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# Implementación de redes virtuales

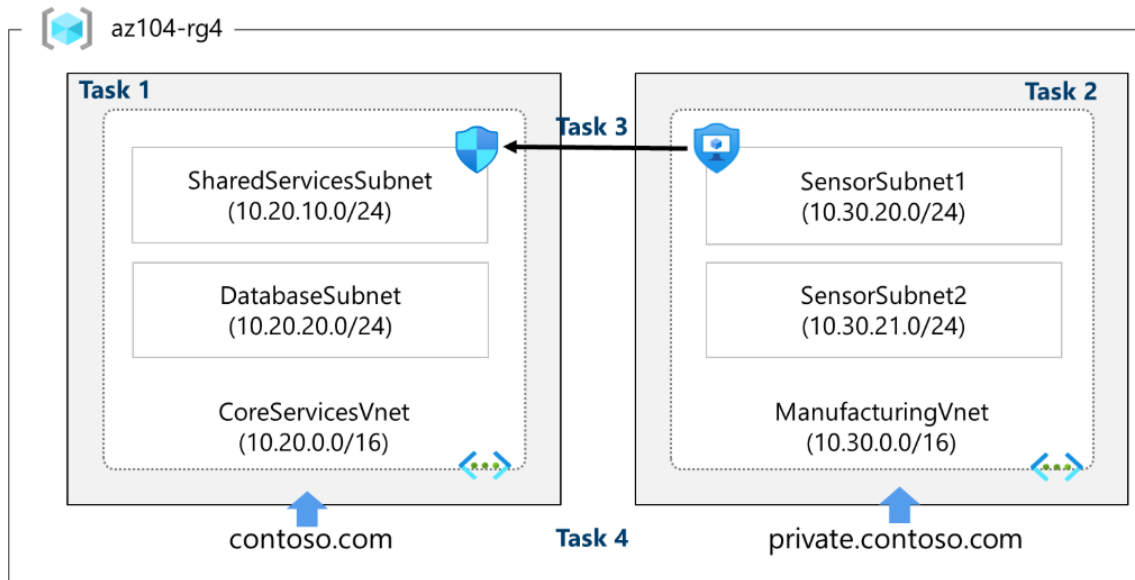
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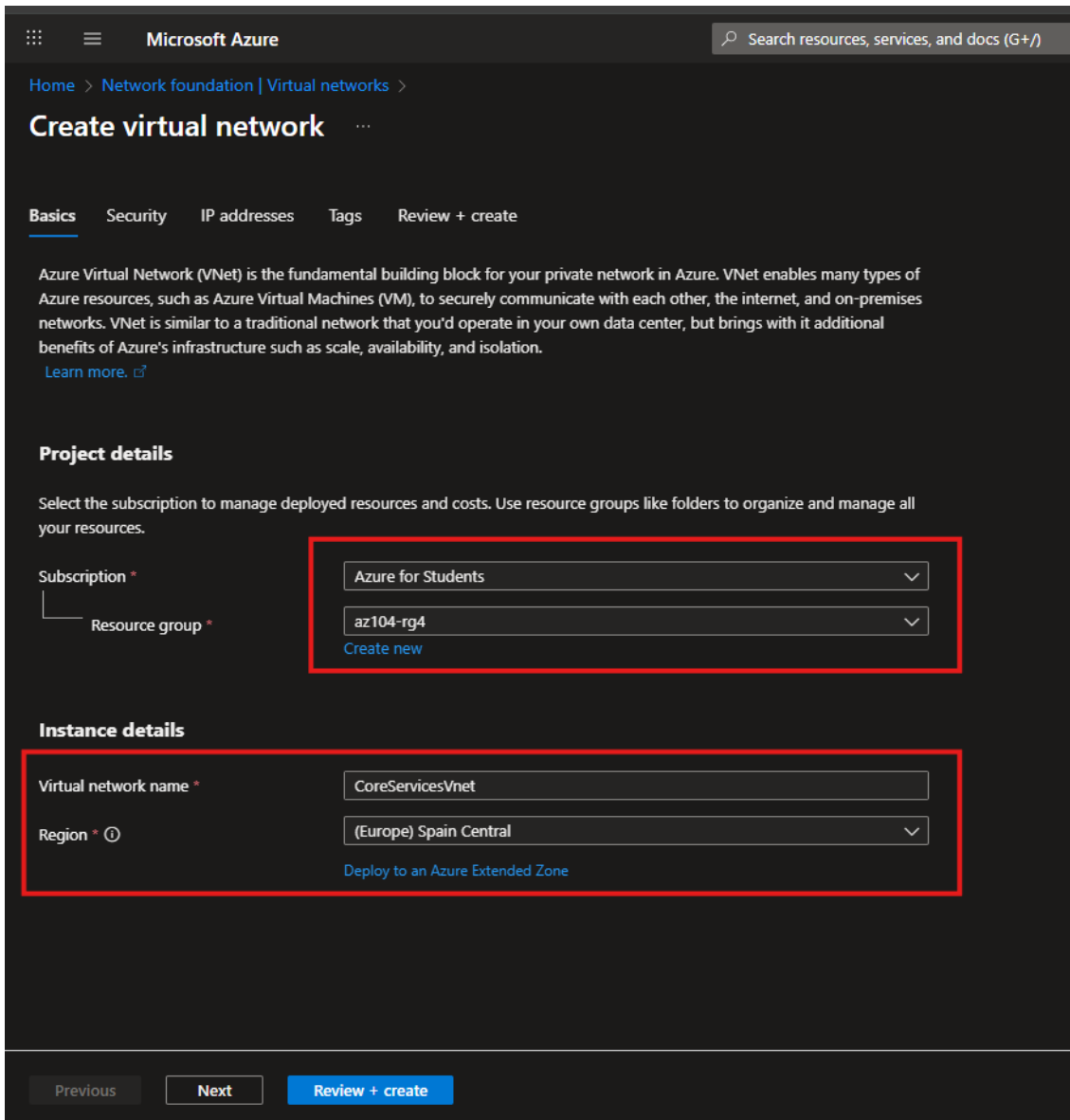
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## Esquema del laboratorio



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## Creación de una red virtual con subredes mediante el portal



Microsoft Azure

Search resources, services, and docs (G+)

Home > Network foundation | Virtual networks >

### Create virtual network

Basics Security IP addresses Tags Review + create

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation.

