Try it out Objective

Use this hands-on to create an Azure VM scale set and use it to deploy a custom application

The goal

The following are the goals of this hands-on

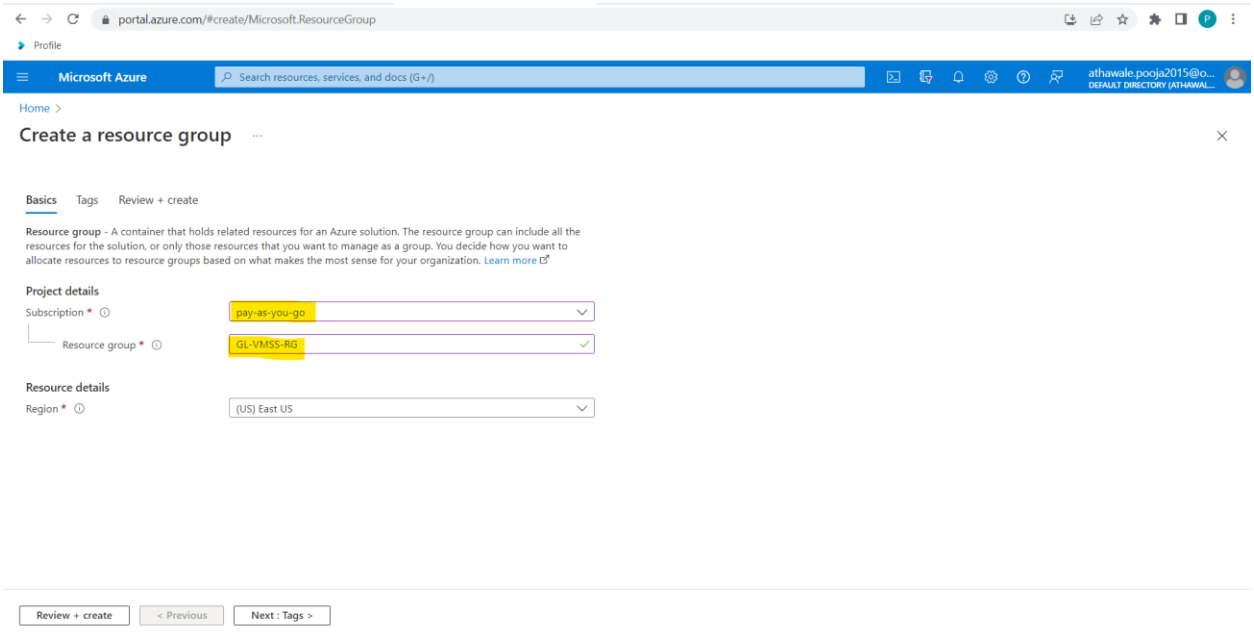
1. Create a resource group.
2. Understand the process of creating a virtual machine scale set
3. Deploy a custom application using a bootstrap script
4. Create firewall rules to allow port 22 and 80
5. Access the custom application using a web browser

A. Hands-On: Create resource group

1. Open the Azure management console at https://portal.azure.com/?quickstart=True#home (you will be required to sign in using your free account)
2. In the Azure search bar paste the value as mentioned below and press enter.

   Resource groups
3. Click on Create
   a. Select Subscription as **Free Trial/Pay-As-You-Go**
   b. Resource group: paste the value as mentioned below

      GL-VMSS-RG
   c. Region leave the default value
   d. Click **Review + Create**
   e. Click **Create**

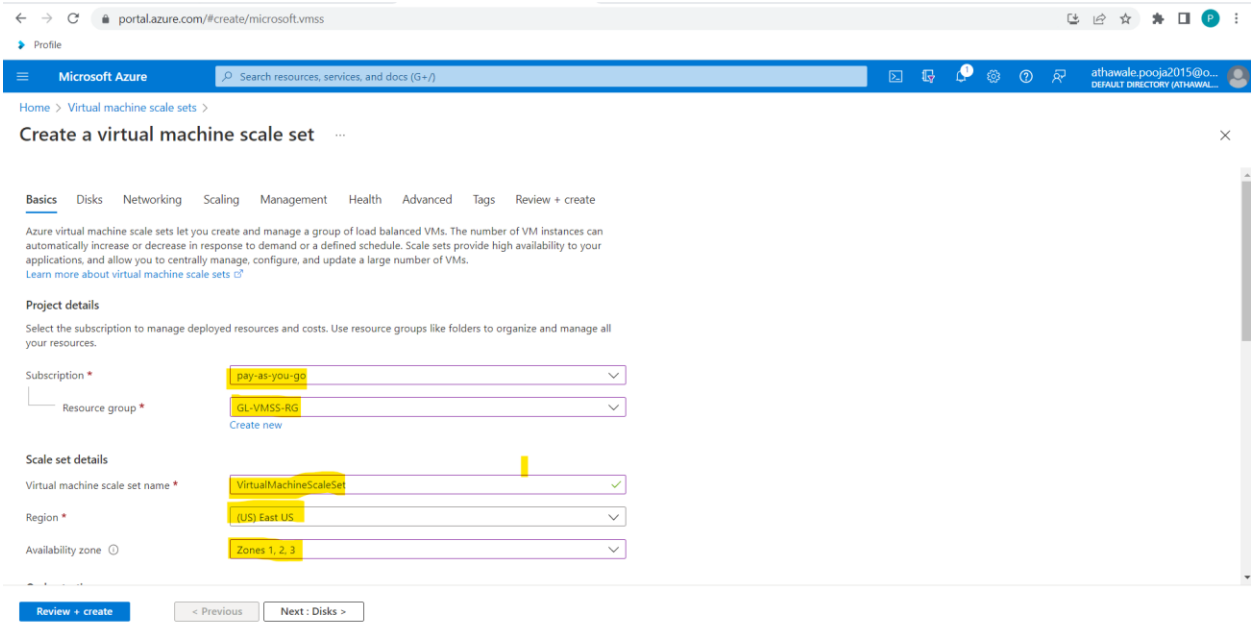


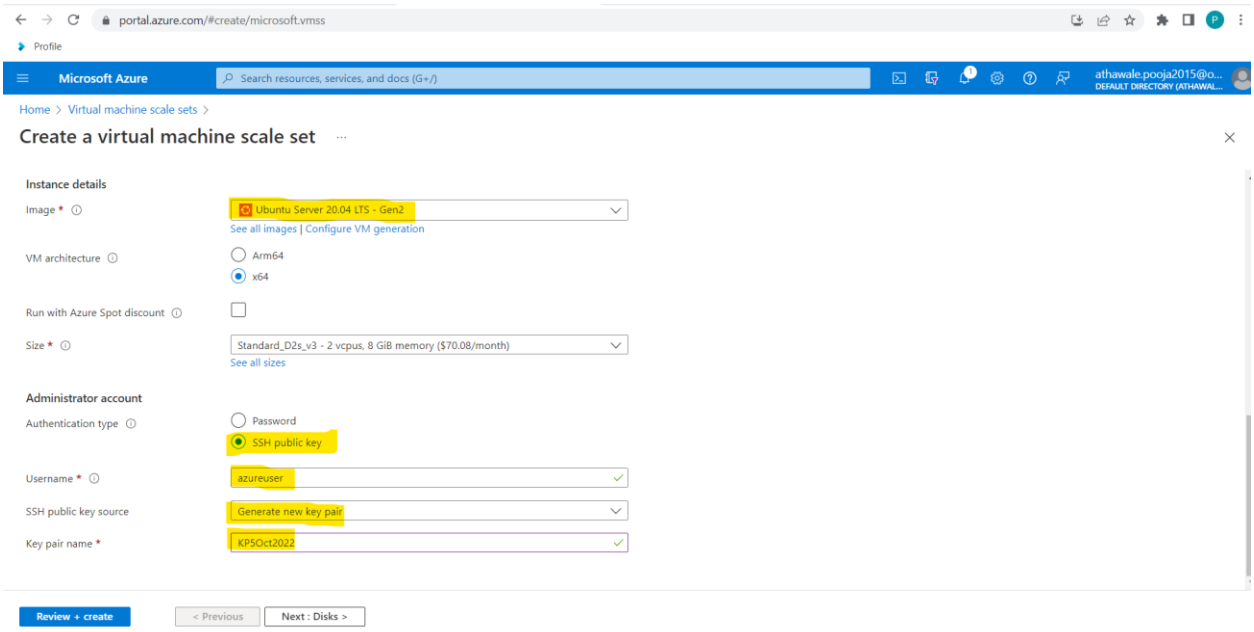
B. Hands-On: Create Virtual Machine Scale Set : Basics

