

 tajamar.	Máster en Ingeniería MultiCloud, DevOps y Seguridad.
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Implementación de la administración del tráfico de red

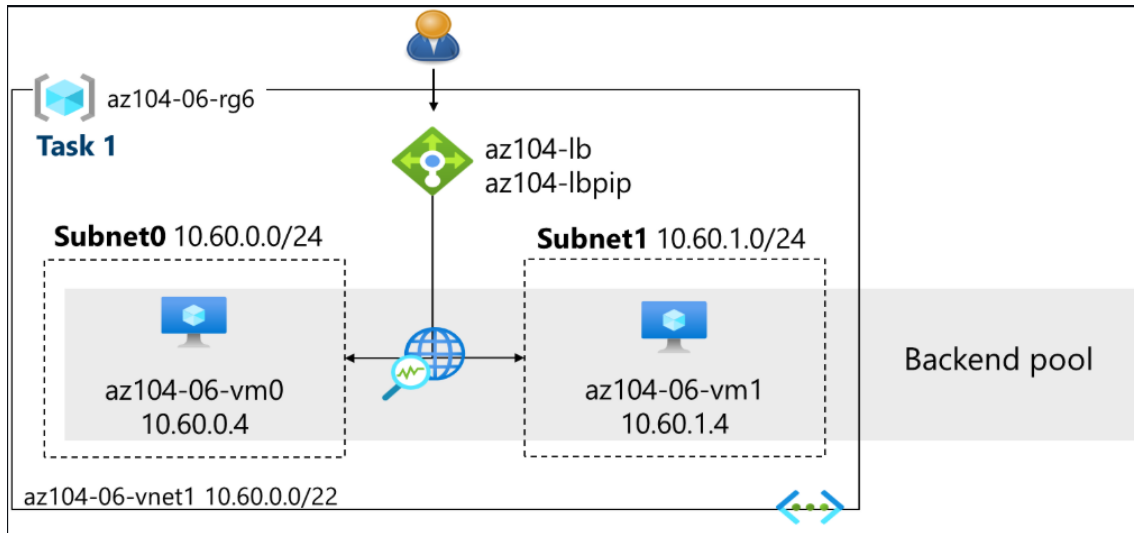
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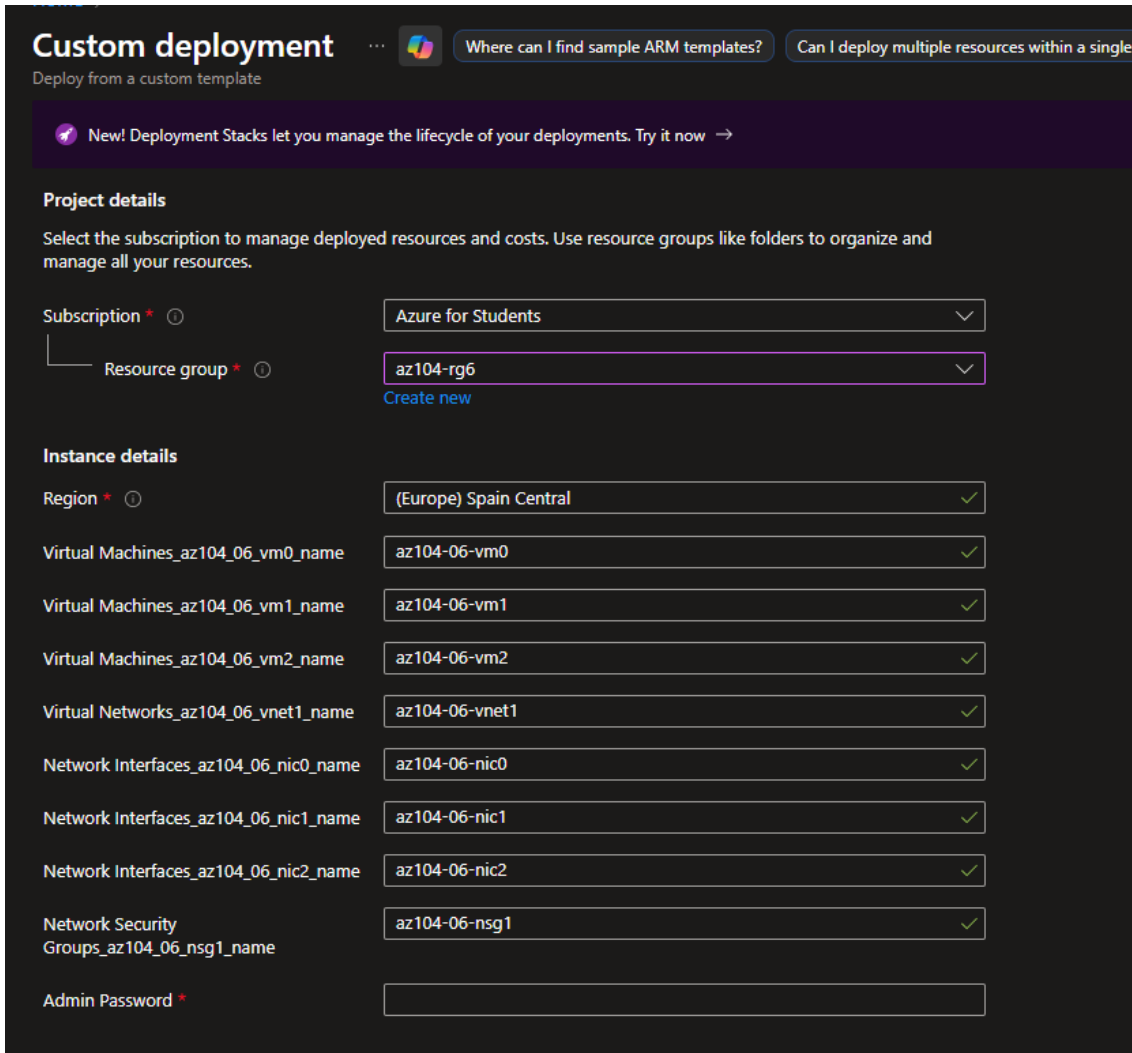
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Esquema del laboratorio