[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 for Students

Resource group \* az104-rg4

[Create new](#)

#### Instance details

Virtual network name \* CoreServicesVnet


Region \* (Europe) Spain Central

[Deploy to an Azure Extended Zone](#)

Previous Next Review + create

Accedemos a virtual networks y creamos una.

Previamente he creado un nuevo grupo de recursos az104-rg4 para que la red se cree dentro de este.

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Home > Network foundation | Virtual networks >

## Create virtual network

Basics Security **IP addresses** Tags Review + create

Configure your virtual network address space with the IPv4 and IPv6 addresses and subnets you need. [Learn more](#)

Define the address space of your virtual network with one or more IPv4 or IPv6 address ranges. Create subnets to segment the virtual network address space into smaller ranges for use by your applications. When you deploy resources into a subnet, Azure assigns the resource an IP address from the subnet. [Learn more](#)

☐ Allocate using IP address pools. [Learn more](#)

+ Add a subnet


10.20.0.0/16 [Delete address space](#)

10.20.0.0 - 10.20.255.255 65,536 addresses

Subnets	IP address range	Size	NAT gateway
default	10.20.0.0 - 10.20.0.255	/24 (256 addresses)	-

Add IPv4 address space

Defino el espacio de red para mi red virtual

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## Add a subnet ✕

Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. [Learn more](#)

Subnet purpose ⓘ
Default

Name \* ⓘ
SharedServicesSubnet

### IPv4

Include an IPv4 address space
☒

IPv4 address range ⓘ

10.20.0.0/16
10.20.0.0 - 10.20.255.255

Starting address \* ⓘ
10.20.10.0

Size ⓘ
/24 (256 addresses)

Subnet address range ⓘ
10.20.10.0 - 10.20.10.255

### IPv6

Include an IPv6 address space
☐ This virtual network has no IPv6 address ranges.

### Private subnet


Private subnets enhance security by not providing default outbound access. To enable outbound connectivity for virtual machines to access the internet, it is necessary to explicitly grant outbound access. A NAT gateway is the recommended way to provide outbound connectivity for virtual machines in the subnet. [Learn more](#)

Enable private subnet (no default outbound access)
☐

**i** After March 31, 2026, private subnet will be the default selection for new virtual networks. [Learn more](#)

### Security

Defino el espacio de red de la subred para recursos.

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## Add a subnet ✕

Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. [Learn more](#)

Subnet purpose ⓘ

Default ▼

Name \* ⓘ

DatabaseSubnet

### IPv4

Include an IPv4 address space

☒

IPv4 address range ⓘ

10.20.0.0/16 ▼

10.20.0.0 - 10.20.255.255

Starting address \* ⓘ

10.20.20.0

Size ⓘ

/24 (256 addresses) ▼

Subnet address range ⓘ

10.20.20.0 - 10.20.20.255

### IPv6

Include an IPv6 address space

☐

This virtual network has no IPv6 address ranges.

### Private subnet

Private subnets enhance security by not providing default outbound access. To enable outbound connectivity for virtual machines to access the internet, it is necessary to explicitly grant outbound access. A NAT gateway is the recommended way to provide outbound connectivity for virtual machines in the subnet. [Learn more](#)


Enable private subnet (no default outbound access)


☐


**i** After March 31, 2026, private subnet will be the default selection for new virtual networks. [Learn more](#)

### Security

Defino el espacio de red de la subred para la base de datos.

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 **Your deployment is complete**


 Deployment name : CoreServicesVnet-1764580627470



Subscription : [Azure for Students](#)

Resource group : [az104-rg4](#)

