

 tajamar.	Máster en Ingeniería MultiCloud, DevOps y Seguridad.
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# Administración de máquinas virtuales

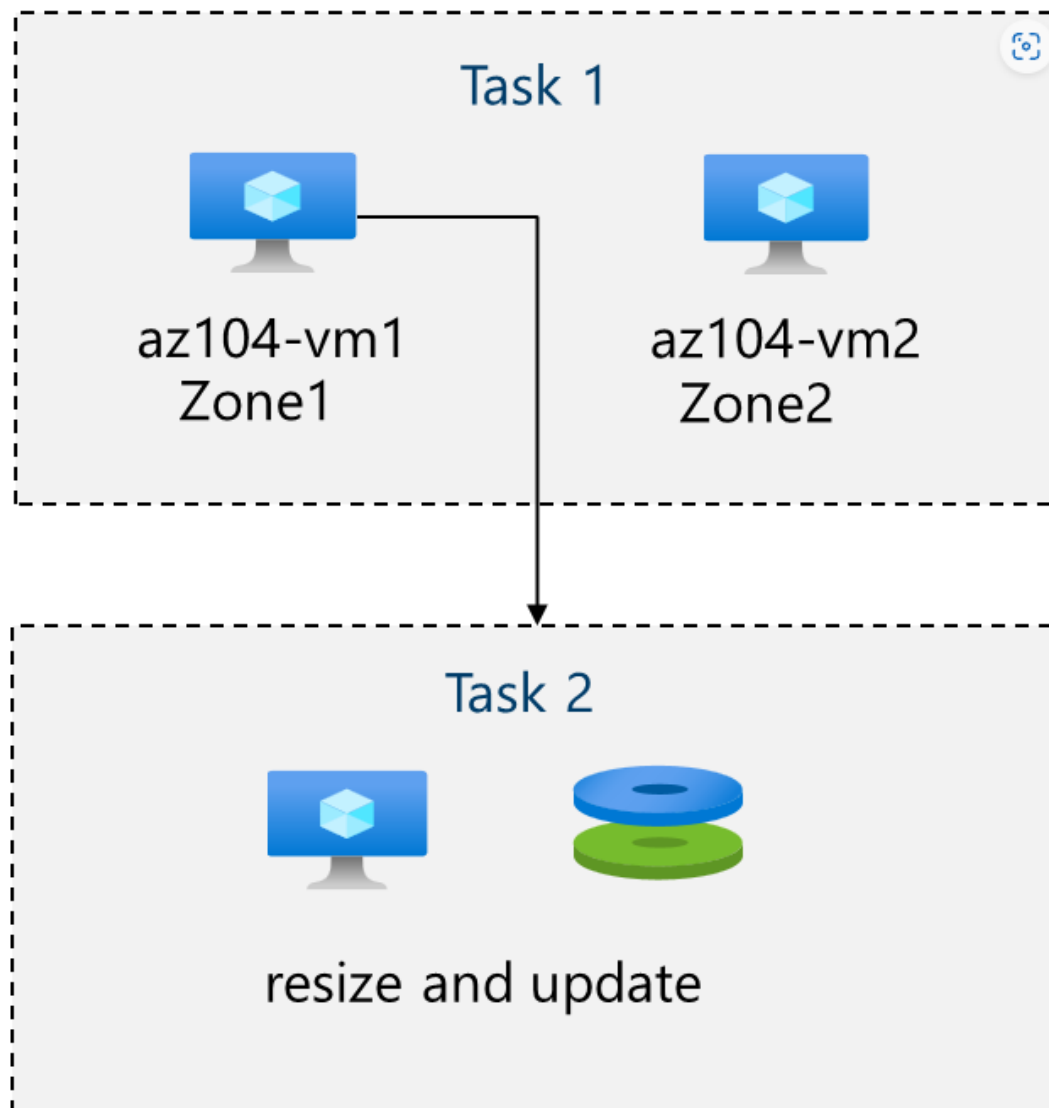
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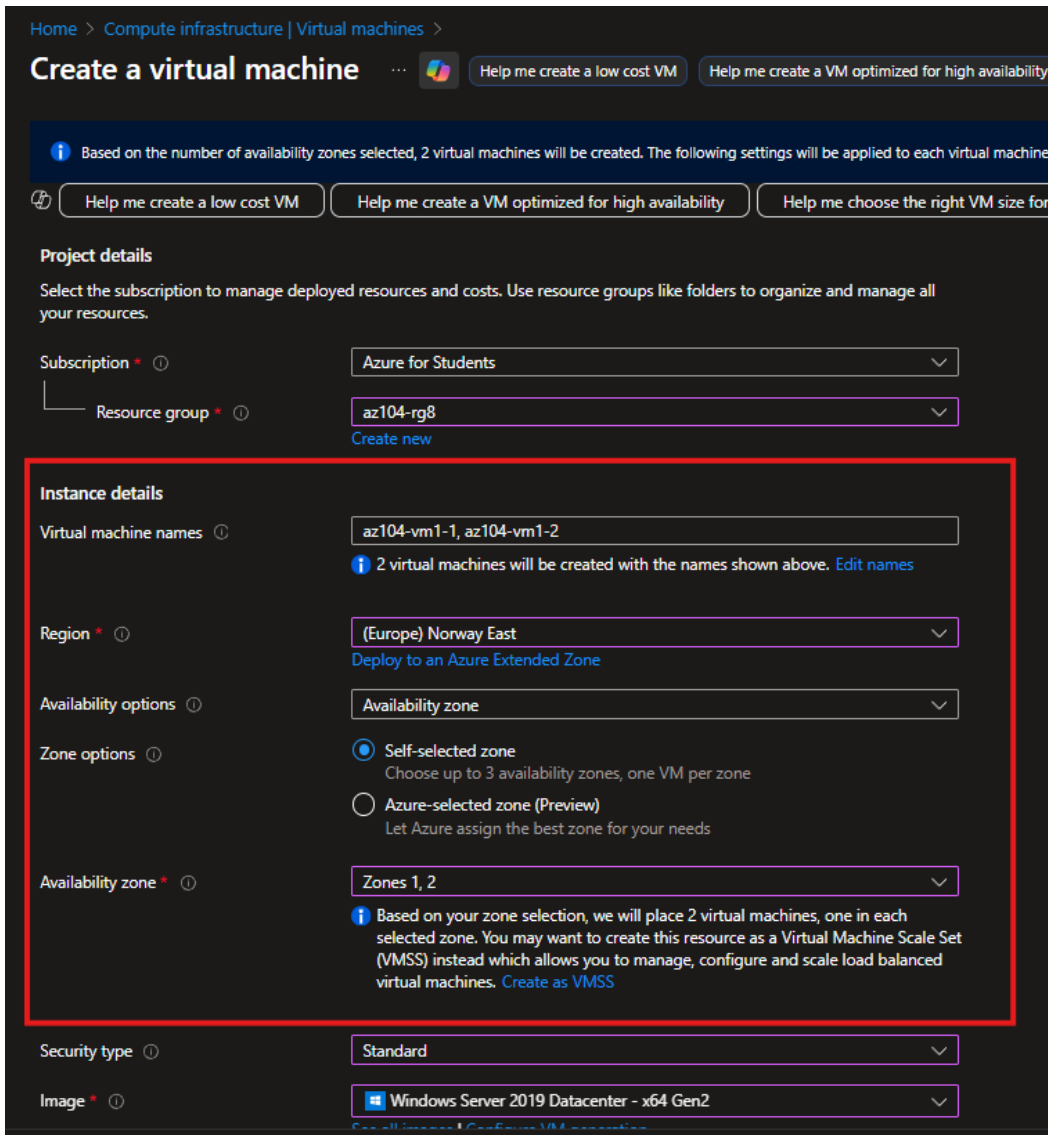
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## Esquema del laboratorio