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Usar una plantilla para aprovisionar la infraestructura



Custom deployment ... [Where can I find sample ARM templates?](#) [Can I deploy multiple resources within a single ARM template?](#)

Deploy from a custom template

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

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 Machines_az104_06_vm0_name ✓

Virtual Machines_az104_06_vm1_name ✓

Virtual Machines_az104_06_vm2_name ✓

Virtual Networks_az104_06_vnet1_name ✓

Network Interfaces_az104_06_nic0_name ✓

Network Interfaces_az104_06_nic1_name ✓

Network Interfaces_az104_06_nic2_name ✓


Network Security Groups_az104_06_nsg1_name ✓

Admin Password *

Descargamos la plantilla arm proporcionada y la vamos a desplegar en un nuevo grupo de recursos que tenemos que crear previamente.

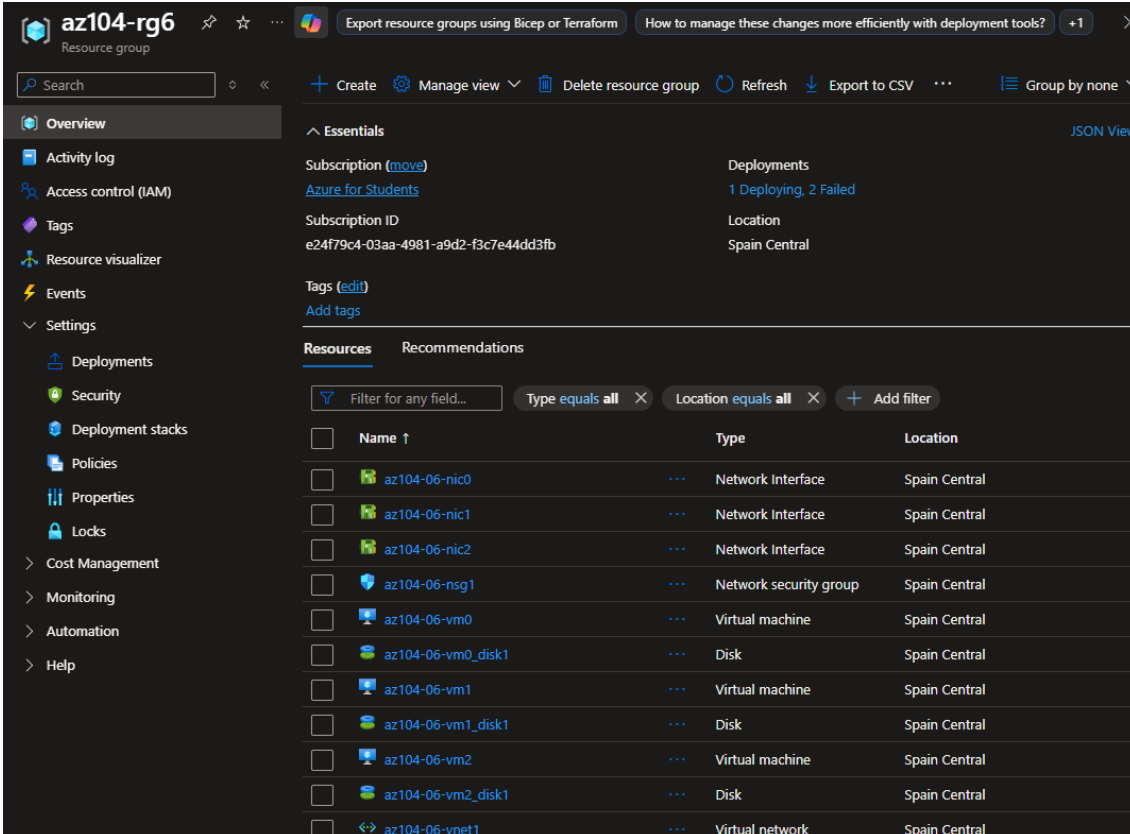
Esta plantilla nos crea 3 VMs, 1 red virtual y 3 subredes y un grupo de seguridad de red.

```
{
  "code": "InvalidTemplateDeployment",
  "details": [
    {
      "code": "QuotaExceeded",
```

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"message": "Operation could not be completed as it results in exceeding approved standardDSv3Family Cores quota. Additional details - Deployment Model: Resource Manager, Location: GermanyWestCentral, Current Limit: 4, Current Usage: 0, Additional Required: 6, (Minimum) New Limit Required: 6. Setup Alerts when Quota reaches threshold.


Al momento de desplegar esta plantilla me genera el error de arriba, solución cambiar el size de la maquina de Standard_D2s_v3 que requiere un total de 6 núcleos a Standard_B1ms con 1 núcleo por máquina.