Start time : 1/12/2025, 10:17:10


Correlation ID : 98b5cddf-74fe-4099-bd29-7c19145c4651

 **Deployment details**

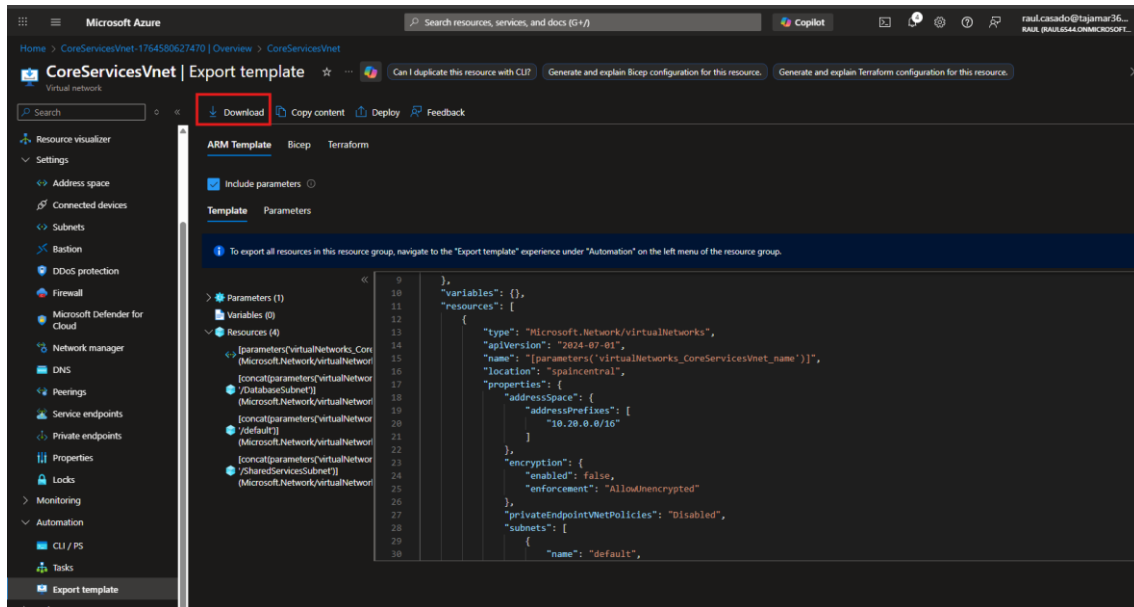
Resource	Type	Status	Operation details
 <a href="#">CoreServicesVnet</a>	 Virtual network	OK	<a href="#">Operation details</a>

Creamos la red virtual.

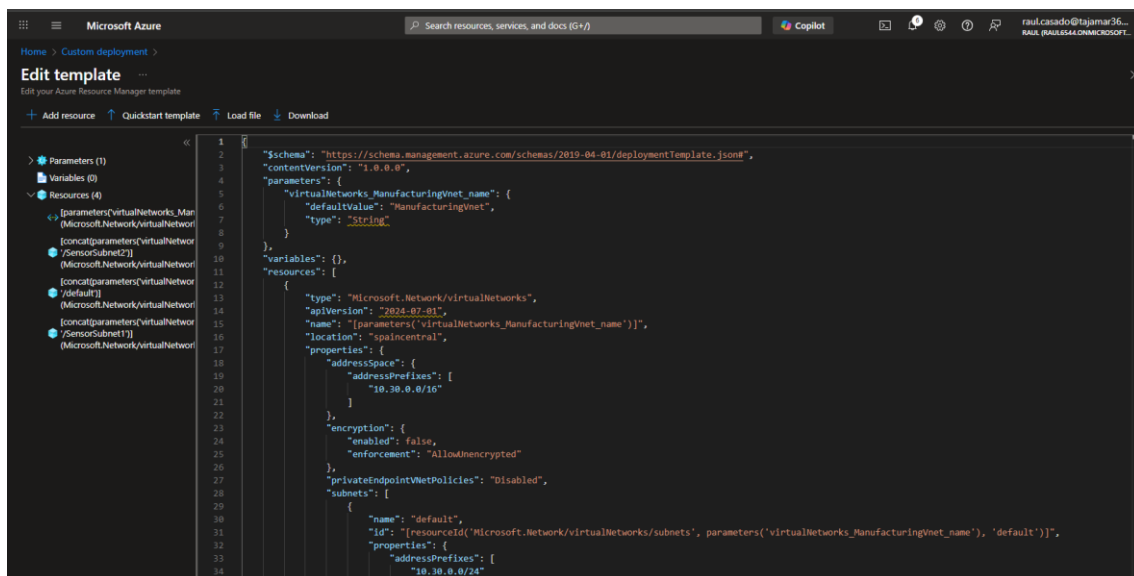


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## Crear una red virtual mediante plantilla.



Exportamos la plantilla y los parámetros y modificamos el nombre de la red, las subredes y las direcciones de la red y subredes.



Subo la plantilla modificada a custom deployments.

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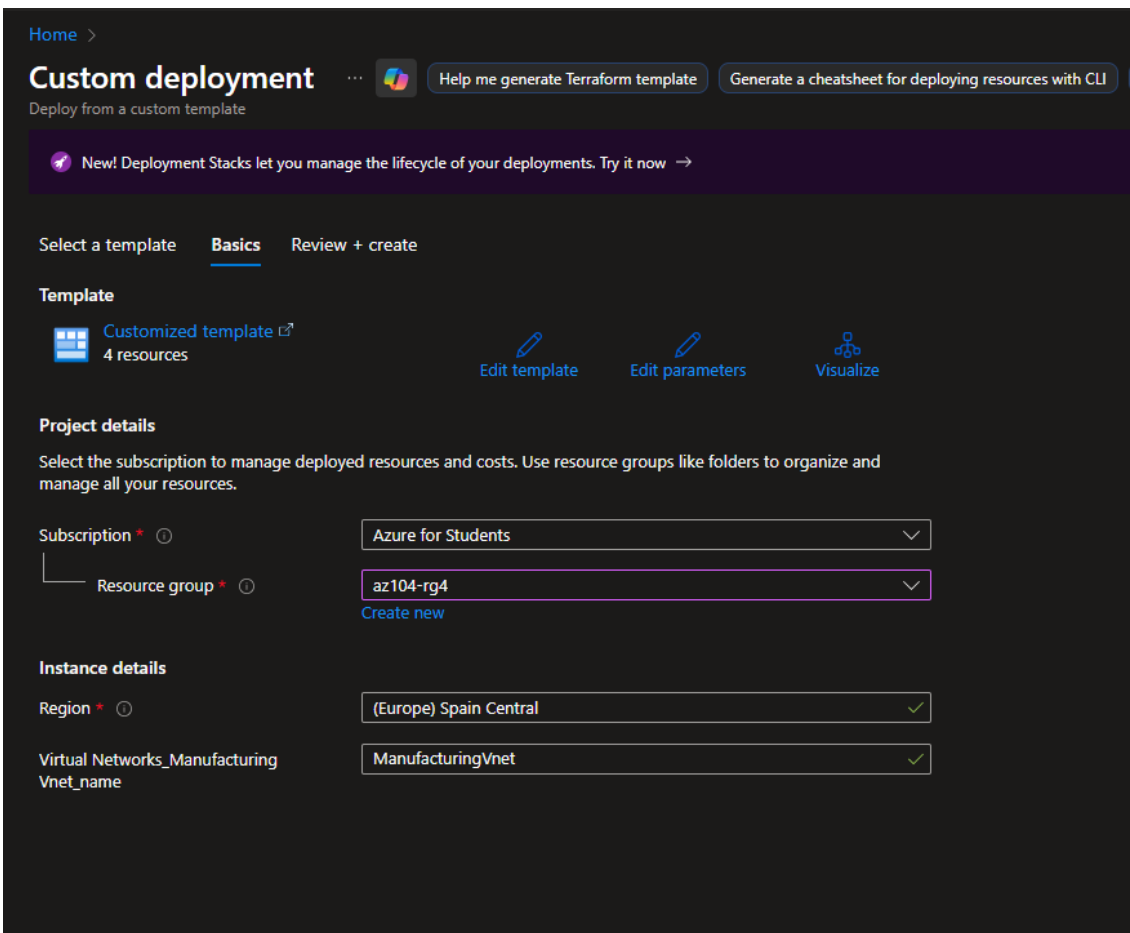


```

1 {
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "virtualNetworks_ManufacturingVnet_name": {
6       "value": null
7     }
8   }
9 }

