

# Module 4 - Azure Virtual Machines And Advance Azure Virtual Machines

## Assignment – 1

### Tasks To Be Performed:

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

### Steps

- Click the create Azure Virtual machine
- Provide the necessary resource group
- Provide the name for the Virtual machine
- Provide the region as US west
- Select the Ubuntu in Image
- Select Inbound rule as SSH
- Provide the necessary configurations
- Finally Virtual machine is created
- Connect to the Virtual machine which was created in terminal

Home > Virtual machines >

### Create a virtual machine

[×](#)

**i** This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

**Project details**

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

Subscription \* ⓘ

Resource group \* ⓘ  [Create new](#)

**Instance details**

Virtual machine name \* ⓘ  ☐

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

[Give feedback](#)

## Create a virtual machine ...



Region \* ⓘ (US) West US

Availability options ⓘ No infrastructure redundancy required

Security type ⓘ Trusted launch virtual machines  
[Configure security features](#)

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

VM architecture ⓘ  
☐ Arm64  
☒ x64

Run with Azure Spot discount ⓘ ☐

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Review + create

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## Create a virtual machine ...



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)

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

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Review + create

Give feedback

## Virtual machines

Default Directory

[+ Create](#) [Switch to classic](#) ...

Filter for any field...

Name ↑↓

task ...

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## task | Serial console ...



Virtual machine

Search

## Help

- Resource health
- Boot diagnostics
- Serial console
- Reset password
- Connection troubleshoot
- Performance diagnostics
- VM Inspector (Preview)
- Ubuntu Advantage support plan
- Redeploy + reapply
- Support + Troubleshooting

Feedback ?

?

```
0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

azureuser@task:~$
```

## Assignment – 2

### Tasks To Be Performed:

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

### Steps

- Click the create Azure Virtual machine
- Provide the necessary resource group
- Provide the name for the Virtual machine
- Provide the region as US west
- Select the Windows server in Image
- Select Inbound rule as RDP
- Provide the necessary configurations
- Finally Virtual machine is created
- Open the Remote desktop connection in PC and Provide the public IP address of Virtual machine
- Click the connect and provide the user name and password
- Finally connected to windows virtual machine which was created.

Home > Virtual machines >

### Create a virtual machine

ⓘ This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

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

Subscription \* ⓘ

Resource group \* ⓘ   
[Create new](#)

**Instance details**

Virtual machine name \* ⓘ

< Previous   Next : Disks >   **Review + create**

[Give feedback](#)

## Create a virtual machine ...



Region \* ⓘ (US) West US

Availability options ⓘ No infrastructure redundancy required

Security type ⓘ Trusted launch virtual machines  
[Configure security features](#)

Image \* ⓘ Windows Server 2019 Datacenter - x64 Gen2 (free services eligible)  
[See all images](#) | [Configure VM generation](#)

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

Run with Azure Spot discount ⓘ ☐

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Next : Disks &gt;

Review + create

Give feedback

## Create a virtual machine ...



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 \* RDP (3389)

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

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Review + create

Give feedback

## windows | Connect ☆ ...

Virtual machine

Search &lt;&lt;

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Connect**
  - Connect
  - Bastion
  - Windows Admin Center
- Networking
  - Network settings
  - Load balancing

