

# A Lecturer's Guide: Installing and Configuring MemVerge CXL Emulation Images in Microsoft Azure

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Prerequisites

Introduction

Create a Primary Linux Virtual Machine

- Create a new Virtual Machine

Configure the VM Disks

Configure Networking

Finalize the VM

Connect to the VM

Update and Prepare the OS Image

Create a VM Snapshot

- Upgrade the Resource Quota

- Request Additional Public IP Addresses

Scale the number of VMs

- Create a Virtual Machine Scale Set (VMSS)

- Modify the Number of VM Instances

## Prerequisites

- You have a Microsoft Azure Account (<https://portal.azure.com>)

# Introduction

This document provides a procedure that creates a primary Virtual Machine image. Once the VM has been configured and prepared, a snapshot of the VM will be created that can be cloned for each student in the class.

## Create a Primary Linux Virtual Machine

Login to your [Microsoft Azure Portal](#).

Use one of the following methods to create a virtual machine:

**Method 1:** From the dashboard, select 'Create a Resource'

### Azure services



Find the 'Virtual Machine' in the list or search for it in the search bar, then click 'Create'

### Create a resource ...

Get Started

Recently created

#### Categories

AI + Machine Learning

 Search services and marketplace

Popular Azure services [See more in All services](#)

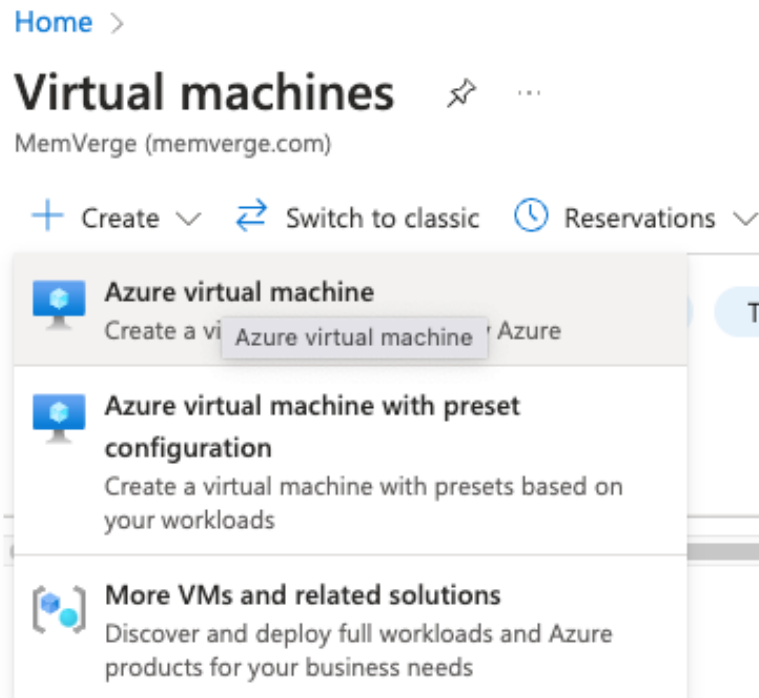


Virtual machine

[Create](#) | [Docs](#) | [MS Learn](#)

Go to the 'Create a new Virtual Machine' section to continue.

**Method 2:** An alternative method to create a Virtual Machine is to select 'Virtual Machine' on your dashboard, then click 'Create' in the top menu or in the central area if no virtual machines exist. Select 'Azure virtual machine' from the drop-down list of options:









## No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

[Learn more about Azure virtual machines](#)

[Learn more about Azure Arc virtual machines](#)

[Create a virtual machine](#)

-  **Azure virtual machine**  
Create a virtual machine hosted by Azure
-  **Azure virtual machine with preset configuration**  
Create a virtual machine with presets based on your workloads
-  **Azure Arc virtual machine**  
Create a new Azure Arc virtual machine in one of your non-Azure environments
-  **Azure VMware Solution virtual machine**  
Create a VMware virtual machine hosted by Azure

## Create a new Virtual Machine

In the VM Creation Screen, select these options:

- **Product details**
  - **Subscription:** Azure subscription 1 (use the default)
  - **Resource Group:** Click 'Create new' and use 'rg-cxldemo' as the resource group name