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## Implementación de máquinas virtuales de Azure con resistencia de zona mediante Azure Portal.



Home > Compute infrastructure | Virtual machines >

### Create a virtual machine

Based on the number of availability zones selected, 2 virtual machines will be created. The following settings will be applied to each virtual machine:

Help me create a low cost VM | Help me create a VM optimized for high availability | Help me choose the right VM size for my workload

**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 for Students

Resource group \* ⓘ: az104-rg8

[Create new](#)

**Instance details**

Virtual machine names ⓘ: az104-vm1-1, az104-vm1-2

2 virtual machines will be created with the names shown above. [Edit names](#)

Region \* ⓘ: (Europe) Norway East

[Deploy to an Azure Extended Zone](#)

Availability options ⓘ: Availability zone

Zone options ⓘ:

- ☒ Self-selected zone  
Choose up to 3 availability zones, one VM per zone
- ☐ Azure-selected zone (Preview)  
Let Azure assign the best zone for your needs

Availability zone \* ⓘ: Zones 1, 2


Based on your zone selection, we will place 2 virtual machines, one in each selected zone. You may want to create this resource as a Virtual Machine Scale Set (VMSS) instead which allows you to manage, configure and scale load balanced virtual machines. [Create as VMSS](#)

Security type ⓘ: Standard

Image ⓘ: Windows Server 2019 Datacenter - x64 Gen2

[See all images & Configure VM selection](#)

Se ha elegido "Availability zone" (Zona de disponibilidad), lo que significa que las máquinas se distribuirán en zonas distintas dentro de la región. Las zonas de disponibilidad son centros de datos física y lógicamente separados dentro de una región de Azure.

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**Create a virtual machine** ... [Help me create a low cost VM](#) [Help me create a VM optimized for high availability](#) [Help me choose the right VM](#)

Based on the number of availability zones selected, 2 virtual machines will be created. The following settings will be applied to each virtual machine unless specified otherwise.

[Help me create a low cost VM](#) [Help me create a VM optimized for high availability](#) [Help me choose the right VM size for my workload](#)

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 \*  [Create new](#)

Subnet \*

Public IP \*  [Configure IP address](#)

**2 public IPs will be created with the names shown above.**

NIC network security group ☐ None ☒ Basic ☐ Advanced

Public inbound ports \* ☐ None ☒ Allow selected ports


Select inbound ports \*


**⚠ 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 ☒

Virtual network y Subnet: Las máquinas virtuales se conectarán a una nueva Red Virtual llamada az104-vm1-1-vnet. Dentro de esta VNet, se asignarán a la subred por defecto, la cual utiliza el rango de direcciones IP 10.0.0.0/24.

Delete public IP and NIC when VM is deleted: Se ha marcado la casilla, asegurando que los recursos de red asociados (la IP pública y la interfaz de red) se eliminen automáticamente cuando se borre la máquina virtual.

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Your deployment is complete


Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...