Connecting using  
Public IP address

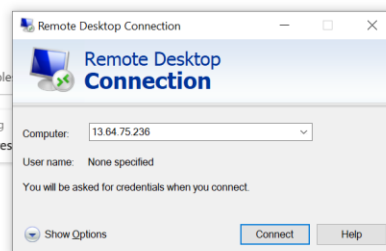
Admin username  
azureuser

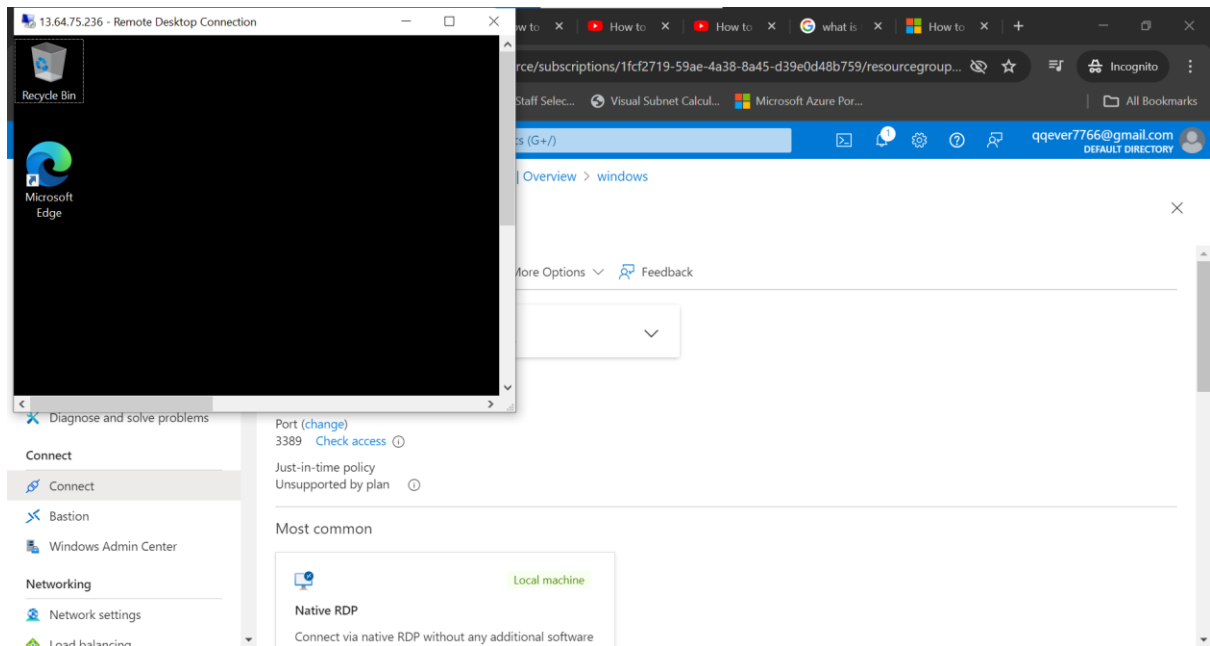
Port (change)  
3389 [Check access](#) ⓘ

Just-in-time policy  
Unsupported by plan ⓘ

## Most common

- Local machine
- Native RDP**  
Connect via native RDP without any additional software





## **Assignment – 3**

### **Tasks To Be Performed:**

1. Create a VM scale set 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 increase by 1 VM

### **Steps**

- Go into the virtual machine scale set in Azure
- Next Click the create
- Provide the necessary resource group
- Provide the name for the virtual machine scale set
- And Provide the necessary region
- Select the Ubuntu in Image
- Select the autoscaling in scaling and click the configure
  - a) Provide the scaling condition initial instance count as 1
  - b) Provide in the instance limit minimum as 1 and maximum as 5
  - c) Provide in the scale out If CPU threshold greater than 75% and increase instance county by 1
  - d) Provide in the scale In If CPU threshold less than 25% and decrease Instance County by 1
  - e) Next click the save
- Provide the necessary configurations
- Finally Virtual machine is created

## Create a virtual machine scale set ...



Basics Spot Disks Networking Management Health Advanced Tags Review + create

Azure virtual machine scale sets let you create and manage a group of load balanced VMs. The number of VM instances can automatically increase or decrease in response to demand or a defined schedule. Scale sets provide high availability to your applications, and allow you to centrally manage, configure, and update a large number of VMs.

[Learn more about virtual machine scale sets](#)

## Project details

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

Subscription \*

Resource group \*   
[Create new](#)

## Scale set details

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Review + create

Give feedback

## Create a virtual machine scale set ...

[Create new](#)

## Scale set details

Virtual machine scale set name \*

Region \*

Availability zone

## 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 \* ☒ **Flexible:** achieve high availability at scale with identical or multiple virtual machine types

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Review + create

Give feedback

## Create a virtual machine scale set ...



## Instance details

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

☒ This image is compatible with additional security features. [Click here to swap to the Trusted launch security type.](#)

VM architecture ☐ Arm64 ☒ x64

Run with Azure Spot discount ☐

Size \*   
[See all sizes](#)

Enable Hibernation ☐

Hibernation is not supported by the size that you have selected. Choose a size that is

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Review + create

Give feedback

## Create a virtual machine scale set ...



## Scaling

Scaling mode ⓘ

- ☐ Manually update the capacity: Maintain a fixed amount of instances.
- ☒ Autoscaling: Scaling based on a CPU metric, on any schedule.
- ☐ No scaling profile: manual attach virtual machines after deployment

Scaling configuration \*

## Scaling configuration

Scaling condition count: 1  
Predictive autoscaling: Disabled  
Diagnostic logs: Disabled  
Scale-in policy: Default  
Force delete: Disabled  
[Configure](#)

⚠ Select configure to review all scaling options prior to creating the virtual machine scale set.