```

Subo los parámetros modificamos para la creación de la nueva red virtual.




Home > Custom deployment ... [Help me generate Terraform template](#) [Generate a cheatsheet for deploying resources with CLI](#)

Deploy from a custom template

New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →

Select a template **Basics** Review + create

Template

 Customized template [↗](#)  
4 resources

[Edit template](#) [Edit parameters](#) [Visualize](#)

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


Region \* ⓘ  ✓

Virtual Networks\_Manufacturing Vnet\_name  ✓


Hacemos el despliegue de la red virtual.









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 **Your deployment is complete**


 Deployment name : Microsoft.Template-20251201103632  
 Subscription : [Azure for Students](#)  
 Resource group : az104-rg4

Start time : 1/12/2025, 10:36:35  
 Correlation ID : 02dfec57-36e4-4788-8443-39d5625a6bc6


 **Deployment details**

Resource	Type	Status	Operation details
 ManufacturingVnet/SensorSubnet2	 Microsoft.Network/virtualNetwc	OK	<a href="#">Operation details</a>
 ManufacturingVnet/SensorSubnet1	 Microsoft.Network/virtualNetwc	OK	<a href="#">Operation details</a>
 ManufacturingVnet/default	 Microsoft.Network/virtualNetwc	OK	<a href="#">Operation details</a>
 ManufacturingVnet	 Virtual network	OK	<a href="#">Operation details</a>

 **Next steps**

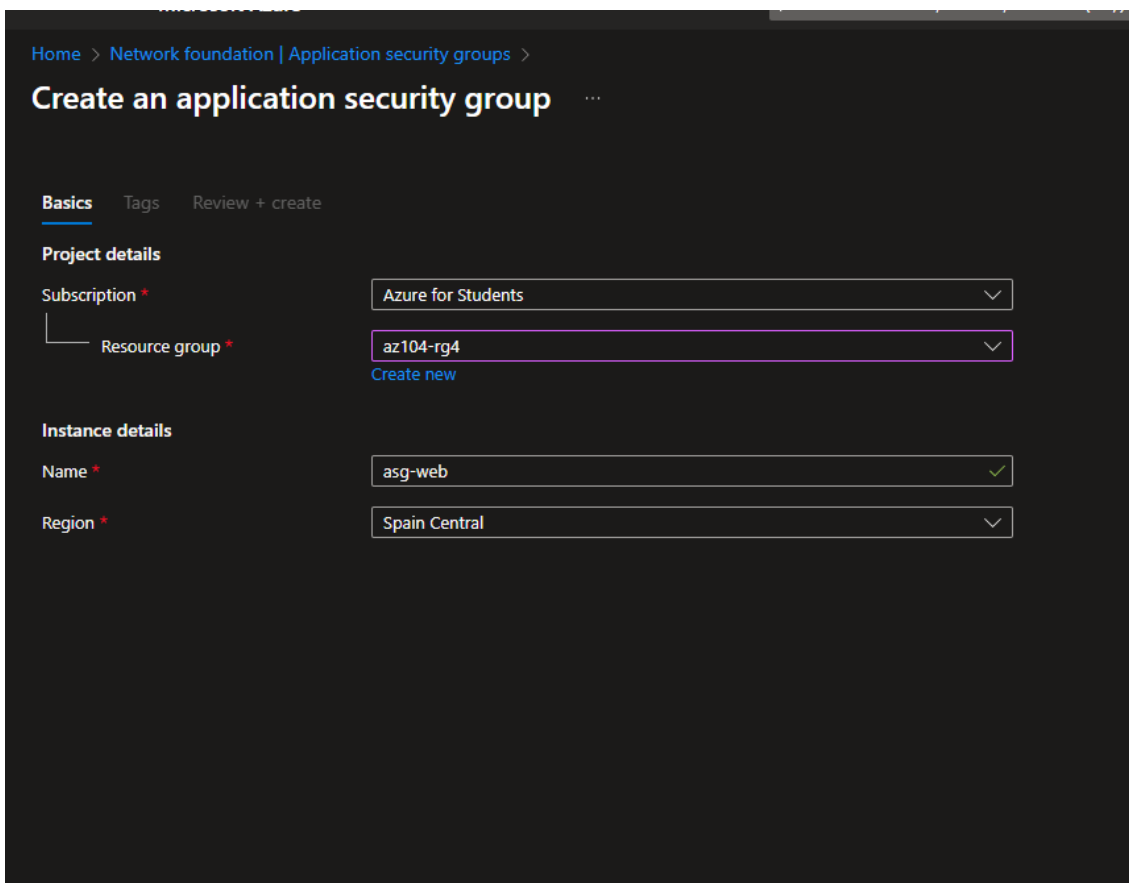
[Go to resource group](#)