- **Instance Details**
  - **Virtual Machine name:** cxldemo01
  - **Region:** *Pick a region closest to you*
  - **Availability Options:** No infrastructure redundancy required
  - **Security Type:** Standard
  - **Image:** Ubuntu Server 22.04 LTS (or newer)
  - **VM architecture:** x86
  - **Run with Azure Spot discount:** unchecked
  - **Size:** Standard\_E2x\_v5 - 2 cpus, 16 GiB memory
- **Administrator account**
  - **Authentication type:** password
  - **Username:** cxluser
  - **Password:** LearningCXL1sFun!
  - **Confirm password:** LearningCXL1sFun!
- **Inbound port rules**
  - **Public inbound ports:** Allow selected ports
  - **Selected inbound ports:** SSH(22)

Here is an example

Microsoft Azure

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

10

steve.scargall@memver...  
MEMVERGE (MEMVERGE.COM)

Home > Virtual machines >

Create a virtual machine

Basics

Disks

Networking

Management

Monitoring

Advanced

Tags

Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

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 \*

Azure subscription 1

Resource group \*

(New) rg-cxldemo

Create new

Instance details

Virtual machine name \*

cxldem01

Region \*

(US) West US

Availability options

No infrastructure redundancy required

Security type

Standard

Image \*

Ubuntu Server 22.04 LTS - x64 Gen2 (free services eligible)

See all images | Configure VM generation

VM architecture

Arm64

x64

Run with Azure Spot discount

You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size \*

Standard\_E2ads\_v5 - 2 vcpus, 16 GiB memory (\$108.04/month)

See all sizes

Administrator account

Authentication type

SSH public key

Password

Username \*

cxldemo

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)

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

Review + create

< Previous

Next : Disks >

Give feedback

Click 'Next: Disks >' to continue

# Configure the VM Disks

Use the defaults for most options. As this is a demo environment, set the **OS disk type** to 'Standard SSD'. The disk screen should look similar to the following:

# Create a virtual machine ...

- Basics
- Disks
- Networking
- Management
- Monitoring
- Advanced
- Tags
- Review + create


Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

## VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host

☐

 Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)

## OS disk

OS disk type \*

Standard SSD (locally-redundant storage)

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM

☒

Key management

Platform-managed key

Enable Ultra Disk compatibility

☐

## Data disks for cxldem01

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
-----	------	------------	-----------	--------------	----------------

Create and attach a new disk

Attach an existing disk

^

## Advanced

Use managed disks

☒


Gallery package requires managed disks.

Ephemeral OS disk

☒ None

☐ OS cache placement

☐ Temp disk placement

 Ephemeral OS disks are currently not supported for the selected instance size.



Click 'Next: Networking >' to continue

# Configure Networking

Use the defaults for these options, except 'Delete public IP and NIC when VM is deleted', which should be selected (unselected by default). The Networking screen should look similar to the following:

Create a virtual machine ...

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 \* ⓘ

(new) cxldem01-vnet

Create new

Subnet \* ⓘ

(new) default (10.0.0.0/24)

Public IP ⓘ

(new) cxldem01-ip

Create new

NIC network security group ⓘ

☐ None

☒ Basic

☐ Advanced


Public inbound ports \* ⓘ

☐ None

☒ Allow selected ports

Select inbound ports \*

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

☒

Delete public IP and NIC when VM is deleted ⓘ



Enable accelerated networking ⓘ



**i** The resource provider 'Microsoft.Network' should be registered in order to enable accelerated networking. [Learn more](#) ↗

### 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.

Click "Review + Create" to continue.






## Finalize the VM


Review the options on the page and click 'Create' to create the VM. It will take a few minutes for the VM to initialize and become available. You will see a progress screen while the VM is initializing, similar to the following:


 **CreateVm-canonical.0001-com-ubuntu-server-jammy-2-20230907184611 | Overview**  


Deployment


<<

 Delete  Cancel  Redeploy  Download  Refresh


 Overview

 Inputs





 Outputs

 Template

**Deployment is in progress**

 Deployment name: CreateVm-canonical.0001-com-ubuntu-server-j... Start time: 9/7/2023, 9:23:46 PM  
Subscription: [Azure subscription 1](#) Correlation ID: ee18dbbd-b2fa-488d-aa5e-ca6  
Resource group: [rg-cxldemo](#)