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Review + create

Give feedback

## Scaling configuration ...

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 perf of your application. [Learn more about VMSS scaling.](#) ⓘ

## Scaling conditions

[+ Add a scaling condition](#) [Delete](#)

<input type="checkbox"/>	Condition	Mode	Instance Count ⓘ	CPU Threshold ⓘ
<input checked="" type="checkbox"/>	Default condition	Autoscale	(2, 20, 2)	(80%, 20%)

## Predictive autoscaling

Save

Cancel

## Add a scaling condition



- ☐ Manually update the capacity: Scaling based on a CPU metric, on any schedule
- ☒ Autoscaling: Scaling based on a CPU metric, on any schedule

Initial instance count \* ⓘ

1

## Instance limit

Minimum \* ⓘ

1  
The minimum count of instances this condition will scale down to is 1.

Maximum \* ⓘ

5  
The maximum count of instances this condition will scale up to is 5.

## Scale out

Save

## Scaling configuration ...

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 perf of your application. [Learn more about VMSS scaling.](#) ⓘ

## Scaling conditions

[+ Add a scaling condition](#) [Delete](#)

<input type="checkbox"/>	Condition	Mode	Instance Count ⓘ	CPU Threshold ⓘ
<input checked="" type="checkbox"/>	Default condition	Autoscale	(2, 20, 2)	(80%, 20%)

## Predictive autoscaling

Save

Cancel

## Add a scaling condition



## Scale out

CPU threshold greater than \* ⓘ

75  
Every time the average CPU usage is greater than 75%.

Increase instance count by \* ⓘ

1  
The condition will increase the instance count by 1 instances

## Scale in

CPU threshold less than \* ⓘ

25  
Every time the average CPU usage is less than 25%.

Decrease instance count by \* ⓘ

1  
The condition will decrease the instance count by 1 instances

Save



Home > Virtual machine scale sets > Create a virtual machine scale set >

Scaling configuration

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.](#)

Scaling conditions

+ Add a scaling condition

Delete

Condition	Mode	Instance Count	CPU Threshold
Default condition	Autoscale	(2, 20, 2)	(80%, 20%)

Predictive autoscaling

Save

Cancel

Add a scaling condition

Every time the average CPU usage is greater than 75%.

Increase instance count by \*  
1  
The condition will increase the instance count by 1 instances

Scale in  
CPU threshold less than \*  
25  
Every time the average CPU usage is less than 25%.

Decrease instance count by \*  
1  
The condition will decrease the instance count by 1 instances

Query duration  
Minutes \*  
Save

Home > Virtual machine scale sets > Create a virtual machine scale set >

Scaling configuration

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.](#)

Scaling conditions

+ Add a scaling condition

Delete

Condition	Mode	Instance Count	CPU Threshold	Schedule
Default condition	Autoscale	(1, 5, 1)	(75%, 25%)	No

Predictive autoscaling

Save

Cancel

Home >

CreateVmss-canonical.0001-com-ubuntu-server-focal-20240527135121 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

✓ Your deployment is complete

Deployment name : CreateVmss-canonical.0001-co...

Start time : 5/27/2024, 1:56:01 PM

Subscription : Free Trial

Correlation ID : d2d0dbd2-4d21-4494-83b1-d2...

Resource group : NetworkWatcherRG

> Deployment details

< Next steps

Go to resource

Give feedback

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Set up cost alerts >

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Secure your apps and infrastructure

Go to Microsoft Defender for Cloud >

Free Microsoft tutorials

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[Home](#) >

# Virtual machines

Default Directory

+ Create

Switch to classic

Reservations

Manage view

Refresh

Export to CSV

Open query

Assign tags

Start

Restart

Stop

...

assignment\_2630f8de

Subscription equals all

Type equals all

Resource group equals all

Location equals all

Add filter

Showing 1 to 1 of 1 records.

