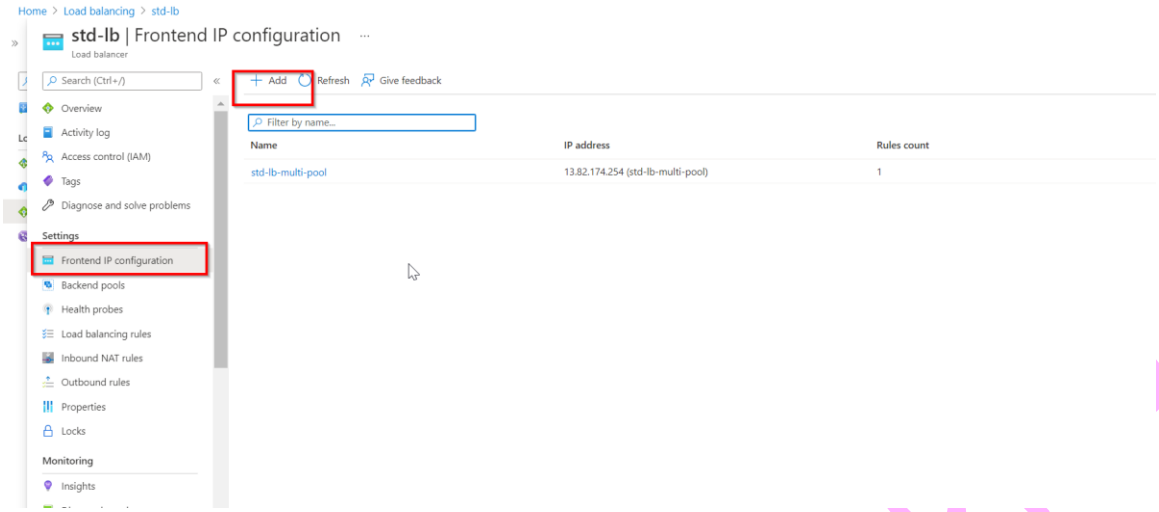


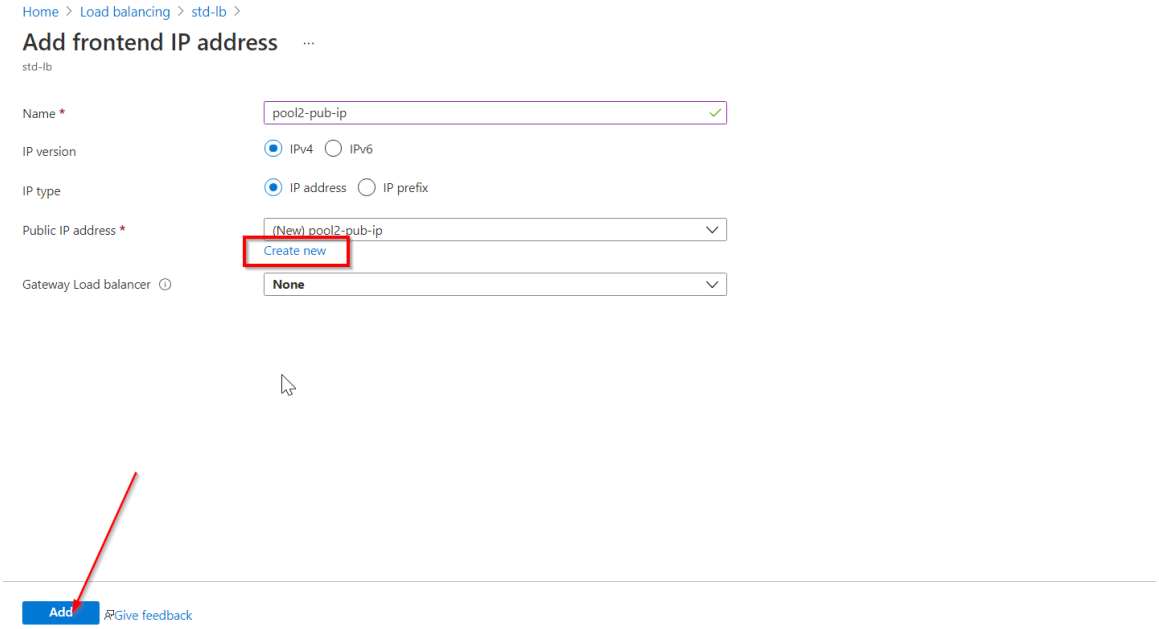
Now let's configure the rule for pool2

Soon after you select the port 80 for pool2 with same ip you will get error message.

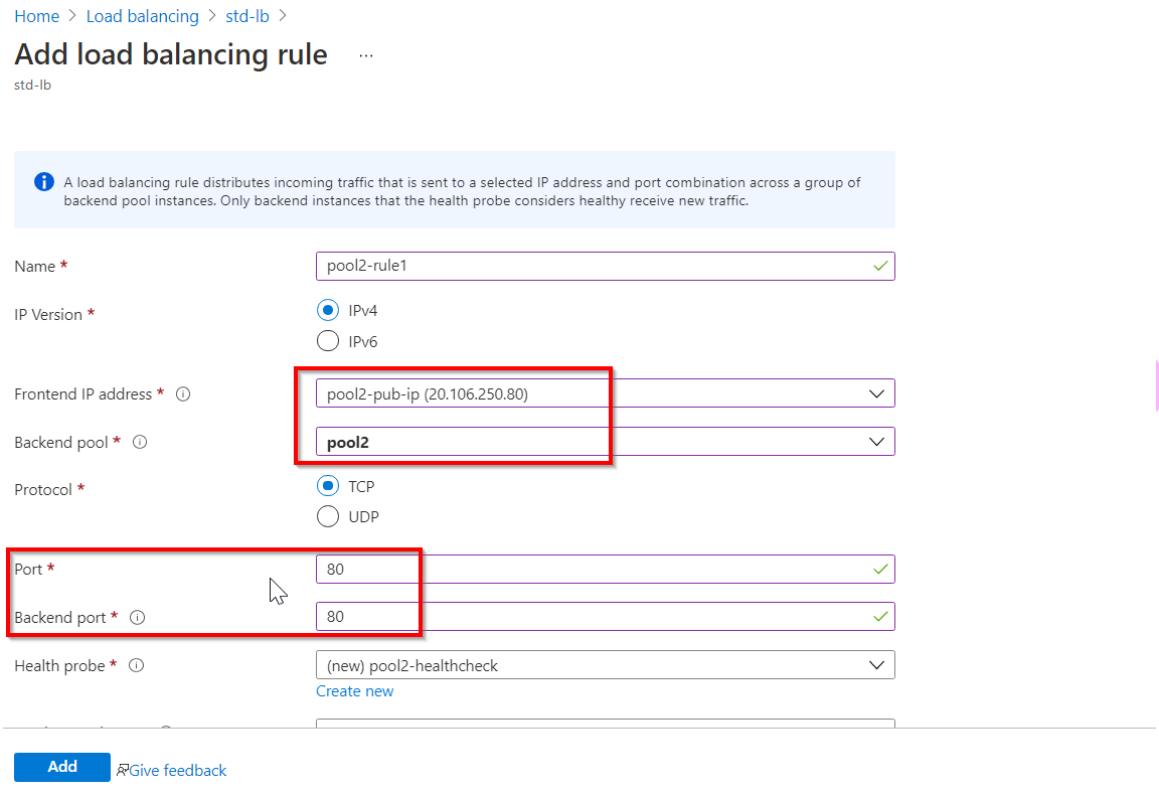


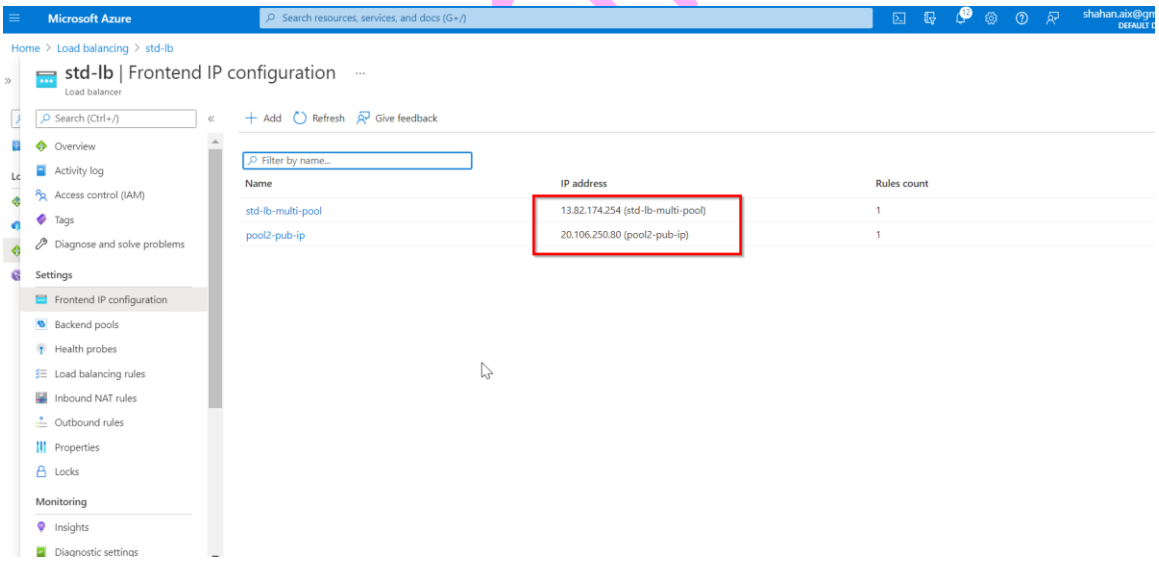
Hence you have to create a new frontend ipaddress for the pool2