Comprobamos que no ha habido errores.

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## Creación y configuración de la comunicación entre un grupo de seguridad de aplicaciones y un grupo de seguridad de red.

En esta tarea, crearemos un grupo de seguridad de aplicaciones y un grupo de seguridad de red. El grupo de seguridad de red tendrá una regla de seguridad de entrada que permita el tráfico desde el ASG. El grupo de seguridad de red también tendrá una regla de salida que deniega el acceso a Internet.



Home > Network foundation | Application security groups >

### Create an application security group

**Basics** | Tags | Review + create

**Project details**

Subscription \* Azure for Students

Resource group \* az104-rg4 [Create new](#)


**Instance details**

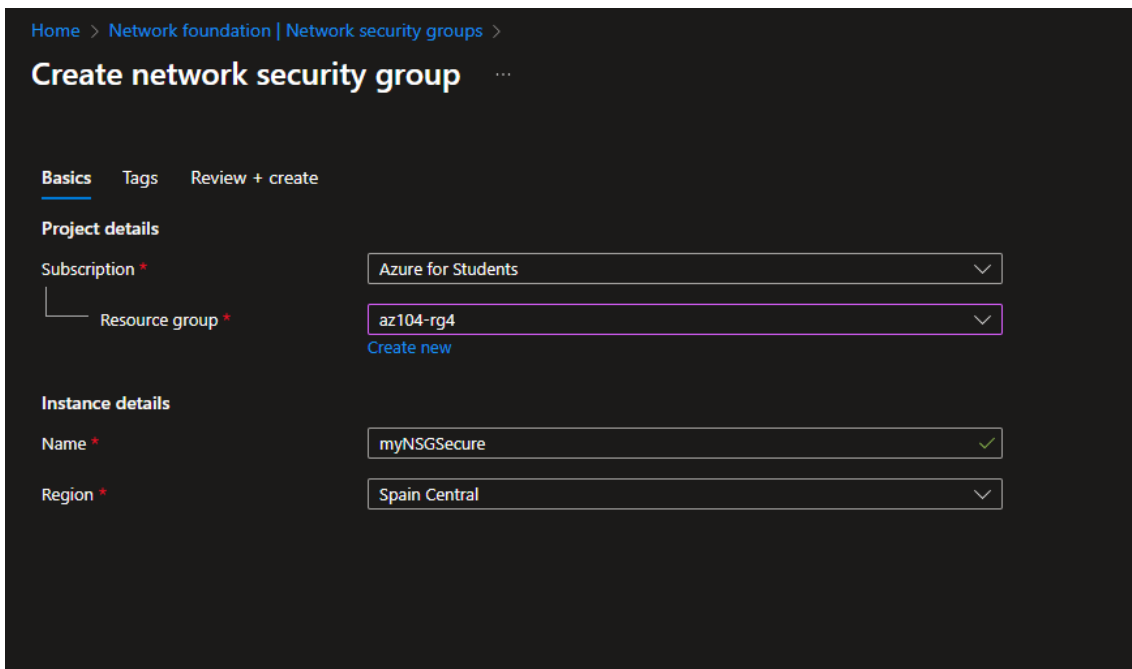
Name \* asg-web

Region \* Spain Central

Creamos el grupo de seguridad de aplicación.

Es un recurso que permite agrupar máquinas virtuales (VMs) de manera lógica para administrar reglas de seguridad de red (NSG, Network Security Groups) más fácilmente.

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Home > Network foundation | Network security groups >

## Create network security group ...

**Basics** Tags Review + create

**Project details**

Subscription \* Azure for Students

Resource group \* az104-rg4 [Create new](#)


