

# Azure Assignment

## (AZ – 104- Module 4)

### Avishekh Sinha

## Module 4 - VMs

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### Assignment 1

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1. Create a VM in the West US region
2. Select the Ubuntu image for creating the VM
3. Open the SSH port
4. Connect to the linux VM using the terminal

## Create a virtual machine ...

### Instance details

Virtual machine name \* ⓘ

app-vm ✓

Region \* ⓘ

(US) West US ▼


Availability options ⓘ

No infrastructure redundancy required ▼

Security type ⓘ

Standard ▼

Image \* ⓘ

✓  Ubuntu Server 20.04 LTS - x64 Gen2 ▼

[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ

☐ Arm64

☒ x64

Run with Azure Spot discount ⓘ

☐

Size \* ⓘ

Standard\_B1s - 1 vcpu, 1 GiB memory (₹652.15/month) ▼

[See all sizes](#)

### Administrator account

Authentication type ⓘ

☐ SSH public key

☒ Password

Username \* ⓘ

avishekh ✓

Password \* ⓘ

..... ✓

Confirm password \* ⓘ

..... ✓

### Inbound port rules

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

Public inbound ports \* ⓘ

☐ None

☒ Allow selected ports

Select inbound ports \*

✓  SSH (22) ▼

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```
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1031-azure x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Mon Jan 16 07:49:26 UTC 2023

System load:  0.08          Processes:            101
Usage of /:   5.2% of 28.89GB Users logged in:        0
Memory usage: 30%          IPv4 address for eth0: 10.0.0.4
Swap usage:   0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
  just raised the bar for easy, resilient and secure K8s cluster deployment.

  https://ubuntu.com/engage/secure-kubernetes-at-the-edge

0 updates can be applied immediately.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