Now let's try to create the LB rules for pool2



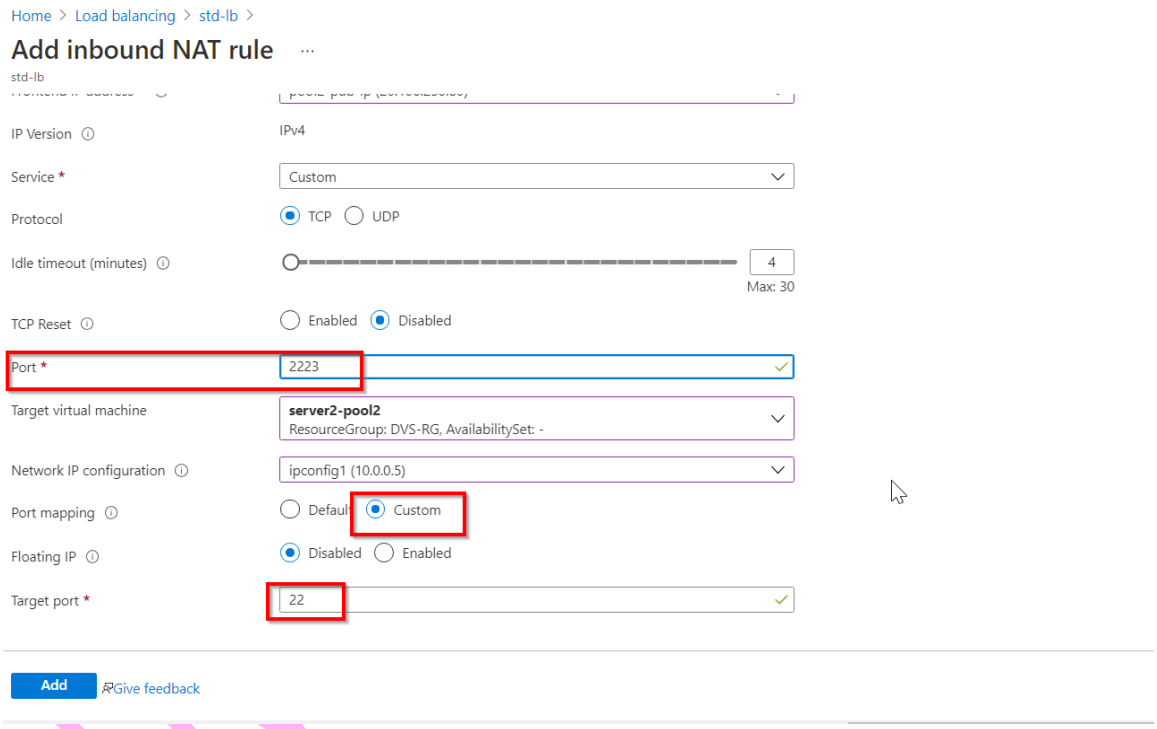


Now you can hit the backend pools

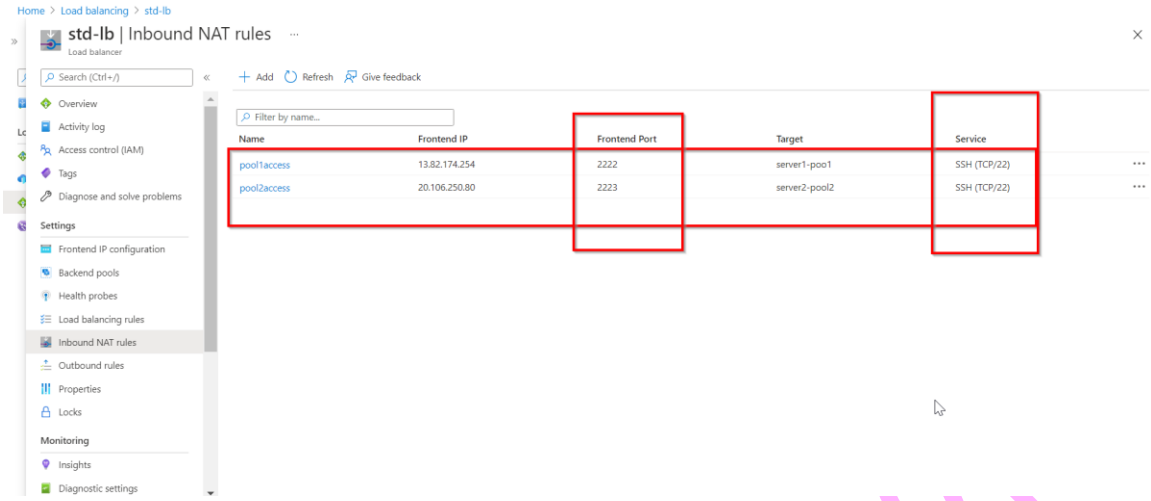
```
shahan.shaik@ubuntu-tpl:~$ curl http://13.82.174.254
Hi I am Pool1
shahan.shaik@ubuntu-tpl:~$ curl http://20.106.250.80
Hi I am Pool2
shahan.shaik@ubuntu-tpl:~$
```

8 Standard LB - Inbound NAT rules

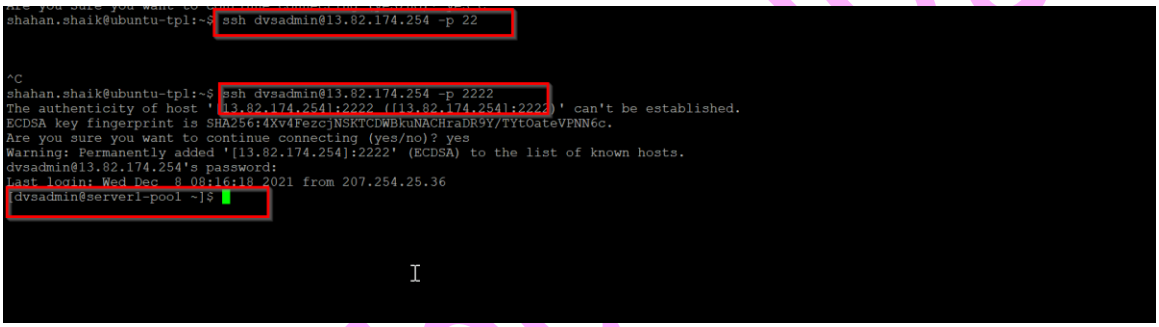
Let's try to create some inbound rules in standard LB to login to the servers we created



Like wise add the nat rule for pool2



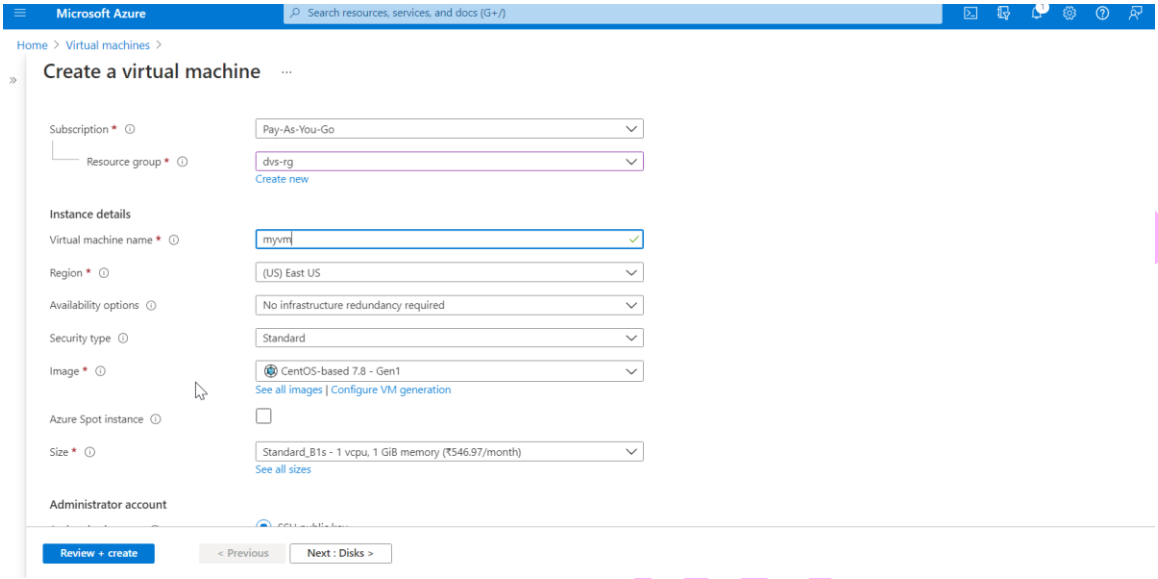
Once done, test the connectivity with ipaddress



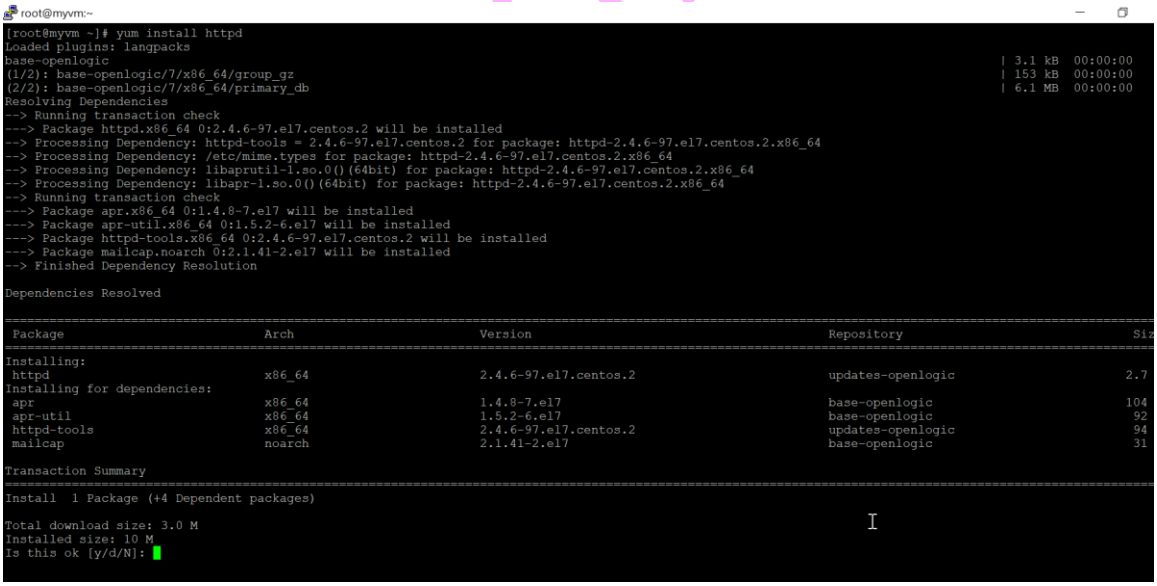
If you observe above port 22 is not working but port 2222 is working and helping us to login to the server.

9 Standard LB - SNAT

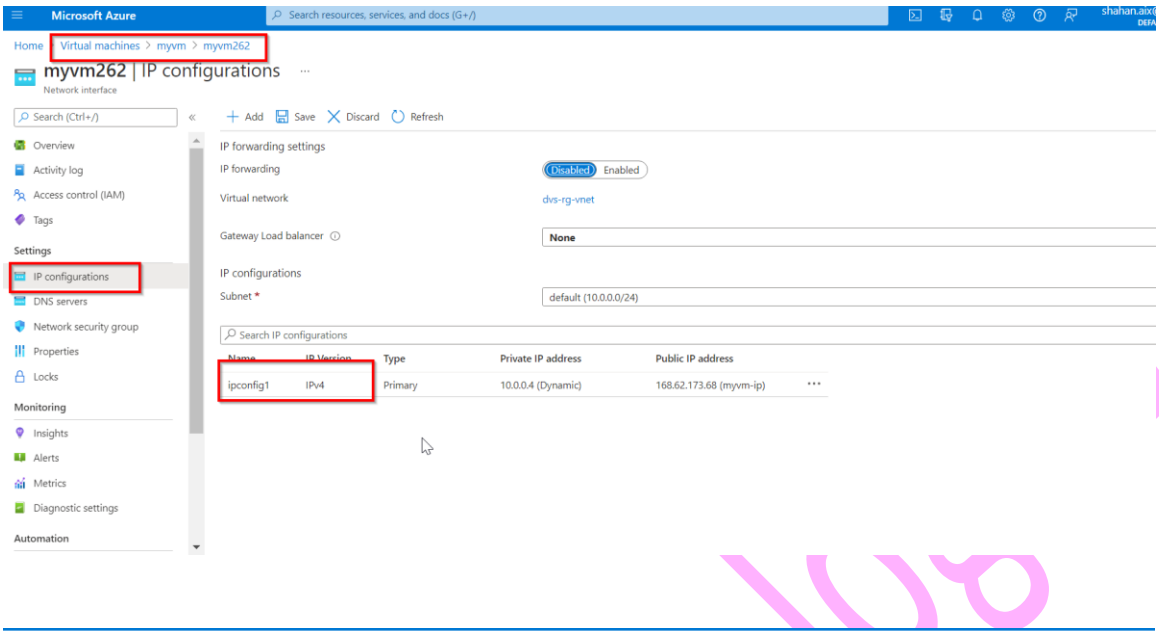
Let's try to create a VM and configure the loadbalancer.