Subscription: [Azure for Students](#)

Resource group: [az104-rg8](#)

Start time: 8/12/2025, 20:38:38

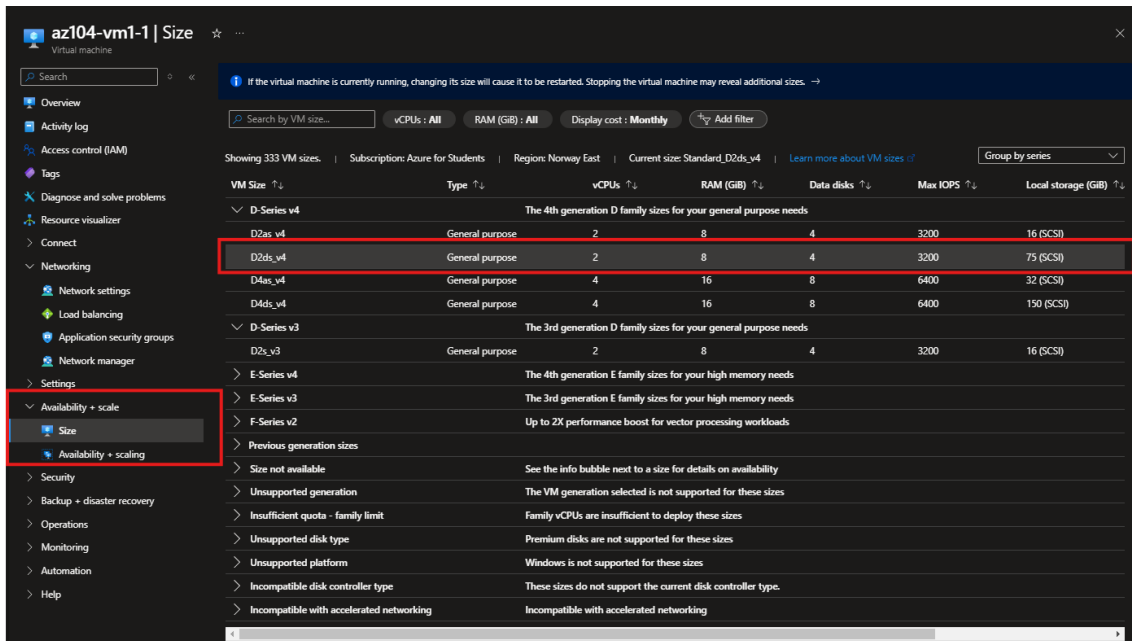
Correlation ID: 568343111-35f1-4fc8-bed7-06bb979c9d12

Deployment details

Resource	Type	Status	Operation details
 az104-vm1-1	Microsoft.Compute/virtualMachines	OK	<a href="#">Operation details</a>
 az104-vm1-2	Microsoft.Compute/virtualMachines	OK	<a href="#">Operation details</a>
 az104-vm1-1977_22	Microsoft.Network/networkInterfaces	OK	<a href="#">Operation details</a>
 az104-vm1-1157_21	Microsoft.Network/networkInterfaces	OK	<a href="#">Operation details</a>
 az104-vm1-1-nsg	Microsoft.Network/networkSecurityGroups	OK	<a href="#">Operation details</a>
 az104-vm1-1-vnet	Microsoft.Network/virtualNetworks	OK	<a href="#">Operation details</a>
 az104-vm1-1-ip	Microsoft.Network/publicIpAddresses	OK	<a href="#">Operation details</a>
 az104-vm1-2-ip	Microsoft.Network/publicIpAddresses	OK	<a href="#">Operation details</a>

Recursos desplegados.

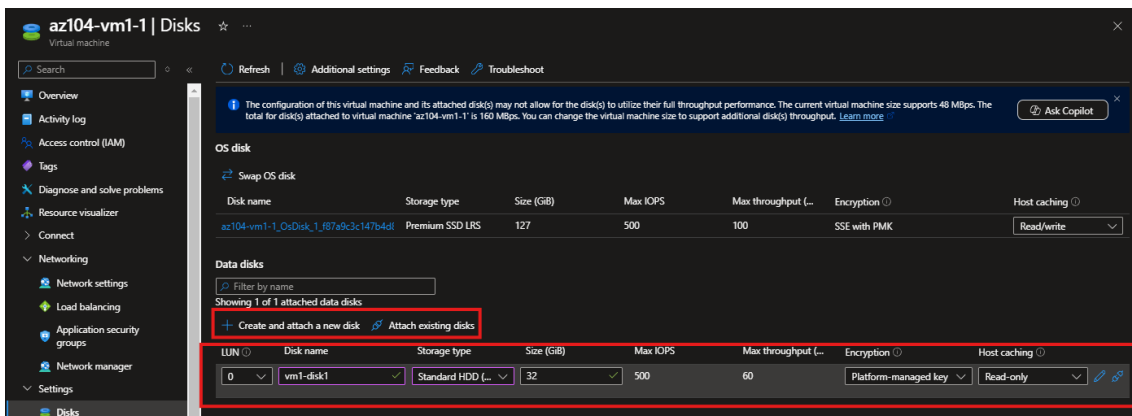
## Administración del escalado del proceso y el almacenamiento para máquinas virtuales



The screenshot shows the 'Size' selection page in the Azure portal for a virtual machine named 'az104-vm1-1'. The left sidebar shows the 'Settings' menu with 'Size' selected. The main area displays a table of available VM sizes. The 'D2ds\_v4' size is highlighted in red, indicating it is the selected size.

