

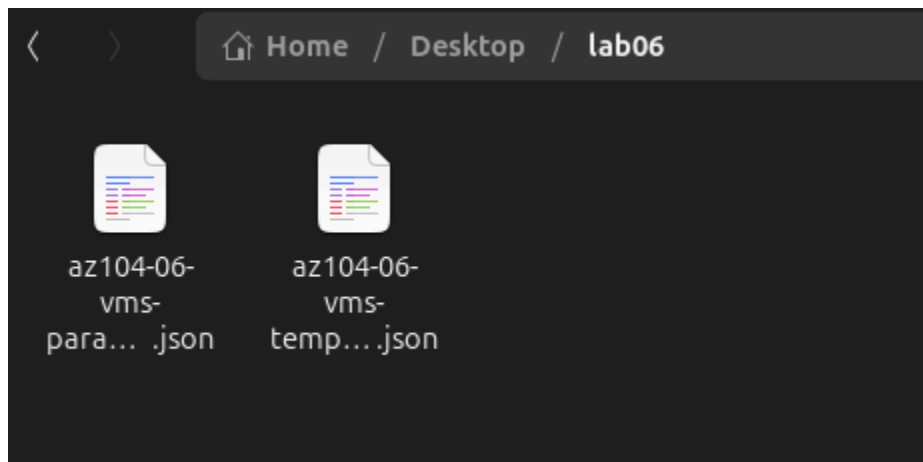
AZ-104-Microsoft Azure Administrator Kateryna Bakhmat

## Lab 06 - Implement Traffic Management

Task 1: Use a template to provision an infrastructure

1.Download the \Allfiles\Lab06 lab files (template and parameters).

Files:<https://github.com/MicrosoftLearning/AZ-104-MicrosoftAzureAdministrator/tree/master/Allfiles/Labs/06>



2.Sign in to the Azure portal - <https://portal.azure.com>.

The screenshot shows the Microsoft Azure portal interface. At the top, there's a navigation bar with 'Microsoft Azure', a search bar, and a 'Copilot' button. Below the navigation bar, the breadcrumb 'Home >' is visible. The main header displays the resource group name '1-bb57ed1f-playground-sandbox' with a close button. A search bar is present below the header. The left sidebar contains a list of navigation options: Overview (selected), Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Cost Management, Monitoring, Automation, and Help. The main content area is divided into two sections: 'Essentials' and 'Resources'. The 'Essentials' section shows subscription details like 'Subscription (move)', 'P8-Real Hands-On Labs', 'Subscription ID', and 'Location'. The 'Resources' section includes a filter bar with 'Type equals all' and 'Add filter' buttons, and a table with columns 'Name', 'Type', and 'Location'. The table currently shows 0 records.

3. Search for and select Deploy a custom template.

The screenshot shows a search results window titled 'Deploy a custom template'. It features a filter bar with 'All' and 'Services (99+)' buttons, and a 'More (5)' link. Under the 'Services' section, there is a list of results, with 'Deploy a custom template' being the first and highlighted item. A 'See more' link is visible to the right of the 'Services' section.

4. On the custom deployment page, select Build your own template in the editor.

Automate deploying resources with Azure Resource Manager templates. Select a template below to get started. [Learn more about templates](#)

 [Build your own template in the editor](#)

5. On the edit template page, select Load file.

Home > Custom deployment >

## Edit template ...

Edit your Azure Resource Manager template

+ Add resource   ↑ Quickstart template   ↑ Load file

6. Locate and select the \\Allfiles\\Lab06\\az104-06-vms-template.json file and select Open.

The screenshot shows the 'Edit template' page in the Azure portal. A notification in the top right corner states: 'Upload Completed for az104-06-vms-template.json' with a green checkmark, '23.4 KiB | "Streaming upload"'. The 'Load file' button is highlighted. The left sidebar shows the 'Resources' section expanded, listing various parameters. The main area displays the JSON template content:

```
1 {
2   "$schema": "https://schema.management.azure.com/schemas/
3   2019-04-01/deploymentTemplate.json#",
4   "contentVersion": "1.0.0.0",
5   "parameters": {
6     "virtualMachines_az104_06_vm0_name": {
7       "defaultValue": "az104-06-vm0",
8       "type": "String"
9     },
10    "virtualMachines_az104_06_vm1_name": {
11      "defaultValue": "az104-06-vm1",
12      "type": "String"
13    },
14    "virtualMachines_az104_06_vm2_name": {
15      "defaultValue": "az104-06-vm2",
16      "type": "String"
17    }
18  }
19 }
```

7. Select Save.

The screenshot shows two buttons at the bottom of the page: a blue 'Save' button and a white 'Discard' button with a black border.