No grouping

List view

<input type="checkbox"/> Name	Type	Subscription	Resource group	Location	Status	Operating system	Size
<input type="checkbox"/> assignment_2630f8de	Virtual machine	Free Trial	NetworkWatcherRG	Central India	Running	Linux	Standard_B1s

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Page 1 of 1

Next >

Give feedback

[Home](#) >

# Virtual machine scale sets

Default Directory

+ Create

Manage view

Refresh

Export to CSV

Open query

Assign tags

Start

Restart

Stop

Delete

Maintenance

Leave preview

Filter for any field...

Subscription equals all

Resource group equals all

Location equals all

Add filter

Showing 1 to 1 of 1 records.

No grouping

List view

<input type="checkbox"/> Name	Subscription	Resource group	Location	Provisioning state	Operating system	Size	Instances
<input type="checkbox"/> assignment	Free Trial	NetworkWatcherRG	Central India	Succeeded	Linux	Standard_B1s	1

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Page 1 of 1

Next >

Give feedback

## Assignment – 4

### Tasks To Be Performed:

1. Create a Linux VM with Ubuntu OS
2. Install Apache2 software
3. Create image out of VM

### Steps

- Click the create Azure Virtual machine
- Provide the necessary resource group
- Provide the name for the Virtual machine
- Provide the necessary region
- Select the Ubuntu in Image
- Provide the necessary configurations
- Finally Virtual machine is created
- Connect to the Virtual machine which was created
- To Update the Virtual machine by running the command **sudo apt update**
- Next to install Apache2 by running the command **sudo apt-get install apache2**
- Next go inside the Virtual machine and click the capture
- Provide the necessary resource group
- Provide the name for the creating image
- Provide the necessary configurations
- Finally the Image is created

## Create a virtual machine ...



This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

## Project details

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

Subscription \*

Resource group \*  [Create new](#)

## Instance details

Virtual machine name \*

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

## Create a virtual machine ...



Region \*

Availability options

Security type  [Configure security features](#)

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

VM architecture ☐ Arm64 ☒ x64

Run with Azure Spot discount ☐

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

## Create a virtual machine ...



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 \*

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

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Home > Virtual machines > task

Virtual machines

Default Directory

+ Create

Switch to classic

Filter for any field...

Name ↑↓

task

Page 0 of 0

task | Serial console

Virtual machine

Search

Help

Resource health

Boot diagnostics

Serial console

Reset password

Connection troubleshoot

Performance diagnostics

VM Inspector (Preview)

Ubuntu Advantage support plan

Redeploy + reapply

Support + Troubleshooting

? Feedback

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates. See <https://ubuntu.com/esm> or run: `sudo pro status`

The list of available updates is more than a week old. To check for new updates run: `sudo apt update`

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.

azureuser@task:~\$

Home > Virtual machines > task

Virtual machines

Default Directory

+ Create

Switch to classic

Filter for any field...

Name ↑↓

task

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task | Serial console

Virtual machine

con

Connect

Connect

Bastion

Settings

Configuration

Operations

Configuration management

Help

Serial console

Connection troubleshoot

Support + Troubleshooting

? Feedback

azureuser@task:~\$ sudo apt update

Home > Virtual machines > task

Virtual machines

Default Directory

+ Create

Switch to classic

Filter for any field...

Name ↑↓

task

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task | Serial console

Virtual machine

con

Connect

Connect

Bastion

Settings

Configuration

Operations

Configuration management

Help

Serial console

Connection troubleshoot

Support + Troubleshooting

? Feedback

azureuser@task:~\$ sudo apt-get install apache2

## Create an image

Basics Tags Review + create

Create an image from this virtual machine that can be used to deploy additional virtual machines and virtual machine scale sets. To create a managed image, you must first generalize this virtual machine. [Learn more](#)

### Project details

Subscription Free Trial

Resource group \* rg-1  
[Create new](#)

### Instance details

Region (Europe) North Europe

Share image to Azure compute gallery ☐ Yes, share it to a gallery as a VM image version.