1. In the Azure search bar paste the value as mentioned below and press enter.

   Virtual Machine Scale Sets

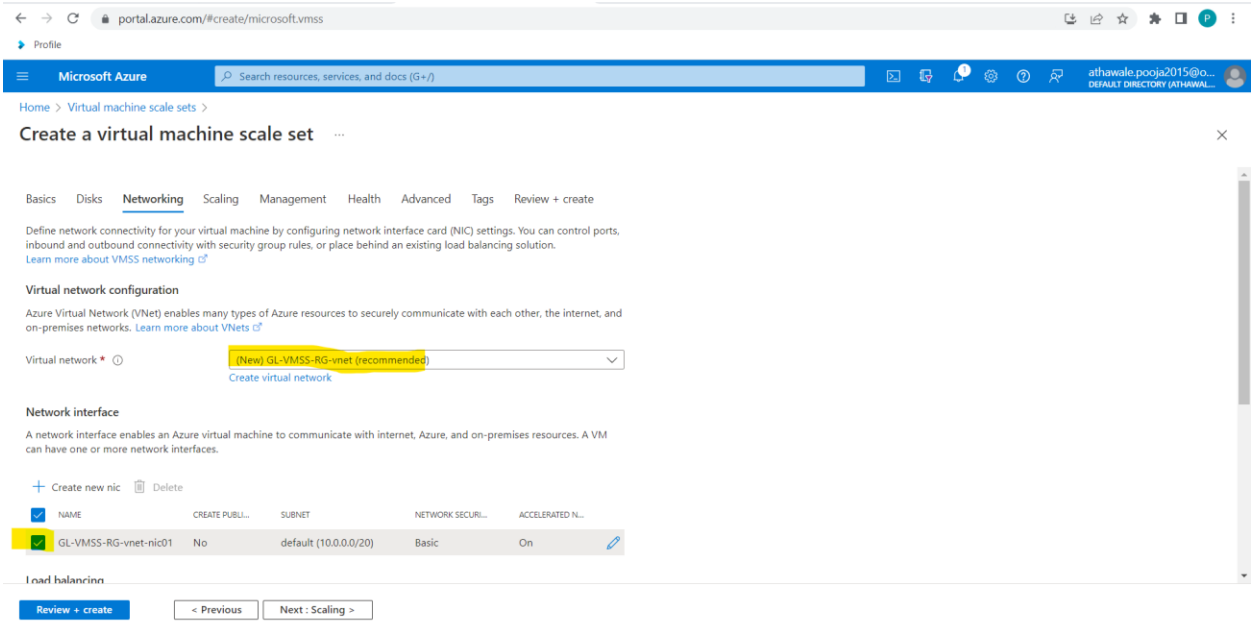
2. Click on **Create**
   a. Select Subscription as **Free Trial**
   b. Resource group as **GL-VMSS-RG** (should be already by default)
   c. Virtual Machine Scale Set Name : Provide a name of your choice
   d. Region : Select East US
   e. Availability Zone : Select All zones available in the drop down
   f. Image : Select Ubuntu 20.04
   g. Authentication type : SSH public key
   h. Username : azureuser
   i. SSH source : Generate New Key Pair
   j. Key Pair Name : Enter a name of your choice

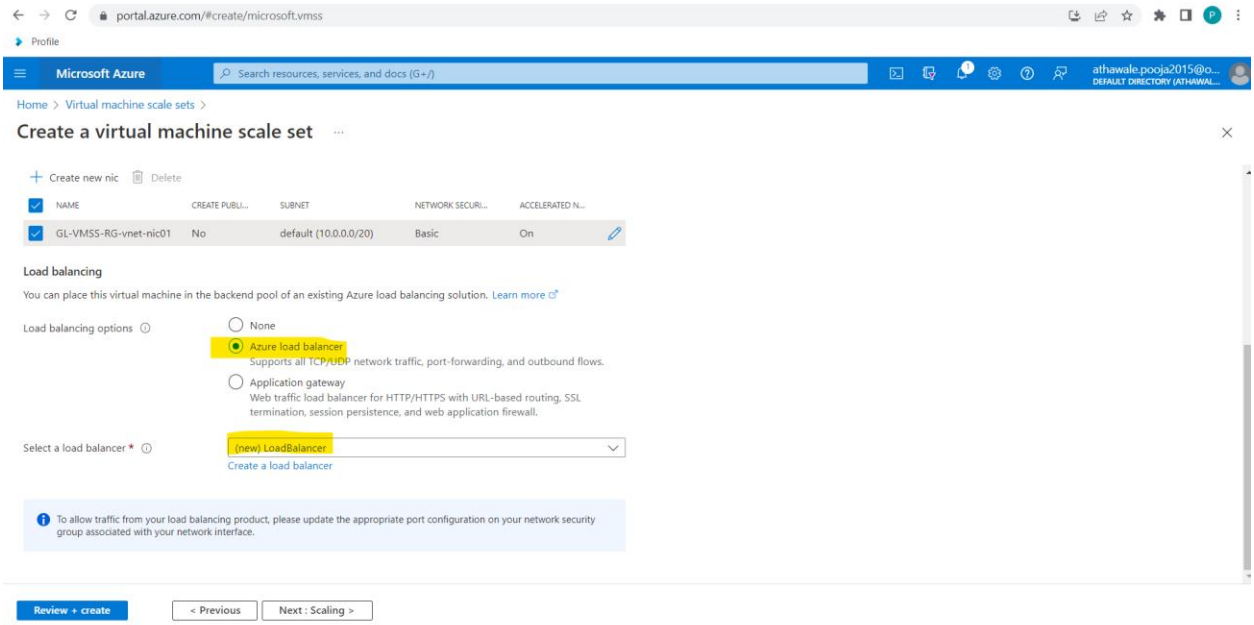




C. Hands-On: Create Virtual Machine Scale Set : Networking

1. Use the following options in the networking tab
    a. Virtual Network : New (should be selected by default)
    b. Select the interface available under the Network Interface section using the checkbox
    c. Check the option : Use a Load Balancer
    d. Load Balancing options : Load Balancer
    e. Select a Load Balancer : New (should be selected by default)
    f. Select a BackEnd Pool : New (should be selected by default)
    g. Click **Next : Scaling**