VM Size	Type	vCPUs	RAM (GiB)	Data disks	Max IOPS	Local storage (GiB)
<b>The 4th generation D family sizes for your general purpose needs</b>						
D2as_v4	General purpose	2	8	4	3200	16 (SCSI)
<b>D2ds_v4</b>	General purpose	2	8	4	3200	75 (SCSI)
D4as_v4	General purpose	4	16	8	6400	32 (SCSI)
D4ds_v4	General purpose	4	16	8	6400	150 (SCSI)
<b>The 3rd generation D family sizes for your general purpose needs</b>						
D2s_v3	General purpose	2	8	4	3200	16 (SCSI)
<b>The 4th generation E family sizes for your high memory needs</b>						
E-Series v4						
<b>The 3rd generation E family sizes for your high memory needs</b>						
E-Series v3						
<b>Up to 2X performance boost for vector processing workloads</b>						
F-Series v2						
<b>Previous generation sizes</b>						
Size not available						
See the info bubble next to a size for details on availability						
<b>Unsupported generation</b>						
The VM generation selected is not supported for these sizes						
Family vCPUs are insufficient to deploy these sizes						
<b>Insufficient quota - family limit</b>						
Premium disks are not supported for these sizes						
<b>Unsupported disk type</b>						
Windows is not supported for these sizes						
<b>Unsupported platform</b>						
These sizes do not support the current disk controller type.						
<b>Incompatible disk controller type</b>						
Incompatible with accelerated networking						

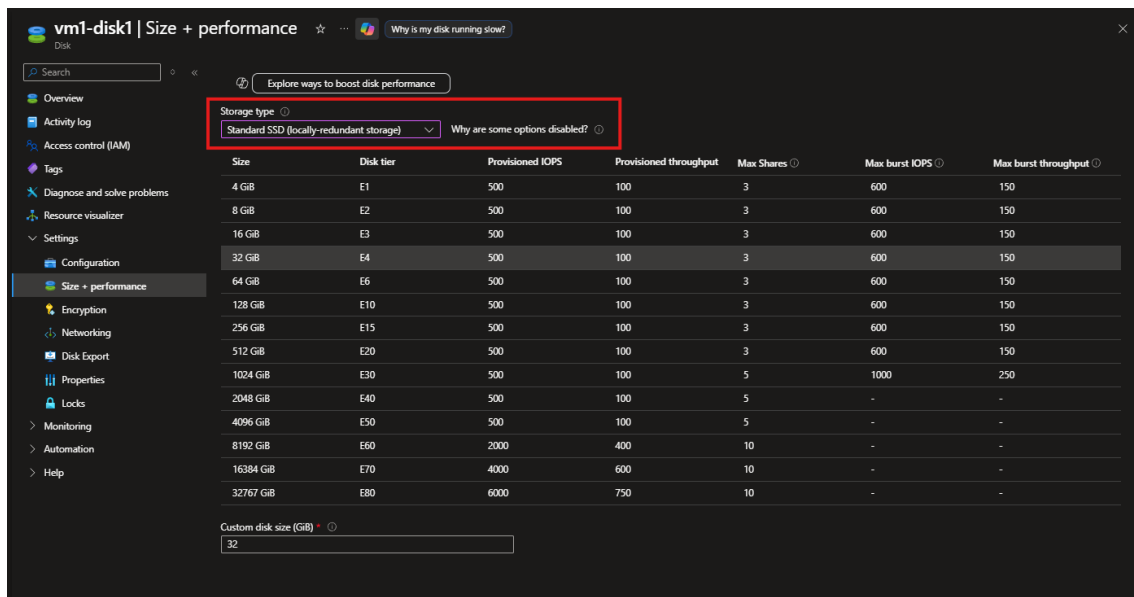
Cambiamos el size de la máquina virtual a un tier superior



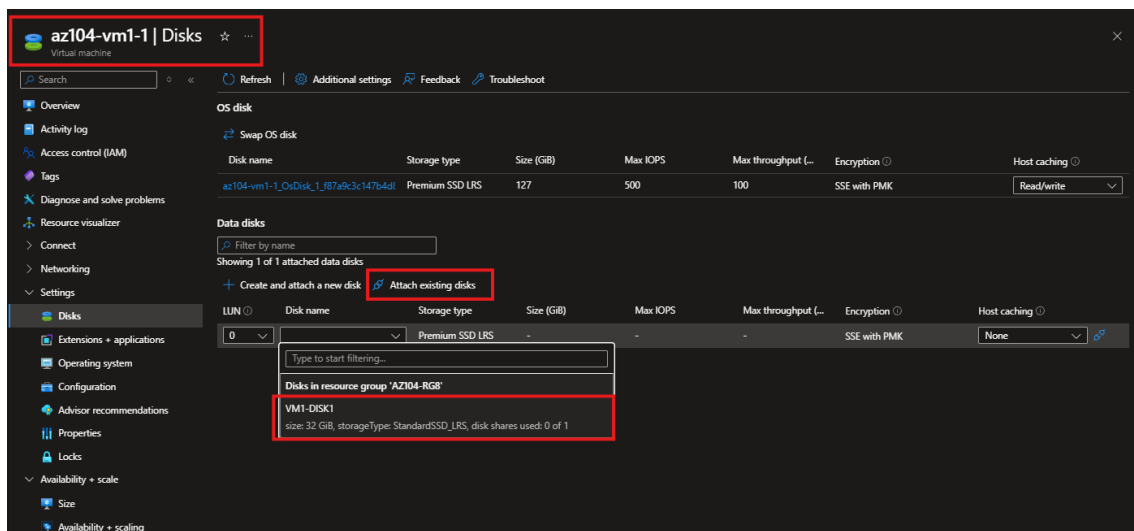
The screenshot shows the 'Disks' page in the Azure portal for a virtual machine named 'az104-vm1-1'. The 'Data disks' section shows a table of attached disks. A new data disk 'vm1-disk1' is being created with a size of 32 GiB. The 'Create and attach a new disk' button is highlighted in red.