8. Select Edit parameters and load the \\Allfiles\\Lab06\\az104-06-vms-parameters.json file.

## Edit parameters ...



↑ Load file   ↓ Download

```
1 {  
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.  
3   json#",  
4   "contentVersion": "1.0.0.0",  
5   "parameters": {  
6     "vmSize": {  
7       "value": "Standard_D2s_v3"  
8     },  
9     "adminUsername": {  
10      "value": "localadmin"  
11    }  
12  }  
13 }
```

9. Select Save.

Save


Discard

10. Use the following information to complete the fields on the custom deployment page, leaving all other fields with the default value.

[Home](#) >

## Custom deployment ...

Deploy from a custom template

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

[Edit template](#)

[Edit parameters](#)

[Resources](#)

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	<input type="text" value="P8-Real Hands-On Labs"/>
Resource group *	<input type="text" value="1-bb57ed1f-playground-sandbox"/>

[Create new](#)

### Instance details

Region *	<input type="text" value="(US) East US"/>
Virtual Machines_az104_06_vm0_name	<input type="text" value="az104-06-vm0"/> ✓
Virtual Machines_az104_06_vm1_name	<input type="text" value="az104-06-vm1"/> ✓
Virtual Machines_az104_06_vm2_name	<input type="text" value="az104-06-vm2"/> ✓
Virtual Networks_az104_06_vnet1_name	<input type="text" value="az104-06-vnet1"/> ✓
Network Interfaces_az104_06_nic0_name	<input type="text" value="az104-06-nic0"/> ✓
Network Interfaces_az104_06_nic1_name	<input type="text" value="az104-06-nic1"/> ✓
Network Interfaces_az104_06_nic2_name	<input type="text" value="az104-06-nic2"/> ✓
Network Security Groups_az104_06_nsg1_name	<input type="text" value="az104-06-nsg1"/> ✓
Admin Password *	<input type="password" value="*****"/> ✓

11. Select Review + Create and then select Create.

<a href="#">Previous</a>	<a href="#">Next</a>	<a href="#">Review + create</a>
--------------------------	----------------------	---------------------------------

Virtual Machines\_az104\_06\_vm0\_name    az104-06-vm0

<a href="#">Previous</a>	<a href="#">Next</a>	<a href="#">Create</a>
--------------------------	----------------------	------------------------

## ✓ Your deployment is complete



Deployment name : Microsoft.Template-20241024130522

Subscription : [P8-Real Hands-On Labs](#)

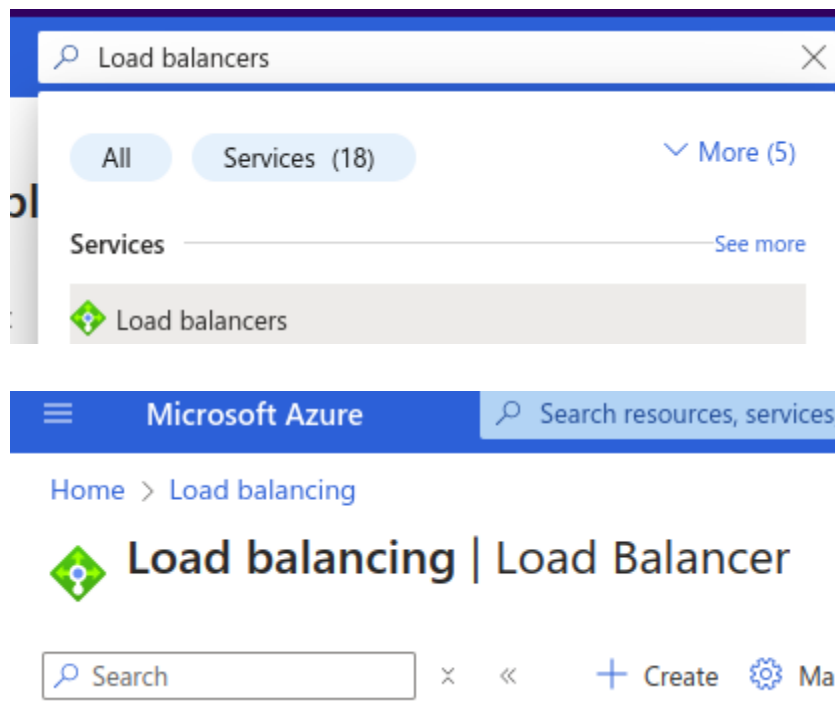
Resource group : [1-bb57ed1f-playground-sandbox](#)