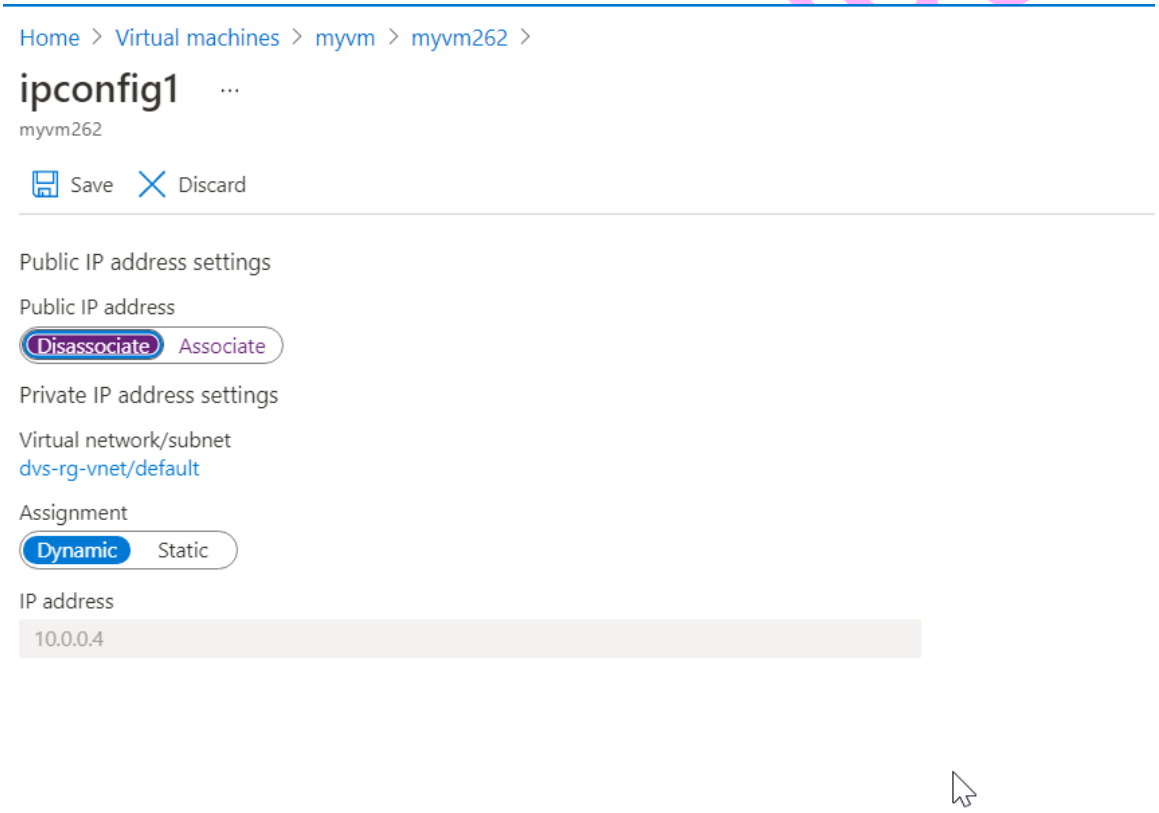


Once done with VM creation try to login and install the software

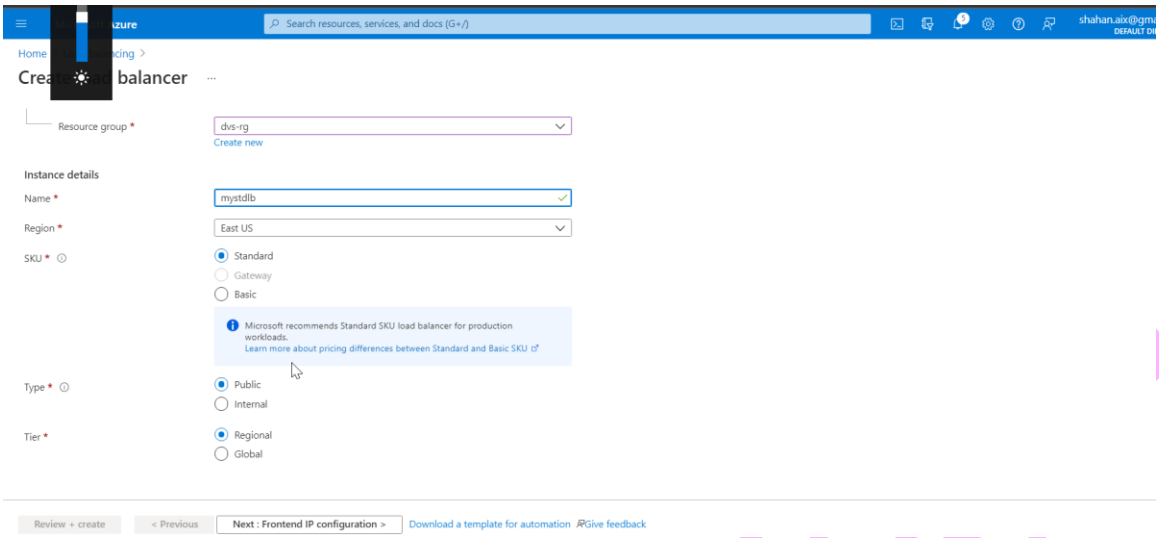


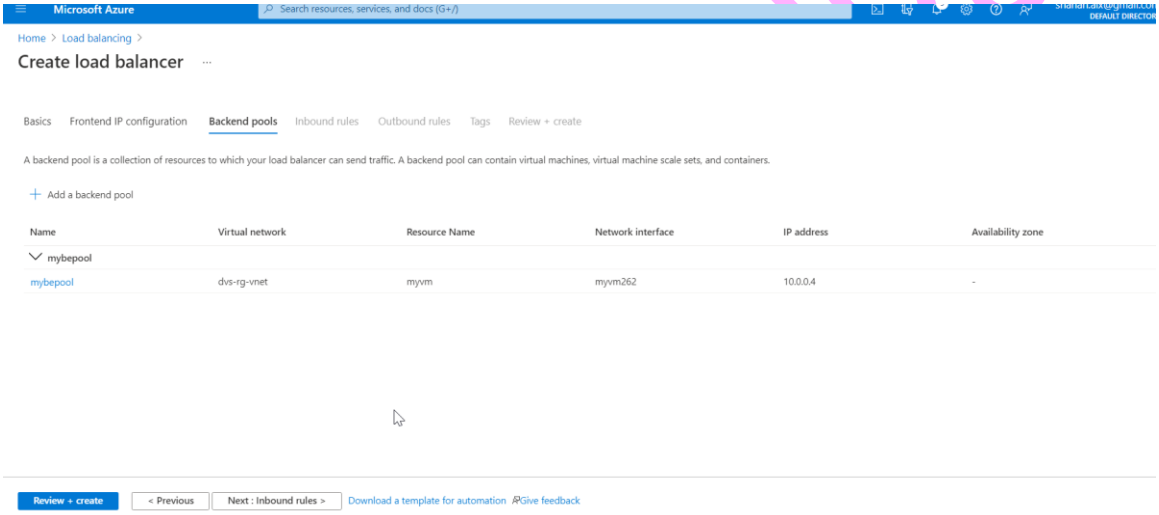
Now let's release the public ipaddress and add this server to the loadbalancer

