Source: C# Corner (www.c-sharpcorner.com) PRINT

Article

Creating Windows Server Machine On Virtual Network And Load Balancing it

By **Mohammed Rameez Khan** on **Aug 01 2017**

Welcome back to an article about creating another Windows Server Machine on Virtual Network and working with Load Balancing. Here, in this article, we will be working with the Virtual Network and we will be creating a Load Balancer on it.

Note

Please go back to my previous article to create a Virtual Network and also to create a Virtual Machine.

Let’s understand a few basic things about Load Balancer!

Load Balancer on Azure

Azure Load Balancer is a scalable Software Load Balancer. There are two versions the External for Internet based traffic and the Internal for Private Traffic. Load Balancer can balance upto 100 virtual machines. It supports TCP or UDP protocols and comes up with Health Probes of TCP and HTTP.

Functions of Load Balancer

- *Front End IP Pool*
  To associate the IP addresses with the Load Balancer. The front-end IP pool is a list of IP’s that can be used for the Load Balancer on External and Internal.

- *Inbound NAT Rules*
  Used for port mapping with the individual Virtual Machines. The inbound NAT rules list what traffic is allowed in and where it will be directed.

- *Load Balancer Rules*
  Used for port mapping with multiple Virtual Machines. The NAT rules are used to move traffic from the front of the load balancer to the backend devices such as your webservers.

- *Health Probes*
  It's based out of TCP or UDP. The Load Balancer probes are used to ensure that traffic in only directed to Back end devices that are “up” and “functioning”.

- *Back end pool*
  Used to list out network interfaces to forward traffic. Load-balanced endpoints can be configured with health probes for an additional layer of high availability. If the load balancer does not receive a reply in response to two probes, then traffic is no longer sent to the virtual machine. The load balancer does continue polling, looking for the response, so when the virtual machine is healthy again, it will automatically be put back in the rotation.

Start creating a Virtual Machine using the below steps

Step 1

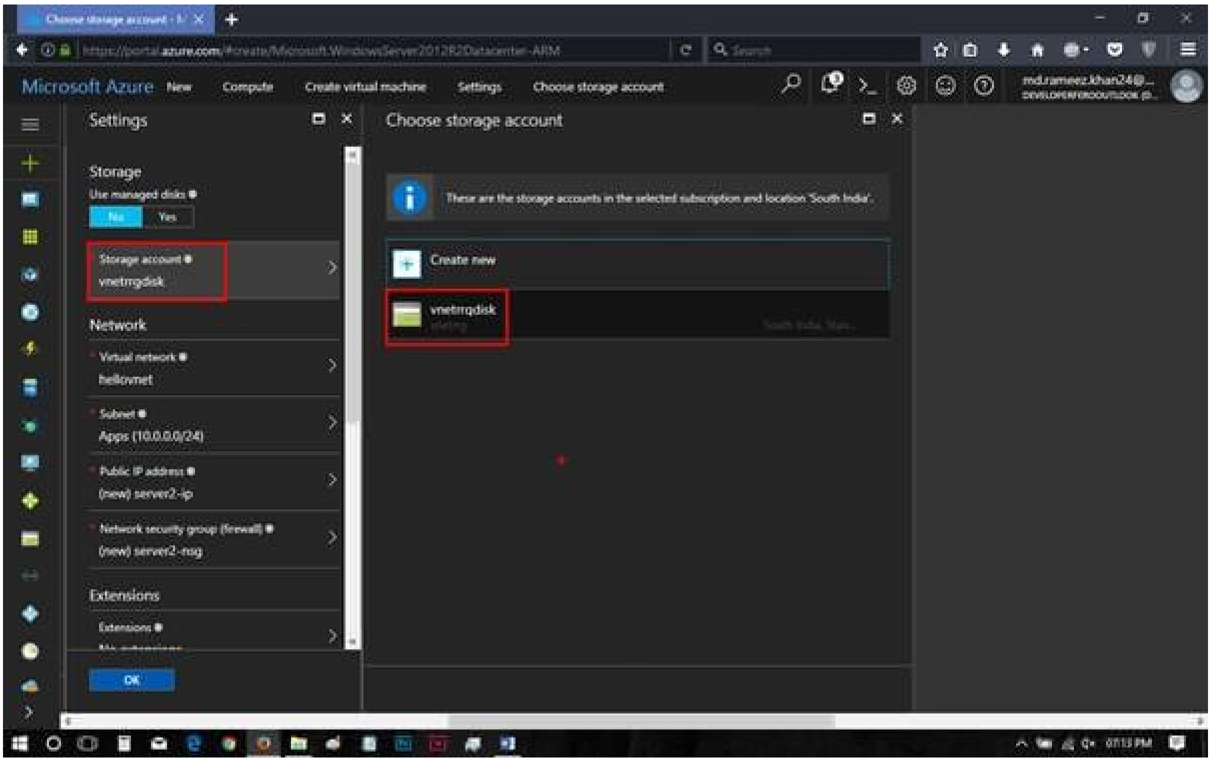
Start creating a Virtual Machine of Windows Server 2012 R2 Datacenter. Look for my previous articles to learn about the "Basics" blade of creating a Virtual Machine.

Step 2

Select the size for the Virtual Machine which has to be created.

Step 3

On the "Settings" blade, configure for the storage account.



Storage

Use managed disks: No

Storage account: vnetrrgdisk

Network

Virtual network: hellovnet

Subnet: Apps (10.0.0.0/24)

Public IP address: (new) server2-ip

Network security group (firewall): (new) server2-nsg

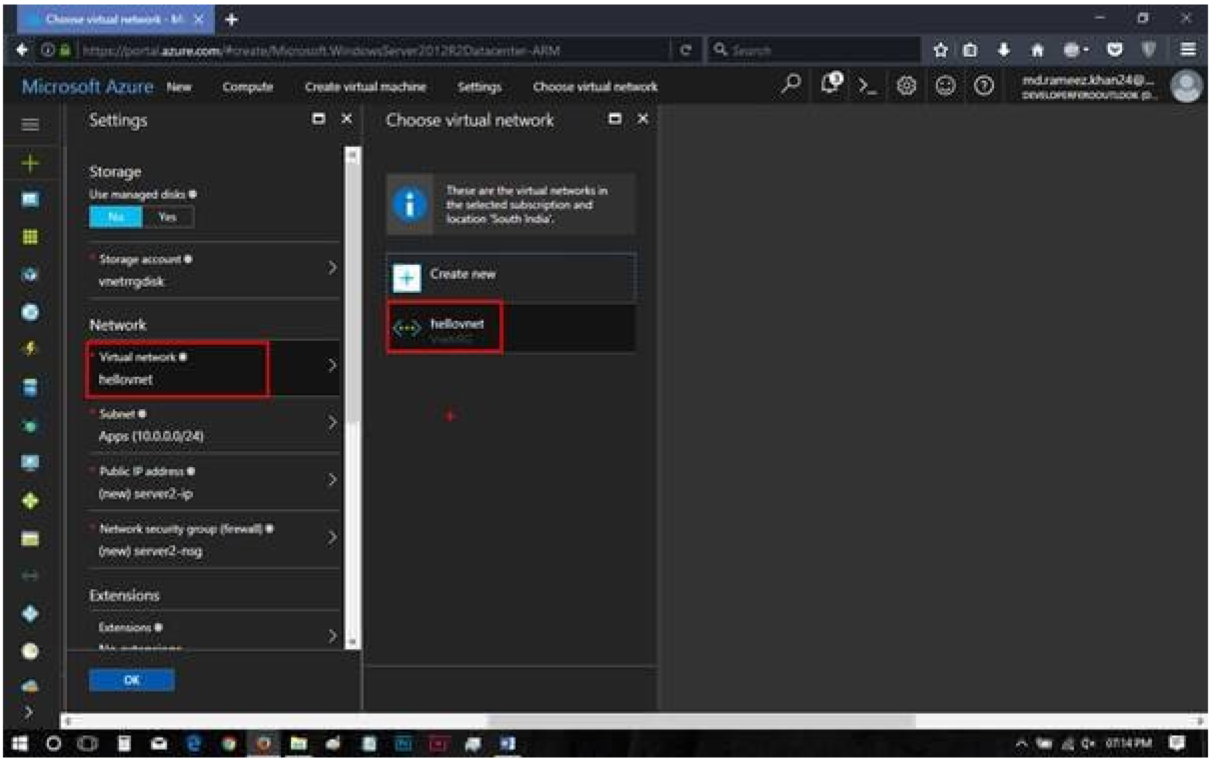
Extensions

Extensions

These are the storage accounts in the selected subscription and location 'South India'.

vnetrrgdisk — South India

Select the Virtual Network of one which was created in the previous demo.