portal.azure.com/#create/microsoft.vmss
Profile
Microsoft Azure
Search resources, services, and docs (G+/)
athawale.pooja2015@o...
DEFAULT DIRECTORY (ATHAWAL...
Home > Virtual machine scale sets >
Create a virtual machine scale set
Basics Disks Networking Scaling Management Health Advanced Tags Review + create
Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.
Learn more about VMSS networking
Virtual network configuration
Azure Virtual Network (VNet) enables many types of Azure resources to securely communicate with each other, the internet, and on-premises networks. Learn more about VNets
Virtual network *
(New) GL-VMSS-RG-vnet (recommended)
Create virtual network
Network interface
A network interface enables an Azure virtual machine to communicate with internet, Azure, and on-premises resources. A VM can have one or more network interfaces.
Create new nic
Delete
NAME
CREATE PUBLI...
SUBNET
NETWORK SECURI...
ACCELERATED N...
GL-VMSS-RG-vnet-nic01
No
default (10.0.0.0/20)
Basic
On
Load balancing
Review + create
< Previous
Next : Scaling >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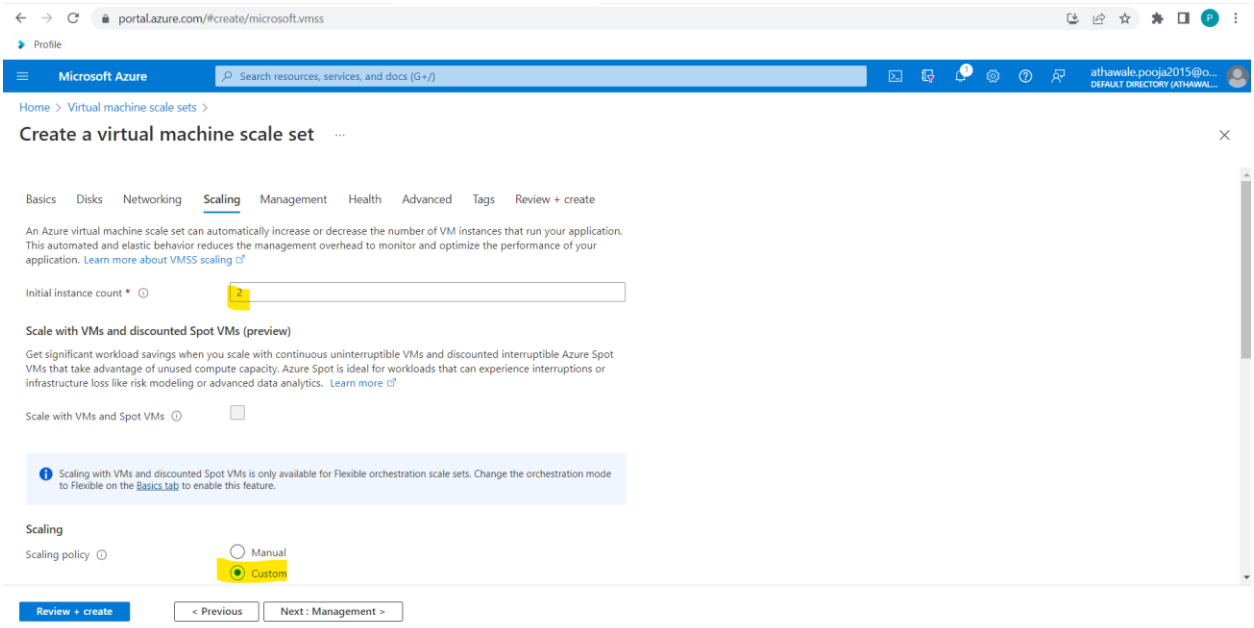
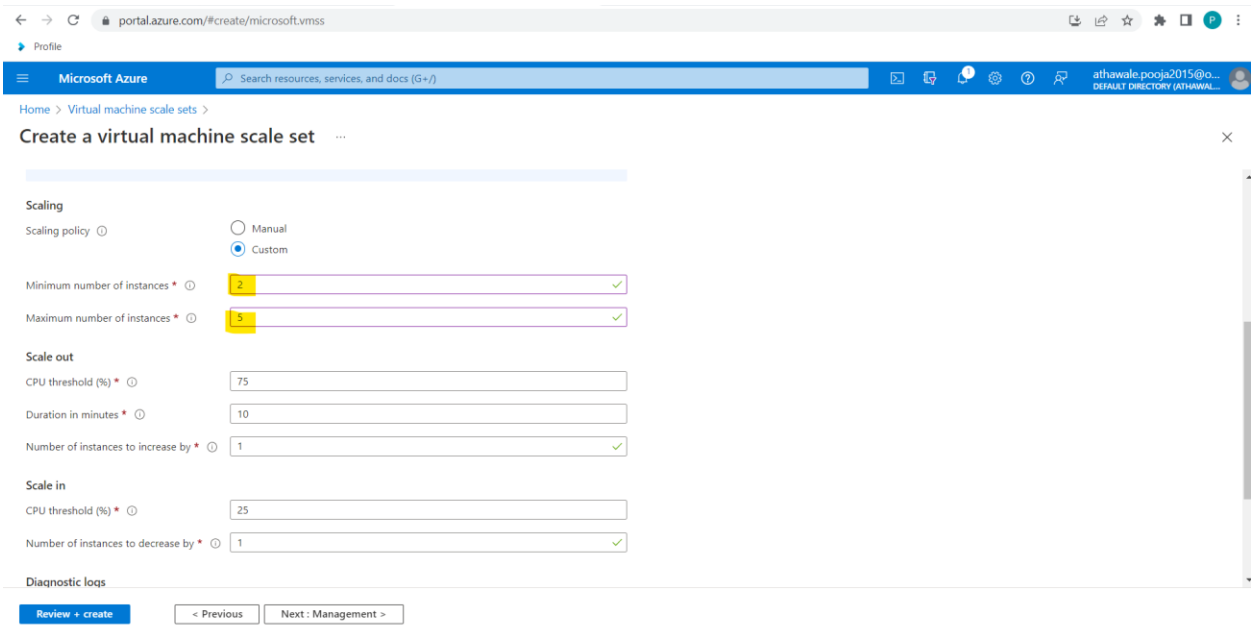
DEFAULT DIRECTORY (ATHAWAL...
Home > Virtual machine scale sets >
Create a virtual machine scale set
Create new nic
Delete
NAME
CREATE PUBLI...
SUBNET
NETWORK SECURI...
ACCELERATED N...
GL-VMSS-RG-vnet-nic01
No
default (10.0.0.0/20)
Basic
On
Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. Learn more
Load balancing options
None
Azure load balancer
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
Application gateway
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.
Select a load balancer *
(new) LoadBalancer
Create a load balancer
To allow traffic from your load balancing product, please update the appropriate port configuration on your network security group associated with your network interface.
Review + create
< Previous
Next : Scaling >