The screenshot shows the Azure portal interface for the resource group 'az104-rg6'. The left sidebar contains navigation options like Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Deployments, Security, Deployment stacks, Policies, Properties, Locks, Cost Management, Monitoring, Automation, and Help. The main area is divided into 'Essentials' and 'Resources' sections. The 'Resources' section is currently selected, showing a table of resources in the 'Spain Central' location. The table includes columns for Name, Type, and Location. Resources listed include three Network Interfaces (az104-06-nic0, az104-06-nic1, az104-06-nic2), a Network security group (az104-06-nsg1), three Virtual Machines (az104-06-vm0, az104-06-vm1, az104-06-vm2), and their respective disks (az104-06-vm0_disk1, az104-06-vm1_disk1, az104-06-vm2_disk1), along with a Virtual network (az104-06-vnet1).

Name	Type	Location
az104-06-nic0	Network Interface	Spain Central
az104-06-nic1	Network Interface	Spain Central
az104-06-nic2	Network Interface	Spain Central
az104-06-nsg1	Network security group	Spain Central
az104-06-vm0	Virtual machine	Spain Central
az104-06-vm0_disk1	Disk	Spain Central
az104-06-vm1	Virtual machine	Spain Central
az104-06-vm1_disk1	Disk	Spain Central
az104-06-vm2	Virtual machine	Spain Central
az104-06-vm2_disk1	Disk	Spain Central
az104-06-vnet1	Virtual network	Spain Central

Recursos desplegados.

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Configurar un balanceador de carga en Azure.

Create load balancer ...