avishekh@app-vm:~$
```

## Assignment 2

---

1. Create a Windows VM in West US region
2. Open the RDP port
3. Connect to it using Windows Remote Desktop

## Create a virtual machine ...

### Instance details

Virtual machine name \* ⓘ  ✓

Region \* ⓘ  ✓

Availability options ⓘ  ✓

Security type ⓘ  ✓

Image \* ⓘ  ✓  
[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ  
☐ Arm64  
☒ x64  
Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ ☐

Size \* ⓘ  ✓  
[See all sizes](#)

### Administrator account

Username \* ⓘ  ✓

Password \* ⓘ  ✓

Confirm password \* ⓘ  ✓

### Inbound port rules

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

Public inbound ports \* ⓘ ☒ Allow selected ports

Select inbound ports \*  ✓

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Server Manager

← →

Server Manager ▸ Dashboard

Dashboard

Local Server

All Servers

WELCOME TO SERVER MANAGER

Server Manager

Try managing servers with Windows Admin Center

Windows Admin Center brings together new and familiar features in one browser-based app. It runs on a server or a PC, and there's no additional cost beyond your Windows licenses.

[Get more info at aka.ms/WindowsAdminCenter](#)

☐ Don't show this message again

LEARN MORE

ROLES AND SERVER GROUPS

Roles: 0 | Server groups: 1 | Servers total: 1

Local Server 1

Manageability

Events

Services

Performance

BPA results

All Servers 1

Manageability

Events

Services

Performance

BPA results

Networks

Network

Do you want to allow your PC to be discoverable by other PCs and devices on this network?

We recommend allowing this on your home and work networks, but not public ones.

Yes

No

## Assignment 3

1. Create a VM scaleset with Ubuntu as OS
2. Give min VM's as 1, and maximum as 5
3. For Scale-out CPU % is 75, and increase by 1 VM
4. For Scale-in CPU % is 25, decrease by 1 VM

STEP 1	STEP 2
--------	--------

Microsoft Azure

Home > Virtual machine scale sets >

Create a virtual machine scale set

Virtual machine scale set name \*

vm-scale-set

Region \*

(Asia Pacific) Central India

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, et 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 in

☐ Flexible: achieve high availability at scale with identical or multiple virt machine types

Security type ⓘ

Standard

Instance details

Image \* ⓘ

Ubuntu Server 20.04 LTS - x64 Gen2

[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ

☐ Arm64

☒ x64

Run with Azure Spot discount ⓘ

☐

Size \* ⓘ

Standard\_B1s - 1 vcpu, 1 GiB memory (₹589.04/month)

[See all sizes](#)

Administrator account

Authentication type ⓘ

☒ Password

☐ SSH public key

Username \* ⓘ

avishekh

Password \* ⓘ

.....

Confirm password \* ⓘ

.....

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Home > Virtual machine scale sets >

Create a virtual machine scale set

Basics

Disks

Networking

Scaling

Management

Health

Advanced

Iags

Review + creat

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

Initial instance count \* ⓘ

1

Scale with VMs and discounted Spot VMs (preview)

Get significant workload savings when you scale with continuous uninterruptible VMs and discounted interruptible Azure VMs that take advantage of unused compute capacity. Azure Spot is ideal for workloads that can experience interruption infrastructure loss like risk modeling or advanced data analytics. [Learn more](#)

Scale with VMs and Spot VMs ⓘ

☐

Scaling

Scaling policy ⓘ

☐ Manual

☒ Custom

Minimum number of instances \* ⓘ

1

Maximum number of instances \* ⓘ

10

Scale out

CPU threshold (%) \* ⓘ

75

Duration in minutes \* ⓘ

10

Number of instances to increase by \* ⓘ

1

Scale in

CPU threshold (%) \* ⓘ

25

Number of instances to decrease by \* ⓘ

1

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Next : Management >

# vm-scale-set | Scaling

Virtual machine scale set

Search

Save Discard Refresh Logs Feedback

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

## Settings

- Instances
- Networking
- Scaling
- Disks
- Operating system
- Microsoft Defender for Cloud
- Guest + host updates
- Size
- Extensions + applications
- Continuous delivery
- Configuration
- Upgrade policy
- Health and repair
- Identity
- Properties
- Locks

## Monitoring

- Insights
- Alerts
- Metrics

### Choose how to scale your resource

☐ Manual scale  
Maintain a fixed instance count

☒ Custom autoscale  
Scale on any schedule, based on any metrics

### Custom autoscale

Autoscale setting name	vm-scale-setautoscale		
Resource group	VM_RG		
Instance count	1		
Predictive autoscale	Mode	Disabled	Pre-launch setup of instances (minutes)
<a href="#">Enable Forecast only or Predictive autoscale. Learn more about Predictive autoscale.</a>			

Default\* Profile1

### Delete warning

The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode ☒ Scale based on a metric ☐ Scale to a specific instance count

### Rules

#### Scale out

When vm-scale-set (Average) Percentage CPU > 75 Increase count by 1

#### Scale in

When vm-scale-set (Average) Percentage CPU < 25 Decrease count by 1

+ Add a rule

### Instance limits

Minimum	Maximum	Default
1	5	1

### Schedule

This scale condition is executed when none of the other scale condition(s) match



## Assignment 4

1. Create a Linux VM with ubuntu OS
2. Install apache2 software
3. Create image out of VM

Home > Virtual machines >

### Create a virtual machine ...


**Instance details**

Virtual machine name \* ⓘ vmApache ✓

Region \* ⓘ (Asia Pacific) Central India ✓

Availability options ⓘ No infrastructure redundancy required ✓

Security type ⓘ Standard ✓

Image \* ⓘ  Ubuntu Server 20.04 LTS - x64 Gen2 ✓  
[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ  
☐ Arm64  
☒ x64

Run with Azure Spot discount ⓘ ☐

Size \* ⓘ Standard\_B1s - 1 vcpu, 1 GiB memory (₹589.04/month) ✓  
[See all sizes](#)

**Administrator account**

Authentication type ⓘ  
☐ SSH public key  
☒ Password

Username \* ⓘ avishekh ✓

Password \* ⓘ ..... ✓

Confirm password \* ⓘ ..... ✓

**Inbound port rules**

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

Public inbound ports \* ⓘ  
☐ None  
☒ Allow selected ports

Select inbound ports \* ⓘ SSH (22) ✓

[Review + create](#) < Previous Next : Disks >

To Install Apache – We need to execute following command from the VM's terminal

1. *sudo apt-get update*
2. *sudo apt-get install apache2*