Deployment details




Resource	Type	Status	Operation details
 <a href="#">cxldem01897</a>	Microsoft.Network/netwo...	Created	<a href="#">Operation details</a>
 <a href="#">cxldem01-ip</a>	Microsoft.Network/public...	OK	<a href="#">Operation details</a>
 <a href="#">cxldem01-nsg</a>	Microsoft.Network/netwo...	OK	<a href="#">Operation details</a>
 <a href="#">cxldem01-vnet</a>	Microsoft.Network/virtual...	OK	<a href="#">Operation details</a>

Give feedback

 [Tell us about your experience with deployment](#)






When the VM is available, you will see a screen similar to the following:


[Home](#) >


 **CreateVm-canonical.0001-com-ubuntu-server-jammy-2-20230907184611 | Overview**  


Deployment


<<


 Delete  Cancel  Redeploy  Download  Refresh


 Overview

 Inputs

 Outputs

 Template

 **Your deployment is complete**

 Deployment name: CreateVm-canonical.0001-com-ubuntu-server-j... Start time: 9/7/2023, 9:23:46 PM  
Subscription: [Azure subscription 1](#) Correlation ID: ee18dbbd-b2fa-488d-aa5e-ca6  
Resource group: [rg-cxldemo](#)

Deployment details

Next steps


[Setup auto-shutdown](#) Recommended

[Monitor VM health, performance and network dependencies](#) Recommended

[Run a script inside the virtual machine](#) Recommended

[Go to resource](#) [Create another VM](#)

Give feedback

 [Tell us about your experience with deployment](#)

Click 'Go to resource'. Information about the virtual machine will be shown. For example:

cxldem01

Virtual machine

Search

ConnectStartRestartStopCaptureDeleteRefreshOpen in mobileFeedbackCLI / PS

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Disks

Size

Microsoft Defender for Cloud

Advisor recommendations

Extensions + applications

Availability + scaling

Configuration

Identity

Properties

Locks

Operations

Bastion

Auto-shutdown

Backup

Disaster recovery

Updates

Inventory

Change tracking

Automanage

Configuration management (Preview)

Policies

Run command

Monitoring

Insights

Essentials

Resource group (move) : rg-cxldemo

Status : Running

Location : West US

Subscription (move) : Azure subscription 1

Subscription ID : 5deb952d-2ddb-47de-b4d4-491c1029358e

Operating system : Linux (ubuntu 22.04)

Size : Standard E2s v5 (2 vcpus, 16 GiB memory)

Public IP address : 168.61.16.89

Virtual network/subnet : cxldem01-vnet/default

DNS name : Not configured

Health state : -

Tags (edit) : Add tags

JSON View

PropertiesMonitoringCapabilities (7)RecommendationsTutorials

Virtual machine

Computer name : cxldem01

Operating system : Linux (ubuntu 22.04)

Image publisher : canonical

Image offer : 0001-com-ubuntu-server-jammy

Image plan : 22\_04-lts-gen2

VM generation : V2

VM architecture : x64

Agent status : Ready

Agent version : 2.9.1.1

Host group : None

Host : -

Proximity placement group : -

Colocation status : N/A

Capacity reservation group : -

Disk controller type : SCSI

Availability + scaling

Availability zone : -

Availability set : -

Scale Set : -

Security type

Security type : Standard

Extensions + applications

Extensions : -

Networking

Public IP address : 168.61.16.89 ( Network interface cxldem01897 )

Public IP address (IPv6) : -

Private IP address : 10.0.0.4

Private IP address (IPv6) : -

Virtual network/subnet : cxldem01-vnet/default

DNS name : Configure

Size

Size : Standard E2s v5

vCPUs : 2

RAM : 16 GiB

Disk

OS disk : cxldem01\_OsDisk\_1\_c666ce8490b949d19fe498b11b622c5e

Encryption at host : Disabled

Azure disk encryption : Not enabled

Ephemeral OS disk : N/A

Data disks : 0

Auto-shutdown

Auto-shutdown : Not enabled

Scheduled shutdown : -

Azure Spot

Azure Spot : -

Azure Spot eviction policy : -

# Connect to the VM

Using an SSH Client, connect to the VM using the public IP address shown in the 'Networking' section of the VM information. For this example, the public IP address is 168.61.16.89. Using a Linux Terminal, Putty (Windows), or MobaXTerm.