Start time : 10/24/2024, 1:05:30 PM

Correlation ID : ba3a4418-9e81-4aa7-91b4-471fc97ca5e8

### Task 2: Configure an Azure Load Balancer

1. In the Azure portal, search for and select Load balancers and, on the Load balancers blade, click + Create.



2. Create a load balancer with the following settings (leave others with their default values) then click Next: Frontend IP configuration:

### Project details

Subscription \*

P8-Real Hands-On Labs

Resource group \*

1-bb57ed1f-playground-sandbox

[Create new](#)

### Instance details

Name \*

az104-lb

Region \*

East US

SKU \* ⓘ

☒ Standard (Recommended)

☐ Gateway

☐ Basic (Retiring soon)

Type \* ⓘ

☒ Public

☐ Internal

Tier \*

☒ Regional

☐ Global

3. On the Frontend IP configuration tab, click Add a frontend IP configuration and use the following settings:

## Add frontend IP configuration



az104-lb

Name \*

az104-fe

IP version

☒ IPv4

☐ IPv6

IP type

☒ IP address

☐ IP prefix

Public IP address \*

Select public IP address

[Create new](#)

Gateway Load balancer ⓘ

None

4. On the Add a public IP address popup, use the following settings before clicking OK and then Add. When completed click Next: Backend pools.

### Add a public IP address

Name \*

az104-lbpip

SKU

Standard

Tier

Regional

Static IPs are assigned at the time the resource is created and released when the resource is deleted. Dynamic IPs are assigned when associating the IP to a resource and is released when you stop, restart, or delete a resource. Dynamic is only available for Basic SKU.

Assignment

☐ Dynamic

☒ Static

Availability zone \*

Zone-redundant

Routing preference ⓘ

☒ Microsoft network

☐ Internet

Save

Cancel

## Create load balancer ...

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

A frontend IP configuration is an IP address used for inbound and/or outbound communication as defined within load balancing, inbound NAT, and out rules.

+ Add a frontend IP configuration

Name ↑↓	IP address ↑↓
az104-fe	(new) az104-lbpip (To be created)

5. On the Backend pools tab, click Add a backend pool with the following settings (leave others with their default values). Click + Add (twice) and then click Next: Inbound rules.



## Add backend pool ...



Name \*

az104-be

Virtual network ⓘ

az104-06-vnet1 (1-bb57ed1f-playground-sandbox)



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](#) | [✕ Remove](#)

Resource Name	Resource group	Type	IP confi...	IP Addr...	Availabi...	
az104-06-vm0	1-bb57ed1f-playground-sandbox	Virtual machine	ipconfig1	10.60.0.4	-	
az104-06-vm1	1-bb57ed1f-playground-sandbox	Virtual machine	ipconfig1	10.60.1.4	-	

6. As you have time, review the other tabs, then click Review + create. Ensure there are no validation errors, then click Create.

Review + create

< Previous

Next : Inbound rules >

# Create load balancer ...



Validation passed

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

## Basics

Subscription	P8-Real Hands-On Labs
Resource group	1-bb57ed1f-playground-sandbox
Name	az104-lb
Region	East US
SKU	Standard
Tier	Regional
Type	Public

## Frontend IP configuration

Frontend IP configuration name	az104-fe
Frontend IP configuration IP address	To be created

## Backend pools

Backend pool name	az104-be
-------------------	----------

## Inbound rules

None

## Outbound rules

None

## Tags

Create

< Previous

Next >

Download a template for automation

Give feedback

7. Wait for the load balancer to deploy then click Go to resource

Home >



## Microsoft.LoadBalancer-20241024131056 | Overview

Deployment

\*\*\* Deployment in progress...

Deployment to resource group 'playground-sandbox' is in progress.

Search × «

Delete Cancel Redeploy Download Refresh

Overview

Inputs  
Outputs  
Template

### Deployment is in progress

Deployment name : Microsoft.LoadBalancer-20241024131056  
Subscription : [P8-Real Hands-On Labs](#)  
Resource group : [1-bb57ed1f-playground-sandbox](#)  
Start time : 10/24/2024, 1:15:19 PM  
Correlation ID : a335fc00-a2b9-4bf4-8b41-ed2352874c6

Home >



## Microsoft.LoadBalancer-20241024131056 | Overview

Deployment

⚙️ ...

