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AZURE LAB #4

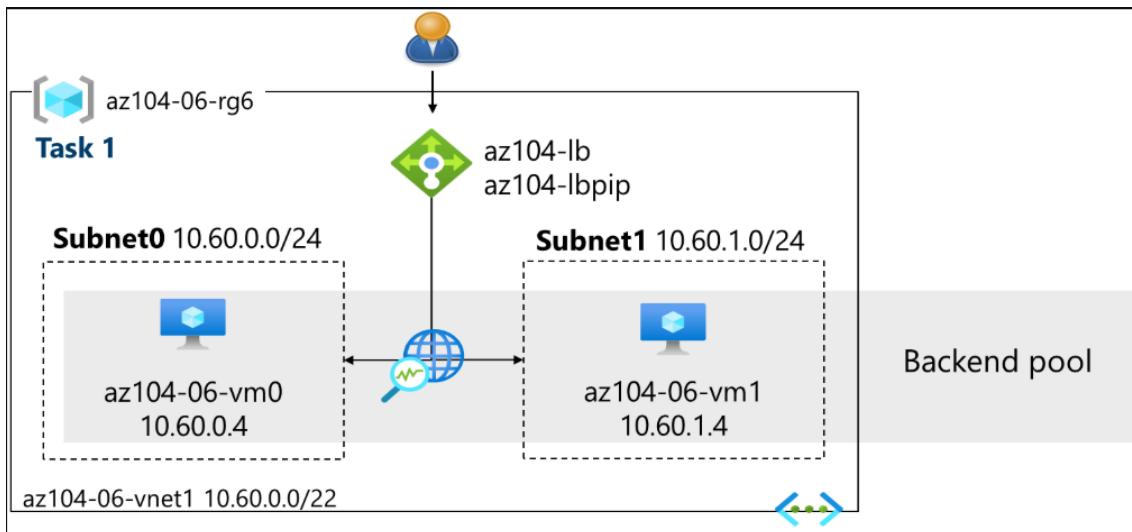
# Implementación de la administración del tráfico de red