Use the `cxluser` user and password `LearningCXL1sFun!` that was configured during the VM creation procedure.

### Linux Terminal:

```
$ ssh cxluser@168.61.16.89
cxluser@168.61.16.89's password:
cxluser@cxldem01:~$
```

## Update and Prepare the OS Image

The following steps will prepare the OS for the lab. Once this first VM has been prepared, it can be cloned as many times as there are students to save time.

Update the package repository cache. This allows packages to be installed.

```
$ sudo apt update
```

Install podman

```
$ sudo apt install -y podman
```

Pull the MemVerge CXL Memory Expansion Image from Docker Hub

```
$ podman pull docker.io/mvpool/qemu_cxl_memexp
```

## Create a VM Snapshot

Once all the required packages have been installed, a snapshot of the VM should be taken using the [Azure Portal](#) from which other VM can be created. Watch [How to capture a VM image and use it from the image gallery](#) for a walk through of this procedure.

Select the VM in your dashboard, then click 'Capture' from the top menu



In the 'Create an image' window, ensure the Resource Group matches the VM resource group. Use the default options and change or select the following:

- **Resource group:** rg-cxldemo
- **Instance Details**
  - **Share image to Azure compute gallery:** Yes, share it to a gallery as a VM image version
- **Gallery details**
  - **Target Azure compute gallery:** Click 'Create new', then use 'cxldemoGallery' as a name.

- **Operating system state:** 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:** Click 'Create new'. In the popup window enter a 'VM image definition name', eg: 'cxldemoOSImg'. Use the default for the remaining options. For example:

## Create a VM image definition



VM image definition name *	<input type="text" value="cxldemoOSImg"/>
OS type	<input checked="" type="radio"/> Linux <input type="radio"/> Windows
VM generation	<input type="radio"/> Gen 1 <input checked="" type="radio"/> Gen 2
Security type	<input type="text" value="Standard"/>
VM architecture	<input checked="" type="radio"/> x64 <input type="radio"/> Arm64
Higher storage performance with NVMe (preview)	<input type="checkbox"/>
Enable hibernation (preview)	<input type="checkbox"/>
Accelerated networking (preview)	<input type="checkbox"/>
Publisher *	<input type="text" value="canonical"/>
Offer *	<input type="text" value="0001-com-ubuntu-server-jammy"/>
SKU *	<input type="text" value="22_04-lts-gen2"/>

▼ Publishing options (Optional)

- **Version details:**
  - **Version number:** 1.0.0

The options should look similar to the following:

# 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. With a shared image, you can easily replicate the image to Azure regions around the world and manage versions of the image. Certain information from the virtual machine will be carried forward to the image including OS type, VM generation, plan, and publishing details. [Learn more](#)

## Project details

Subscription

Azure subscription 1

Resource group \*

rg-cxldemo

## Instance details

Region

(US) West US

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) cxldemoGallery

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) cxldemoOSImg

Create new

## Version details

Version number \* 

1.0.0

Exclude from latest

End of life date 

MM/DD/YYYY

Shallow replication

## 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 storage sku ⓘ

Standard HDD LRS

Default replica count \* ⓘ

1

Target regions	Target region replica count	Storage account type
(US) West US	1	Standard HDD LRS
(US) East US	1	Standard HDD LRS

Review + create


< Previous

Next : Tags >

Click 'Review + create' to continue

Review the summary page and click 'Create' to finalize the image. The VM will be stopped while the image creation process completes. When the procedure completes, you'll see a confirmation page similar to the following:

Home >

 **Microsoft.Compute-CaptureVM-20230907214828** | Overview

Deployment

Search

<<

Delete

Cancel

Redeploy

Download

Refresh

Overview

Inputs

Outputs

Template

✔ Your deployment is complete

Deployment name : Microsoft.Compute-CaptureVM-20230907214828

Subscription : Azure subscription 1

Resource group : rg-cxldemo

Start time : 9/7/2023, 10:17:44 PM

Correlation ID : 115d6cae-6445-49fc-a858-f437d91c...