D. Hands-On: Create Virtual Machine Scale Set : Scaling

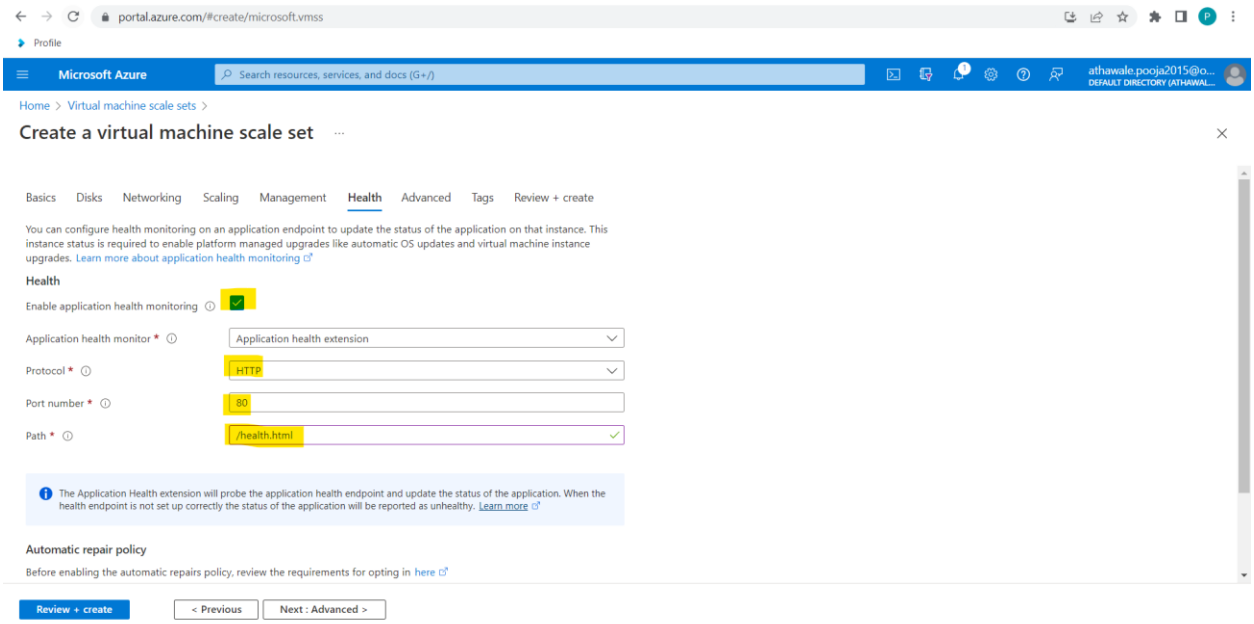
1. Use the following options in the Scaling tab
    a. Initial Instance Count : 2
    b. Scaling Policy : Custom
    c. Minimum instances : 2
    d. Maximum instances : 5
    e. Rest of the options can be left to their default values
2. Click on **Next : Management.**
3. Use the default options and click on **Next : Health**





E. Hands-On: Create Virtual Machine Scale Set : Health

a. Check the box " Enable application health monitoring"
b. Protocol : HTTP
c. Port number : 80
d. Path : /health.html
e. Click on **Next : Advanced**

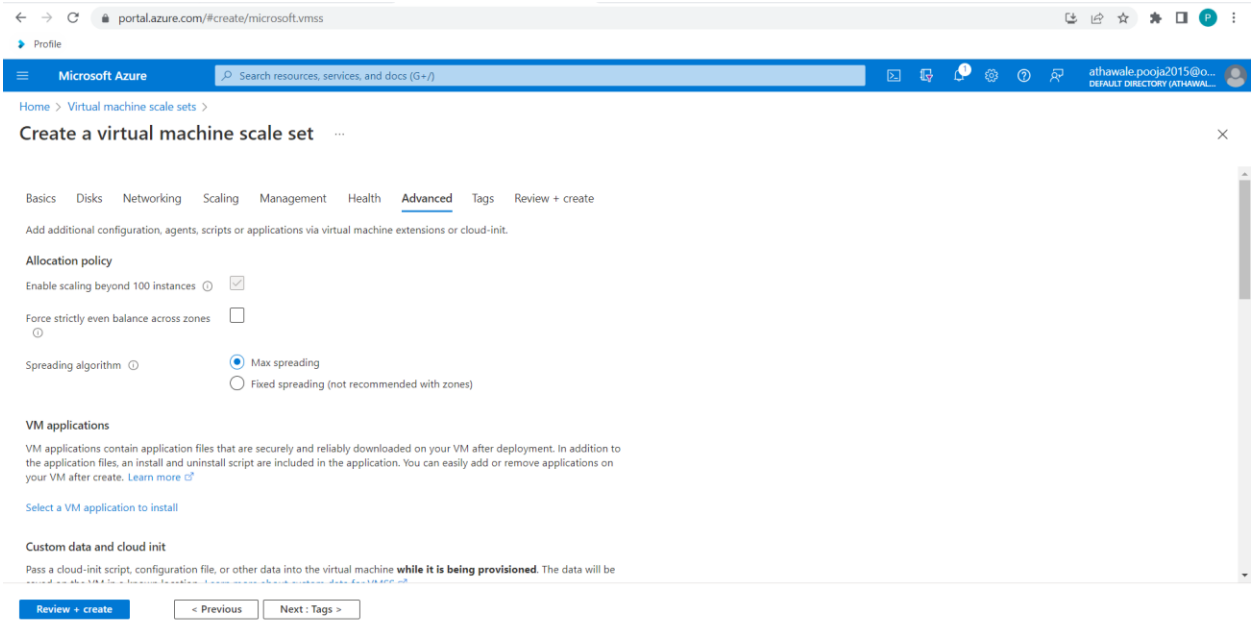


F. Hands-On: Create Virtual Machine Scale Set : Advanced

a. Under the field Custom Data, enter the following script (As always, please be careful while copying the script)

```
#!/bin/bash
APP_NAME=LiftShift-Application
apt update -y && apt -y install python3-pip zip
cd /opt
wget https://d6opu47qoi4ee.cloudfront.net/loadbalancer/simuapp-v1.zip
unzip simuapp-v1.zip
rm -f simuapp-v1.zip
sed -i "s=MOD_APPLICATION_NAME=$APP_NAME=g" templates/index.html
pip3 install -r requirements.txt
nohup python3 simu_app.py >> application.log 2>&1 &
```

b. The rest of the options can be left to their default values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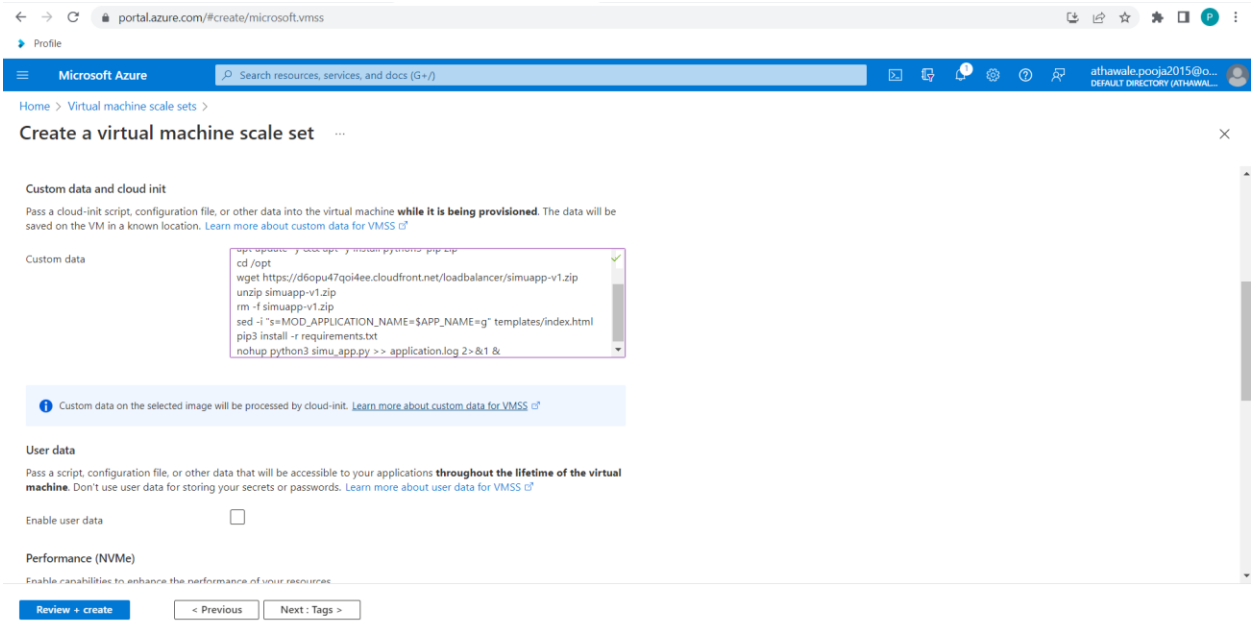
Home > Virtual machine scale sets >
Create a virtual machine scale set
Basics Disks Networking Scaling Management Health Advanced Tags Review + create
Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.
Allocation policy
Enable scaling beyond 100 instances
Force strictly even balance across zones
Spreading algorithm
Max spreading
Fixed spreading (not recommended with zones)
VM applications
VM applications contain application files that are securely and reliably downloaded on your VM after deployment. In addition to the application files, an install and uninstall script are included in the application. You can easily add or remove applications on your VM after create. Learn more
Select a VM application to install
Custom data and cloud init
Pass a cloud-init script, configuration file, or other data into the virtual machine while it is being provisioned. The data will be
Review + create
< Previous
Next : Tags >