Settings

Storage

Use managed disks: No / Yes

Storage account: vnetrrgdisk

Network

Virtual network: hellovnet

Subnet: Apps (10.0.0.0/24)

Public IP address: (new) server2-ip

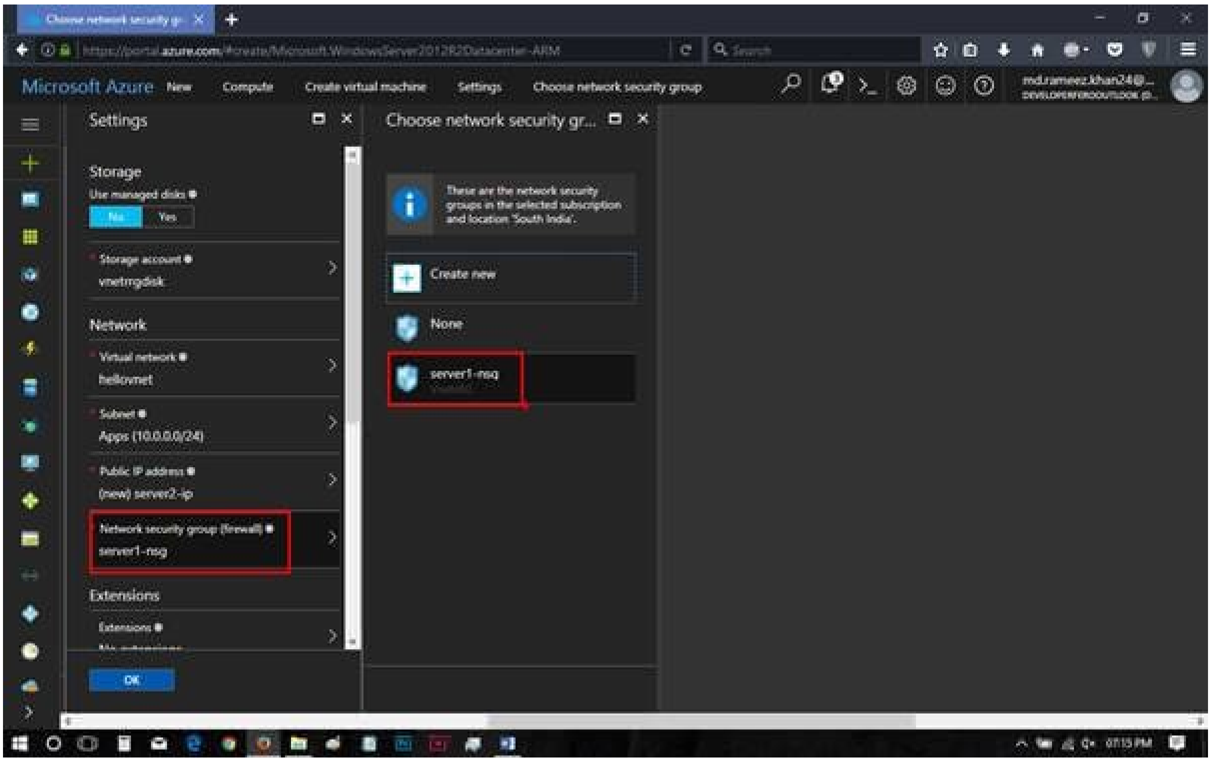
Network security group (firewall): (new) server2-nsg

Extensions

Choose virtual network

These are the virtual networks in the selected subscription and location 'South India'.

Configure the Network Security Group (NSG), select the NSG which was created in the previous demo.



Settings

Storage

Use managed disks: No / Yes

Storage account: vnetrrgdisk

Network

Virtual network: hellovnet

Subnet: Apps (10.0.0.0/24)

Public IP address: (new) server2-ip

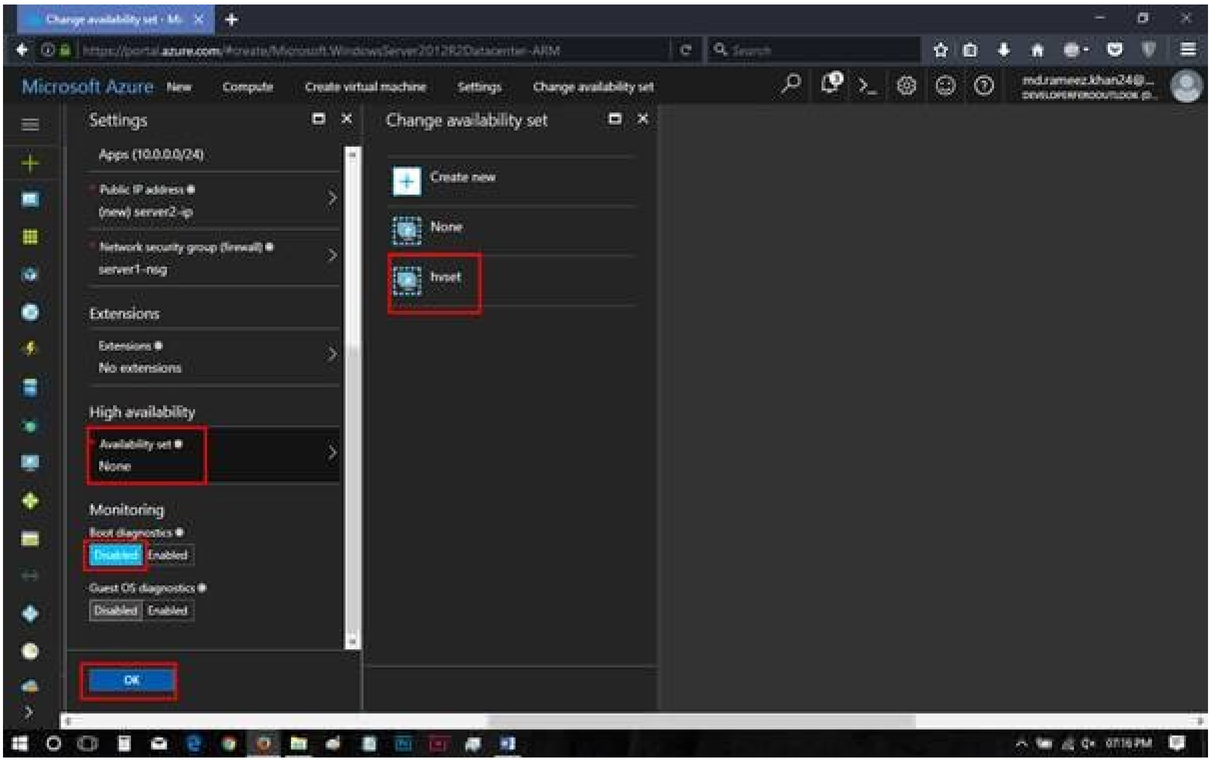
Network security group (firewall): server1-nsg

Extensions

Choose network security group

These are the network security groups in the selected subscription and location 'South India'.

Enable "Guest monitoring" and click on OK to pass for the next blade.


Change availability set - Mi
https://portal.azure.com/#create/Microsoft.WindowsServer2012R2Datacenter-ARM
Microsoft Azure
New
Compute
Create virtual machine
Settings
Change availability set
OK

Settings

Apps (10.0.0.0/24)

Public IP address
(new) server2-ip

Network security group (firewall)
server1-nsg

Extensions

Extensions
No extensions

High availability

Availability set
None

Monitoring

Boot diagnostics
Disabled | Enabled

Guest OS diagnostics
Disabled | Enabled

Change availability set

Create new

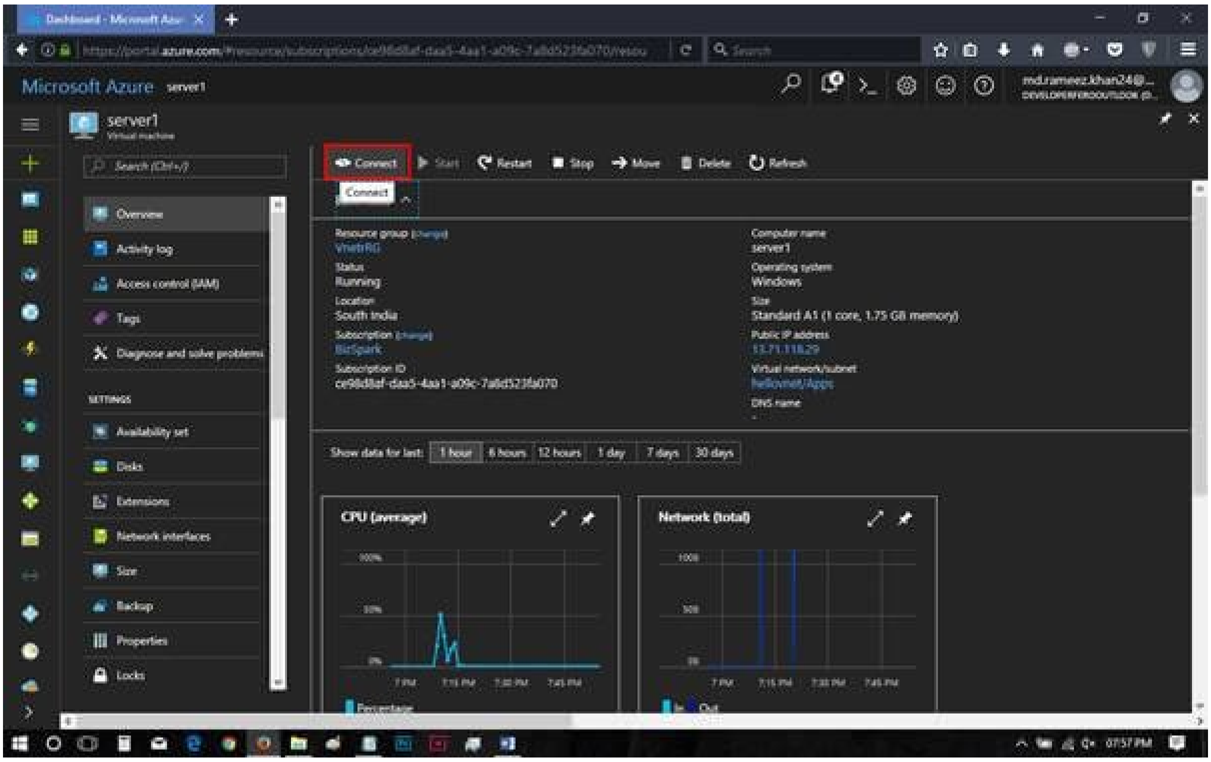
None

hvset

Pass the "Summary" blade and purchase the new Virtual Machine of Windows Server.