## Contenido

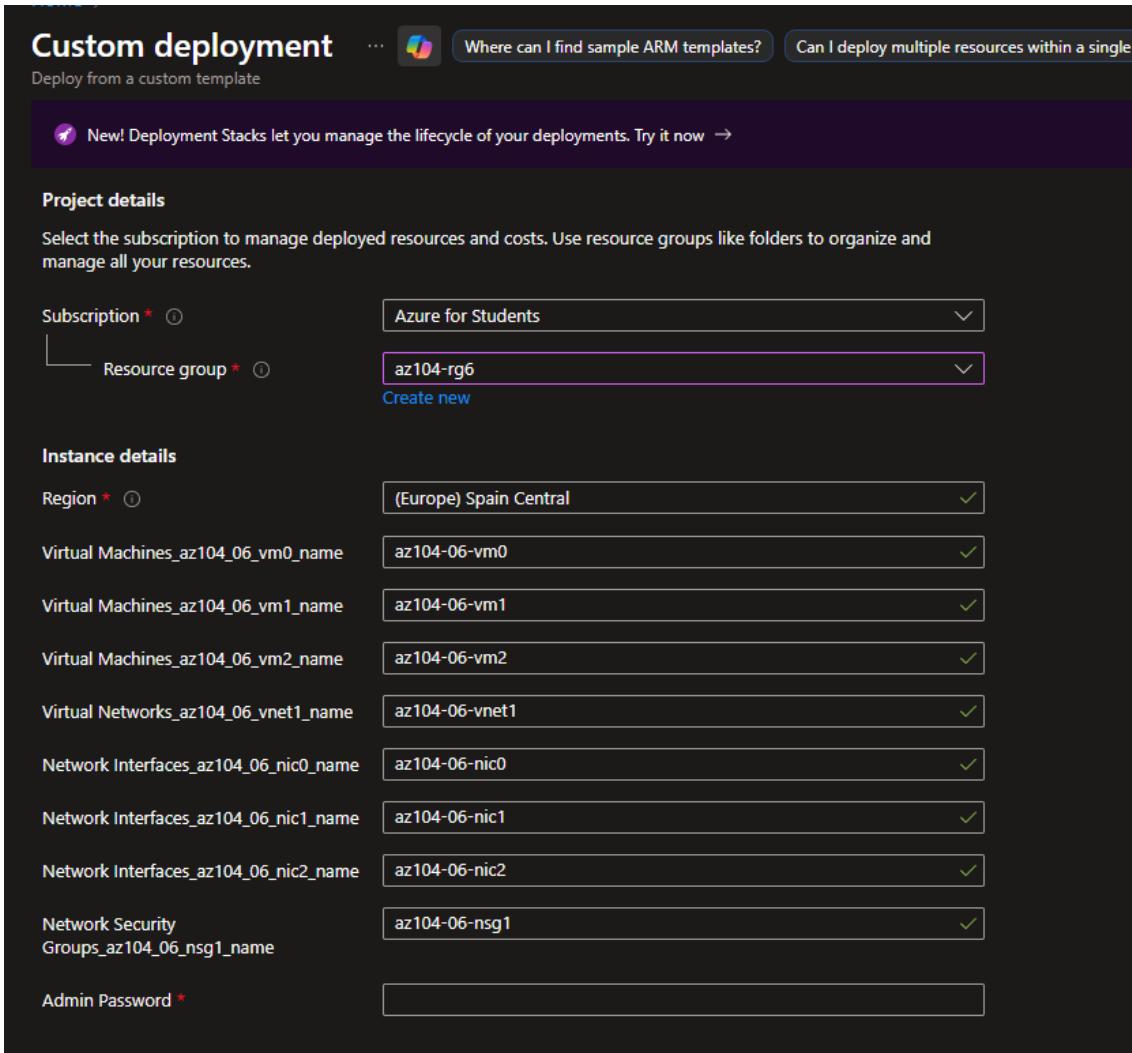
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## Esquema del laboratorio



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## Usar una plantilla para aprovisionar la infraestructura



The screenshot shows the Azure Custom Deployment interface. At the top, there are links for "Where can I find sample ARM templates?" and "Can I deploy multiple resources within a single ARM template?". Below that, it says "Deploy from a custom template". A purple banner at the top indicates that "Deployment Stacks" are now available. The "Project details" section shows a subscription set to "Azure for Students" and a resource group named "az104-rg6". The "Instance details" section lists various Azure resources with their names and status indicators:

- Region: (Europe) Spain Central
- Virtual Machines\_az104\_06\_vm0\_name: az104-06-vm0
- Virtual Machines\_az104\_06\_vm1\_name: az104-06-vm1
- Virtual Machines\_az104\_06\_vm2\_name: az104-06-vm2
- Virtual Networks\_az104\_06\_vnet1\_name: az104-06-vnet1
- Network Interfaces\_az104\_06\_nic0\_name: az104-06-nic0
- Network Interfaces\_az104\_06\_nic1\_name: az104-06-nic1
- Network Interfaces\_az104\_06\_nic2\_name: az104-06-nic2
- Network Security Groups\_az104\_06\_nsg1\_name: az104-06-nsg1
- Admin Password: (redacted)

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.