> Deployment details

< Next steps

Go to resource





Click 'Go to resource' to continue to the image details, which looks similar to the following:

## 1.0.0 (cxldemoGallery/cxldemoOSImg/1.0.0) ...





VM image version

<< [+ Create VM](#) [+ Create VMSS](#) [Delete](#) [Refresh](#) [Give feedback](#)



### Overview

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

### Settings

-  Update replication
-  Configuration
-  Properties
-  Locks

### Automation

-  Tasks (preview)
-  Export template

### Help

-  Support + Troubleshooting

### Essentials


Resource group ( <a href="#">move</a> )	: <a href="#">rg-cxldemo</a>	Azure compute gallery	: <a href="#">cxldemoGallery</a>
Status	: Succeeded	VM image definition	: <a href="#">cxldemoOSImg</a>
Location	: West US	Replication status	: Completed
Subscription ( <a href="#">move</a> )	: <a href="#">Azure subscription 1</a>	Replication mode	: Full
Subscription ID	: 5deb952d-2ddb-47de-b4d4-491c1029358e	Confidential OS disk encr...	: -
		Encryption type	: Platform-managed key
		End of life date	: -
		Exclude from latest	: No
		Storage account type	: Standard HDD LRS
Tags ( <a href="#">edit</a> )	: <a href="#">Add tags</a>		


Click 'Create VM' from the list of commands at the top. You will be presented with a prepopulated 'Create a virtual machine' form with most of the details automatically populated based on the VM configuration we created earlier. The only fields that require attention are:

- Virtual machine name: cxldemo01 (increment for each new VM)
- Authentication type: Password

## Create a virtual machine ...

**Basics**   Disks   Networking   Management   Monitoring   Advanced   Tags   Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#) 

 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 *	<div><div></div><div>Azure subscription 1</div><div>▼</div></div>
Resource group *	<div><div></div><div>rg-cxldemo</div><div>▼</div></div> <div>Create new</div>

## Instance details

Virtual machine name *	<div><div></div><div>cxldemo01</div><div>✓</div></div>
Region *	<div><div></div><div>(US) West US</div><div>▼</div></div>
Availability options	<div><div></div><div>No infrastructure redundancy required</div><div>▼</div></div>
Security type	<div><div></div><div>Standard</div><div>▼</div></div>
Image *	<div><div></div><div>cxldemoGallery/cxldemoOSImg/1.0.0/cxldemoGallery/cxldemoOSImg/1.0.0</div><div>▼</div></div> <div>See all images   Configure VM generation</div>
VM architecture	<div><div><input type="radio"/> Arm64</div><div><input checked="" type="radio"/> x64</div></div> <div><div></div><div>Arm64 is not supported with the selected image.</div></div>
Run with Azure Spot discount	<div><div></div><div><input type="checkbox"/></div></div>

**i** You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size *	<div><div></div><div>Standard_E2s_v5 - 2 vcpus, 16 GiB memory (\$102.20/month)</div><div>▼</div></div> <div>See all sizes</div>
--------	---

## Administrator account

Authentication type	<div><div><input type="radio"/> SSH public key</div><div><input checked="" type="radio"/> Password</div></div>
Username	<div><div></div></div>
Password	<div><div></div></div>
Confirm password	<div><div></div></div> <div><div></div><div>Administrator account is predefined with specialized images. <a href="#">Learn more about specialized images</a></div></div>

## 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) ▼

**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.

**Review + create**

< Previous

Next : Disks >

Click 'Review + create' to continue to the summary screen. Verify the details are correct, then click 'Create' to create the new VM. Once the VM is provisioned, click 'Go to resource'.

SSH to the new VM using the IP Address shown on the VM summary page.

## Upgrade the Resource Quota

Creating VMs requires CPU and Public IP Addresses. Depending on these resource quotas for your account, you may have to request a quota increase.

From the Azure Dashboard Home, select or find 'Usage + quotas'.

**Request Additional vCPUs for Compute Instances.**

Select 'Compute' from the resource type drop-down and find the instance type 'Standard ESv5 Family vCPUs'. Click the pencil icon on the right to change the maximum number of vCPUs. Each compute node needs two vCPUs. For example, to run 30 virtual machines, the vCPU limit needs to be 60 or higher.