Basics Frontend IP configuration Backend pools Inbound rules Outbound rules Tags Review + create

Azure load balancer is a layer 4 load balancer that distributes incoming traffic among healthy virtual machine instances. Load balancers use a hash-based distribution algorithm. By default, it uses a 5-tuple (source IP, source port, destination IP, destination port, protocol type) hash to map traffic to available servers. Load balancers can either be internet-facing where it is accessible via public IP addresses, or internal where it is only accessible from a virtual network. Azure load balancers also support Network Address Translation (NAT) to route traffic between public and private IP addresses. [Learn more.](#)

Project details

Subscription * Azure for Students

Resource group * az104-rg6 [Create new](#)

Instance details

Name * az104-lb

Region * Spain Central

SKU * ☒ Standard (Distribute traffic to backend resources) ☐ Gateway (Direct traffic to network virtual appliances)


Type * ☒ Public ☐ Internal

Tier * ☒ Regional ☐ Global

El Azure Load Balancer es un servicio de capa 4 (TCP/UDP) que distribuye el tráfico de entrada entre instancias de máquinas virtuales (VMs) en buen estado dentro de un conjunto de recursos o grupo de escalado de máquinas virtuales.

Type Public: Especifica que el Load Balancer está orientado a Internet (Internet-facing). Recibirá tráfico de direcciones IP públicas y distribuirá la carga a las VMs internas.

Tier Regional: Indica que el Load Balancer se implementará solo dentro de la región seleccionada (Spain Central). El tráfico se distribuye a los recursos dentro de esa región.

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az104-fe

az104-lb

Name *

az104-fe

Type ⓘ

Public

IP type

☒ IP address

☐ IP prefix

Public IP address *

az104-lbpip (az104-rg6)

▼

[Create new](#)

Gateway Load balancer ⓘ

None

▼


Used by

The list of load balancing rules, inbound NAT rules, inbound NAT pools, and outbound rules using this IP address.


Name	Type
Not used	

Save

Cancel

 [Give feedback](#)

A

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Home
>
Load balancing and content delivery
|
Load balancers
>
Create load balancer
>

Add backend pool
...

Name *
az104-be

Virtual network ⓘ
az104-06-vnet1 (az104-rg6)

The dropdown only shows virtual networks in the same subscription and location as the load balancer. If you don't see the one you're looking for, it's either in another subscription or location or you don't have access to it.

Backend Pool Configuration

NIC
IP address


IP configurations

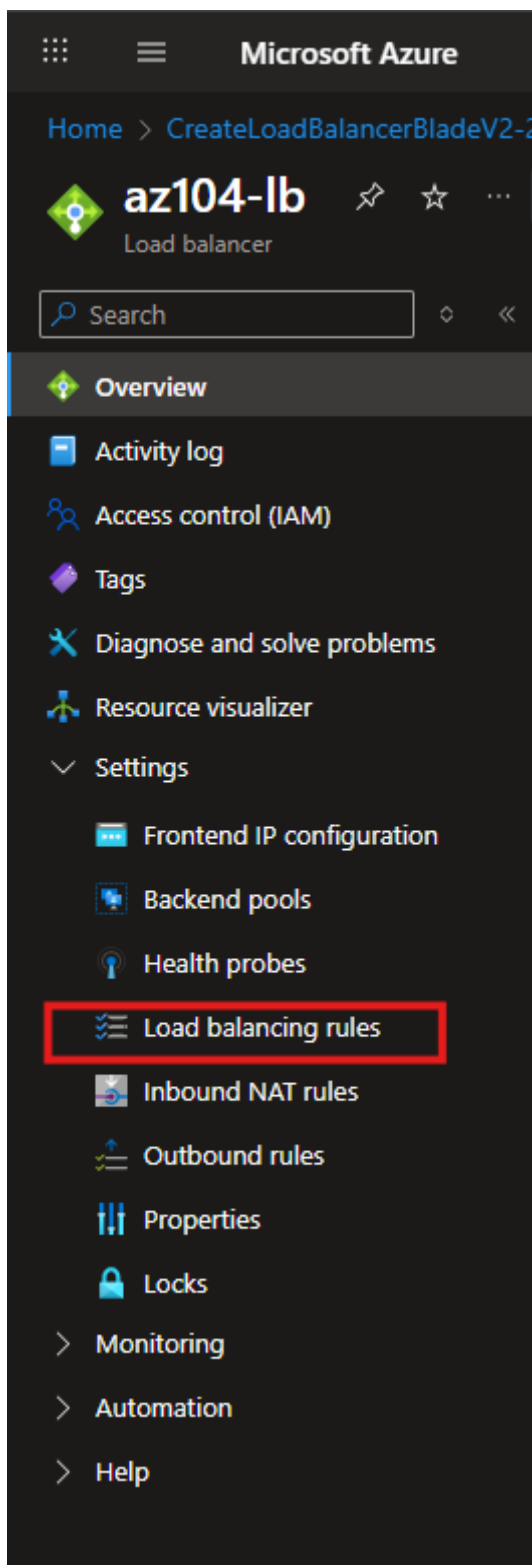
IP configurations associated to virtual machines and virtual machine scale sets must be in same location as the load balancer and be in the same virtual network.