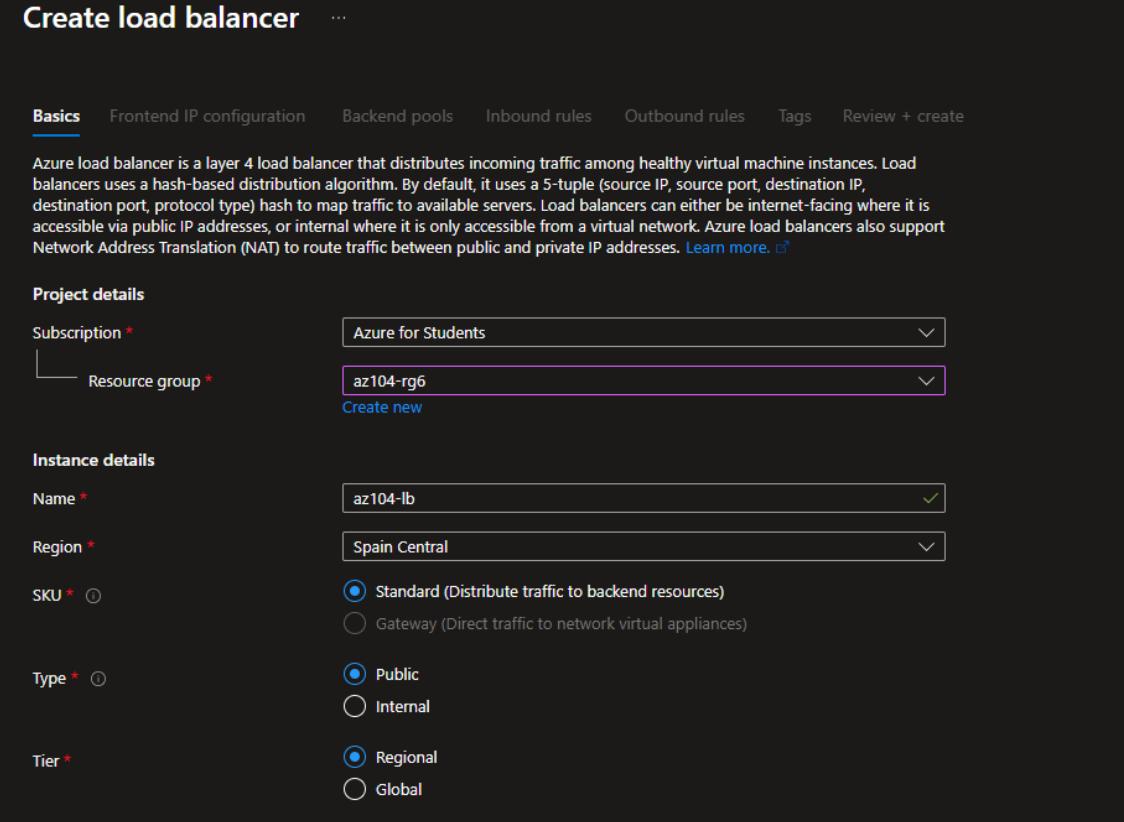
Al momento de desplegar esta plantilla me genera el error de arriba, solución cambiar el size de la maquina de Standard\_D2s\_v3 que requiere un total de 6 núcleos a Standard\_B1ms con 1 núcleo por máquina.

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.



The screenshot shows the 'Create load balancer' wizard in the Azure portal, specifically the 'Basics' step. The page title is 'Create load balancer' with a '... more' link. Below it is a descriptive text about Azure Load Balancer. The 'Basics' tab is selected, followed by 'Frontend IP configuration', 'Backend pools', 'Inbound rules', 'Outbound rules', 'Tags', and 'Review + create'. The main area is titled 'Project details' and includes fields for 'Subscription' (set to 'Azure for Students') and 'Resource group' (set to 'az104-rg6'). Below this is the 'Instance details' section, which includes fields for 'Name' (set to 'az104-lb'), 'Region' (set to 'Spain Central'), 'SKU' (set to 'Standard (Distribute traffic to backend resources)'), 'Type' (set to 'Public'), and 'Tier' (set to 'Regional'). Each field has a small info icon next to it.

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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The screenshot shows the 'Add backend pool' configuration page in the Azure portal. The 'Name' field is set to 'az104-be'. The 'Virtual network' dropdown shows 'az104-vnet1 (az104-rg6)'. A note at the bottom of the dropdown says: '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.' Under 'Backend Pool Configuration', the 'NIC' option is selected. In the 'IP configurations' section, two entries are listed: 'az104-06-vm0' and 'az104-06-vm1', both associated with the 'az104-rg6' resource group. The table below shows the details of these IP configurations:

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.