portal.azure.com/#create/microsoft.vmss
Profile
Microsoft Azure
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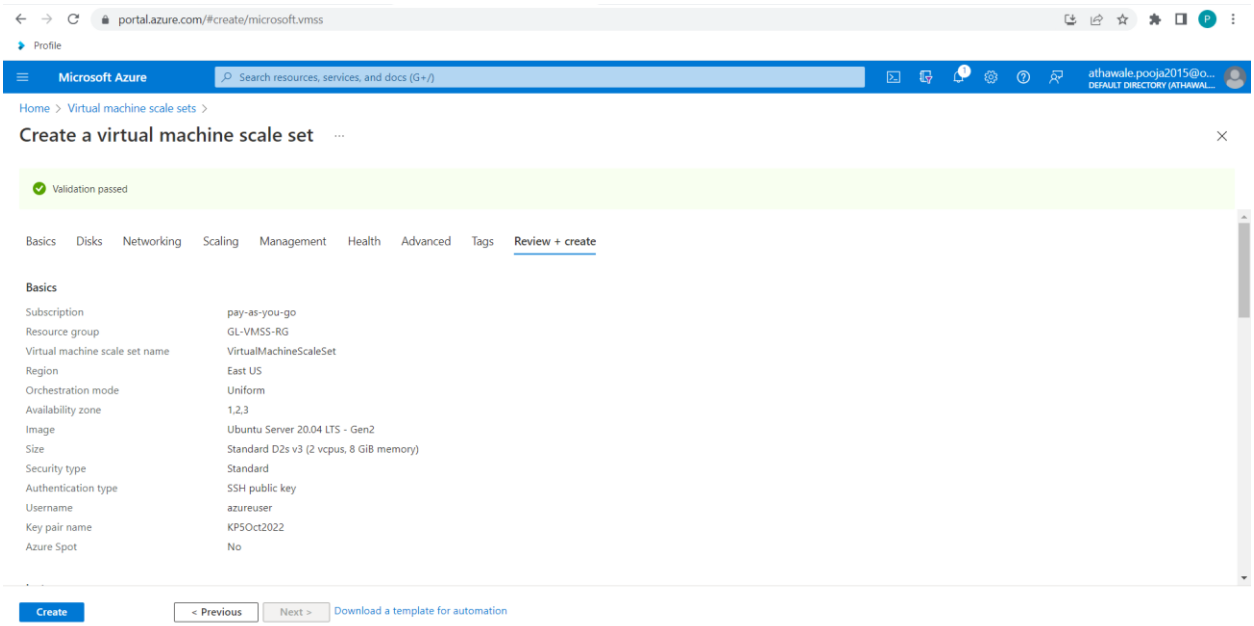
DEFAULT DIRECTORY (ATHAWAL...
Home > Virtual machine scale sets >
Create a virtual machine scale set
Custom data and cloud init
Pass a cloud-init script, configuration file, or other data into the virtual machine while it is being provisioned. The data will be saved on the VM in a known location. Learn more about custom data for VMSS
Custom data
cd /opt
wget https://d6opu47qoi4ee.cloudfront.net/loadbalancer/simuapp-v1.zip
unzip simuapp-v1.zip
rm -f simuapp-v1.zip
sed -i "s=MOD_APPLICATION_NAME=$APP_NAME=g" templates/index.html
pip3 install -r requirements.txt
nohup python3 simu_app.py >> application.log 2>&1 &
Custom data on the selected image 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 VMSS
Enable user data
Performance (NVMe)
Review + create
< Previous
Next : Tags >