```
Selecting previously unselected package apache2.
Preparing to unpack .../09-apache2_2.4.41-4ubuntu3.12_amd64.deb ...
Unpacking apache2 (2.4.41-4ubuntu3.12) ...
Selecting previously unselected package ssl-cert.
Preparing to unpack .../10-ssl-cert_1.0.39_all.deb ...
Unpacking ssl-cert (1.0.39) ...
Setting up libapr1:amd64 (1.6.5-1ubuntu1) ...
Setting up libjansson4:amd64 (2.12-1build1) ...
Setting up ssl-cert (1.0.39) ...
Setting up liblua5.2-0:amd64 (5.2.4-1.1build3) ...
Setting up apache2-data (2.4.41-4ubuntu3.12) ...
Setting up libaprutil1:amd64 (1.6.1-4ubuntu2) ...
Setting up libaprutil1-ldap:amd64 (1.6.1-4ubuntu2) ...
Setting up libaprutil1-dbd-sqlite3:amd64 (1.6.1-4ubuntu2) ...
Setting up apache2-utils (2.4.41-4ubuntu3.12) ...
Setting up apache2-bin (2.4.41-4ubuntu3.12) ...
Setting up apache2 (2.4.41-4ubuntu3.12) ...
Enabling module mpm_event.
Enabling module authz_core.
Enabling module authz_host.
Enabling module authn_core.
Enabling module auth_basic.
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36-6ubuntu1) ...
Processing triggers for systemd (245.4-4ubuntu3.19) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
avishekh@vmApache:~$
```

CREATING IMAGE

Home > Virtual machines >

Virtual machines

Default Directory

Create

Switch to classic

Filter for any field...

Name

app-vm

app-vm-win

vmApache

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Disks

Size

Microsoft Defender for Cloud

Advisor recommendations

Extensions + applications

Continuous delivery

Availability + scaling

vmApache

Virtual machine

Search

Connect

Start

Restart

Stop

Capture

Delete

Refresh

Open in mobile

CLI / PS

Feedback

Essentials

Resource group (move)

Status

Location

Subscription (move)

Subscription ID

Tags (edit)

VM\_RG

Stopped (deallocated)

Central India

Azure Pass - Sponsorship

408acfb-e132a-4323-96ba-105075f523d4

Click here to add tags

Operating system

Size

Public IP address

Virtual network/subnet

DNS name

Linux

Standard B1s (1 vcpu, 1 GiB memory)

20.204.136.17

VM\_RGvnet984/default

Not configured

Properties

Monitoring

Capabilities (7)

Recommendations

Tutorials

Virtual machine

Computer name

Health state

Operating system

Publisher

Offer

Plan

vmApache

-

Linux

canonical

0001-com-ubuntu-server-focal

20\_04-lts-gen2

Networking

Public IP address

Public IP address (IPv6)

Private IP address

Private IP address (IPv6)

Virtual network/subnet

DNS name

20.204.136.17

-

10.1.0.4


-


VM\_RGvnet984/default


Configure

## Create an image ...

### Instance details


Region (Asia Pacific) Central India 



Share image to Azure compute gallery  ☒ Yes, share it to a gallery as a VM image version.  
☐ No, capture only a managed image.

Automatically delete this virtual machine after creating the image  ☐

### Gallery details

Target Azure compute gallery \*  (new) computeVMImage   
[Create new](#)

Operating system state  ☐ Generalized: VMs created from this image require hostname, admin user, and other VM related setup to be completed on first boot  