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput	Encryption	Host caching
0	vm1-disk1	Standard HDD	32	500	60	Platform-managed key	Read-only

Creamos un nuevo disco y lo quitamos de la maquina virtual para usarlo luego.



Con el disco creado, accedemos a settings – size performance donde voy a modificar el tipo de almacenamiento a STANDARD SSD y lo volveremos a asignar en la máquina virtual.



Volvemos a la configuración de la máquina virtual donde selecciono la configuración de discos, vamos a añadirle el disco modificado que hemos creado anteriormente.



az104-vm1-1 | Disks

Virtual machine

Search

Refresh

Additional settings

Feedback

Troubleshoot

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Connect

Networking

Settings

Disks

Extensions + applications

Operating system

Configuration

Advisor recommendations

Properties

Locks

The configuration of this virtual machine and its attached disk(s) may not allow for the disk(s) to utilize their full throughput performance. The current virtual machine size supports 48 MBps. The total for disk(s) attached to virtual machine "az104-vm1-1" is 200 MBps. You can change the virtual machine size to support additional disk(s) throughput. [Learn more](#)

Ask Copilot

OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption	Host caching
az104-vm1-1_OsDisk_1_87293c147b4d1	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

Data disks

Filter by name


Showing 1 of 1 attached data disks

Create and attach a new disk

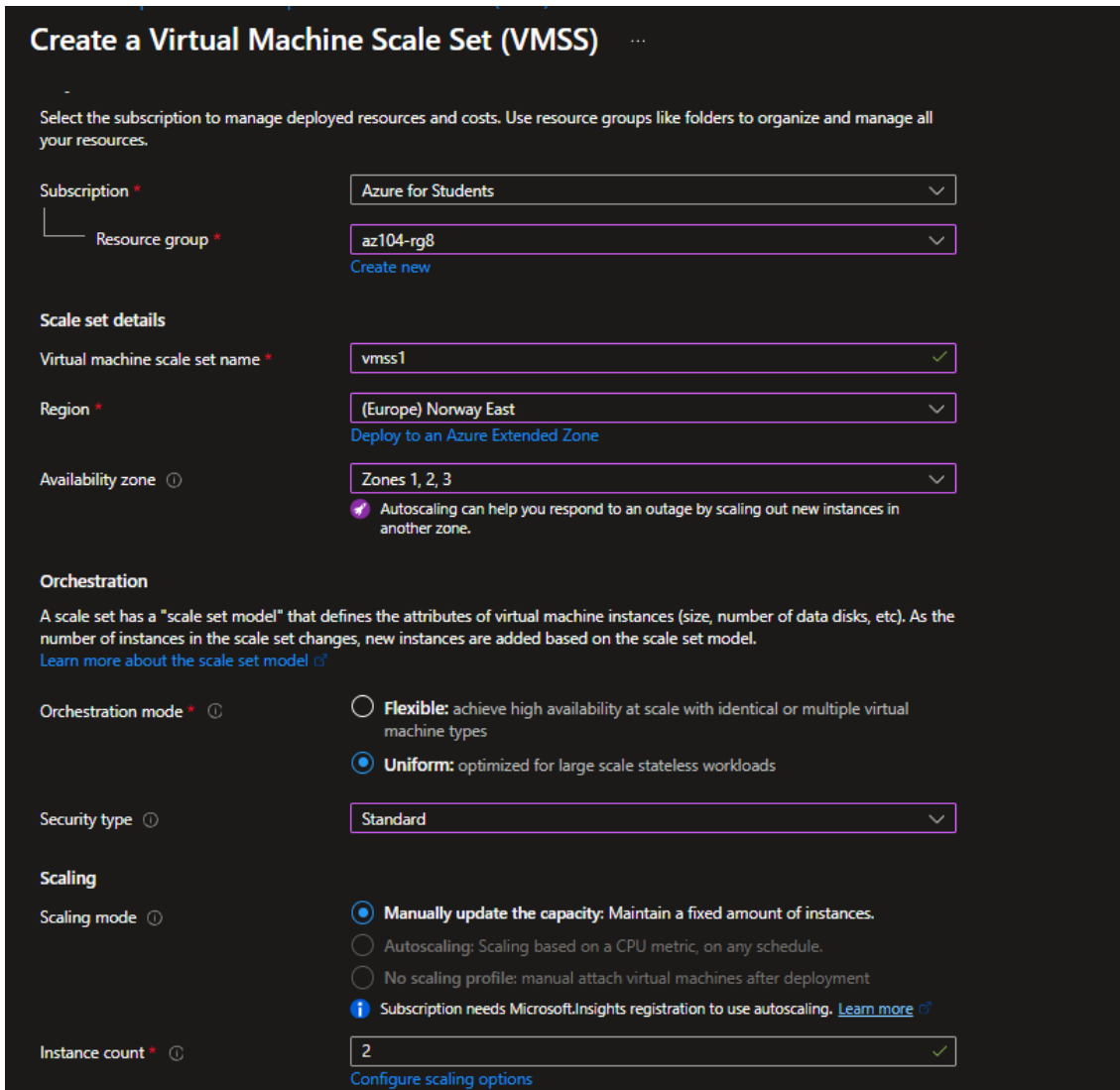
Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption	Host caching
0	vm1-disk1	Standard SSD LRS	32	500	100	SSE with PMK	None

Disco añadido.