**Instance details**

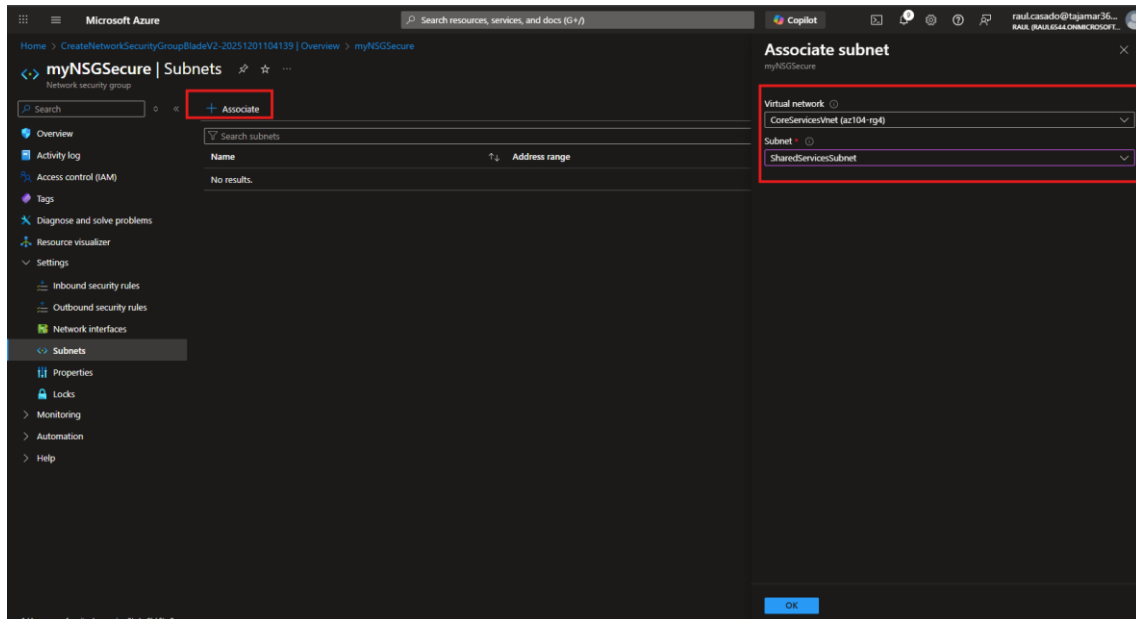
Name \* myNSGSecure ✓

Region \* Spain Central

Creo el grupo de seguridad de red.


Un NSG (Network Security Group) es un recurso que se utiliza para controlar el tráfico de red hacia y desde recursos en una red virtual (VNet), como máquinas virtuales, interfaces de red o subredes.

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+ Associate			
Search subnets			
Name	Address range	Virtual network	
SharedServicesSubnet	10.20.10.0/24	CoreServicesVnet	...

Una vez creado el nsg, accedemos a los recursos y le asociamos la red virtual CoreServices y la subred sharedservices.

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Microsoft Azure

Search resources, services, and docs (G+)

Home > CreateNetworkSecurityGroupBladeV2-20251201104139 | Overview > myNSGSecure

myNSGSecure | Inbound security rules

Network security group

Search

+ Add

Hide default rules

Refresh

Delete

Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Settings

Inbound security rules

Outbound security rules

Network interfaces

Subnets

Properties

Locks

Monitoring

Automation

Help

Filter by name

Port == all


Protocol == all

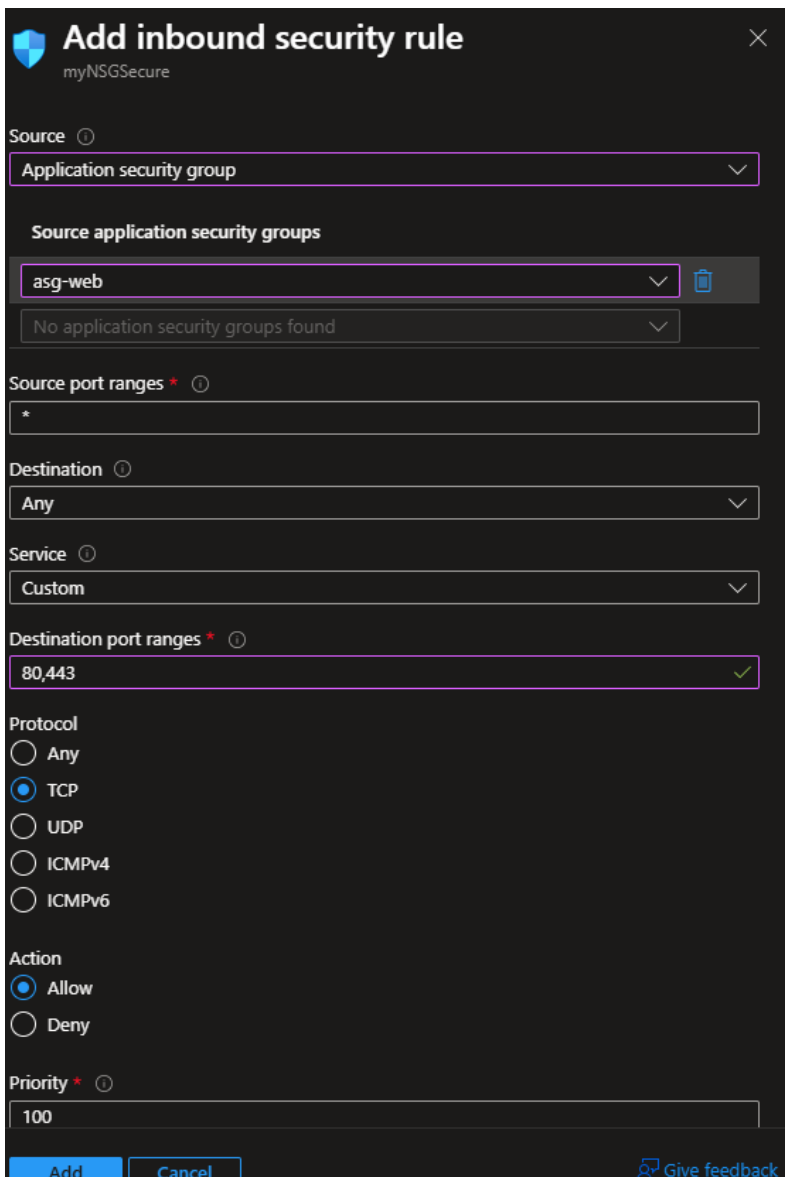
Source == all

Destination == all

Priority	Name	Port	Protocol	Source
<input type="checkbox"/> 65000	AllowVnetInBound	Any	Any	Virt
<input type="checkbox"/> 65001	AllowAzureLoadBalancerInBo...	Any	Any	Azu
<input type="checkbox"/> 65500	DenyAllInBound	Any	Any	Any