Search × «

Delete Cancel Redeploy Download Refresh

Overview

Inputs  
Outputs  
Template

### Your deployment is complete

Deployment name : Microsoft.LoadBalancer-20241024131056  
Subscription : [P8-Real Hands-On Labs](#)  
Resource group : [1-bb57ed1f-playground-sandbox](#)  
Start time : 10/24/2024, 1:15:19 PM  
Correlation ID : a335fc00-a2b9-4bf4-8b41-ed2352874c6

## Add a rule to determine how incoming traffic is distributed

1. In the Settings blade, select Load balancing rules.

Home > Microsoft.LoadBalancer-20241024131056 | Overview >



az104-lb

Load balancer

⚙️ ☆ ...

Load balancing × × «

Move Delete Refresh

Settings


Load balancing rules





Essentials

Resource group ([move](#))  
[1-bb57ed1f-playground-sandbox](#)

Location

2. Select + Add. Add a load balancing rule with the following settings (leave others with their default values). As you configure the rule use the informational icons to learn about each setting. When finished click Save

 Health probes are used to check the status of a backend pool instance. If the health probe fails to get a response from a backend instance then no new connections will be sent to that backend instance until the health probe succeeds again.

Name *	<input type="text" value="az104-hp"/>
Protocol *	<input type="text" value="TCP"/> 
Port * 	<input type="text" value="80"/>
Interval (seconds) * 	<input type="text" value="5"/>
Used by * 	Not used

az104-lb

backend pool instances. Only backend instances that the health probe considers healthy receive new traffic. [Learn more.](#)

Name *	<input type="text" value="az104-lbrule"/>
IP Version *	<input checked="" type="radio"/> IPv4 <input type="radio"/> IPv6
Frontend IP address * ⓘ	<input type="text" value="az104-fe (4.255.97.98)"/>
Backend pool * ⓘ	<input type="text" value="az104-be"/>
Protocol	<input checked="" type="radio"/> TCP <input type="radio"/> UDP
Port *	<input type="text" value="80"/>
Backend port * ⓘ	<input type="text" value="80"/>
Health probe * ⓘ	<input type="text" value="(new) az104-hp (TCP:80)"/> <a href="#">Create new</a>
Session persistence ⓘ	<input type="text" value="None"/>
Idle timeout (minutes) * ⓘ	<input type="text" value="4"/>
Enable TCP Reset	<input type="checkbox"/>
Enable Floating IP ⓘ	<input type="checkbox"/>
Outbound source network address translation (SNAT) ⓘ	<input checked="" type="radio"/> (Recommended) Use outbound rules to provide backend pool members access to the internet. <a href="#">Learn more.</a> <input type="radio"/> 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. <a href="#">Learn more.</a>

3. Select Frontend IP configuration from the Load Balancer page. Copy the public IP address.

Load balancer

Frontend IP configura... x x <<

+ Add ↻ Refresh

Settings

Frontend IP configuration

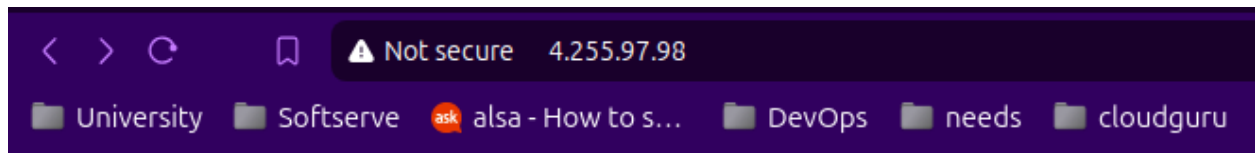
The frontend IP address configuration of a load balancer serves as the entry point for incoming traffic to the load balancer, and the load balancer then distributes the traffic to the backend pool of virtual machines or services. [Learn more](#)

Type to start filtering ...

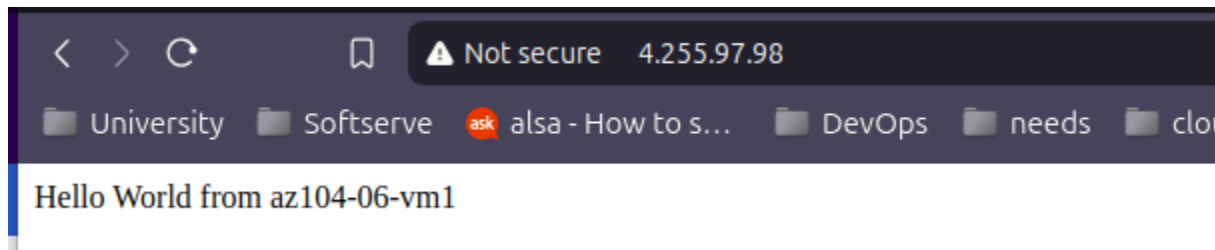
Showing all 1 items

Name ↕	IP address ↕	Rules count ↕	
az104-fe	4.255.97.98 (az104-lbpip)	1	

4. Open another browser tab and navigate to the IP address. Verify that the browser window displays the message Hello World from az104-06-vm0 or Hello World from az104-06-vm1.