Step 4

Click on "Connect" to connect with the Virtual Machine now.



Resource group (change)
VnetRG

Status
Running

Location
South India

Subscription (change)
BizSpark

Subscription ID
ce98d8af-daa5-4aa1-a09c-7a8d523fa070

Computer name
server1

Operating system
Windows

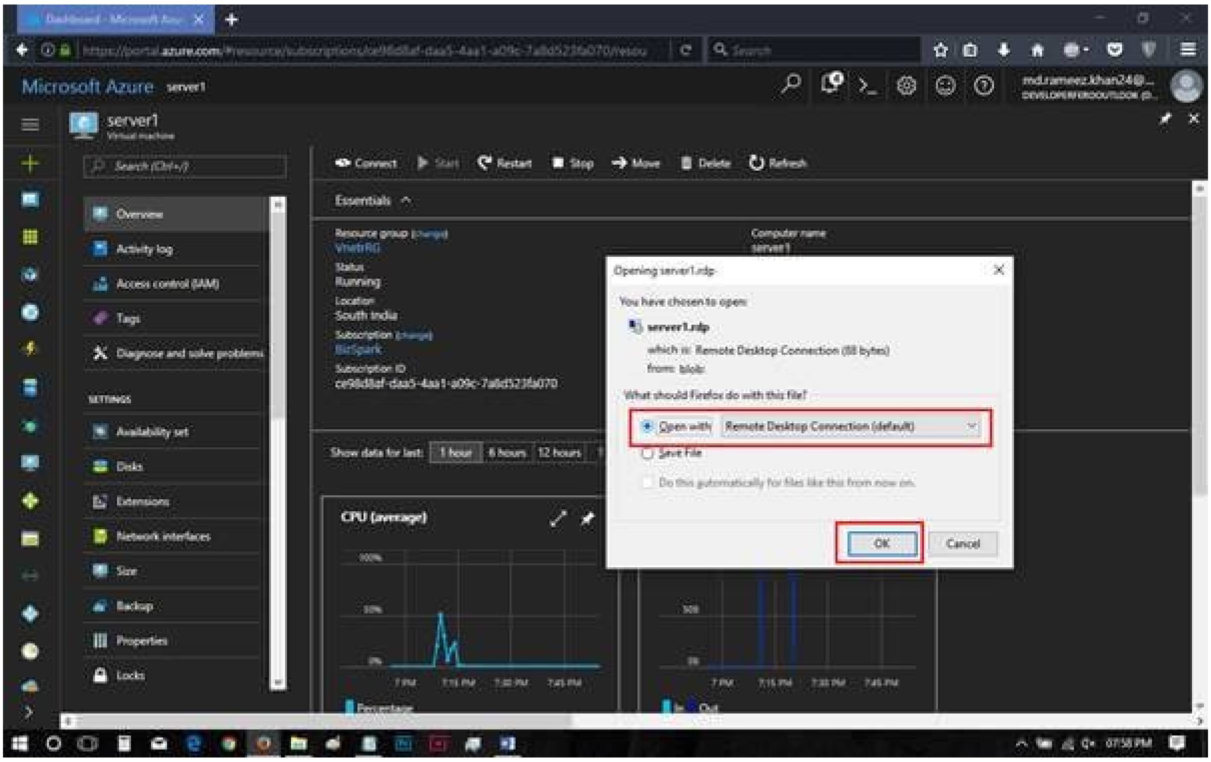
Size
Standard A1 (1 core, 1.75 GB memory)

Public IP address
13.71.118.29

Virtual network/subnet
hellovnet/Apps

DNS name
-

Save the downloadable RDP file and open it with the help of Remote Desktop Connection.



Opening server1.rdp

You have chosen to open:

server1.rdp

which is: Remote Desktop Connection (88 bytes)

from: blob:

What should Firefox do with this file?

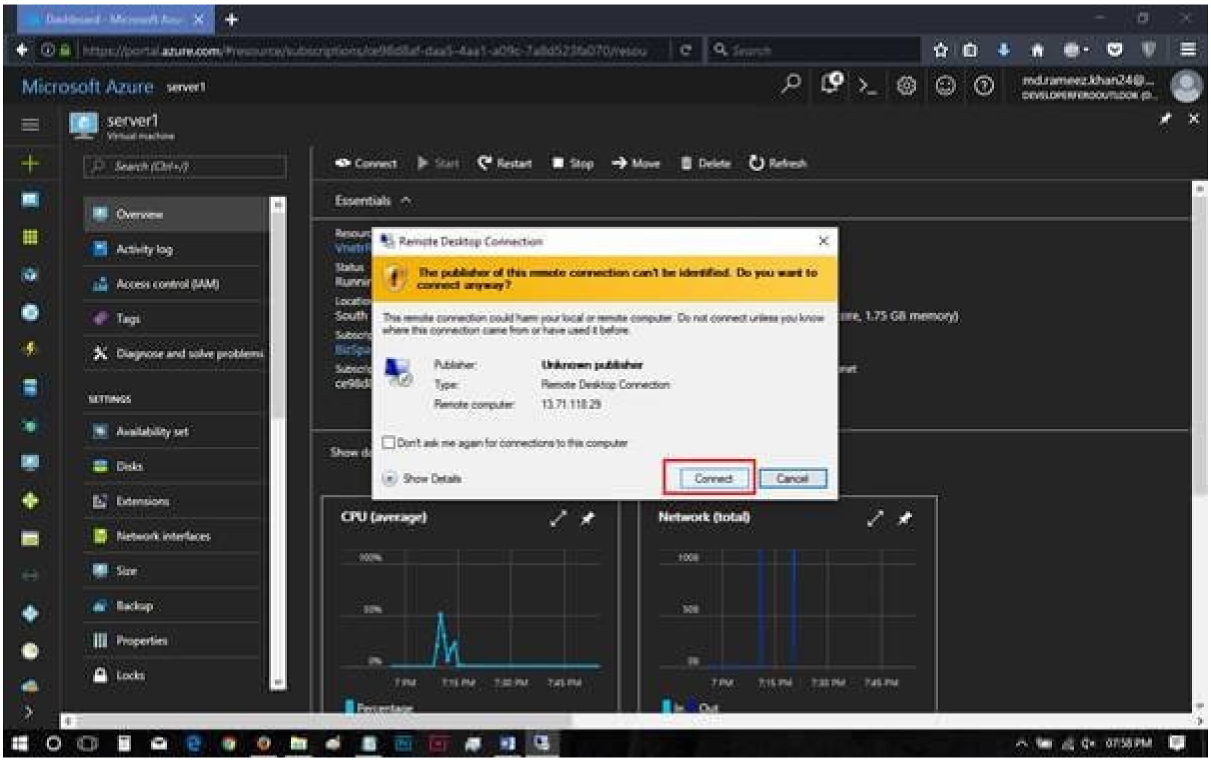
● Open with Remote Desktop Connection (default)

○ Save File

□ Do this automatically for files like this from now on.

OK Cancel

Click on "Connect" again in the RDP popup box and connect with the Virtual Machine.



Remote Desktop Connection

The publisher of this remote connection can't be identified. Do you want to connect anyway?

This remote connection could harm your local or remote computer. Do not connect unless you know where this connection came from or have used it before.

Publisher: Unknown publisher

Type: Remote Desktop Connection

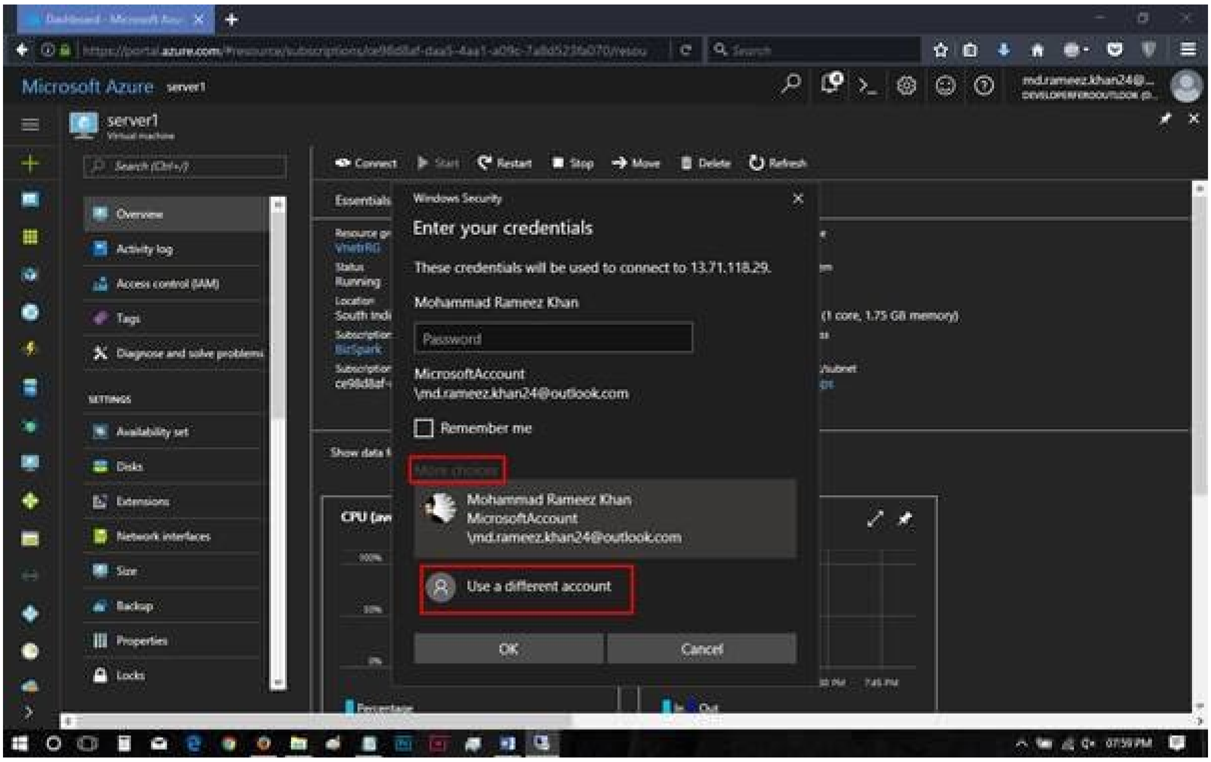
Remote computer: 13.71.118.29

□ Don't ask me again for connections to this computer

Show Details

Connect Cancel

Enter the credentials for the Virtual Machine to get connected.