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## Creación y configuración de conjuntos de escalado de máquinas virtuales de Azure



**Create a Virtual Machine Scale Set (VMSS)** ...

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**

Virtual machine scale set name \*  ✓

Region \*  [Deploy to an Azure Extended Zone](#)

Availability zone ⓘ    
 ⓘ Autoscaling can help you respond to an outage by scaling out new instances in another 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   
☒ **Uniform:** optimized for large scale stateless workloads

Security type ⓘ

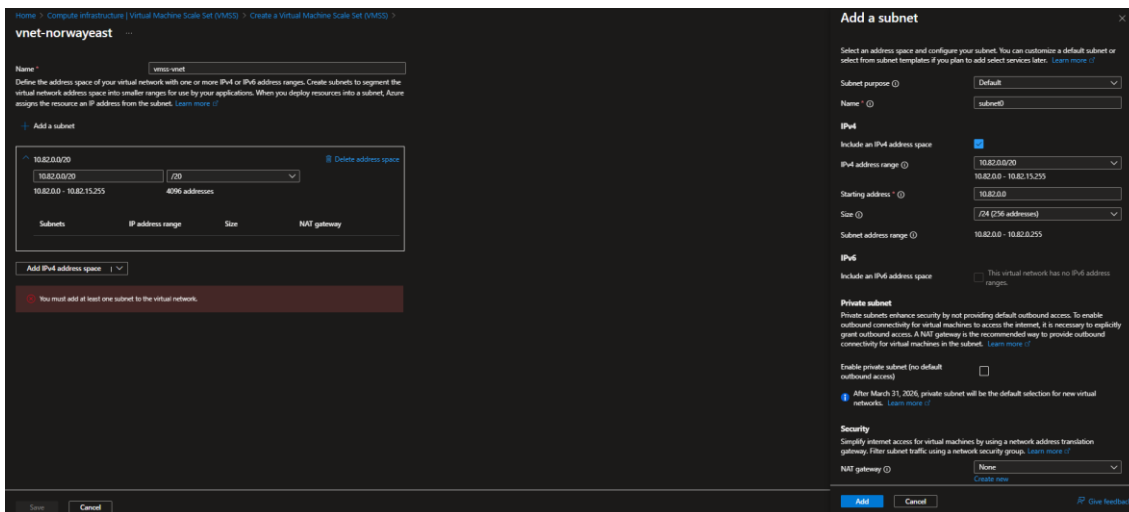
**Scaling**

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   
 ⓘ Subscription needs Microsoft Insights registration to use autoscaling. [Learn more](#) ⓘ

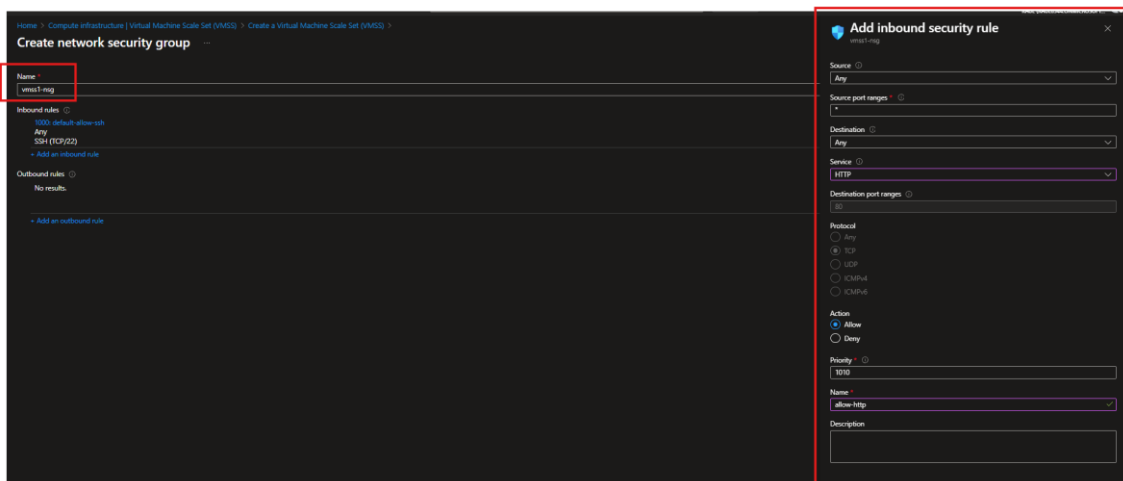
Instance count \* ⓘ  ✓   
[Configure scaling options](#)

Creación de un Virtual Machine Scale Set (VMSS), una herramienta que permite desplegar y gestionar un conjunto de máquinas virtuales idénticas.