☒ Specialized: VMs created from this image are completely configured and do not require parameters such as hostname and admin user/password

Target VM image definition \*  (new) VMApache   
[Create new](#)

### Version details

Version number \*  0.0.1 



Exclude from latest  ☐

End of life date  MM/DD/YYYY 

### Replication

A VM image version can be replicated to different regions depending on what makes sense for your organization. One example is to always replicate the latest image in multiple regions while all older versions are only available in 1 region. This can help save on storage costs for VM image versions.

Default replica count \*  1

Target regions	Target region replica count	Storage account type
<span>(Asia Pacific) Central India</span> 	<span>1</span>	<span>Premium SSD LRS</span>  
	<span>1</span>	<span>Standard HDD LRS</span> 

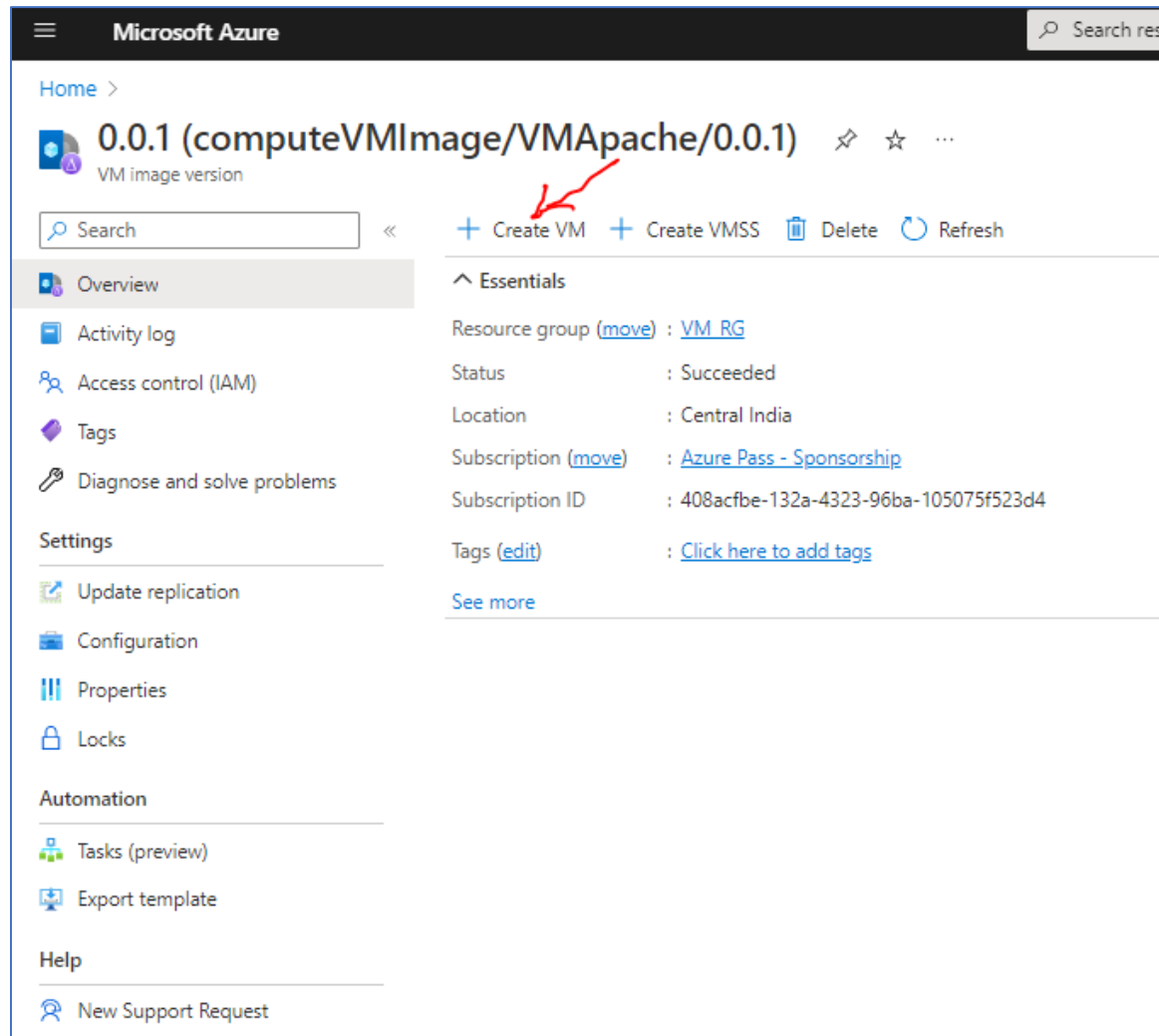
[Review + create](#)

[< Previous](#)

[Next : Tags >](#)

## Assignment 5

1. Deploy a VM from the previously created image
2. Open Port 80 in NSG
3. Start the apache2 service in the VM
4. Verify if you are able to access the website




CREATING VM FROM IMAGE

Microsoft Azure

Search resources

[Home](#) > [0.0.1 \(computeVMImage/VMApache/0.0.1\)](#) >

## Create a virtual machine

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

for full customization. [Learn more](#)

### Project details

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

Subscription \*

Azure Pass - Sponsorship (408acfbe-132a-4323-96ba-105075f523d4)

Resource group \*

VM\_RG

[Create new](#)

### Instance details

Virtual machine name \*

vmapache2

Region \*

(Asia Pacific) Central India


Availability options

No infrastructure redundancy required

Security type

Standard

Image \*


 computeVMImage/VMApache/0.0.1/computeVMImage/VMApache/0.0.1/c

[See all images](#) | [Configure VM generation](#)

VM architecture

☐ Arm64

☒ x64

 Arm64 is not supported with the selected image.

Run with Azure Spot discount

☐

Size \*

Standard\_B1s - 1 vcpu, 1 GiB memory (₹589.04/month)

[See all sizes](#)

### Administrator account

Authentication type

☐ SSH public key

☒ Password

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## ADDING PORT TO NSG

Basics Disks **Networking** Management Monitoring 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](#)

### Network interface

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

Virtual network \* ⓘ VM\_RGvnet984 [Create new](#)

Subnet \* ⓘ default (10.1.0.0/16) [Manage subnet configuration](#)

Public IP ⓘ (new) vmapache2-ip [Create new](#)

NIC network security group ⓘ ☐ None ☒ Basic ☐ Advanced

Public inbound ports \* ⓘ ☐ None ☒ Allow selected ports

Select inbound ports \* HTTP (80), SSH (22)

**⚠ This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Delete public IP and NIC when VM is deleted ⓘ ☐

Enable accelerated networking ⓘ ☐

The selected image does not support accelerated networking.

Load balancing

## ACCESSING APACHE HOME PAGE