Windows Security

Enter your credentials

These credentials will be used to connect to 13.71.118.29.

Mohammad Rameez Khan

Password

MicrosoftAccount
\md.rameez.khan24@outlook.com

□ Remember me

More choices

Mohammad Rameez Khan
MicrosoftAccount
\md.rameez.khan24@outlook.com

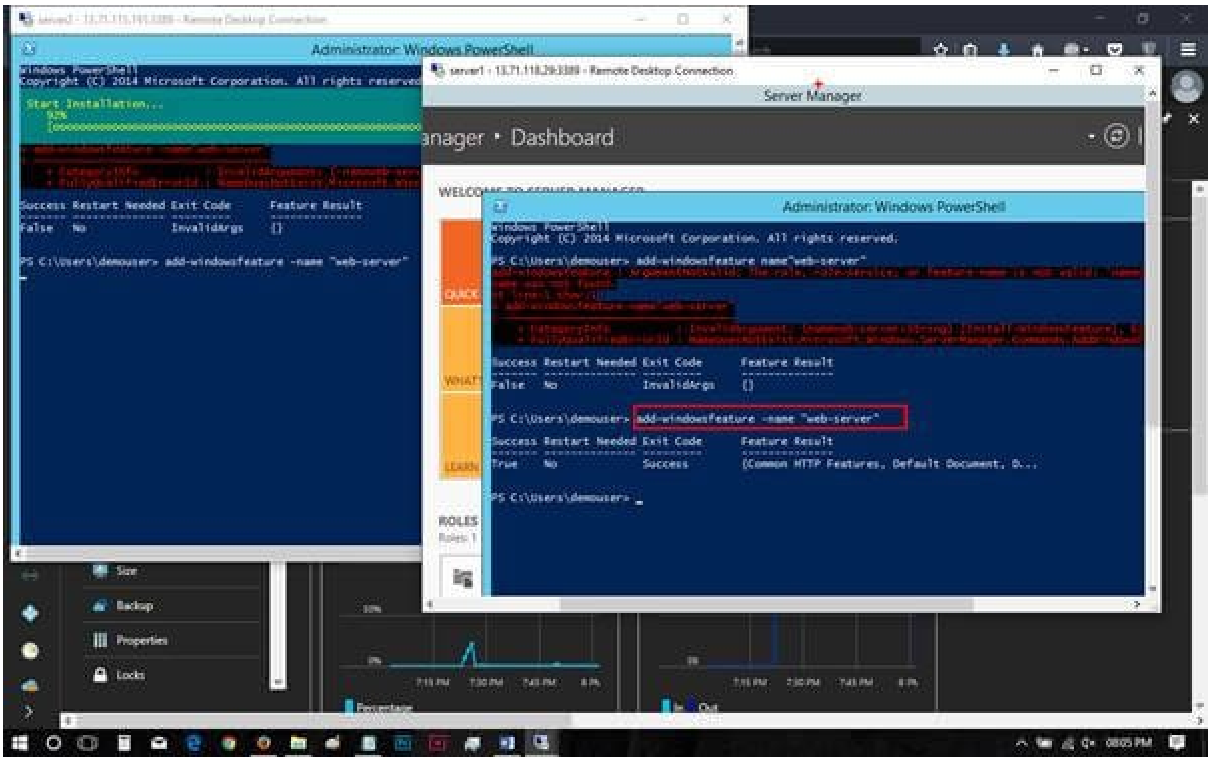
Use a different account

OK Cancel

Step 5

Connect with both the Server machines and install IIS using the below Powershell commands using Powershell.

Add-windowsfeature –name “web-server”



Administrator: Windows PowerShell

```
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.
 Start Installation...
    92%
    [ooooooooooooooooooooooooooooooooooooooooooooooooooooo

Success Restart Needed Exit Code      Feature Result
------- -------------- ---------      --------------
False   No             InvalidArgs    {}

PS C:\Users\demouser> add-windowsfeature -name "web-server"
```

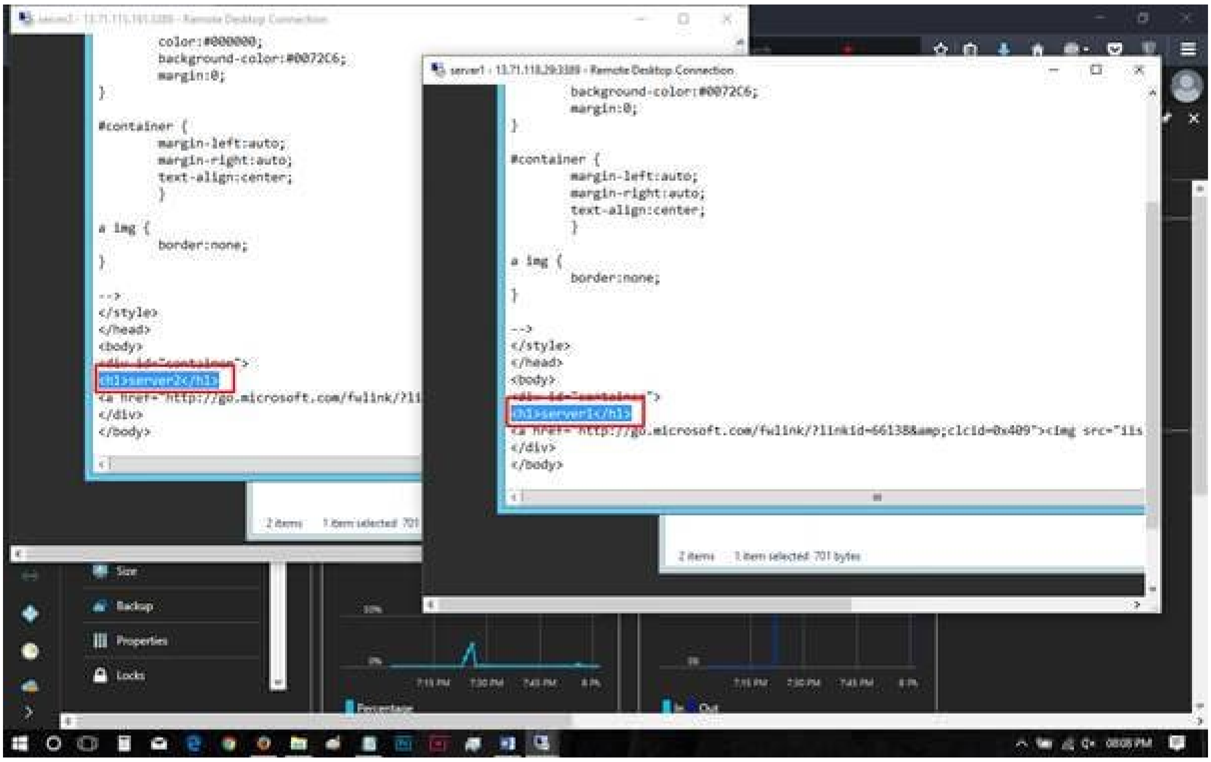
Administrator: Windows PowerShell

```
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\demouser> add-windowsfeature name"web-server"

Success Restart Needed Exit Code      Feature Result
------- -------------- ---------      --------------
False   No             InvalidArgs    {}

PS C:\Users\demouser> add-windowsfeature -name "web-server"

Success Restart Needed Exit Code      Feature Result
------- -------------- ---------      --------------
True    No             Success        {Common HTTP Features, Default Document, D...

PS C:\Users\demouser> _
```

Open the IIS HTML file from your C drive’s program files of both the Virtual Machine and add some lines on HTML file to represent the difference.