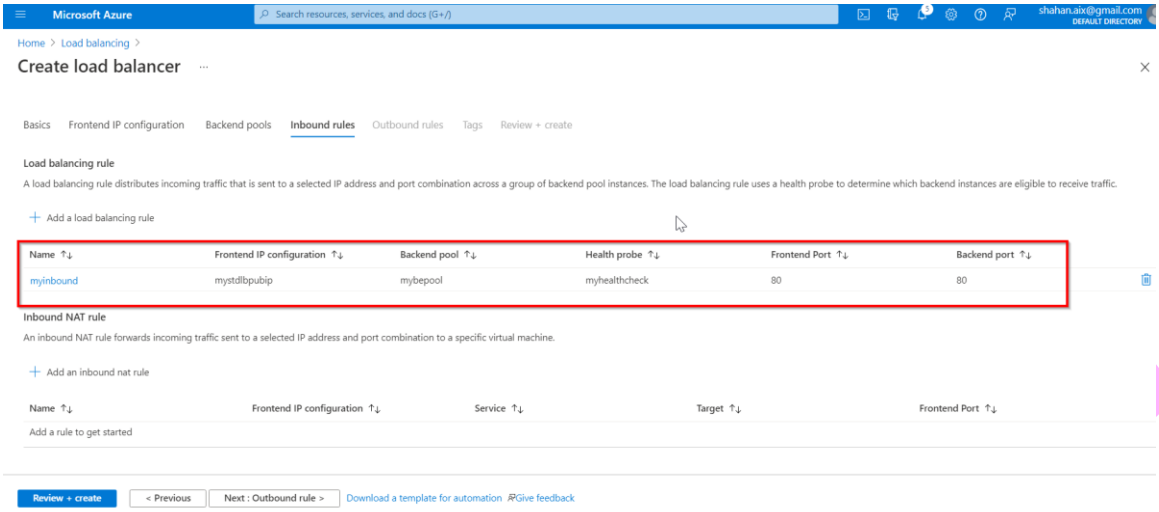




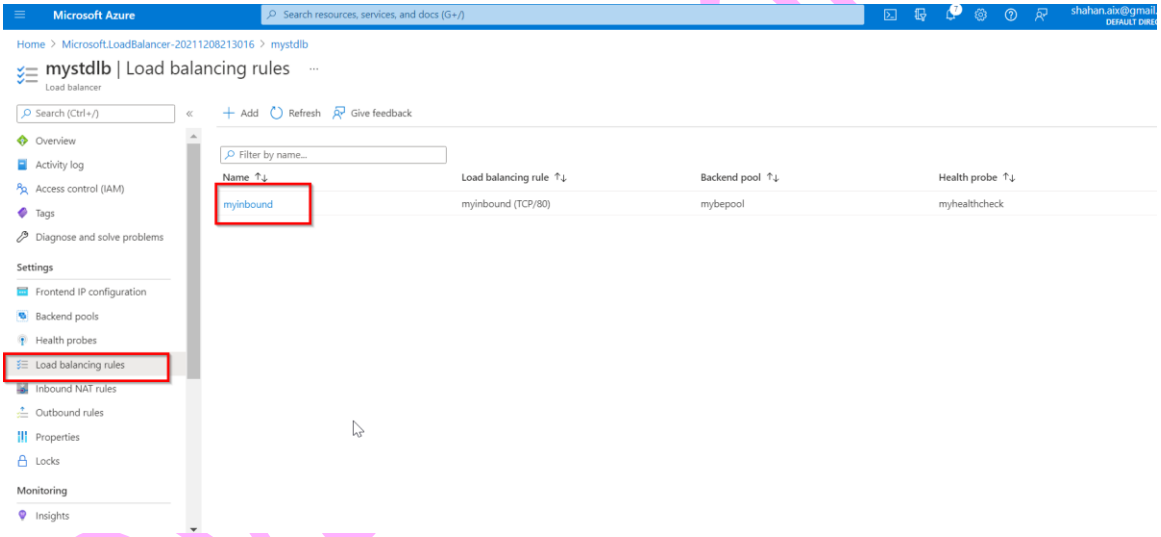
Let's create the STD LB

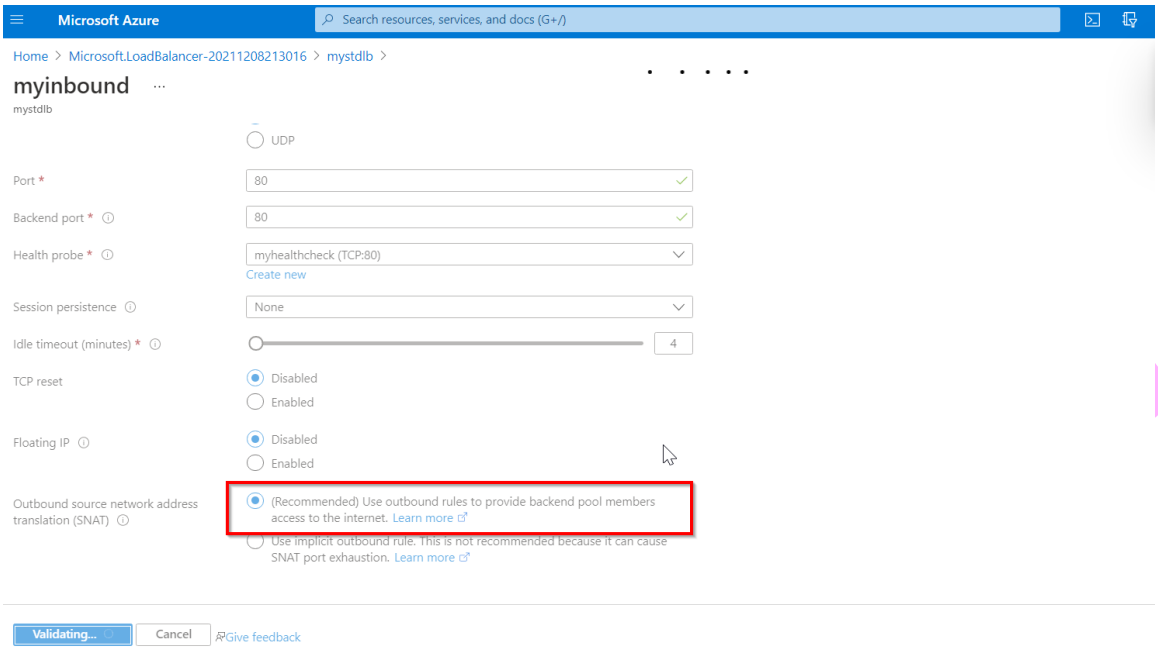

Search resources, services, and docs (G+/)
Home
Resource group *
dvs-rg
Create new
Instance details
Name *
mystdlb
Region *
East US
SKU *
Standard
Gateway
Basic
Microsoft recommends Standard SKU load balancer for production workloads.
Learn more about pricing differences between Standard and Basic SKU
Type *
Public
Internal
Tier *
Regional
Global
Review + create
< Previous
Next : Frontend IP configuration >
Download a template for automation
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Home > Load balancing >
Create load balancer
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
A backend pool is a collection of resources to which your load balancer can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, and containers.
Add a backend pool
Name
Virtual network
Resource Name
Network interface
IP address
Availability zone
mybepool
mybepool
dvs-rg-vnet
myvm
myvm262
10.0.0.4
-
Review + create
< Previous
Next : Inbound rules >
Download a template for automation
Give feedback

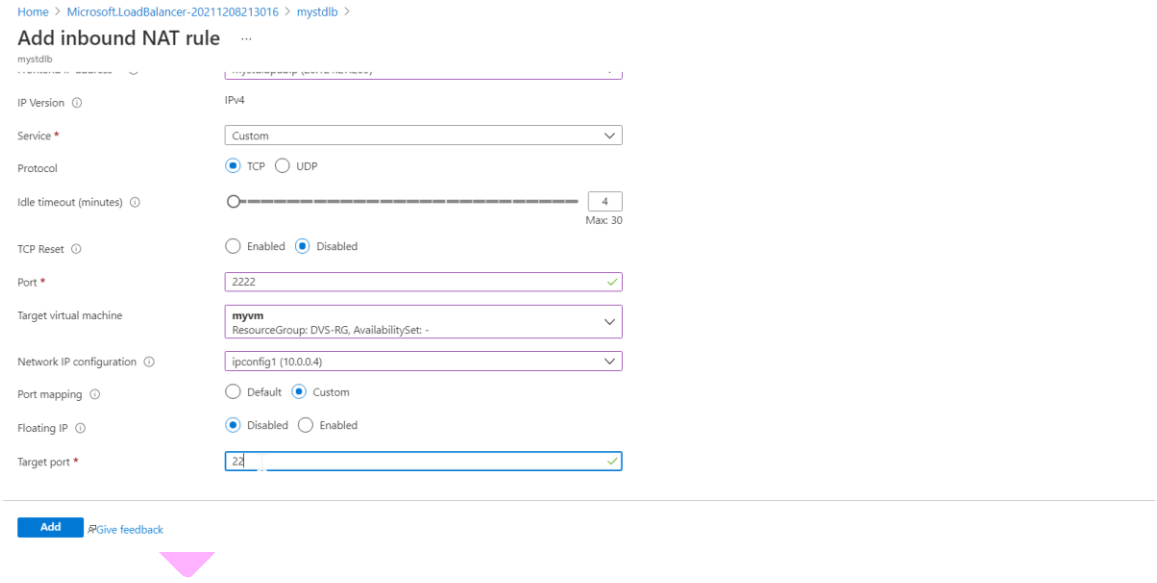


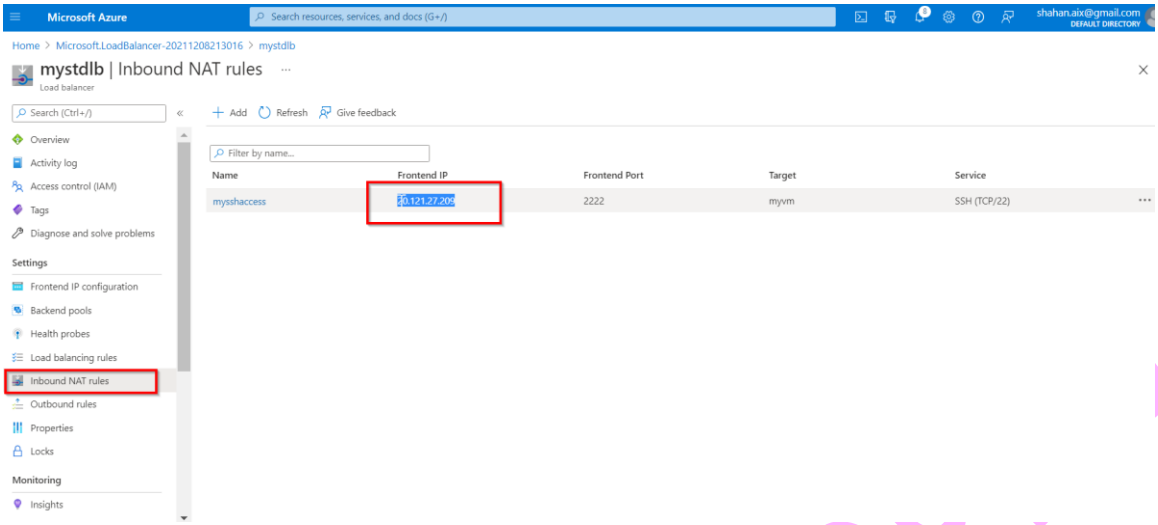
Let's configure the SNAT rule



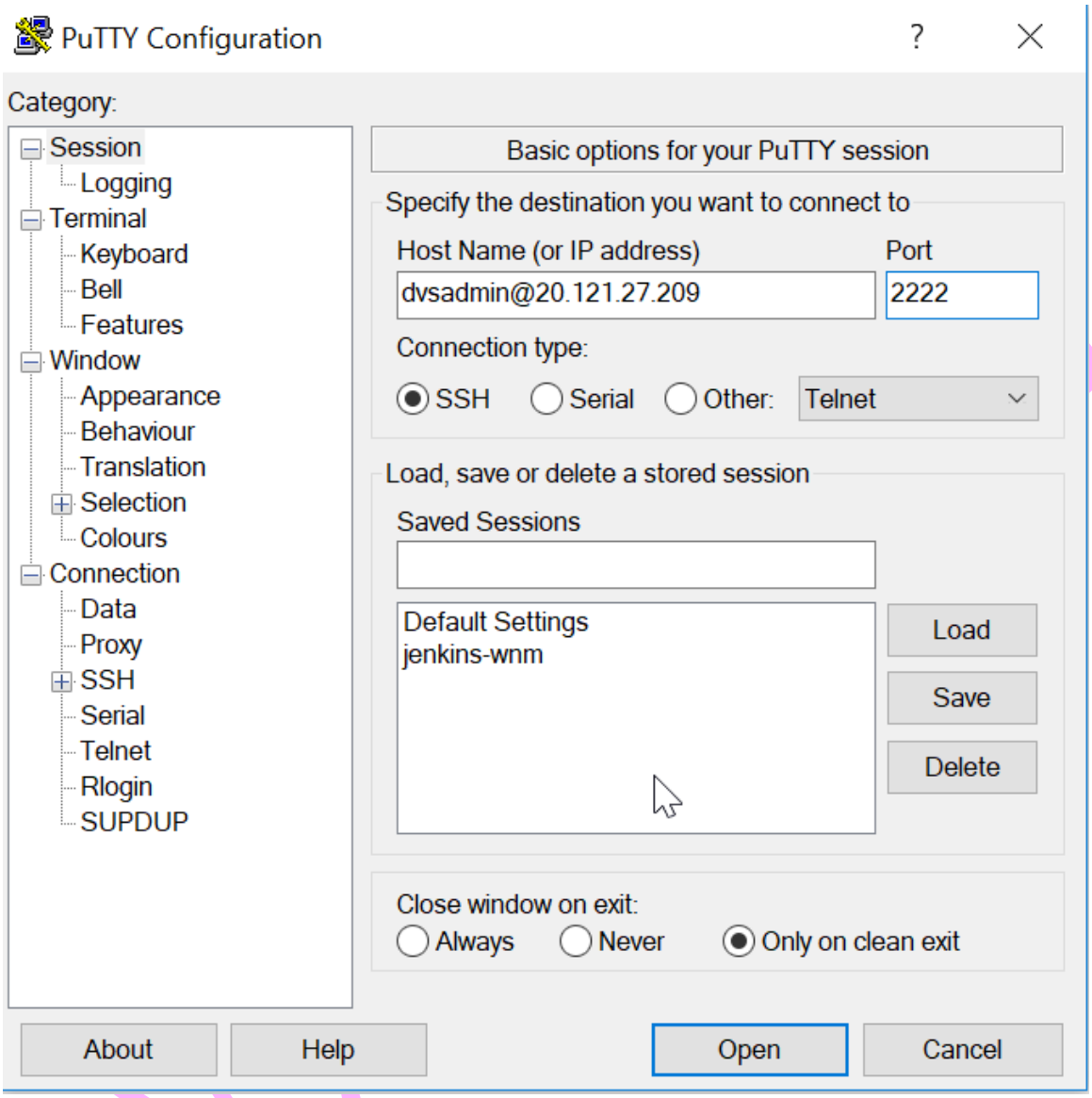


Since we removed public ip we can't login now, just create a NAT rule and try to login to server.