+ Add
|
X Remove


Resource Name	Resource group	Type	IP configuration	IP Address	Availability set	
az104-06-vm0	az104-rg6	Virtual machine	ipconfig1	10.60.0.4	-	
az104-06-vm1	az104-rg6	Virtual machine	ipconfig1	10.60.1.4	-	

Agrupación de Backends (Backend Pool Configuration), que es el conjunto de recursos que recibirán el tráfico distribuido. Para este balanceador de carga, se está creando una agrupación llamada az104-be y se está asociando con la red virtual az104-06-vnet1 dentro del mismo grupo de recursos.

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Accedemos al recurso creado y dentro de settings load balancing rules.

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Add load balancing rule

az104-lb

IP version *

☒ IPv4
☐ IPv6

Frontend IP address * ⓘ az104-fe (70.156.233.163) ▼

Backend pool * ⓘ az104-be ▼

Protocol

☒ TCP
☐ UDP

Port * 80

Backend port * ⓘ 80

Health probe * ⓘ (new) az104-hp (TCP:80) ▼
[Create new](#)

Session persistence None ▼
 ⓘ Session persistence specifies that traffic from a client should be handled by the same virtual machine in the backend pool for the duration of a session. [Learn more.](#)

Idle timeout (minutes) * ⓘ 4

Enable TCP Reset ☐


Enable Floating IP ⓘ ☐

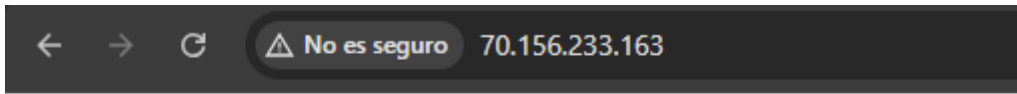
Outbound source network address translation (SNAT) ⓘ

☒ (Recommended) Use outbound rules to provide backend pool members access to the internet. [Learn more.](#)

☐ Use default port allocation to provide backend pool members with a minimal set of SNAT ports. This is not recommended because it can cause SNAT port exhaustion. [Learn more.](#)


La Regla de Balanceo de Carga es el componente principal que une el frontend (la IP pública) con el backend (el grupo de VMs) y las reglas de tráfico. Esta regla opera en IPv4 utilizando el protocolo TCP. Está configurada para escuchar el tráfico en el puerto 80 en la IP pública de frontend (az104-fe con la IP (70.156.233.163) y dirige ese tráfico al puerto 80 en las máquinas del backend pool (az104-be).

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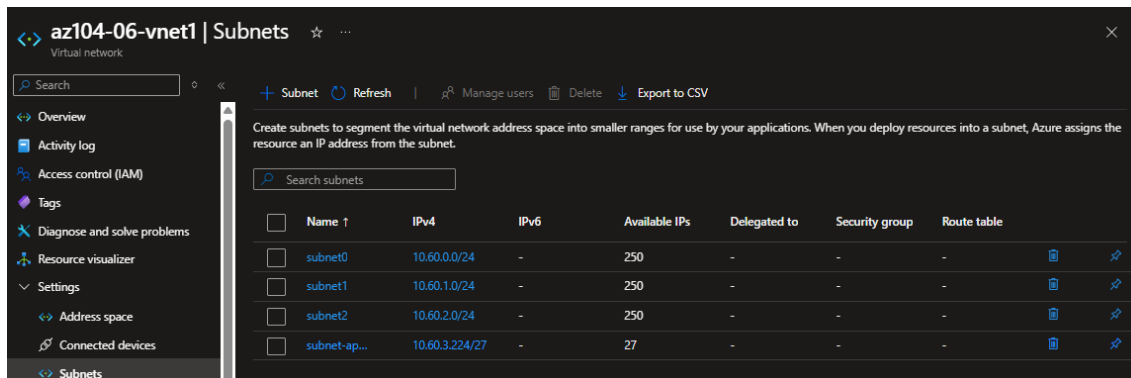


Hello World from az104-06-vm0


Accedo mediante web browser a la Ip y vemos el mensaje.