Usage + quotas ☆ ...

Request quota increase ▾

Refresh

Download ▾

Recommended

To view and manage quotas across all your subscri

Search

Compute

Showing 1 to 100 of 6000 records in 3 groups.

Quota name	Region
Usage at regular level (1)	
<input type="checkbox"/> Standard ESv5 Family vCPUs	West US 3
Usage at low level (9)	
<input type="checkbox"/> Total Regional vCPUs	West US 3
<input type="checkbox"/> Gallery	West US 3

Request quota increase

Enter a new limit for the following 1 quota.

Azure subscription 1

West US 3

Quota	Usage	New limit
Standard ESv5 Family vCPUs	44 of 128	<input type="text"/>

See also

[VM-series vCPU quotas](#)

[Total regional vCPU quotas](#)

[Spot vCPU quotas](#)

Click 'Submit' to continue.

The process is automated. Upon success, you'll be granted the resources. A support ticket must be created to assist if a failure occurs.

## Request Additional Public IP Addresses

Select 'Networking' from the resource type drop-down and find 'Public IP Addresses' and 'Static Public IP Addresses' in the list. Click the pencil icon to edit the resource, enter the new maximum limit, then click 'Submit'.

The process is automated. Upon success, you'll be granted the resources. A support ticket must be created to assist if a failure occurs.

Usage + quotas ☆ ...

Request quota increase ▾

Refresh

Download ▾

Recommended

To view and manage quotas across all your subscriptions

Search

Networking

Showing 1 to 100 of 1794 records in 3 groups.

Quota name	Region	Subscription
Usage at or near quota (2)		
Network Watchers	West US	Azure subscription 1
Network Watchers	West US 3	Azure subscription 1
Usage at low level (6)		
Public IP Addresses	West US 3	Azure subscription 1
Static Public IP Addresses	West US 3	Azure subscription 1
Public IP Addresses - Standard	West US 3	Azure subscription 1

Request quota increase

×

Enter a new limit for the following 1 quota.

Azure subscription 1

West US 3

Quota	Usage	New limit	
Public IP Addresses	20 of 65	<input type="text" value="66"/>	

See also

[Learn more about Azure network quota increase requests](#)

# Scale the number of VMs

Find the 'VM image version' from the Azure Portal home page under 'Resources'. It may be in the 'Recent' list. Click 'See all' if it is not. Select the OS Image - "1.01 (cxldemoGallery/cxldemoOSImg/1.0.1)"

Resources

Recent

Favorite

Name	Type	Last Viewed
1.0.1 (cxldemoGallery/cxldemoOSImg/1.0.1)	VM image version	5 minutes ago
rg-IntelOn	Resource group	28 minutes ago
cxldemo	Virtual machine	40 minutes ago
Azure subscription 1	Subscription	2 hours ago

[See all](#)

To create a single VM from the OS image, select 'Create VM' from the commands at the top. To create multiple VMs in one go, or change the number of VMs over time, choose 'Create VMSS' from the command options.

[Home](#) >



**1.0.1 (cxldemoGallery/cxldemoOSImg/1.0.1)**

VM image version



Create VM



Create VMSS



Delete



Refresh



Give feedback

## Create a Virtual Machine Scale Set (VMSS)

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](#)

The following shows the options used. You can change the options to suit your requirements. The 'Instance count' specifies how many new VMs will be created.

**Microsoft Azure**

[Home](#) > [1.0.1 \(cxldemoGallery/cxldemoOSImg/1.0.1\)](#) >

### 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 \*

Azure subscription 1

Resource group \*

rg-IntelOn

[Create new](#)

### Scale set details

Virtual machine scale set name \*

cxldemoSet

Region \*

(US) West US 3

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 \* ⓘ

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

Security type ⓘ

Standard

### Instance details

Image \* ⓘ

cxldemoGallery/cxldemoOSImg/1.0.1/cxldemoGallery/cxldemoOSImg/1.0.1

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

VM architecture ⓘ

- ☐ Arm64
- ☒ x64

**i** Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ

☐

Size \* ⓘ

Standard\_E2s\_v5 - 2 vcpus, 16 GiB memory (\$91.98/month)

[See all sizes](#)

### Scaling

Scaling mode ⓘ

- ☒ **Manually update the capacity:** Maintain a fixed amount of instances.
- ☐ **Autoscaling:** Scaling based on a CPU metric, on any schedule.