Location of HTML file could be – c/inetpub/wwwroot.iis.html

Save the HTML file on both of the Virtual Machine which has been created and close the same.



```
        color:#000000;
        background-color:#0072C6;
        margin:0;
}

#container {
        margin-left:auto;
        margin-right:auto;
        text-align:center;
        }

a img {
        border:none;
}

-->
</style>
</head>
<body>
<div id="container">
<h1>server2</h1>
<a href="http://go.microsoft.com/fwlink/?li
</div>
</body>
```

server1 - 13.71.118.29:3389 - Remote Desktop Connection

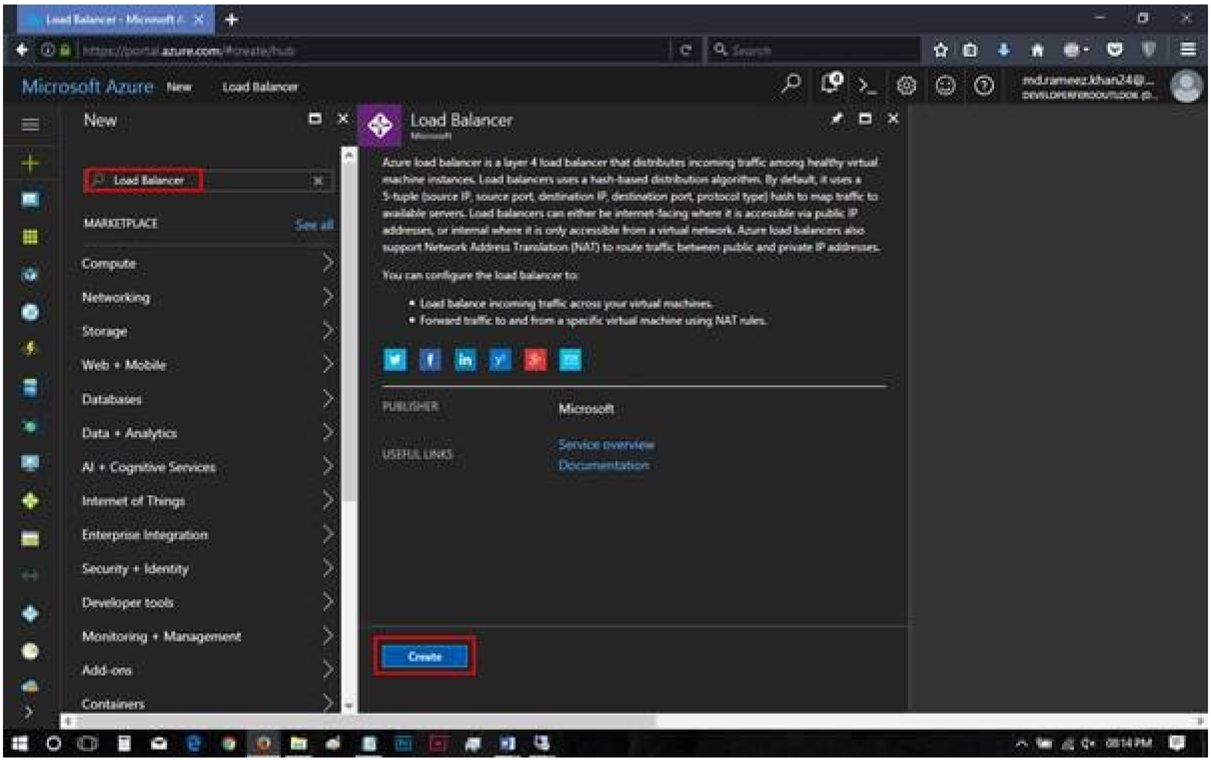
```
        background-color:#0072C6;
        margin:0;
}

#container {
        margin-left:auto;
        margin-right:auto;
        text-align:center;
        }

a img {
        border:none;
}

-->
</style>
</head>
<body>
<div id="container">
<h1>server1</h1>
<a href="http://go.microsoft.com/fwlink/?linkid=66138&amp;clcid=0x409"><img src="iis
</div>
</body>
```

2 items 1 item selected 701 bytes

Creating a Load Balancer to connect with the Server Machine.

Step 6

Move to the Azure portal and search for Load Balancer on it. Click on "Create".



Azure load balancer is a layer 4 load balancer that distributes incoming traffic among healthy virtual machine instances. Load balancers uses a hash-based distribution algorithm. By default, it uses a 5-tuple (source IP, source port, destination IP, destination port, protocol type) hash to map traffic to available servers. Load balancers can either be internet-facing where it is accessible via public IP addresses, or internal where it is only accessible from a virtual network. Azure load balancers also support Network Address Translation (NAT) to route traffic between public and private IP addresses.

You can configure the load balancer to:

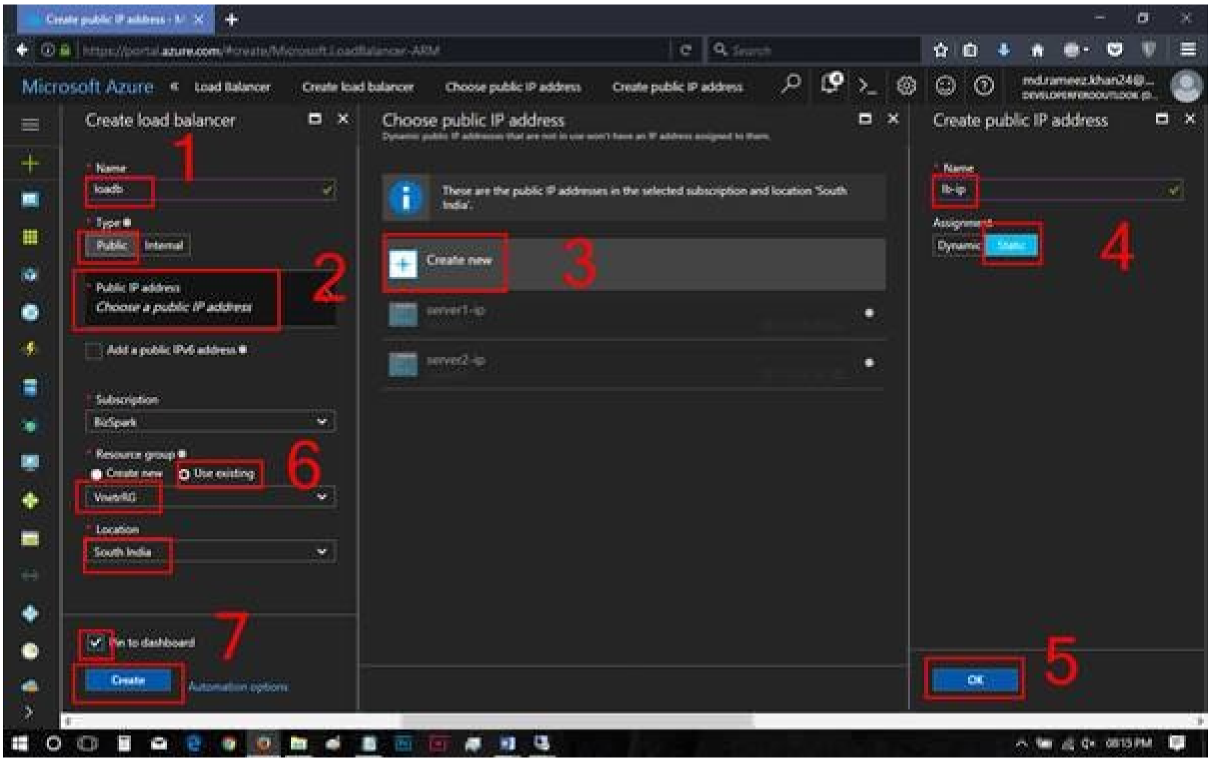
- Load balance incoming traffic across your virtual machines.
- Forward traffic to and from a specific virtual machine using NAT rules.

PUBLISHER Microsoft

USEFUL LINKS Service overview
Documentation

- Name the Load Balancer here.
- Specify the type of Load Balancer either as a Public one or an internal one as such.
- Set the Public IP Address for the load balancer, supposed to be a static one and it should be named after it.
- Select the Subscription and specify the Resource Group of an existing one where the V-Net is present.
- Select the Location of where the Load Balancer has to be deployed.

- Click on "Create" to create the Load Balancer now.



Create load balancer

Name: loadb

Type: Public | Internal

Public IP address: Choose a public IP address

□ Add a public IPv6 address

Subscription: BizSpark

Resource group: ○ Create new ● Use existing

VnetRG

Location: South India

☑ Pin to dashboard

Create | Automation options

Choose public IP address

These are the public IP addresses in the selected subscription and location 'South India'.

Create new

server1-ip

server2-ip

Create public IP address

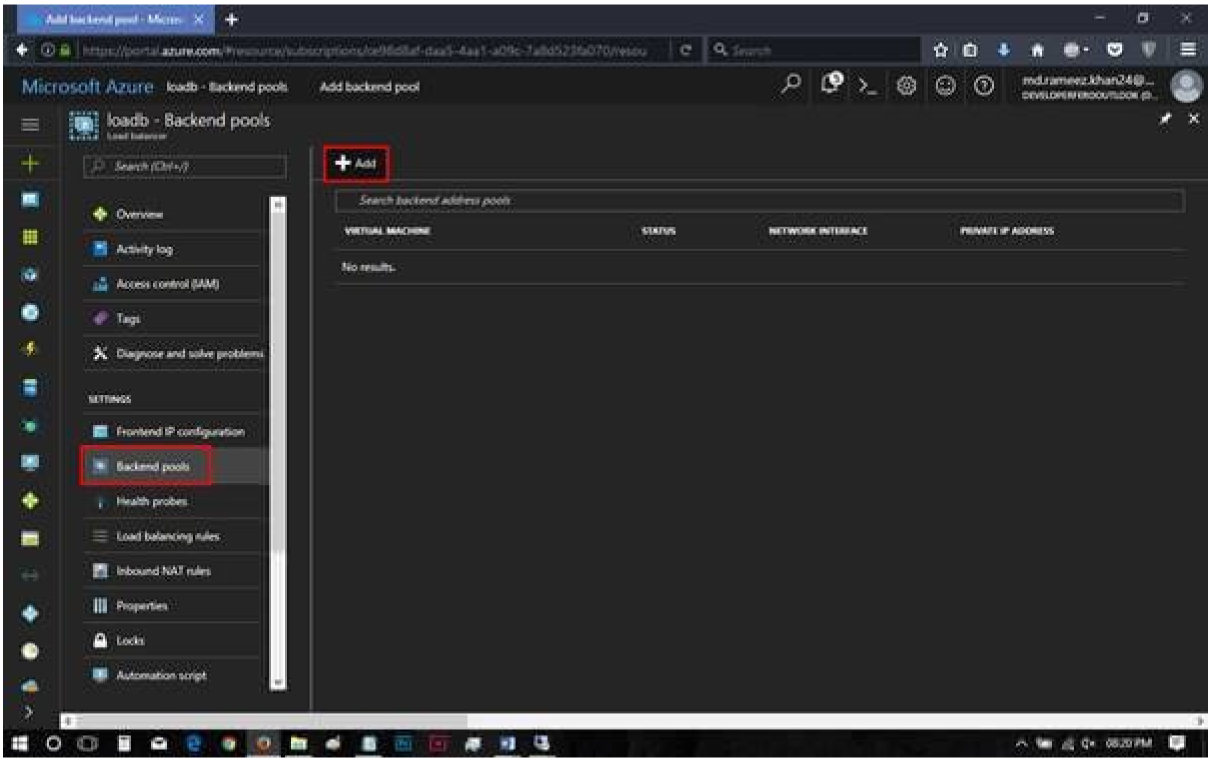
Name: lb-ip

Assignment: Dynamic | Static

OK

Step 7

Add a back-end pool towards the Load Balancer which has been created.