The screenshot shows the Microsoft Azure portal interface for managing a load balancer named "az104-lb". The left sidebar contains a navigation menu with the following items:

- Overview (selected)
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Settings
  - Frontend IP configuration
  - Backend pools
  - Health probes
  - Load balancing rules (selected and highlighted with a red box)
  - Inbound NAT rules
  - Outbound rules
- Properties
- Locks
- Monitoring
- Automation
- Help

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

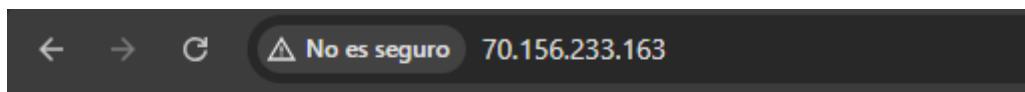
Enable Floating IP ⓘ

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



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## Configurar un Azure Application Gateway

The screenshot shows the Azure portal interface for managing subnets in a virtual network. The left sidebar includes options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource visualizer, Settings (Address space, Connected devices, Subnets), and Subnets. The main content area is titled 'az104-06-vnet1 | Subnets' and shows a table of subnets:

Name	IPv4	IPv6	Available IPs	Delegated to	Security group	Route table
subnet0	10.60.0.0/24	-	250	-	-	-
subnet1	10.60.1.0/24	-	250	-	-	-
subnet2	10.60.2.0/24	-	250	-	-	-
subnet-ap...	10.60.3.224/27	-	27	-	-	-

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

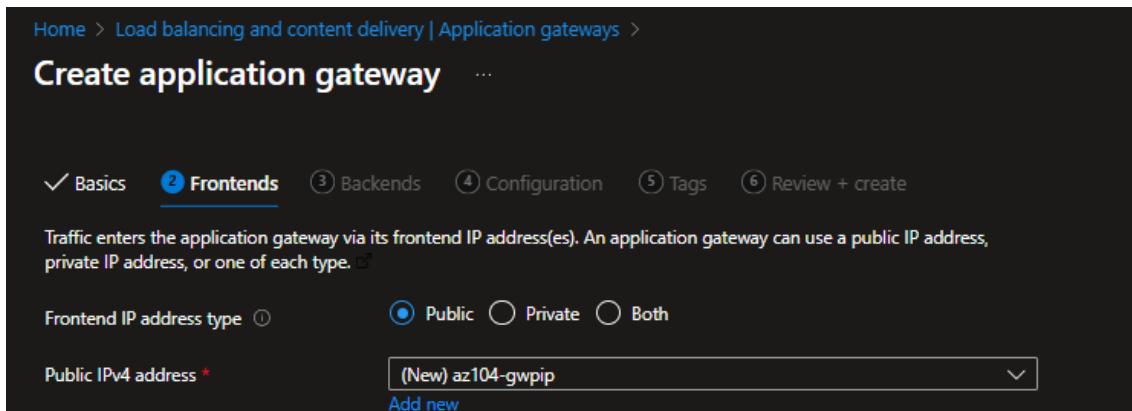
... [Edit page](#)

✓ 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. [Edit](#)

Frontend IP address type [Edit](#)     Public  Private  Both

Public IPv4 address \* [Edit](#) [\(New\) az104-gwpip](#) [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