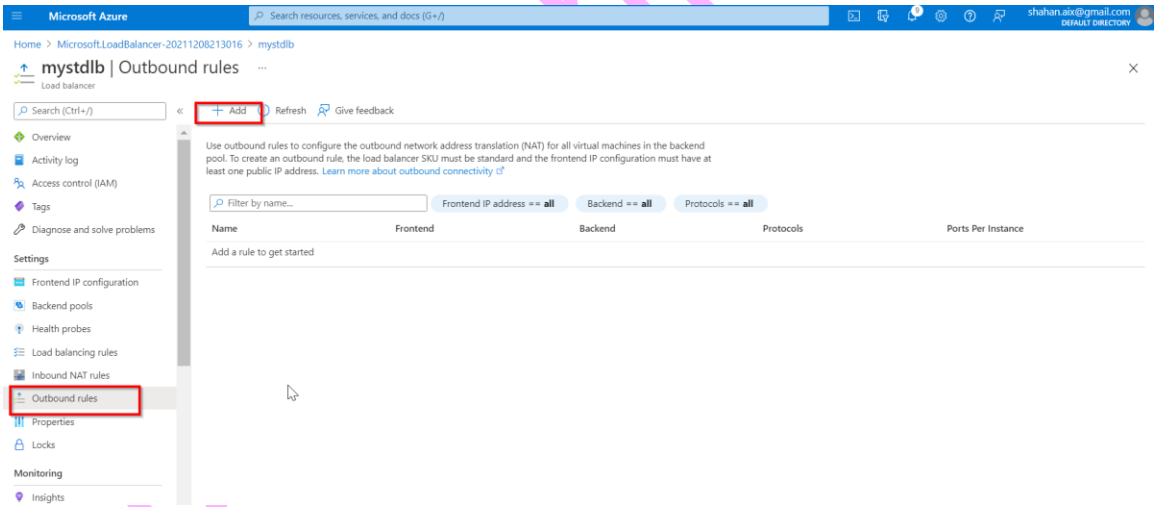
DVS Technologies

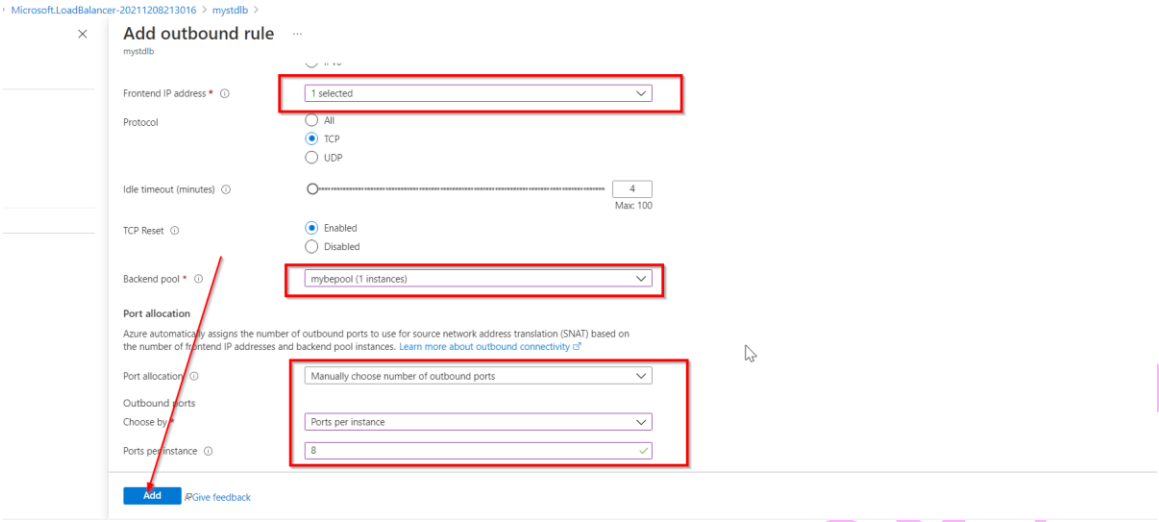

PuTTY Configuration
Category:
Session
Logging
Terminal
Keyboard
Bell
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
SSH
Serial
Telnet
Rlogin
SUPDUP
Basic options for your PuTTY session
Specify the destination you want to connect to
Host Name (or IP address)
Port
dvsadmin@20.121.27.209
2222
Connection type:
SSH
Serial
Other:
Telnet
Load, save or delete a stored session
Saved Sessions
Default Settings
jenkins-wnm
Load
Save
Delete
Close window on exit:
Always
Never
Only on clean exit
About
Help
Open
Cancel

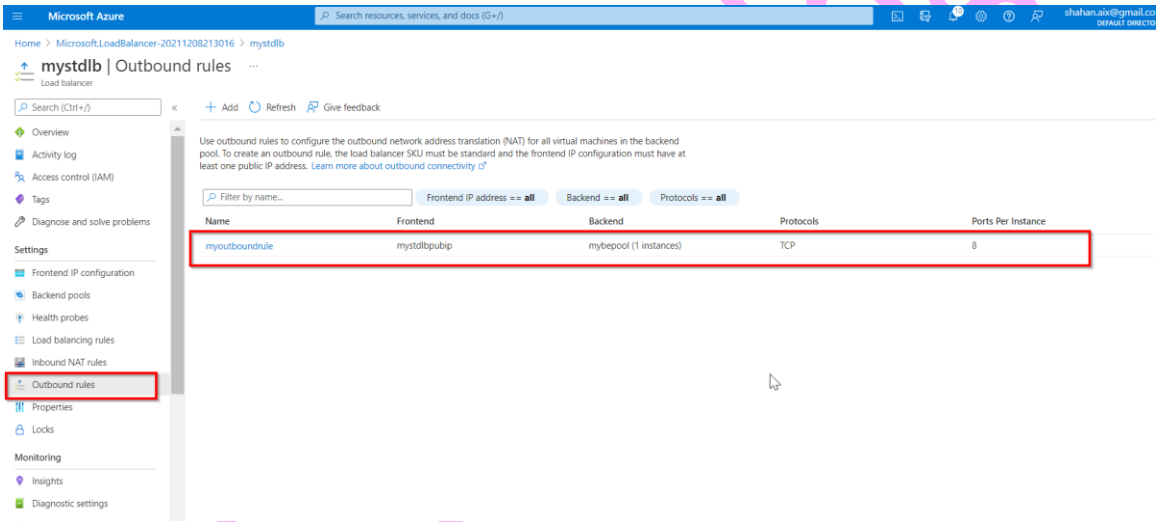
```
root@myvm:~
[root@myvm ~]# yum install httpd
Loaded plugins: langpacks
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.6-97.el7.centos.2 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
 Package        Arch        Version                    Repository        Size
================================================================================
Installing:
 httpd          x86_64      2.4.6-97.el7.centos.2      updates-openlogic 2.7 M

Transaction Summary
================================================================================
Install  1 Package

Total download size: 2.7 M
Installed size: 9.4 M
Is this ok [y/d/N]: y
Downloading packages:
```

If you observe above its in hung state in simple you can't reach to the internet from this machine.

Let's configure the outbound rules to allow the internet







Now let's check the server

```
root@myvm:~
[root@myvm ~]# yum install httpd
Loaded plugins: langpacks
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.6-97.el7.centos.2 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================================================================
 Package                    Arch                    Version                                  Repository                     Size
================================================================================================================================
Installing:
 httpd                      x86_64                  2.4.6-97.el7.centos.2                    updates-openlogic              2.7 M

Transaction Summary
================================================================================================================================
Install  1 Package

Total download size: 2.7 M
Installed size: 9.4 M
Is this ok [y/d/N]: y
Downloading packages:
Delta RPMs disabled because /usr/bin/applydeltarpm not installed.
httpd-2.4.6-97.el7.centos.2.x86_64.rpm                                                                   | 2.7 MB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : httpd-2.4.6-97.el7.centos.2.x86_64                                                                          1/1
  Verifying  : httpd-2.4.6-97.el7.centos.2.x86_64                                                                          1/1

Installed:
  httpd.x86_64 0:2.4.6-97.el7.centos.2

Complete!
[root@myvm ~]#
```

10 App Gateway - Context based routing

Azure Application Gateway service

- This service is a web traffic load balancer that is used to distribute traffic to web applications.
- The web applications can reside on Virtual Machines, Virtual Machine Scale sets or even on on-premise servers.
- The Application gateway is an OSI Layer 7 load balancer.
- Secure Sockets Layer (SSL/TLS) termination
- Here requests to the Application Gateway can be secure.
- And then the requests to the backend pool resources can go unencrypted.
- This can lift the burden of the backend pool for decrypting requests.

- You can also enable Autoscaling for your Application Gateway resource.
- This allows the Application Gateway to scale up or down based on traffic load patterns.
- You can also enable the Web Application Firewall feature for the Application Gateway resource.
- You can also enable session affinity which allows a user session to directed to the same server for processing. If the state of the user session is stored on the server , then this can be a useful feature.

- Different components of the Application Gateway
- **Frontend IP address** – Users will hit the Application Gateway via the Frontend IP address.
- **Listener** – This is a logical entity that checks for incoming connection requests. There can be multiple listeners attached to an application gateway.
- There are 2 types of Listener configurations
- **Basic** – Here the listener listens to a single domain site
- **Multi-site** – Here the listeners maps to multiple domain sites.