loadb - Backend pools

Load balancer

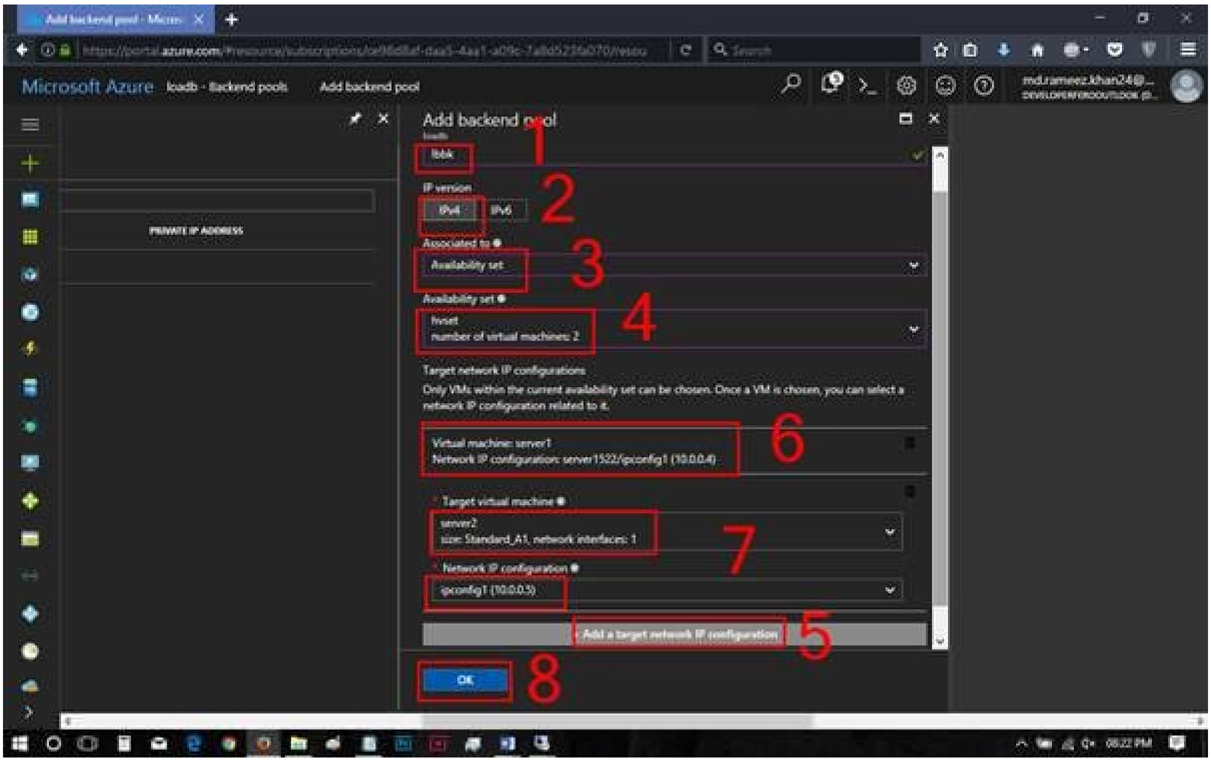
Add

Search backend address pools

VIRTUAL MACHINE	STATUS	NETWORK INTERFACE	PRIVATE IP ADDRESS
No results.			

1. Name the back-end pool.
2. Select the IP version of the backend pool for IPV4.
3. Associated to the Availability Set which was configured on the previous demo.
4. Specify the availability sets over here.
5. Add another target IP network configuration.
6. Select the new Virtual Machine for target.
7. Specify the Network IP configuration.

8. Click on "OK" to add the Back-end pool.



Add backend pool

loadb

lbbk

IP version: IPv4

Associated to: Availability set

Availability set: hvset, number of virtual machines: 2

Target network IP configurations

Only VMs within the current availability set can be chosen. Once a VM is chosen, you can select a network IP configuration related to it.

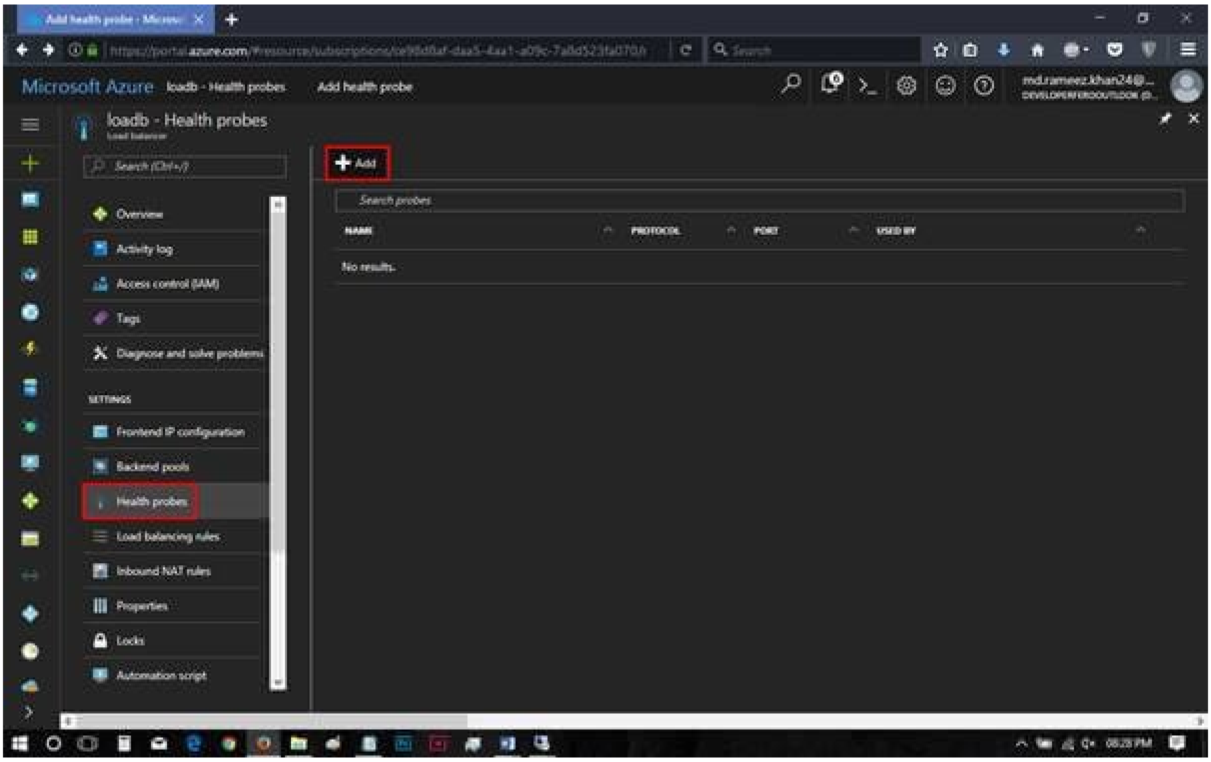
Virtual machine: server1
Network IP configuration: server1522/ipconfig1 (10.0.0.4)

Target virtual machine: server2, size: Standard_A1, network interfaces: 1

Network IP configuration: ipconfig1 (10.0.0.5)

Step 8

Add Health Probes over here. Click on "Add" to add the health probes.