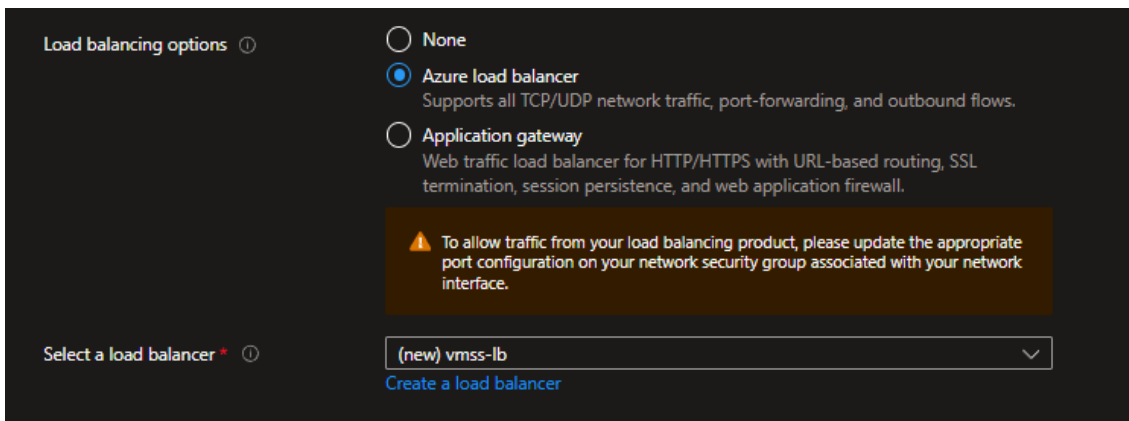
El Orchestration mode (Modo de Orquestación) se establece en Uniform. Este modo está optimizado para grandes cargas de trabajo sin estado (stateless workloads) y asegura que todas las instancias VM tengan una configuración idéntica basada en un modelo único.




Creo una nuevo espacio de red y una subred virtual para el scale set.





Dentro de la configuración de red, creo un nuevo grupo de seguridad y añado una regla de tráfico entrante para permitir conexiones HTTP.



Creo un balanceador de carga con las configuraciones por defecto de azure.

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 Your deployment is complete


 Deployment name : CreateVmss-MicrosoftWindowsServer.WindowsServer-2-20251208211232











Subscription : [Azure for Students](#)

Resource group : [az104-rg8](#)


Start time : 8/12/2025, 21:17:43

Correlation ID : dc90e53c-7581-4e75-9bc5-46641efa8ac1

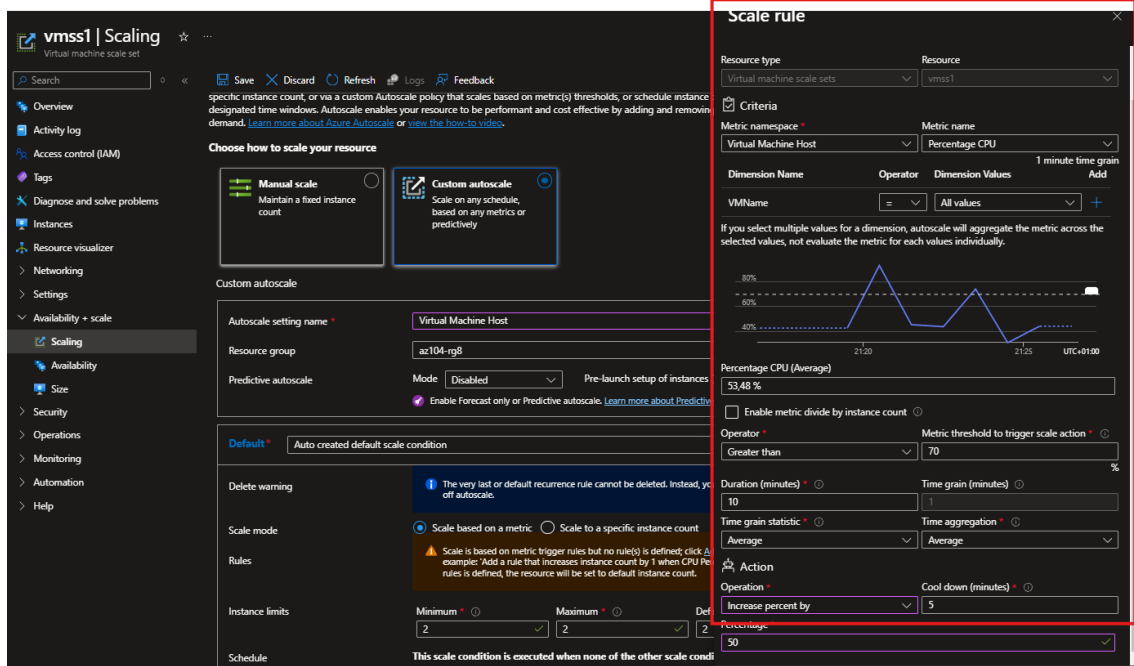
 Deployment details

Resource	Type	Status	Operation details
 vmss1	 Virtual machine scale set	OK	<a href="#">Operation details</a>
 vmss-lb	 Load balancer	Created	<a href="#">Operation details</a>
 network-interface-associated-virtual-network-20251208211744	 Deployment	OK	<a href="#">Operation details</a>
 vmss1-mig	 Network security group	OK	<a href="#">Operation details</a>
 vmss-lb-publicip	 Public IP address	OK	<a href="#">Operation details</a>

El scale set desplegado.

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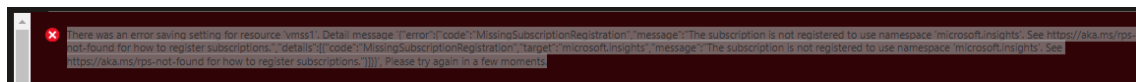
## Escalado de los Conjuntos de escalado de las máquinas virtuales de Azure



The screenshot shows the Azure portal interface for configuring a Virtual Machine Scale Set (vmss1). The 'Scale rule' panel is open, displaying the configuration for a custom autoscale rule. The rule is named 'Virtual Machine Host' and is based on the 'Percentage CPU' metric. The threshold is set to 'Greater than 70%'. The action is 'Increase percent by 50%'. The current CPU usage is 53.48%.