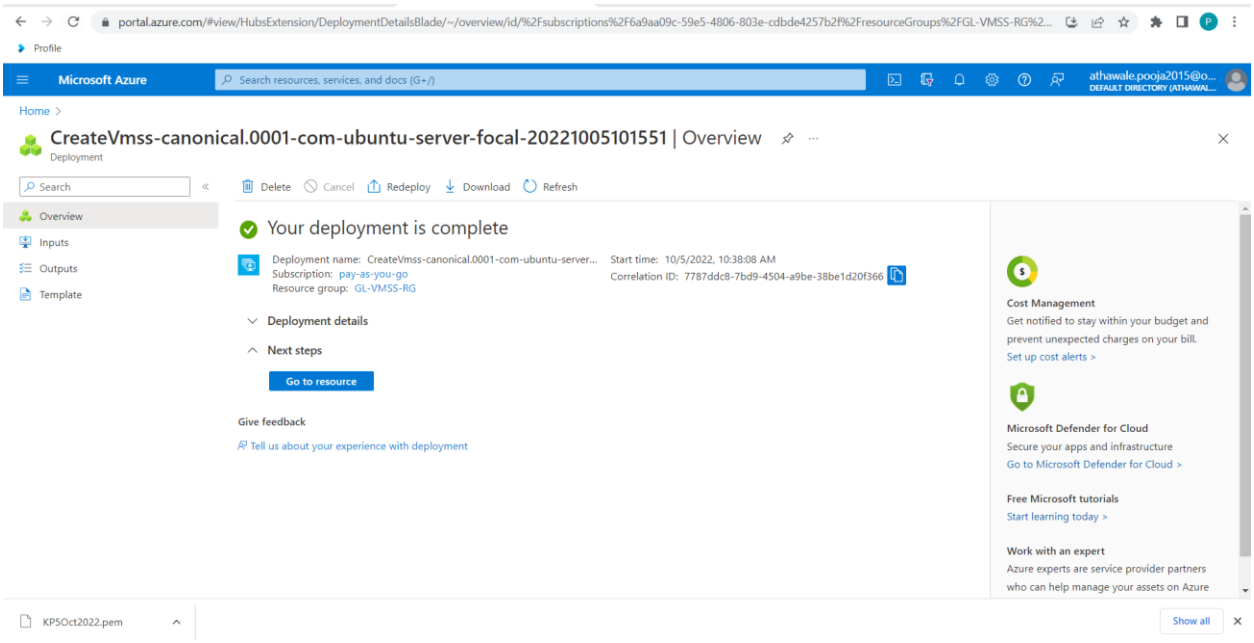
c. Click on **Next : Tags**

d. Click on **Next : Review+Create**

e. Click on **Create**

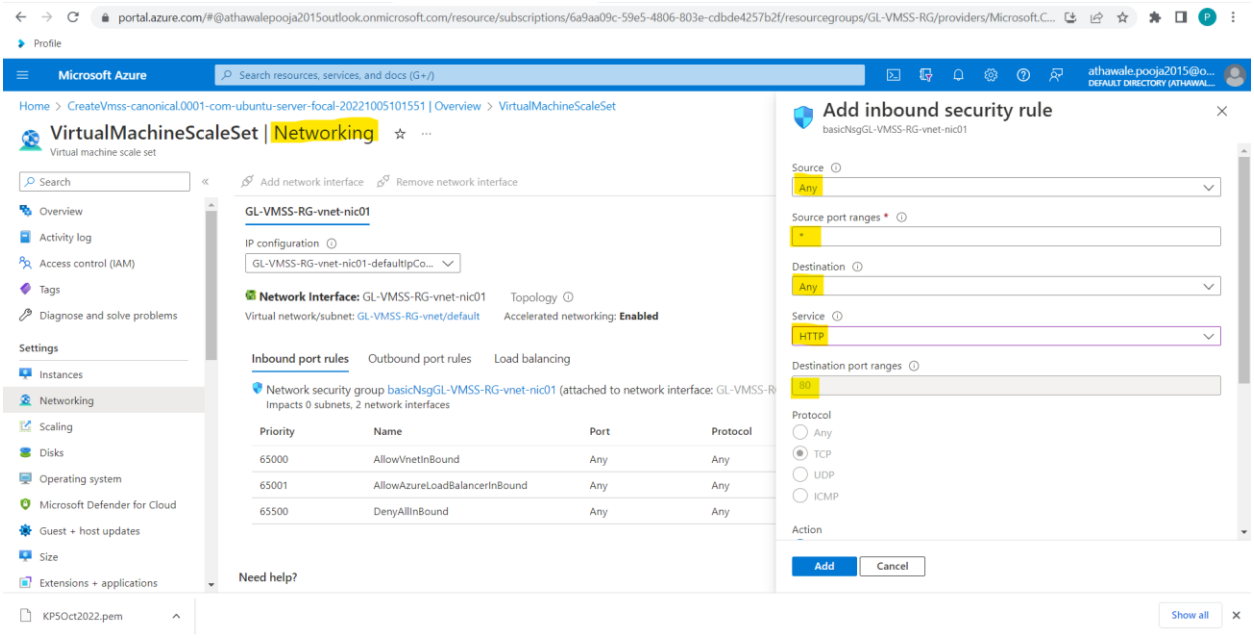
f. You will be presented with a dialog box “Generate New Key Pair”. Select “Download private key and create resource”. Then select “Return to create virtual machine” after the pem file is downloaded.

g. Deployment of the resource will take a few minutes.



G. Hands-On: Configure Networking rules

1. Once the resource is created ,navigate to it using the “Go to Resource” button presented.
2. Navigate to “Networking ” using the left sidebar
3. Click on **Add Inbound Port Rule**
4. Fill up the options as given below
    a. Source : Any
    b. Source Port Ranges : *
    c. Destination : Any
    d. Service : HTTP
    e. Action : Allow
    f. Priority : 100
    g. Name : Port_80
    h. Click on Add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DEFAULT DIRECTORY (ATHAWAL...
Home > CreateVmss-canonical.0001-com-ubuntu-server-focal-20221005101551 | Overview > VirtualMachineScaleSet
VirtualMachineScaleSet | Networking
Virtual machine scale set
Search
Add network interface
Remove network interface
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
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Networking
Scaling
Disks
Operating system
Microsoft Defender for Cloud
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Size
Extensions + applications
GL-VMSS-RG-vnet-nic01
IP configuration
GL-VMSS-RG-vnet-nic01-defaultIpCo...
Network Interface: GL-VMSS-RG-vnet-nic01
Topology
Virtual network/subnet: GL-VMSS-RG-vnet/default
Accelerated networking: Enabled
Inbound port rules
Outbound port rules
Load balancing
Network security group basicNsgGL-VMSS-RG-vnet-nic01 (attached to network interface: GL-VMSS-R