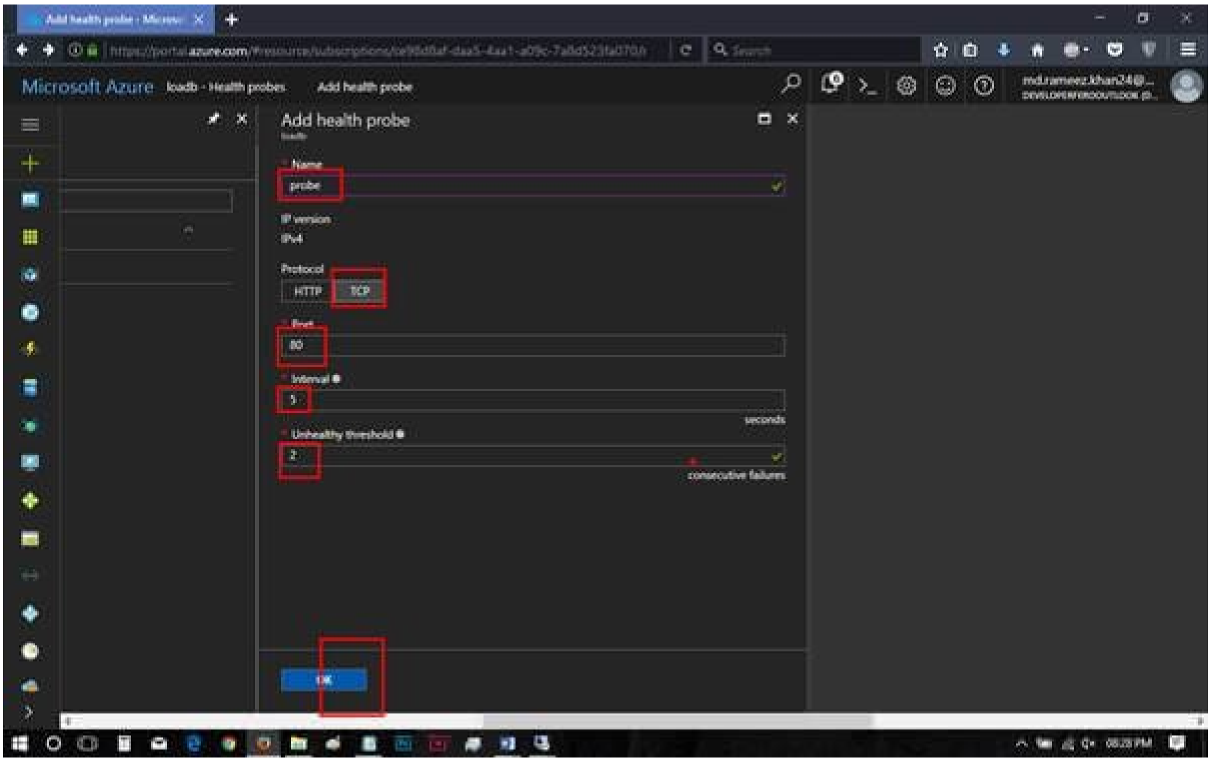


loadb - Health probes

Load balancer

NAME	PROTOCOL	PORT	USED BY
No results.			

- Name the Health Probe.
- Select the Protocol as TCP.
- Set the port number for 80.
- Set interval timing for 5 seconds.
- Set unhealthy threshold for 2
- Click on OK to add the Health Probes.



Add health probe

loadb

* Name: probe

IP version: IPv4

Protocol: HTTP TCP

* Port: 80

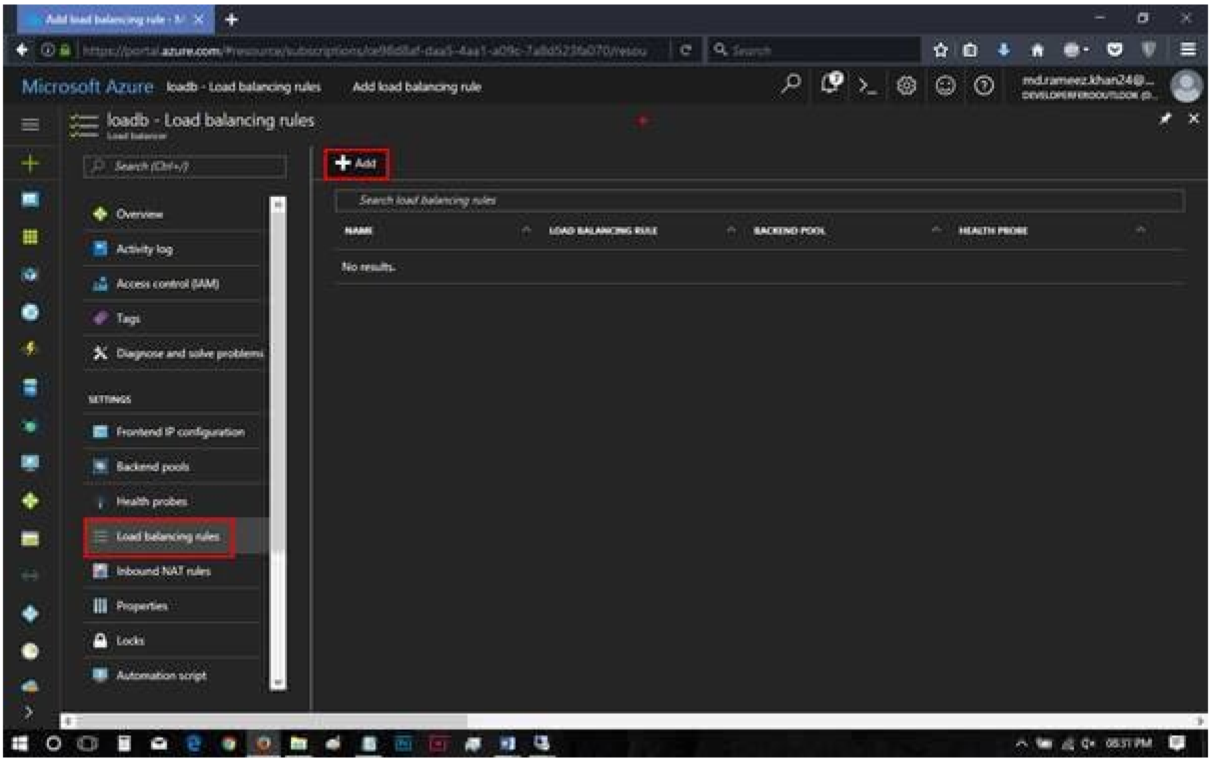
* Interval: 5 seconds

* Unhealthy threshold: 2 consecutive failures

OK

Step 9

Adding Load Balancer Rules.



loadb - Load balancing rules

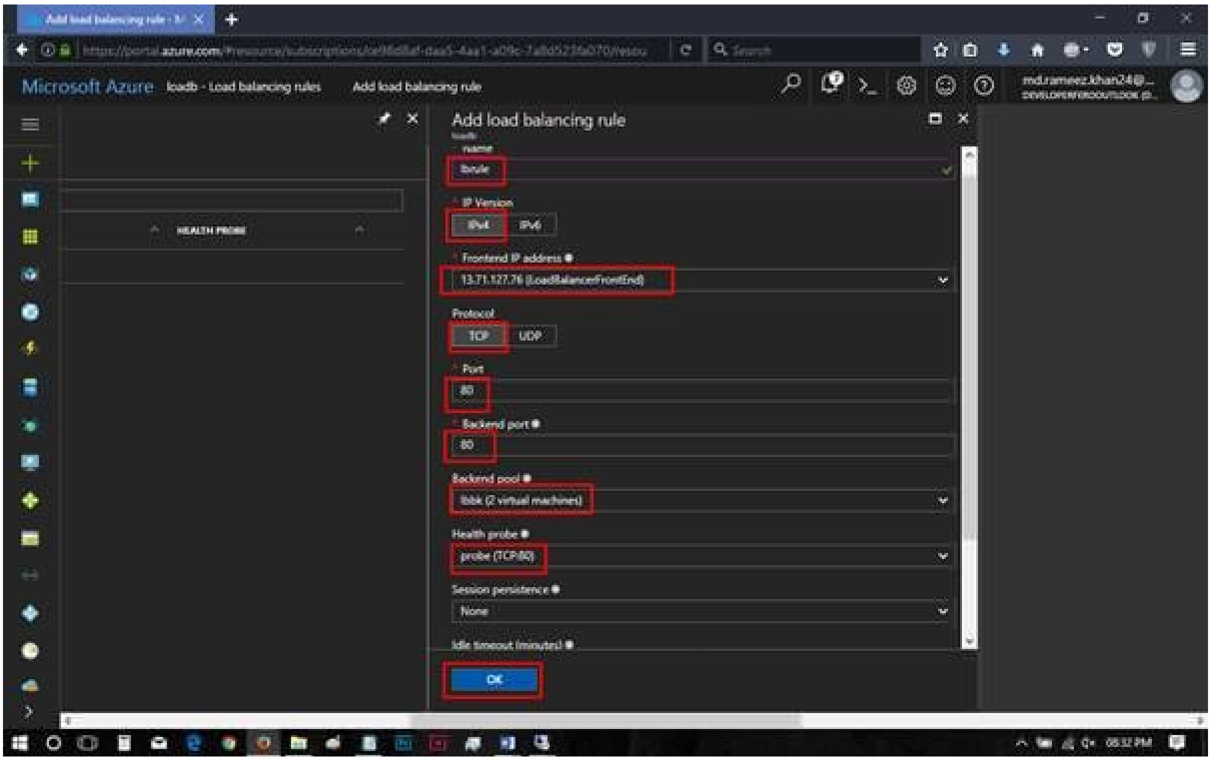
Load balancer

+ Add

Search load balancing rules

NAME	LOAD BALANCING RULE	BACKEND POOL	HEALTH PROBE
No results.			

- Name the load balancer.
- Set IP Version as IPv4.
- Specify the Frontend IP address.
- Protocol for TCP.
- Port as 80.
- Backend port for 80.
- Backend pool of which was created in previous step.
- Health Probe again which was created in the previous step.
- Now, click on "OK" to add the Load Balancing Rules.