[Review + create](#)

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[Give feedback](#)

## Create an image

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 ☐

Zone resiliency ☐

**i** Before creating an image, use "waagent -deprovision+user" to prepare the Linux guest OS on the virtual machine. If you create an image from a virtual machine that hasn't been generalized, any virtual machines created from that image won't start. [Learn more](#)

Name \* task-imag

[Review + create](#)

[< Previous](#)

[Next : Tags >](#)

[Give feedback](#)

## Microsoft.Compute-CaptureVM-20240527145103 | Overview

Deployment

[Delete](#) [Cancel](#) [Redeploy](#) [Download](#) [Refresh](#)

Overview

Inputs

Outputs

Template

### Your deployment is complete

Deployment name : Microsoft.Compute-CaptureV... Start time : 5/27/2024, 2:53:40 PM  
Subscription : [Free Trial](#) Correlation ID : 4b87b05b-b3e1-4c5d-93c6-5c...  
Resource group : rg-1

[Deployment details](#)

[Next steps](#)

[Go to resource](#)



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## Assignment – 5

### Tasks To Be Performed:

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

### Steps

- Click the create Azure Virtual machine
- Provide the necessary resource group
- Provide the name for the Virtual machine
- In Image select the image which was created in previous assignment - 4
- Provide the necessary configurations
- Finally Virtual machine is created
- Go inside the created Virtual machine and click network settings
- Next click create port rule and provide the port as 80 and click on add
- Connect to the Virtual machine which was created
- Next to start the Apache2 service by running the command **sudo service apache2 start**
- To see the Apache2 page on browser put the **public IP address** of Virtual machine in the Browser the Apache2 page will be reflected.

Home > Virtual machines >

### Create a virtual machine

ⓘ This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

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

Subscription \* ⓘ

Resource group \* ⓘ  [Create new](#)

**Instance details**  
Virtual machine name \* ⓘ

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[Give feedback](#)

Home > Virtual machines > Create a virtual machine >

Select an image

Other Items

My Images

Shared Images

Community Images

Direct Shared Images (PREVIEW)

Marketplace

All

Recently created

Private products

Categories

Other Items | My Images

Search in My Images

Image Name	Subscription	Type	Location
task-imag	Free Trial	Microsoft.Compute/images	northeurope

Is Marketplace helpful?

Home > Virtual machines >

Create a virtual machine

Availability zone \* ⓘ

Zone 1

You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type ⓘ

Standard

Image \* ⓘ

task-imag - x64 Gen2

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

VM architecture ⓘ

Arm64

x64

Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ

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Next : Disks >

Review + create

[Give feedback](#)

https://portal.azure.com/#

Home > CreateVm-task-imag-20240527145924 | Overview > demo

demo | Network settings

Virtual machine

Search

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Connect

Bastion

Networking

Network settings

Load balancing

Application security groups

This is a new experience. [Please provide feedback](#)

Public IP address

40.85.99.68

Private IP address

10.0.0.5

Admin security rules

0 (Configure)

Rules

Collapse all

Network security group **demonsq480** (attached to net)

Impacts 0 subnets, 1 network interfaces

Search rules

Source == all

Destination

Priority ↑

Name

Add inbound security rule

demonsq480

Source

Any

Source port ranges \*

\*

Destination

Any

Service

HTTP

Destination port ranges

80

Protocol

Any

Add

Cancel

[Give feedback](#)



Home > CreateVm-task-imag-20240527145924 | Overview > demo

## demo | Network settings

Virtual machine

Search

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

Connect

- Connect
- Bastion

Networking

- Network settings
- Load balancing
- Application security groups

This is a new experience. [Please provide feedback](#)

### Rules

Collapse all

Network security group **demonsg480** (attached to networkInterface: demo686)  
Impacts 0 subnets, 1 network interfaces

[+ Create port rule](#)

Search rules

Source == all Destination == all Protocol == all Action == all

Priority ↑	Name	Port	Protocol	Source	Destination
Inbound port rules (7)					
300	SSH	22	TCP	Any	Any
320	HTTPS	443	TCP	Any	Any
340	HTTP	80	TCP	Any	Any

Home > CreateVm-task-imag-20240527145924 | Overview > demo

## demo | Serial console

Virtual machine

Search

- Tasks (preview)
- Export template

Help

- Resource health
- Boot diagnostics
- Serial console
- Reset password
- Connection troubleshoot
- Performance diagnostics
- VM Inspector (Preview)
- Redeploy + reapply
- Support + Troubleshooting

Feedback

```
azureuser@demo:~$ sudo service apache2 start
```

Not secure 40.85.99.68

My Courses | Navee... Cloud Computing S... Railway Recruitment... Notices | Staff Selec... Visual Subnet Calcul... Microsoft Azure Por... All Bookmarks

## Apache2 Ubuntu Default Page

### ubuntu

#### It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

#### Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/  
|-- apache2.conf  
|   |-- ports.conf  
|-- mods-enabled  
|   |-- *.load  
|   |-- *.conf
```