Network security group security rules are evaluated by priority using the combination of source, source port, destination, destination port, and an existing rule. You can't delete default security rules, but you can override them with rules that have a higher priority. [Learn more](#)

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**Add inbound security rule** myNSGSecure ×

Source ⓘ  
Application security group

Source application security groups  
asg-web ✕  
No application security groups found

Source port ranges \* ⓘ  
\*

Destination ⓘ  
Any

Service ⓘ  
Custom

Destination port ranges \* ⓘ  
80,443 ✓

Protocol  
☐ Any  
☒ TCP  
☐ UDP  
☐ ICMPv4  
☐ ICMPv6


Action  
☒ Allow  
☐ Deny

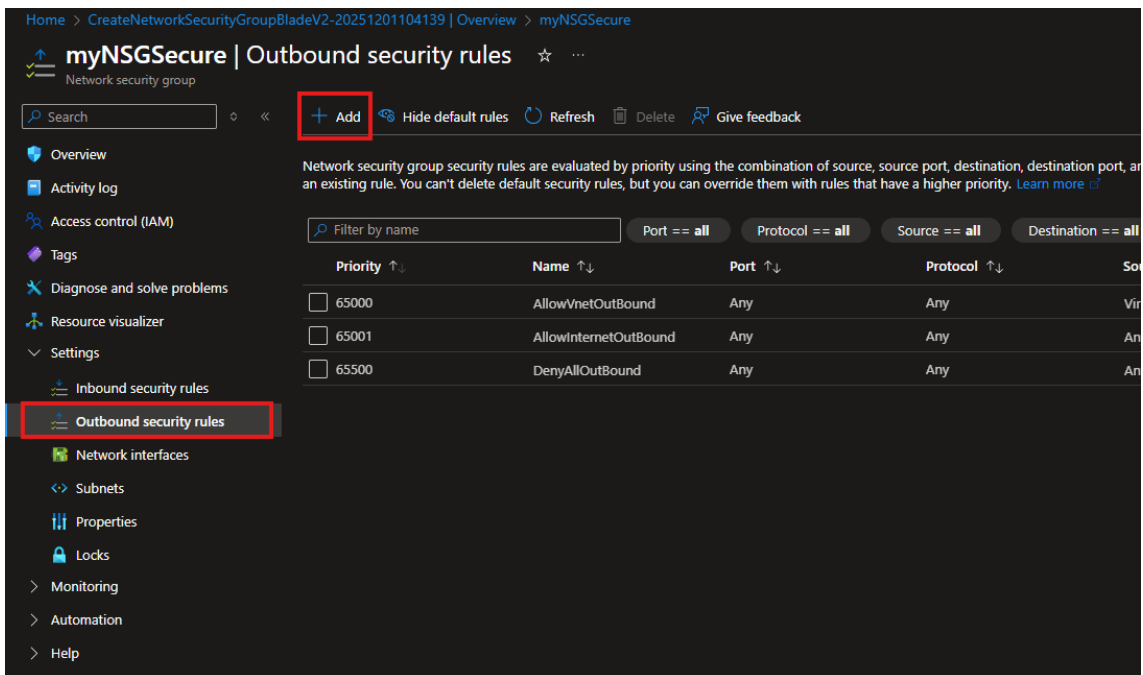
Priority \* ⓘ  
100

Add Cancel Give feedback

Creo la regla de tráfico entrante para permitir tráfico con el ASG.



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Home > CreateNetworkSecurityGroupBladeV2-20251201104139 | Overview > myNSGSecure

**myNSGSecure | Outbound security rules** ☆ ...

Network security group

Search < < **+ Add** Hide default rules Refresh Delete Give feedback


Overview  
Activity log  
Access control (IAM)  
Tags  
Diagnose and solve problems  
Resource visualizer  
Settings  
Inbound security rules  
**Outbound security rules**  
Network interfaces  
Subnets  
Properties  
Locks  
Monitoring  
Automation  
Help


Network security group security rules are evaluated by priority using the combination of source, source port, destination, destination port, and protocol. You can't delete default security rules, but you can override them with rules that have a higher priority. [Learn more](#)

Filter by name Port == all Protocol == all Source == all Destination == all

Priority	Name	Port	Protocol	Source	Destination
65000	AllowVnetOutBound	Any	Any	Virtual network	Virtual network
65001	AllowInternetOutBound	Any	Any	Internet	Internet
65500	DenyAllOutBound	Any	Any	Any	Any

Accedemos a las reglas de tráfico saliente donde vamos a crear una regla para denegar el acceso a internet.

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**DenyInternetOutbound**
myNSGSecure
✕

Source ⓘ  
Any ▼

Source port ranges \* ⓘ  
\*

Destination ⓘ  
Service Tag ▼

Destination service tag ⓘ  
Internet ▼

Service ⓘ  
Custom ▼


Destination port ranges \* ⓘ  
\*

Protocol  
☒ Any  
☐ TCP  
☐ UDP  
☐ ICMPv4  
☐ ICMPv6

Action  
☐ Allow  
☒ Deny

Priority \* ⓘ  
4096 ✓

Regla para denegar el tráfico a internet.