La condición para activar el escalado es cuando el promedio del porcentaje de CPU es Greater than 70% (Mayor que 70%).

El número de instancias se incrementará en un 50% de la capacidad actual. Si el recuento actual de instancias es 2 (como se configuró en otra captura), esto añadiría 1 instancia más (50% de 2).




```
raul_casado [ ~ ]$ az provider register --namespace Microsoft.Insights
Registering is still on-going. You can monitor using 'az provider show -n Microsoft.Insights'
```

Este error significa que la suscripción de Azure que estás utilizando no tiene registrado el proveedor de recursos microsoft.insights.

Para resolver este problema y permitir que la configuración de escalado se guarde, debo registrar el proveedor de recursos microsoft.insights en mi suscripción.

Para ello he utilizado el comando de azure cli `az provider register --namespace Microsoft.Insights`

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### Scale rule

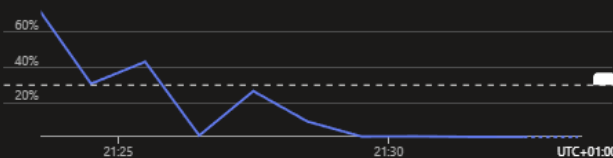
Resource type: Virtual machine scale sets | Resource: vmss1

☒ Criteria

Metric namespace: Virtual Machine Host | Metric name: Percentage CPU | 1 minute time grain

Dimension Name	Operator	Dimension Values	Add
VMName	=	All values	+

If you select multiple values for a dimension, autoscale will aggregate the metric across the selected values, not evaluate the metric for each values individually.



Percentage CPU (Average): 18,82 %

☐ Enable metric divide by instance count

Operator: Less than | Metric threshold to trigger scale action: 30 %

Duration (minutes): 10 | Time grain (minutes): 1


Time grain statistic: Average | Time aggregation: Average

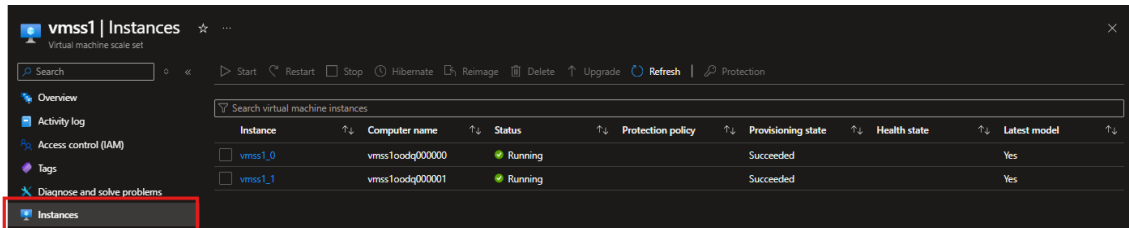
☒ Action

Operation: Decrease percent by | Cool down (minutes): 5


Percentage: 50

Creo una regla para disminuir las máquinas del escalado en caso de que la cpu esté por debajo del 30%

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Aquí visualizo las instancias de las máquinas virtuales del scale set.

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## Creación de una máquina virtual mediante Azure PowerShell

```
PS /home/raul_casado> New-AzVm `
>> -ResourceGroupName 'az104-rg8' `
>> -Name 'myPSVM' `
>> -Location 'Norway East' `
>> -Image 'Win2019Datacenter' `
>> -Zone '1' `
>> -Size 'Standard_D2s_v3' `
>> -Credential (Get-Credential)

PowerShell credential request
Enter your credentials.
User: localadmin
Password for user localadmin: *****

WARNING: Upcoming breaking changes in the cmdlet 'New-AzVM' :
The default VM size will change from 'Standard_D2s_v3' to 'Standard_D2s_v5'.
- This change will take effect on '11/1/2025'
- The change is expected to take effect in Az version : '15.0.0'
- The change is expected to take effect in Az.Compute version : '11.0.0'
Note : Go to https://aka.ms/azps-changewarnings for steps to suppress this breaking change warning, and other information on breaking changes in Azure PowerShell.
You can reference https://aka.ms/findImagePS on how to find VM Images using PowerShell.
[Creating Azure resources (8s, 1m)]
```

New-AzVm `

-ResourceGroupName 'az104-rg8' `

-Name 'myPSVM' `

-Location 'Norway EAST' `

-Image 'Win2019Datacenter' `

-Zone '1' `

-Size 'Standard\_D2s\_v3' `

-Credential (Get-Credential)

Comando utilizado para la creación de la vm

```
PS /home/raul_casado> Get-AzVM `
>> -StatusGroup 'az104-rg8' `
>>
ResourceGroupName Name Location VmSize OsType NIC Provisioning Zone PowerState MaintenanceAllowed
-----
az104-rg8 myPSVM norwayeast Standard_D2s_v3 Windows myPSVM Succeeded 1 VM running
```

Uso Get-AzVM para mostrar una lista de las máquinas virtuales del grupo de recursos.

```
PS /home/raul_casado> Remove-AzResourceGroup -name az104-rg8
```

Remove-AzResourceGroup -name az104-rg8

Para borrar el grupo de recursos donde he ido haciendo el laboratorio.