Impacts 0 subnets, 2 network interfaces
Priority
Name
Port
Protocol
65000
AllowVnetInBound
Any
Any
65001
AllowAzureLoadBalancerInBound
Any
Any
65500
DenyAllInBound
Any
Any
Need help?
Add inbound security rule
basicNsgGL-VMSS-RG-vnet-nic01
Source
Any
Source port ranges *
*
Destination
Any
Service
HTTP
Destination port ranges
80
Protocol
Any
TCP
UDP
ICMP
Action
Add
Cancel
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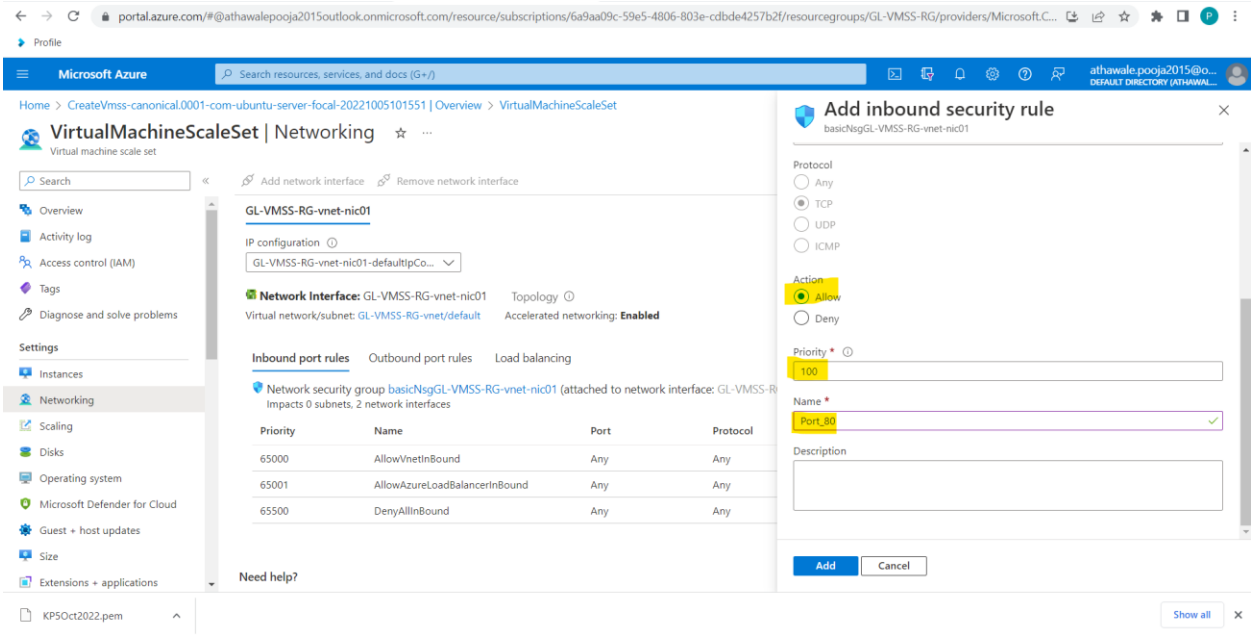
Show all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DEFAULT DIRECTORY (ATHAWAL...
Home > CreateVmss-canonical.0001-com-ubuntu-server-focal-20221005101551 | Overview > VirtualMachineScaleSet
VirtualMachineScaleSet | Networking
Virtual machine scale set
Search
Add network interface
Remove network interface
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
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Operating system
Microsoft Defender for Cloud
Guest + host updates
Size
Extensions + applications
GL-VMSS-RG-vnet-nic01
IP configuration
GL-VMSS-RG-vnet-nic01-defaultIpCo...
Network Interface: GL-VMSS-RG-vnet-nic01
Topology
Virtual network/subnet: GL-VMSS-RG-vnet/default
Accelerated networking: Enabled
Inbound port rules
Outbound port rules
Load balancing
Network security group basicNsgGL-VMSS-RG-vnet-nic01 (attached to network interface: GL-VMSS-R
Impacts 0 subnets, 2 network interfaces
Priority
Name
Port
Protocol
65000
AllowVnetInBound
Any
Any
65001
AllowAzureLoadBalancerInBound
Any
Any
65500
DenyAllInBound
Any
Any
Need help?
Add inbound security rule
basicNsgGL-VMSS-RG-vnet-nic01
Protocol
Any
TCP
UDP
ICMP
Action
Allow
Deny
Priority *
100
Name *
Port_80
Description
Add
Cancel
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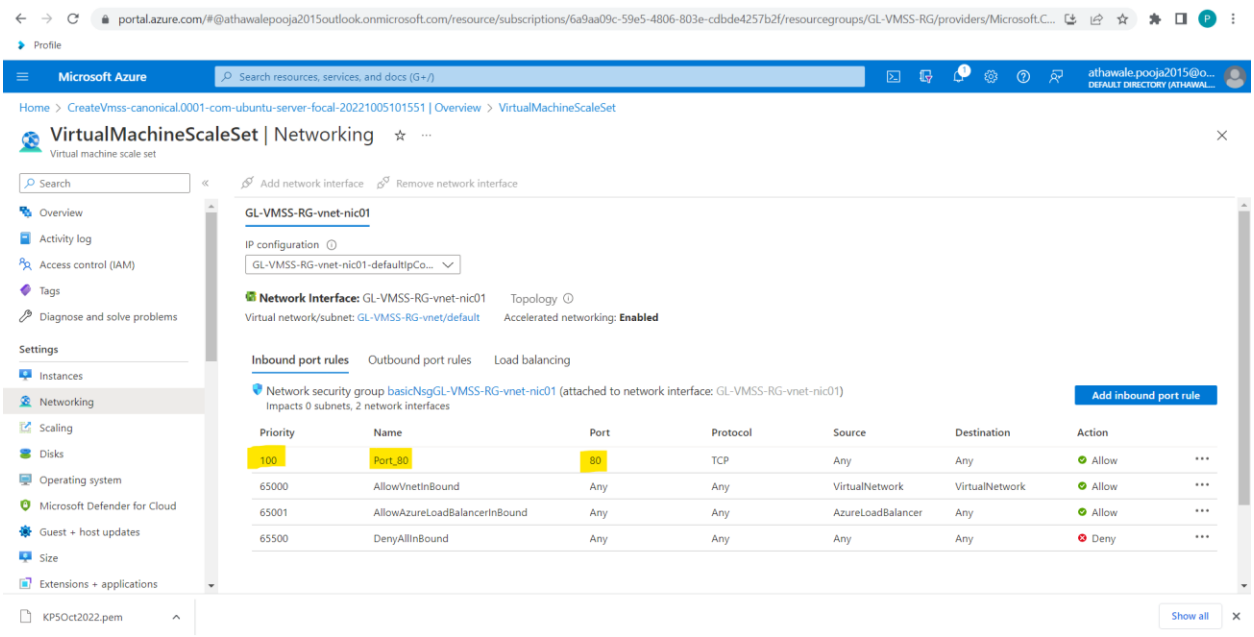
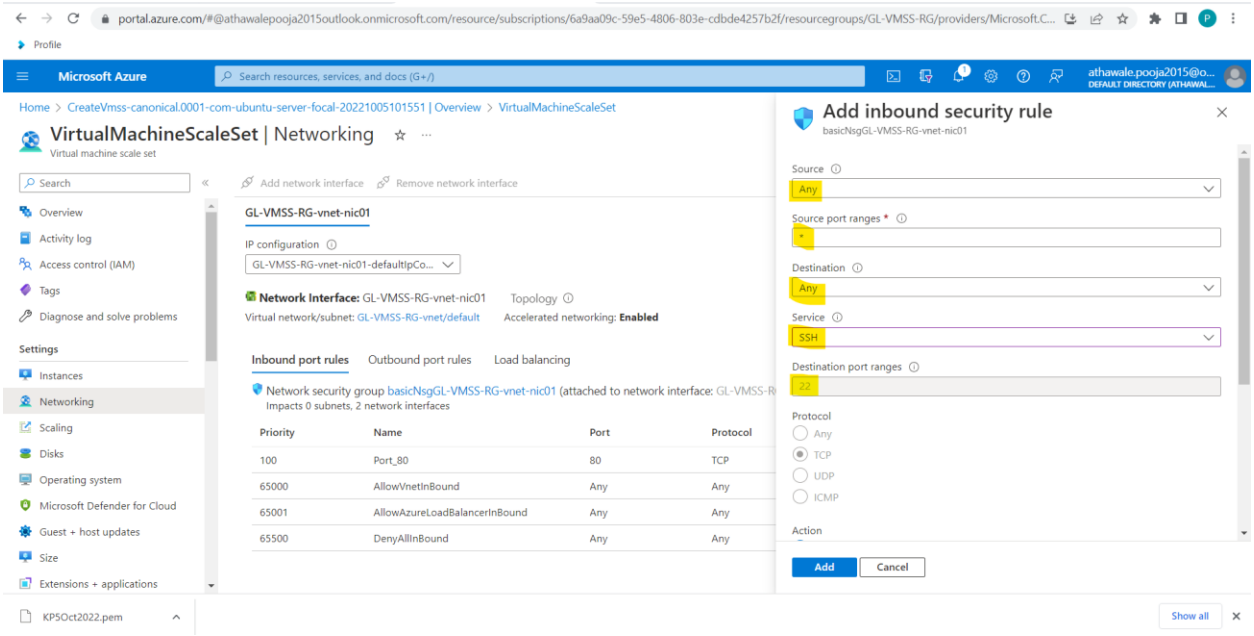
Show all