Instance count \* ⓘ

2

[Configure scaling options](#)

### Administrator account

Authentication type ⓘ

- ☒ Password
- ☐ SSH public key



Username ⓘ

Password ⓘ

Confirm password ⓘ

### Licensing

License type \*


Other

If you are using a RedHat or SLES image, you may be eligible for the Azure Hybrid Benefit and can save money on the license costs. [Learn more](#) about this benefit and how to enable it using Azure CLI for custom images from snapshots and Azure compute gallery.

Review + create

< Previous


Next : Spot >

 Give feedback



Click 'Review + create' to continue or 'Next: Spot >' to review and configure options. The defaults are good enough for this lab.

The new deployment may take several minutes, depending on the options and number of VMs that will be created. Once the VMSS deployment is complete, click 'Go to resource'

[Home](#) >




CreateVmss-1.0.1-20230915163815 | Overview


 


Deployment


Search


<<


 Delete


 Cancel


 Redeploy


 Download


 Refresh


 Overview

 Inputs

 Outputs

 Template

 Your deployment is complete

 Deployment name : CreateVmss-1.0.1-20230915163815

Subscription : [Azure subscription 1](#)

Resource group : [rg-IntelOn](#)

Start time : 9/15/2023, 4:42:19 PM

Correlation ID : a931bcbe-7dfa-41ff-9a04-07c975065980

> Deployment details

> Next steps

Go to resource

View the VMs in the Settings → Instances page

Home > cxldemoScaleSet

## cxldemoScaleSet | Instances

Virtual machine scale set

Search

Start Restart Stop Reimage Delete Upgrade Refresh

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

Settings

- Instances
- Networking
- Scaling

Search virtual machine instances

Instance	Computer name	Type	Status	Provisioning state
cxldemoScaleSet_a91ff550	cxldemo	VM	Running	Succeeded
cxldemoScaleSet_b714239e	cxldemo	VM	Running	Succeeded

You can also see a list of VMs from the 'Virtual Machines' page. Home → Virtual Machines.

Home >

## Virtual machines

MemVerge

Create Switch to classic Reservations Manage view Refresh Export to CSV Open query Assign tags Start Restart Stop Delete Services Maintenance

Filter for any field... Subscription equals all Type equals all Resource group equals all Location equals all Add filter

Showing 1 to 3 of 3 records. No grouping List view

Name	Type	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
cxldemo	Virtual machine	Azure subscription 1	rg-IntelOn	West US 3	Stopped (deallocated)	Linux	Standard_E2s_v5	20.118.163.6	1
cxldemoScaleSet_a91ff...	Virtual machine	Azure subscription 1	rg-IntelOn	West US 3	Running	Linux	Standard_E2s_v5	20.106.75.164	1
cxldemoScaleSet_b714...	Virtual machine	Azure subscription 1	rg-IntelOn	West US 3	Running	Linux	Standard_E2s_v5	20.106.75.219	1

## Modify the Number of VM Instances

Within the Scale Set, go to Settings → Scaling in the menu on the left and change the desired number of VMs

## cxldemoScaleSet | Scaling

Virtual machine scale set

 <<  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
- Size
- Extensions + applications

### Configure

Scale-In Policy

Predictive charts

Run history



JSON

Notify

Diagnostic settings

Autoscale is a built-in feature that helps applications perform their best when demand changes. You can choose to scale your resource manually to a specific instance count, or via a custom Autoscale policy that scales based on metric(s) thresholds, or schedule instance count which scales during designated time windows. Autoscale enables your resource to be performant and cost effective by adding and removing instances based on demand. [Learn more about Azure Autoscale](#) or [view the how-to video](#).

#### Choose how to scale your resource

 <b>Manual scale</b> Maintain a fixed instance count	 <b>Custom autoscale</b> Scale on any schedule, based on any metrics
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#### Manual scale

Override condition

Instance count ⓘ

2

Click 'Save' to continue. This will deploy the requested number of VMs.