- Different components of the Application Gateway
- **Routing Rules** – This is used to route the traffic from the listener to the backend pool.
- There are 2 types of routing rules
- **Basic** – Here all requests are routed to backend pool directly.
- **Path-based** – Here requests are routed to the backend pool based on the URL in the request.
- **Backend pools** – These can be Network Interface cards , Virtual Machine scale sets , Public or Internal IP addresses , FQDN or backends such as App Service.

Application gateway acts like application load balancer. Let's create two servers with application installed in it with diff context paths like /movies & /songs

Let's create the servers and configure the application inside them.

Videos-server:

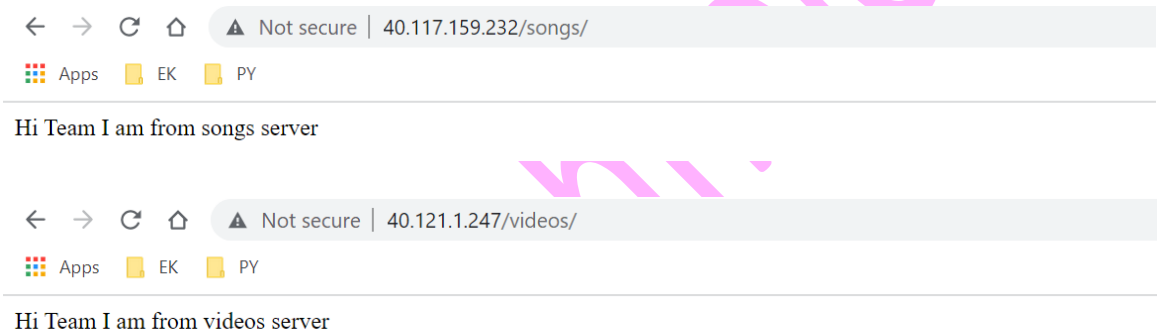
#!/bin/bash

```
yum install httpd -y
systemctl enable httpd
mkdir /var/www/html/videos
echo "default page" > /var/www/html/index.html
echo "Hi Team I am from videos server" > /var/www/html/videos/index.html
systemctl restart httpd
```

Similarly build the songs-server

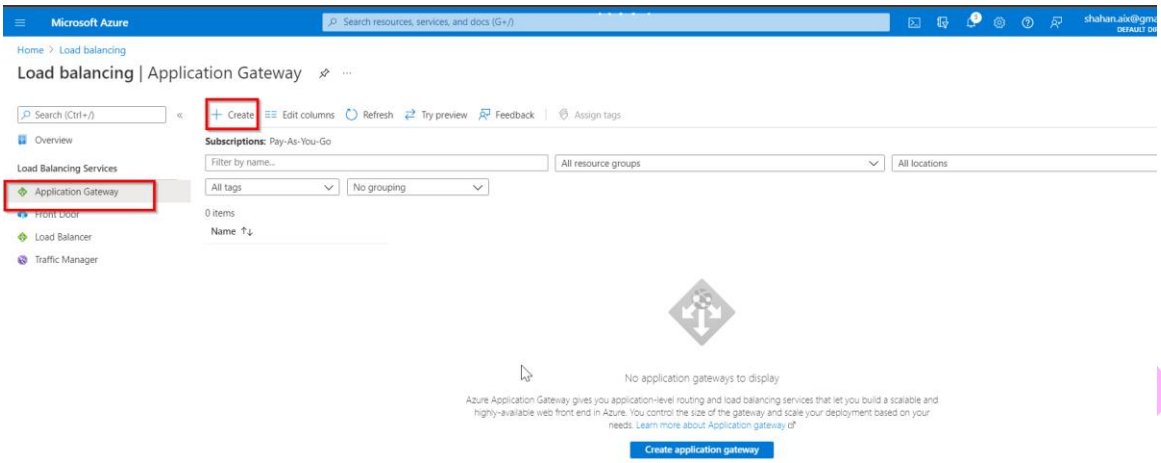
Name	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
songs-server	Pay-As-You-Go	DVS-RG	East US	Creating	Linux	Standard_B1s	40.117.159.232	1
videos-server	Pay-As-You-Go	dvs-rg	East US	Running	Linux	Standard_B1s	40.121.1.247	1

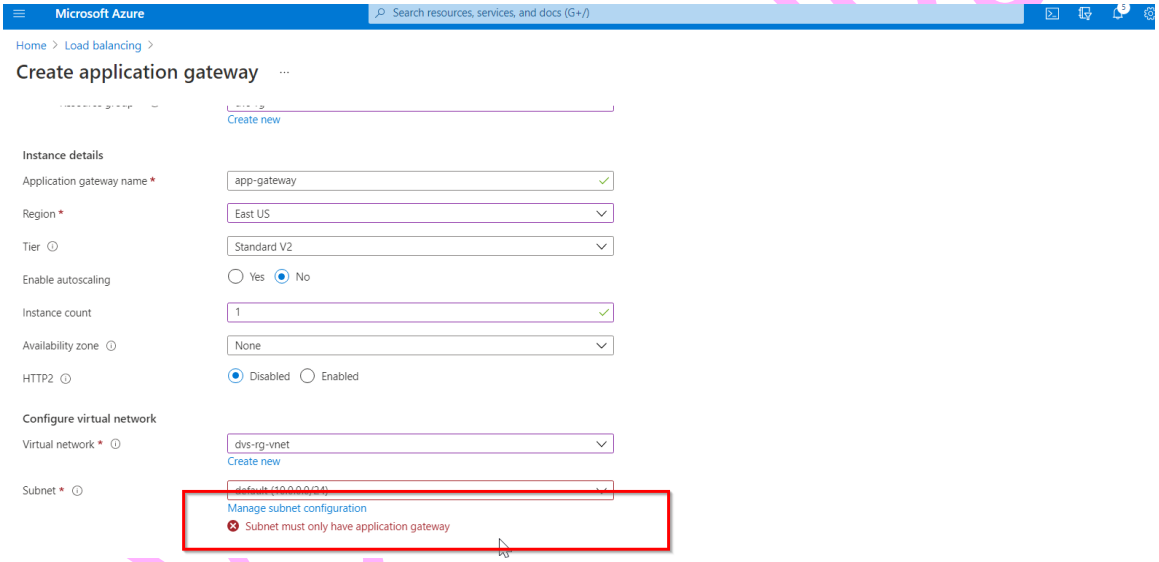
Verification:



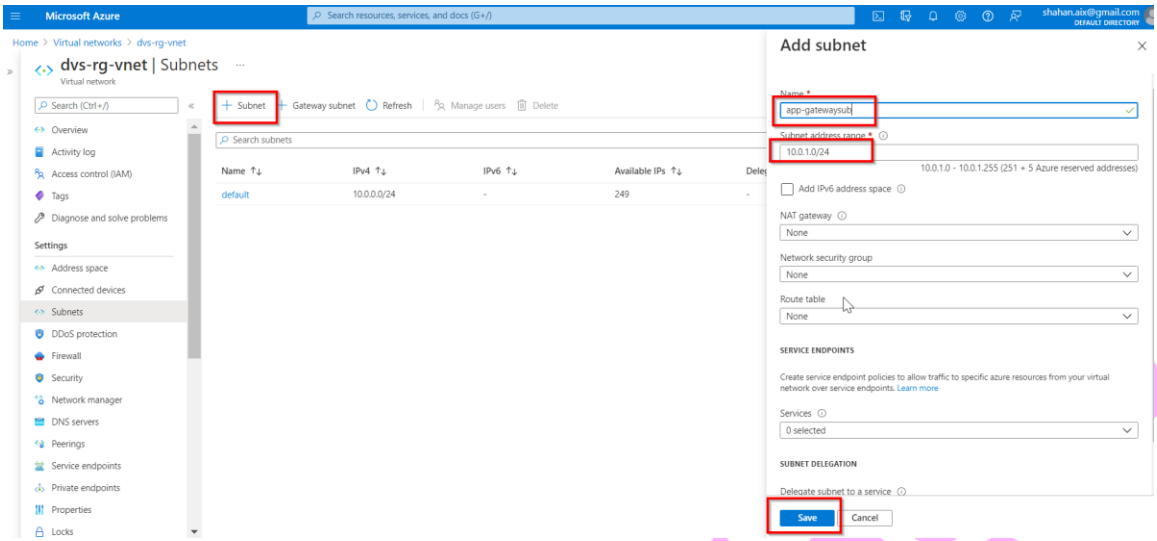
Now let's build the application gateway

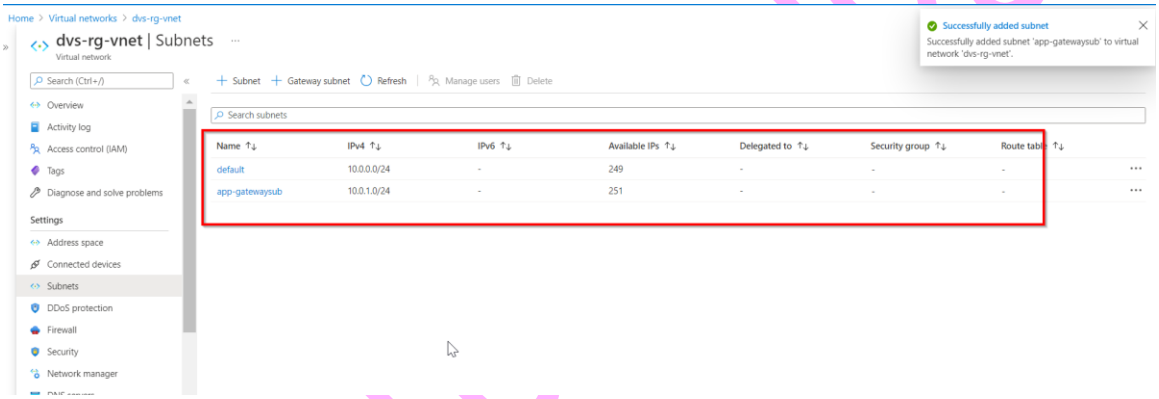
Note: Make sure you have an empty subnet before creating application gateway





Please create one empty subnet so that application gateway can use it.





Now let's re try our app-gateway

Microsoft Azure

Home > Load balancing >

Create application gateway

Resource group * dvs-rg
Create new

Instance details

Application gateway name * app-gateway

Region * East US

Tier Standard V2

Enable autoscaling Yes No

Instance count 1

Availability zone None

HTTP2 Disabled Enabled

Configure virtual network

Virtual network * dvs-rg-vnet
Create new

Subnet * app-gatewaysub (10.0.1.0/24)
Manage subnet configuration

Previous | Next : Frontends >

Home > Load balancing >

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 IP address (New) app-gw-pubip
Add new

Microsoft Azure

Home > Load balancing >

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
No results	

Previous | Next : Configuration >

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 machines scale sets, IP addresses, domain names, or an App Service.