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## Configuración de zonas DNS de Azure públicas y privadas

Home > DNS zones >

### Create a DNS Zone

Basics DNS Zone Editor Tags Review + Create

A DNS zone is used to host the DNS records for a particular domain. For example, the domain 'contoso.com' may contain a number of DNS records such as 'mail.contoso.com' (for a mail server) and 'www.contoso.com' (for a web site). Azure DNS allows you to host your DNS zone and manage your DNS records, and provides name servers that will respond to DNS queries from end users with the DNS records that you create. [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 for Students

Resource group \* ⓘ az104-rg4 [Create new](#)

#### Instance details

☐ This zone is a child of an existing zone already hosted in Azure DNS ⓘ

Name \* raulcs.com

Resource group location \* ⓘ (Europe) Spain Central

Creo una zona pública DNS.

Home > raulcs.com\_1764583503261 | Overview > raulcs.com

### raulcs.com | Recordsets

Search

+ Add Refresh Delete Give feedback


A record set is a collection of records in a zone that have the same name and are the same type. You can search for record sets that have been loaded on this page. If you don't see what you're looking for, you can try scrolling to allow more record sets to load. [Learn more](#)

Search

Fetches 2 record sets.

Name	Type	TTL	Value	Alias resource type	Alias target
•	NS	172800	ns1-04.azure-dns.com. ns2-04.azure-dns.net. ns3-04.azure-dns.org. ns4-04.azure-dns.info.		
•	SOA	3600	Email: azuredns-hostmaster@microsoft.com Host: ns1-04.azure-dns.com. Refresh: 3600 Retry: 300 Expire: 2419200 Minimum TTL: 300 Serial number: 1		

Accedo al recurso creado, dentro de DNS Management creo un nuevo registro DNS.

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www	A	3600	10.1.1.4
-----	---	------	----------

Registro añadido.

```

Windows PowerShell
Copyright (C) Microsoft Corporation. Todos los derechos reservados.

Instale la versión más reciente de PowerShell para obtener nuevas características y mejoras. https://aka.ms/powershell

PS C:\Users\casado> nslookup www.raulcs.com ns1-04.azure-dns.com
Servidor: UnKnown
Address: 13.107.236.4

Nombre: www.raulcs.com
Address: 10.1.1.4

PS C:\Users\casado>

```

Comprobamos el registro, al utilizar nslookup sobre el registro creado y pidiendo al servidor ns1-04.azure-dns.com que nos resuelva el nombre nos devuelve la IP asignada al registro.

[Home](#) > [Private DNS zones](#) >

## Create Private DNS Zone

[Basics](#)
[Private DNS Zone Editor](#)
[Virtual Network Links](#)
[Tags](#)
[Review + Create](#)

A Private DNS zone provides name resolution services within virtual networks. A Private DNS zone is accessible only from the virtual networks that it is linked to and can't be accessed over internet. For example you can create a Private DNS zone named contoso.com and then create DNS records like www.contoso.com in this zone. You can then link the zone to a one or more virtual networks. [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 for Students

Resource group \* ⓘ

az104-rg4

[Create new](#)

### Instance details


Name \*

private.raulcs.com

Resource group location \* ⓘ

(Europe) Spain Central

Creo una zona privada de DNS.

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Home > private.raulcs.com\_1764584199623 | Overview > private.raulcs.com | Virtual Network Links >

## Add Virtual Network Link ...

private.raulcs.com

Link name \*

### Virtual network details

*Only virtual networks with Resource Manager deployment model are supported for linking with Private DNS zones. Virtual networks with Classic deployment model are not supported.*

☐ I know the resource ID of virtual network ⓘ

Subscription \*

Virtual Network \*

### Configuration


☐ Enable auto registration ⓘ

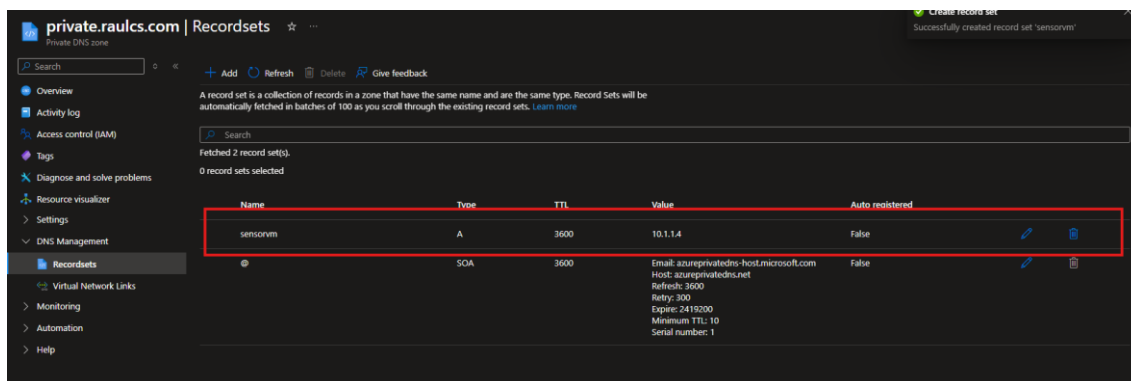
☐ Enable fallback to internet ⓘ

*The ResolutionPolicy property is applicable exclusively to private link zones.*

Dentro del recurso, accedemos a DNS management y creamos un link de red virtual.

El objetivo de esta configuración es permitir que las máquinas virtuales (VMs) y otros recursos dentro de la red virtual seleccionada (ManufacturingVnet) puedan **resolver los nombres de dominio** registrados en la Zona DNS Privada (private.raulcs.com).

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El propósito de esta configuración es crear un registro DNS de tipo A en una Zona DNS Privada de Azure para mapear un nombre de host interno a una dirección IP específica.