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Configurar un Azure Application Gateway



Configuramos una nueva subred

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Home > Load balancing and content delivery | Application gateways >

Create application gateway

An application gateway is a web traffic load balancer that enables you to manage traffic to your web application. [Learn about creating application gateway](#)

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-rg6 ▼
[Create new](#)

Instance details

Application gateway name * az104-appgw ✓

Region * Spain Central ▼

Tier ⓘ Standard V2 ▼

Enable autoscaling ☐ Yes ☒ No

Instance count * 2

IP address type ⓘ ☒ IPv4 only ☐ Dual stack (IPv4 & IPv6)

HTTP2 ⓘ ☒ Disabled ☐ Enabled


FIPS (Federal Information Processing Standard) mode 140-2 ⓘ ☒ Disabled ☐ Enabled

Configure virtual network

Virtual network * ⓘ az104-06-vnet1 ▼
[Create new](#)

Subnet * ⓘ subnet-appgw (10.60.3.224/27) ▼
[Manage subnet configuration](#)

El Application Gateway se asocia a la red virtual az104-06-vnet1, lo que garantiza su conectividad con los demás recursos de la solución (como los servidores web).

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Home > Load balancing and content delivery | Application gateways >

Create application gateway

✓ Basics **2 Frontends** ③ Backends ④ Configuration ⑤ Tags ⑥ Review + create

Traffic enters the application gateway via its frontend IP address(es). An application gateway can use a public IP address, private IP address, or one of each type. ⓘ

Frontend IP address type ⓘ ☒ Public ☐ Private ☐ Both

Public IPv4 address * [Add new](#)

La configuración de Frontends es donde se define la dirección IP que usará el Application Gateway como punto de entrada público. En este caso, el Tipo de dirección IP de Frontend se ha seleccionado como Público. Esto significa que el Application Gateway será accesible a través de Internet, permitiendo a los usuarios externos conectarse a las aplicaciones que se ejecutan detrás de él.

Home > Load balancing and content delivery | Application gateways >

Create application gateway


✓ Basics ✓ Frontends **3 Backends** ④ Configuration ⑤ Tags ⑥ Review + create

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machine scale sets, app services, IP addresses, or fully qualified domain names (FQDN). ⓘ

[Add a backend pool](#)

Backend pool	Targets	
az104-appgwbe	▼ 2 targets	...
	az104-06-nic1	...
	az104-06-nic2	...
az104-imagebe	▼ 1 target	...
	az104-06-nic1	...
az104-videobe	▼ 1 target	...
	az104-06-nic2	...

La configuración de Backends en un Application Gateway define los conjuntos de servidores de destino a los que se enviará el tráfico web entrante después de ser procesado por la puerta de enlace de aplicación.

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Add a routing rule ✕

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name *

az104-gwrule ✓

Priority * ⓘ

10 ✓

Listener

Backend targets

A listener "listens" on a specified port and IP address for traffic that uses a specified protocol. If the listener criteria are met, the application gateway will apply this routing rule. ⓘ

Listener name * ⓘ

az104-listener ✓

Frontend IP * ⓘ

Public IPv4 ✓

Protocol ⓘ

☒ HTTP
 ☐ HTTPS
 ☐ TCP
 ☐ TLS

Port * ⓘ

80 ✓

Listener type ⓘ

☒ Basic
 ☐ Multi site

Custom error pages

Show customized error pages for different response codes generated by Application Gateway. This section lets you configure Listener-specific error pages. [Learn more](#) ⓘ

Please verify that the url(s) being added here is reachable from your application gateway using the [connection troubleshoot](#) tool to prevent any deployment error.