Name * videos-BE

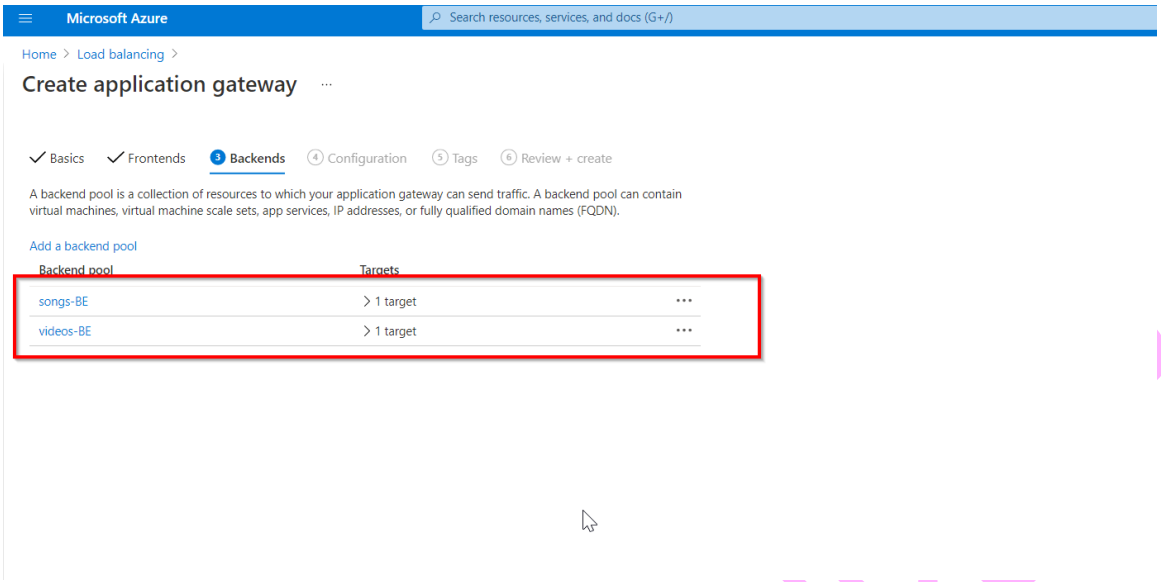
Add backend pool without targets Yes No

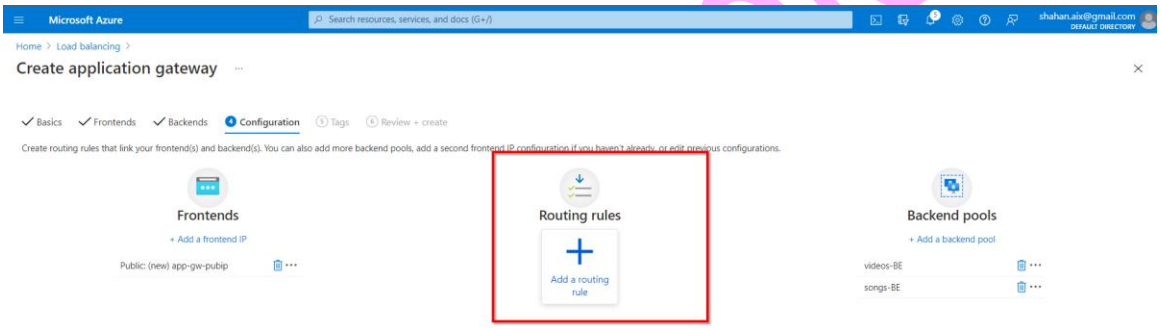
Backend targets

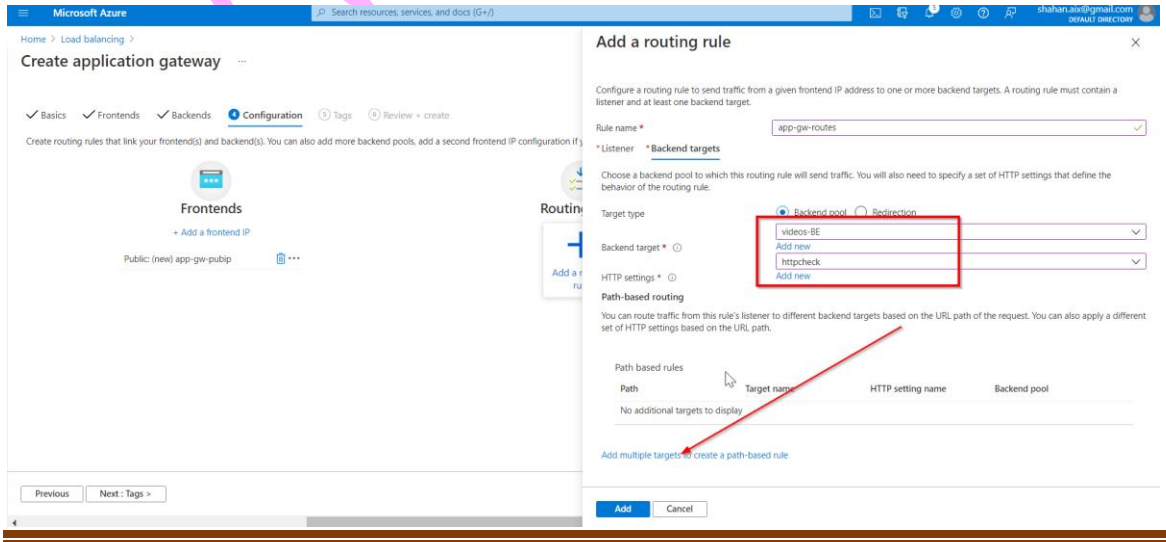
1 item

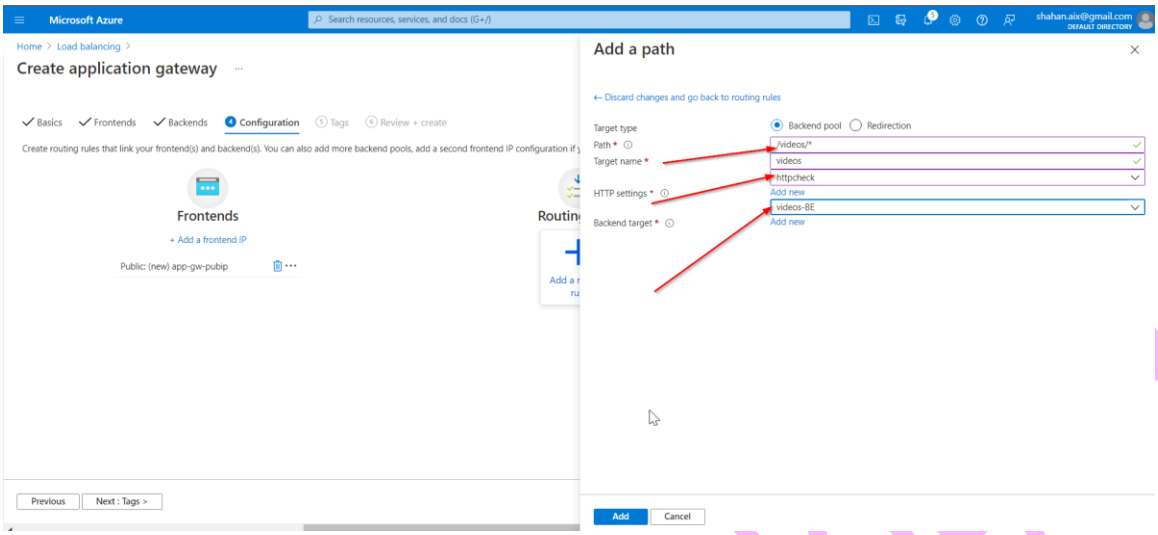
Target type	Target
Virtual machine	videos-server378 (10.0.0.4)
IP address or FQDN	

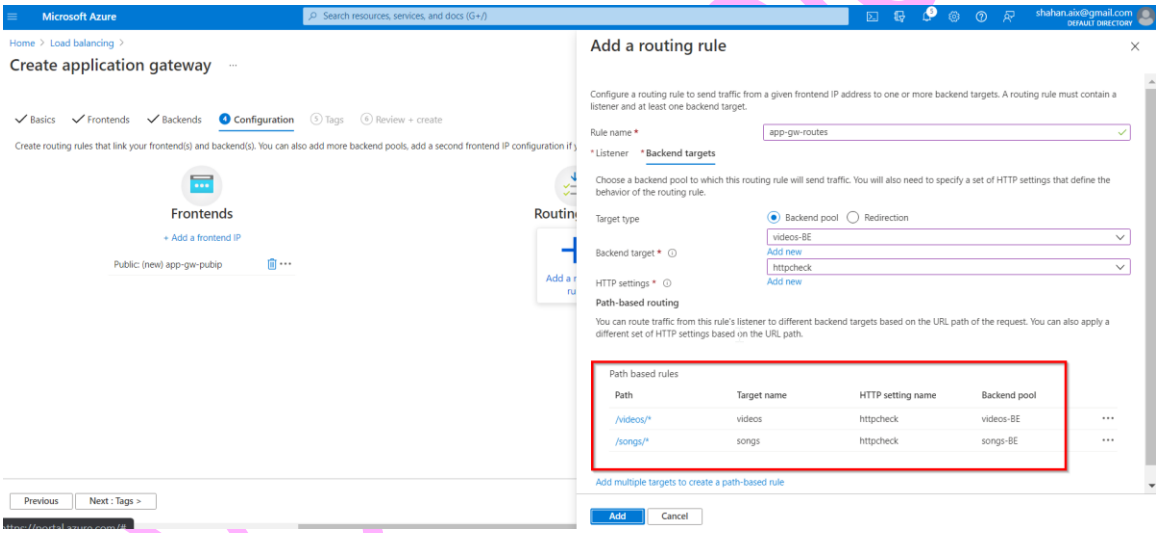
Add | Cancel

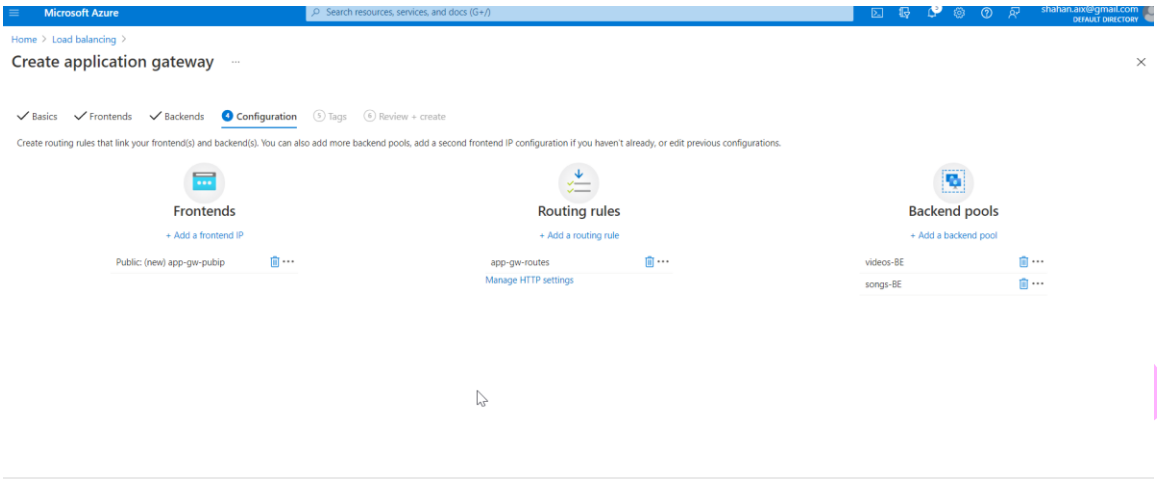

Microsoft Azure
Search resources, services, and docs (G+/)
Home > Load balancing >
Create application gateway
Basics
Frontends
Backends
Configuration
Tags
Review + create
A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN).
Add a backend pool
Backend pool
Targets
songs-BE
1 target
videos-BE
1 target