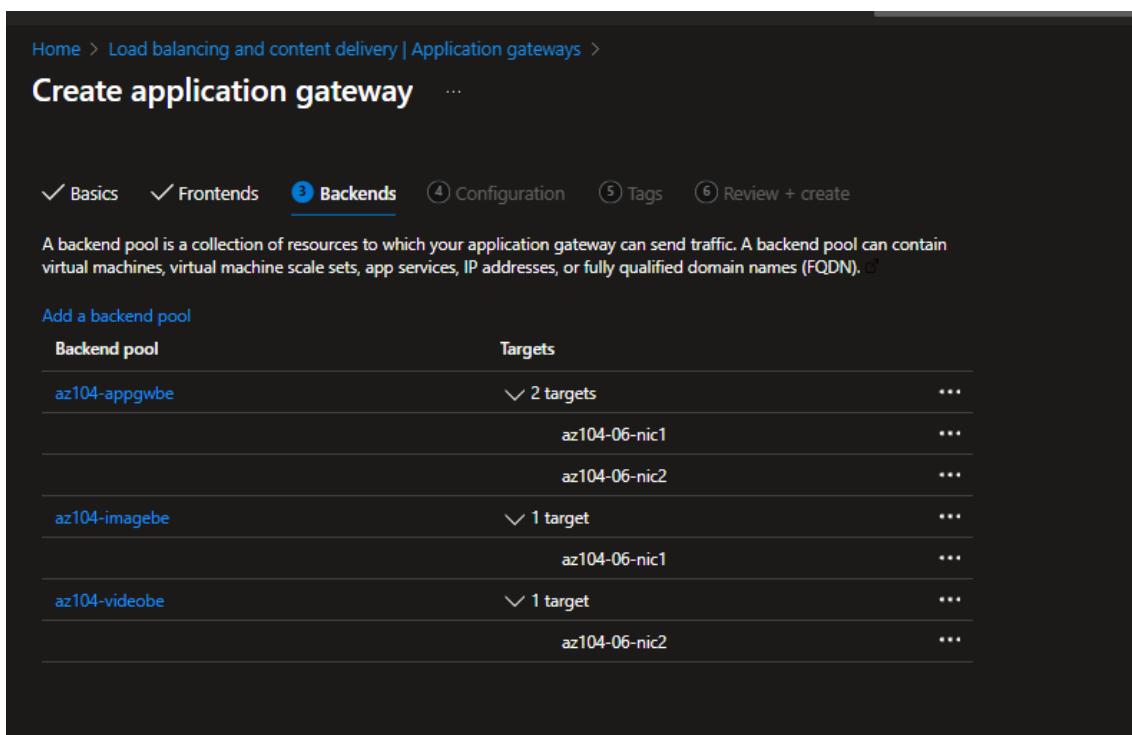
... [Edit page](#)

✓ 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). [Edit](#)

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-videoobe	✓ 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.



## AZURE LAB #4

## 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](#)



## AZURE LAB #4

## 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	<a href="#">Backend targets</a>		
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	<input checked="" type="radio"/> Backend pool <input type="radio"/> Redirection		
Backend target *	<a href="#">az104-appgwbe</a> <a href="#">Add new</a>		
Backend settings	<a href="#">az104-http</a> <a href="#">Add new</a>		
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 based rules			
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	<input checked="" type="radio"/> Backend pool <input type="radio"/> Redirection
Path *	/image/*
Target name *	images
Backend settings *	<a href="#">az104-http</a> <a href="#">Add new</a>
Backend target *	<a href="#">az104-imagebe</a> <a href="#">Add new</a>



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### Add a routing rule

← Discard changes and go back to routing rules

Target type: Backend pool (selected) Redirection

Path: /video/\*

Target name: videos

Backend settings: az104-http

Backend target: az104-videoobe

Backend target: Add new

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

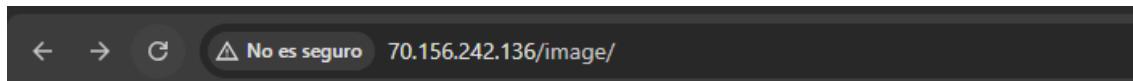


Image from: az104-06-vm1



En videos me da este error por la siguiente razón:

Microsoft Azure

Home > Microsoft.Template-20251204104110 | Overview

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

Deployment name: Microsoft.Template-20251204104110  
Subscription: Azure for Students  
Resource group: az104-rg6

Your deployment failed

Deployment details

Resource	Type	Status	Operation details
az104-06-vm1/customScriptExtension	Microsoft.Compute/virtualMachine	OK	Operation details
az104-06-vm0/customScriptExtension	Microsoft.Compute/virtualMachine	OK	Operation details
az104-06-vm2/customScriptExtension	Microsoft.Compute/virtualMachine	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.



## AZURE LAB #4

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).