Bad Gateway - 502

Enter Html file URL

Forbidden - 403

Enter Html file URL

[Show more status codes](#)

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Add a routing rule ✕

Configure a routing rule to send traffic from a given frontend IP address to one or more backend targets. A routing rule must contain a listener and at least one backend target.

Rule name * ✓

Priority * ⓘ ✓

* Listener * **Backend targets**

Choose a backend pool to which this routing rule will send traffic. You will also need to specify a set of Backend settings that define the behavior of the routing rule. ⓘ

Target type ☒ Backend pool ☐ Redirection

Backend target * ⓘ [Add new](#)

[Add new](#)

Backend settings * ⓘ [Add new](#)

Path-based routing

You can route traffic from this rule's listener to different backend targets based on the URL path of the request. You can also apply a different set of Backend settings based on the URL path. ⓘ

Path	Target name	Backend setting name	Backend pool
No additional targets to display			

Add a path ✕

[← Discard changes and go back to routing rules](#)

Target type ☒ Backend pool ☐ Redirection

Path * ⓘ ✓


Target name * ✓

✓

Backend settings * ⓘ [Add new](#)

✓

Backend target * ⓘ [Add new](#)

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Add a routing rule

[← Discard changes and go back to routing rules](#)

Target type: ☒ Backend pool ☐ Redirection

Path *

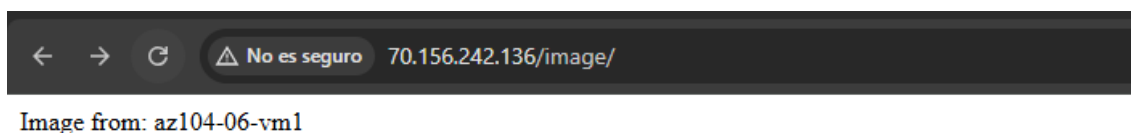
Target name *

Backend settings *

Backend target *

[Add new](#)

Añadimos las rutas a las carpetas donde se encuentran los archivos web que se van a ver.



En videos me da este error por la siguiente razón:

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

Home >

Microsoft.Template-20251204104110 | Overview

Deployment

Search

Delete

Cancel

Redeploy

Download

Refresh

Overview

The resource write operation failed to complete successfully, because it reached terminal provisioning state 'Failed'. Click here for details

Your deployment failed

Deployment name : Microsoft.Template-20251204104110

Subscription : Azure for Students

Resource group : az104-rg6


Start time : 4/12/2025, 10:41:14

Correlation ID : c84910b4-e056-4036-a94e-281c02af6bdd

Deployment details

Resource	Type	Status	Operation details
az104-06-vm1/customScriptExtension	Microsoft.Compute/virtualMach	OK	Operation details
az104-06-vm0/customScriptExtension	Microsoft.Compute/virtualMach	OK	Operation details
az104-06-vm2/customScriptExtension	Microsoft.Compute/virtualMach	Conflict (Error details)	Operation details
az104-06-vm1	Virtual machine	OK	Operation details

Al momento de hacer el despliegue, el scrip que debe crear el servidor web en la vm2 ha dado error, desconozco el porqué y no ha creado los recursos necesarios para que se muestren.

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Característica	Azure Load Balancer	Azure Application Gateway
Capa OSI	Capa 4 (Transporte)	Capa 7 (Aplicación)
Protocolos	TCP, UDP	HTTP, HTTPS, WebSocket, HTTP/2
Entiende el tráfico	No. Solo ve direcciones IP y Puertos.	Sí. Ve URLs, cookies, cabeceras y contenido.
Seguridad	Básica (Listas de control de acceso a red - NSG).	Avanzada (WAF - Web Application Firewall), protección contra bots.
Terminación SSL	No. El tráfico cifrado pasa directo al servidor.	Sí. Puede descifrar el tráfico (SSL Offloading) antes de enviarlo al servidor.
Afinidad de sesión	Por IP de origen (Source IP Affinity).	Por Cookies (Cookie-based Affinity).
Enrutamiento	Simple (Round-robin, Hash).	Inteligente (basado en URL, host, cabeceras).
Costo	Generalmente más bajo.	Más alto (debido al WAF y procesamiento extra).