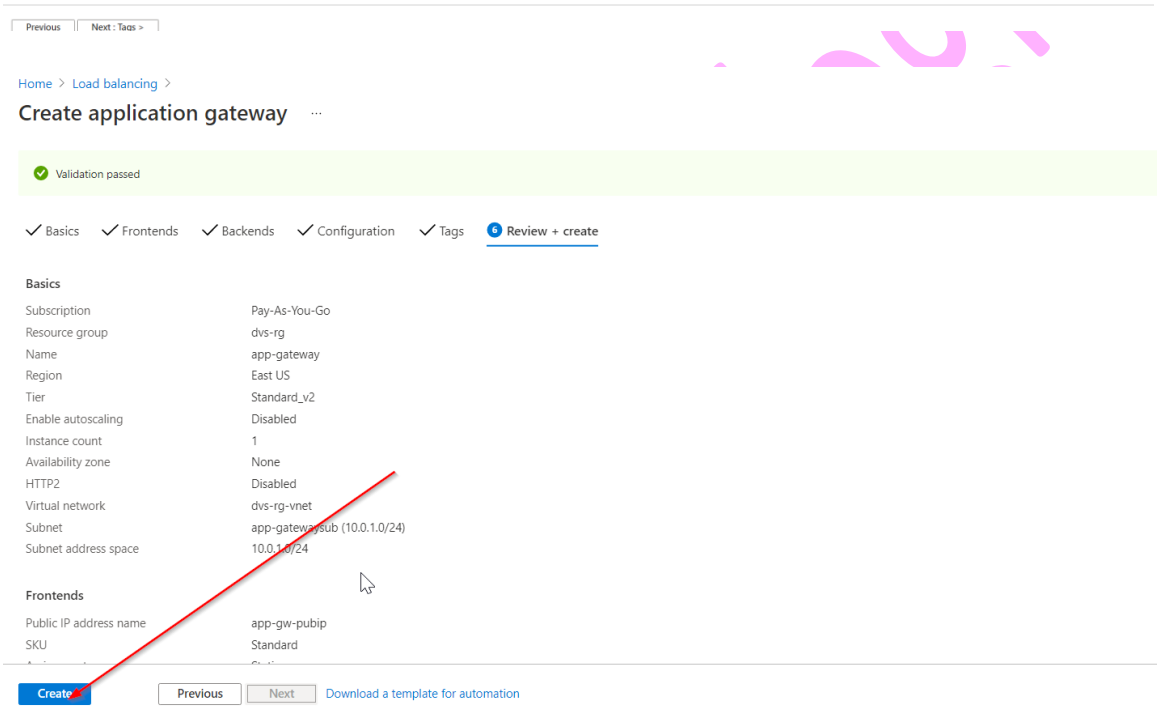

Microsoft Azure
Home > Load balancing >
Create application gateway
Basics
Frontends
Backends
Configuration
Tags
Review + create
Frontends
+ Add a frontend IP
Public: (new) app-gw-pubip
Routing rules
Add a routing rule
Backend pools
+ Add a backend pool
videos-BE
songs-BE


Microsoft Azure
Home > Load balancing >
Create application gateway
Basics
Frontends
Backends
Configuration
Tags
Review + create
Frontends
+ Add a frontend IP
Public: (new) app-gw-pubip
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 *
app-gw-routes
* Listener
* Backend targets
Choose a backend pool to which this routing rule will send traffic. You will also need to specify a set of HTTP settings that define the behavior of the routing rule.
Target type
Backend pool
Redirection
Backend target *
videos-BE
Add new
HTTP settings *
httpcheck
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 HTTP settings based on the URL path.
Path based rules
Path
Target name
HTTP setting name
Backend pool
No additional targets to display
Add multiple targets to create a path-based rule
Add
Cancel

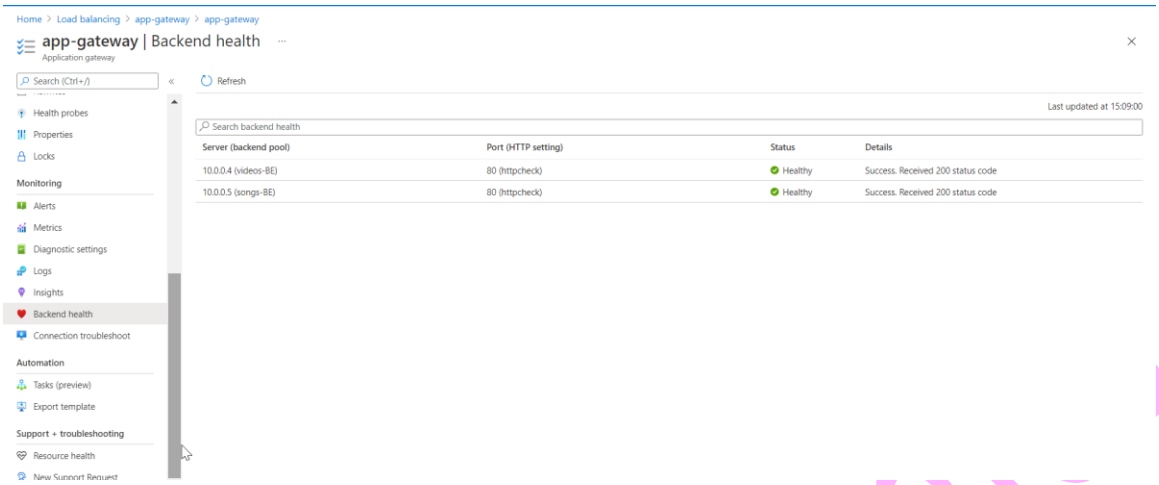

Microsoft Azure
Search resources, services, and docs (G+/)
shahan.aix@gmail.com
DEFAULT DIRECTORY
Home > Load balancing >
Create application gateway
Basics
Frontends
Backends
Configuration
Tags
Review + create
Create routing rules that link your frontend(s) and backend(s). You can also add more backend pools, add a second frontend IP configuration if
Frontends
+ Add a frontend IP
Public: (new) app-gw-pubip
Previous
Next : Tags >
Add a path
← Discard changes and go back to routing rules
Target type
Backend pool
Redirection
Path *
/videos/*
Target name *
videos
HTTP settings *
httpcheck
Add new
Backend target *
videos-BE
Add new
Add
Cancel


Microsoft Azure
Search resources, services, and docs (G+/)
shahan.aix@gmail.com
DEFAULT DIRECTORY
Home > Load balancing >
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
Frontends
+ Add a frontend IP
Public: (new) app-gw-pubip
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 *
app-gw-routes
* Listener
* Backend targets
Choose a backend pool to which this routing rule will send traffic. You will also need to specify a set of HTTP settings that define the behavior of the routing rule.
Target type
Backend pool
Redirection
Backend target *
videos-BE
Add new
HTTP settings *
httpcheck
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 HTTP settings based on the URL path.
Path based rules
Path
Target name
HTTP setting name
Backend pool
/videos/*
videos
httpcheck
videos-BE
/songs/*
songs
httpcheck
songs-BE
Add multiple targets to create a path-based rule
Add
Cancel

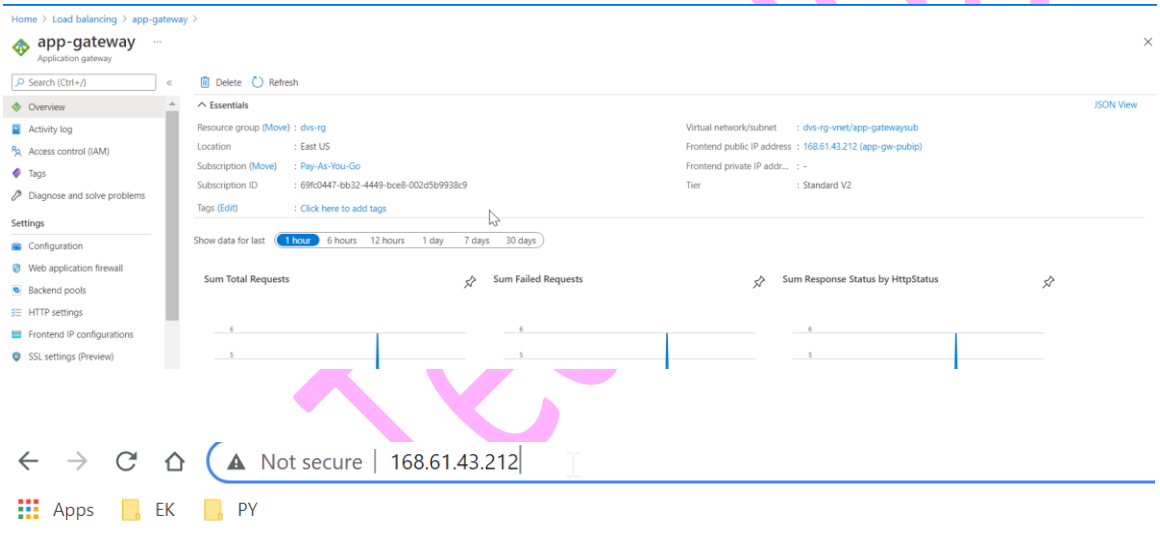




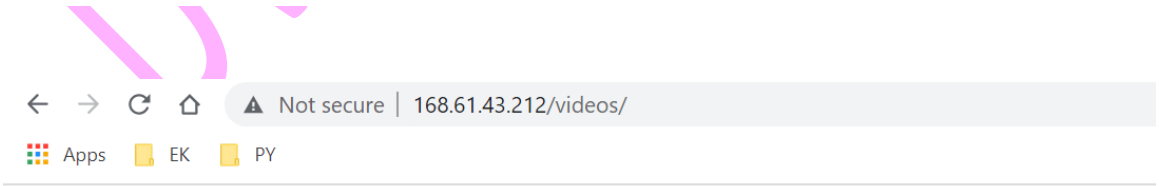
Note: Please make sure that you are removing the public ipaddress for the servers



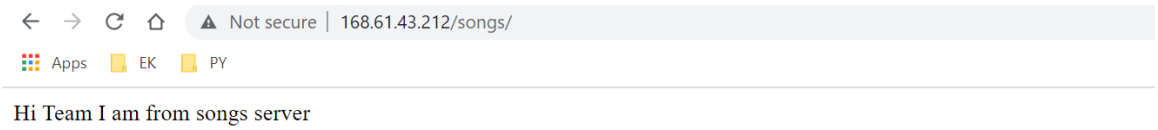
Checking health check for the backend nodes



default page



Hi Team I am from videos server



Hi Team I am from songs server

DVS Technologies