5. Select **Add Inbound Port Rule** Again
6. Fill up the options as given below
    a. Source : Any
    b. Source Port Ranges : *
    c. Destination : Any
    d. Service : SSH
    e. Action : Allow
    f. Priority : 110
    g. Name : Port_22
    h. Click on Add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GL-VMSS-RG-vnet-nic01
IP configuration
GL-VMSS-RG-vnet-nic01-defaultIpCo...
Network Interface: GL-VMSS-RG-vnet-nic01
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Virtual network/subnet: GL-VMSS-RG-vnet/default
Accelerated networking: Enabled
Inbound port rules
Outbound port rules
Load balancing
Network security group basicNsgGL-VMSS-RG-vnet-nic01 (attached to network interface: GL-VMSS-R
Impacts 0 subnets, 2 network interfaces
Priority
Name
Port
Protocol
100
Port_80
80
TCP
65000
AllowVnetInBound
Any
Any
65001
AllowAzureLoadBalancerInBound
Any
Any
65500
DenyAllInBound
Any
Any
Add inbound security rule
basicNsgGL-VMSS-RG-vnet-nic01
Source
Any
Source port ranges *
*
Destination
Any
Service
SSH
Destination port ranges
22
Protocol
Any
TCP
UDP
ICMP
Action
Add
Cancel
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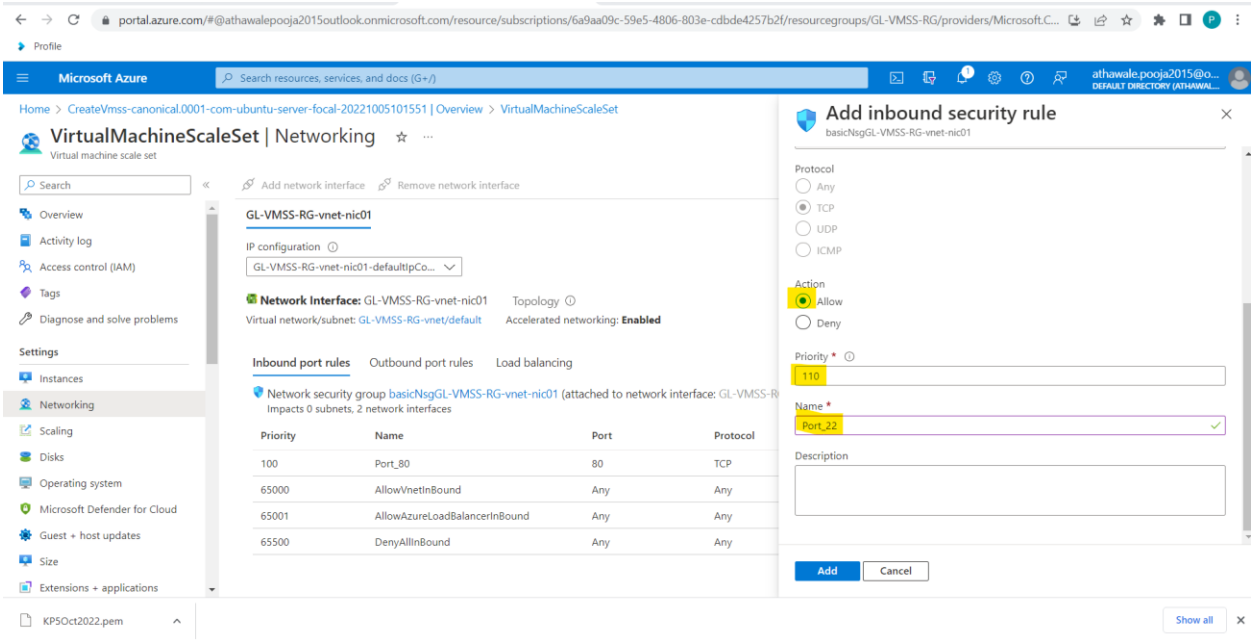
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IP configuration
GL-VMSS-RG-vnet-nic01-defaultIpCo...
Network Interface: GL-VMSS-RG-vnet-nic01
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Virtual network/subnet: GL-VMSS-RG-vnet/default
Accelerated networking: Enabled
Inbound port rules
Outbound port rules
Load balancing
Network security group basicNsgGL-VMSS-RG-vnet-nic01 (attached to network interface: GL-VMSS-R
Impacts 0 subnets, 2 network interfaces
Priority
Name
Port
Protocol
100
Port_80
80
TCP
65000
AllowVnetInBound
Any
Any
65001
AllowAzureLoadBalancerInBound
Any
Any
65500
DenyAllInBound
Any
Any
Add inbound security rule
basicNsgGL-VMSS-RG-vnet-nic01
Protocol
Any
TCP
UDP
ICMP
Action
Allow
Deny
Priority *
110
Name *
Port_22
Description
Add
Cancel
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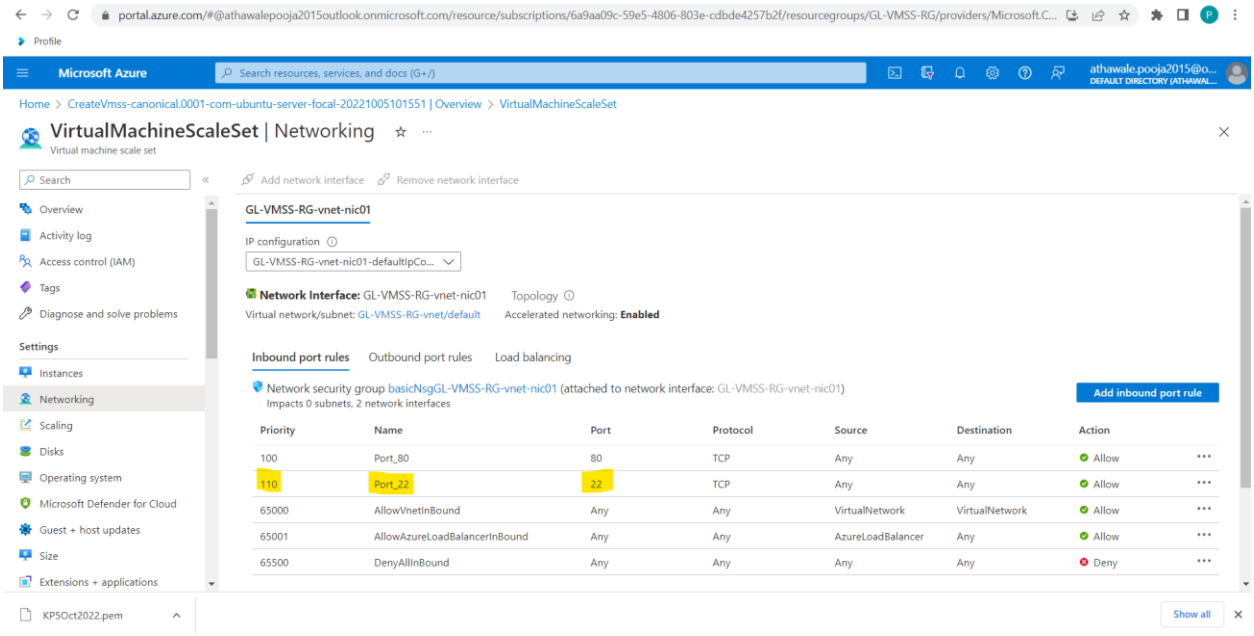
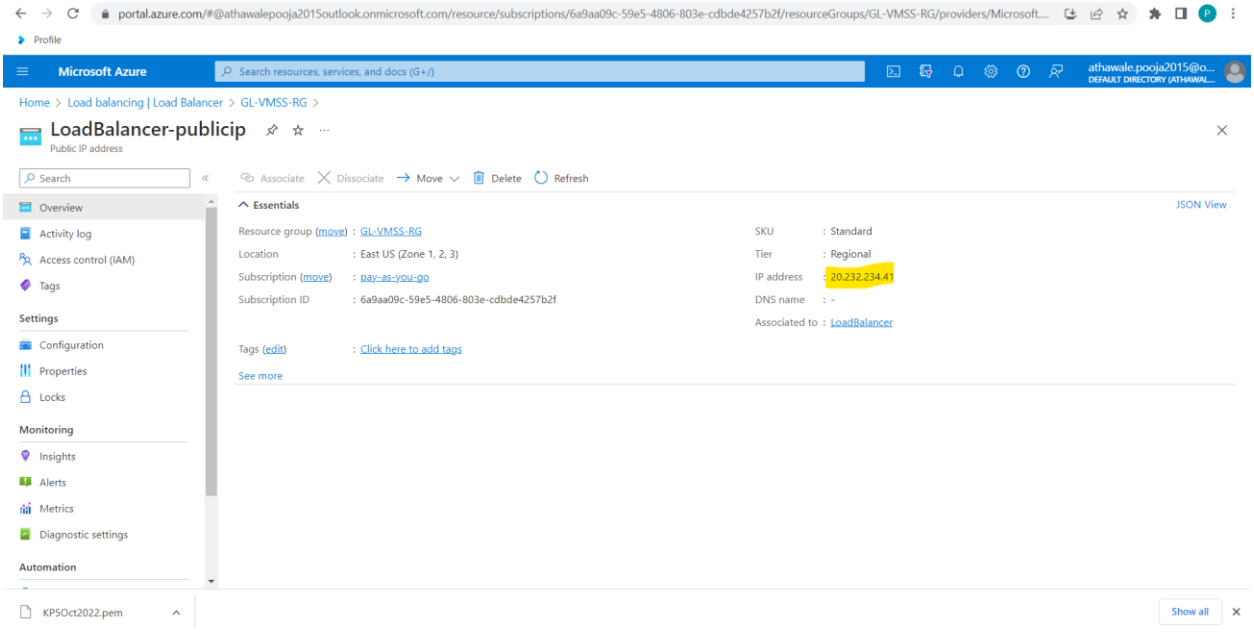
Show all



H. Access the application

a. Search for **Load Balancers** using the Search Box at the top of the screen and navigate to it

b. Select the created resource

c. Under the Overview section, copy the public IP address. You may have to click on the “See More button”

d. Paste the IP address into the web browser to access the custom application