Add load balancing rule

Name: lbrule

IP Version: IPv4 | IPv6

Frontend IP address: 13.71.127.76 (LoadBalancerFrontEnd)

Protocol: TCP | UDP

Port: 80

Backend port: 80

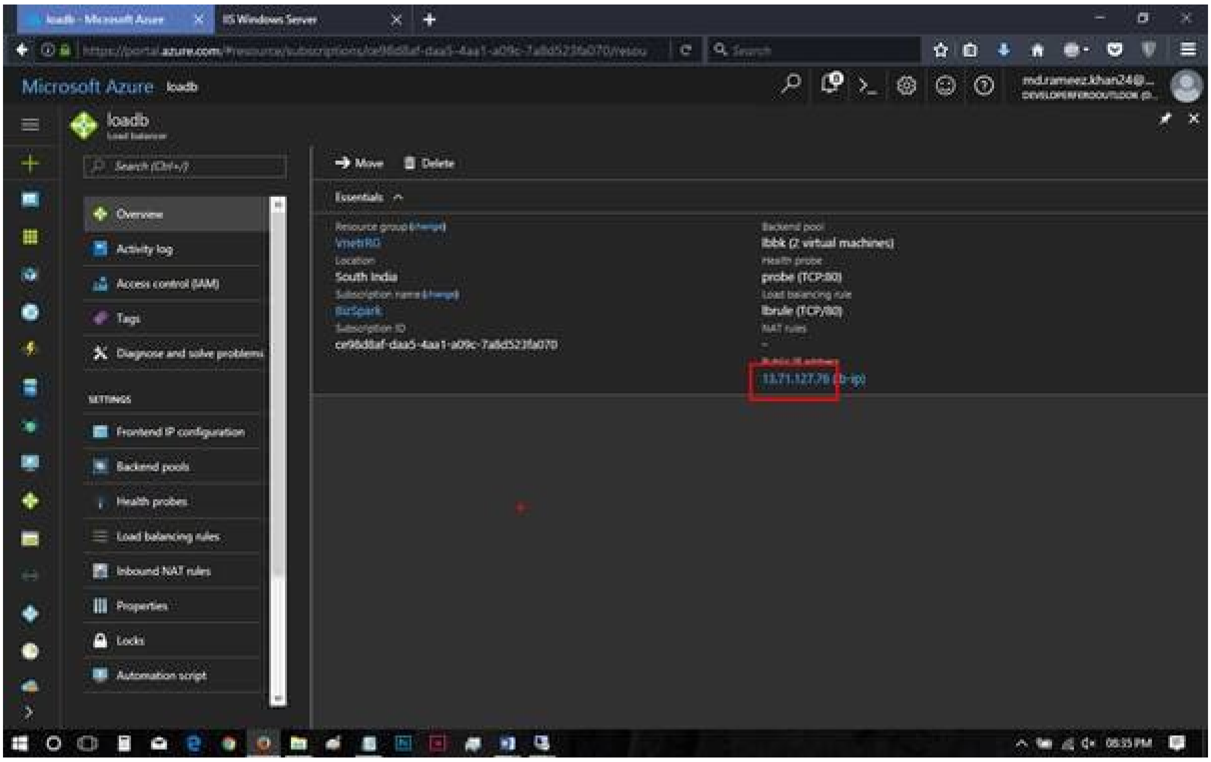
Backend pool: lbbk (2 virtual machines)

Health probe: probe (TCP:80)

Session persistence: None

Idle timeout (minutes)

Now, here we will be getting a Public IP address on the Overview blade.



Resource group (change): VnetRG

Location: South India

Subscription name (change): BizSpark

Subscription ID: ce98d8af-daa5-4aa1-a09c-7a8d523fa070

Backend pool: lbbk (2 virtual machines)

Health probe: probe (TCP:80)

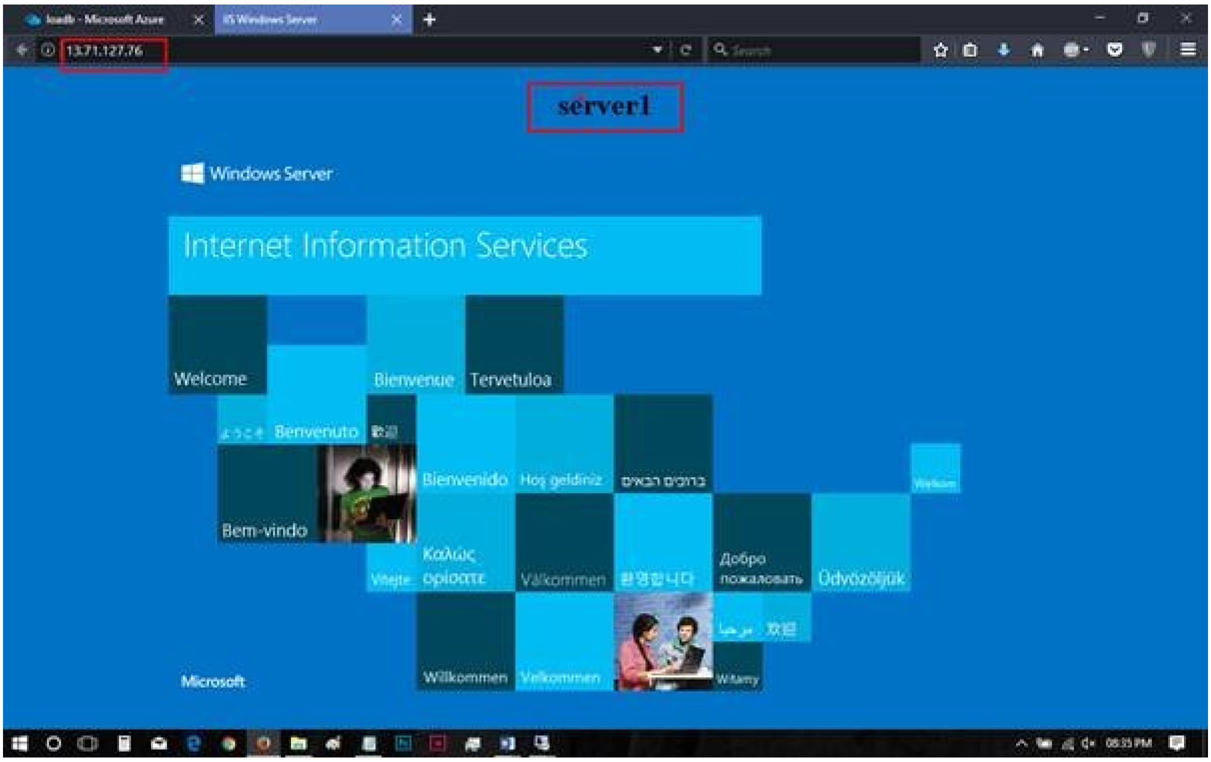
Load balancing rule: lbrule (TCP/80)

NAT rules: -

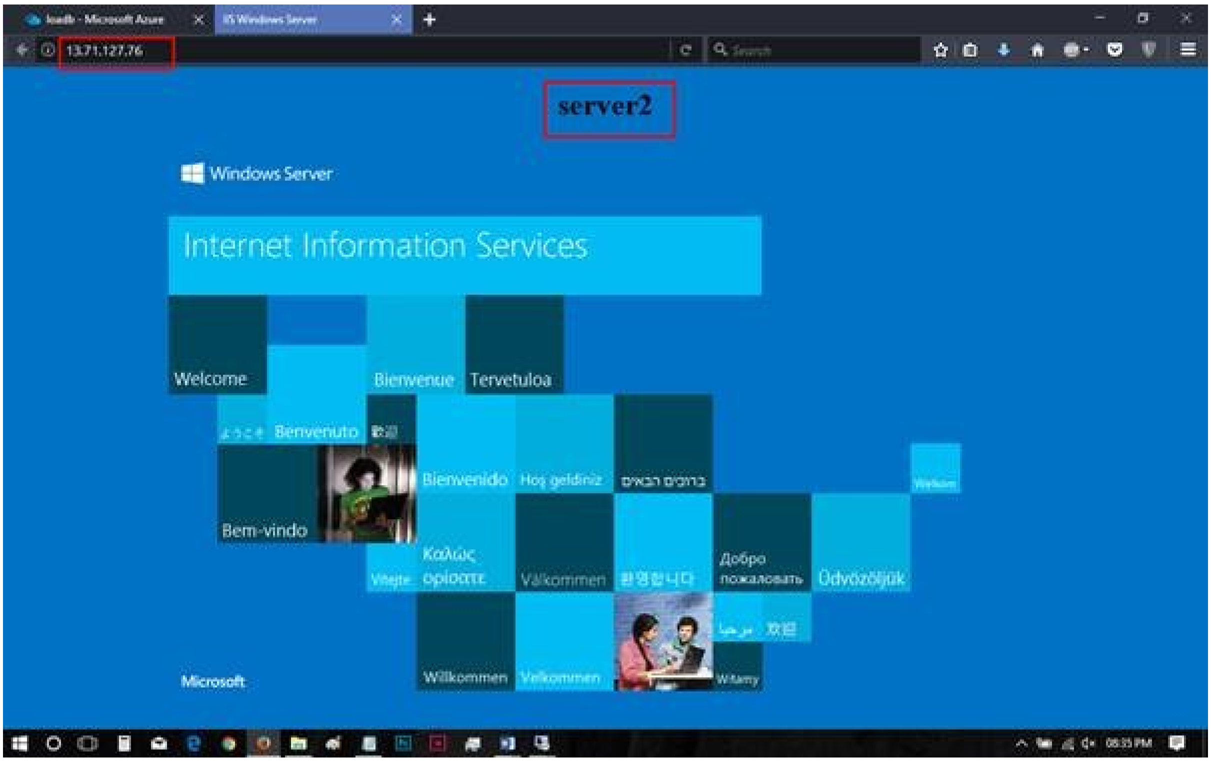
Public IP address: 13.71.127.76 (lb-ip)

Click on the Public IP address or either copy and paste it on a new tab of the browser. We can find that the application gets accessed from both the servers alternatively depending on the load.

In this below image, the application gets accessed from Server 1.



Now, when we refresh the page, the application gets accessed from the another server machine of 2.



Thank you for using C# Corner