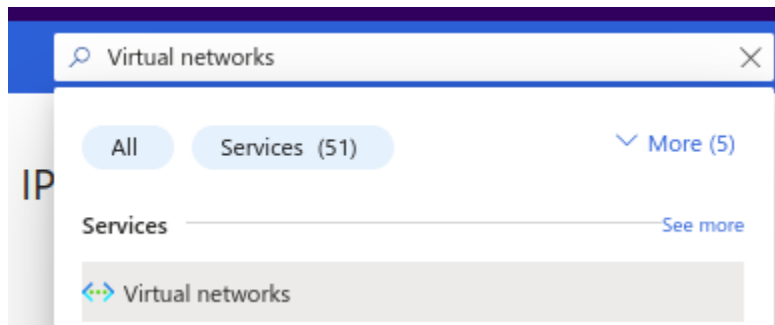


5. Refresh the window to verify the message changes to the other virtual machine. This demonstrates the load balancer rotating through the virtual machines.



### Task 3: Configure an Azure Application Gateway

1. In the Azure portal, search and select Virtual networks.



2. On the Virtual networks blade, in the list of virtual networks, click az104-06-vnet1.

Home >

## Virtual networks

Pluralsight Cloud

+ Create Manage view Refresh Export to CSV Open query Assign tags

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

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

<input type="checkbox"/> Name ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓
<input type="checkbox"/> <=> az104-06-vnet1	1-bb57ed1f-playground-sandb...	East US	P8-Real Hands-On Labs

3. On the az104-06-vnet1 virtual network blade, in the Settings section, click Subnets, and then click + Subnet.

Home > Virtual networks >

## <=> az104-06-vnet1

Virtual network

subnet

Settings

Connected devices

<=> Subnets

4. Add a subnet with the following settings (leave others with their default values).

X

19



add

add

5. Click Save.

t1 | Subnets ☆ ...

&gt;

X

&lt;&lt;

+

+

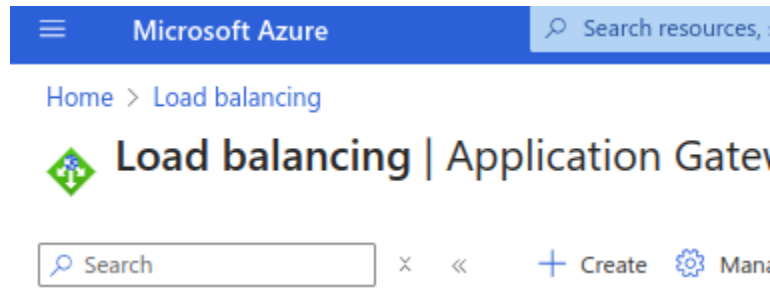
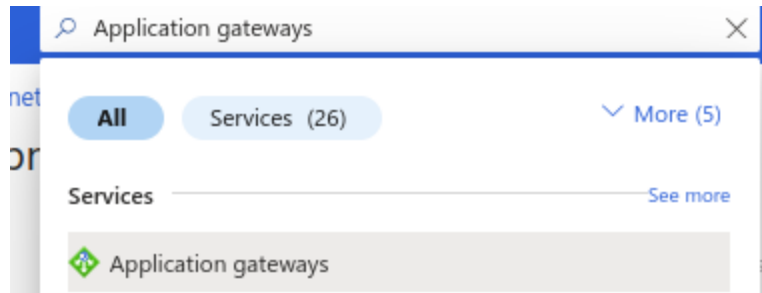


Delete



Gateways blade, click + Create.





7. On the Basics tab, specify the following settings (leave others with their default values):

## Create application gateway ...

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

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 *	P8-Real Hands-On Labs
Resource group *	1-bb57ed1f-playground-sandbox

[Create new](#)

### Instance details

Application gateway name *	az104-appgw
Region *	East US
Tier	Standard V2
Enable autoscaling	<input type="radio"/> Yes <input checked="" type="radio"/> No
Instance count *	2
Availability zone *	Zones 1
IP address type	<input checked="" type="radio"/> IPv4 only <input type="radio"/> Dual stack (IPv4 & IPv6)
HTTP2	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled

### Configure virtual network

Virtual network *	az104-06-vnet1
Subnet *	subnet-appgw (10.60.3.224/27)

[Create new](#)  
[Manage subnet configuration](#)

8. Click Next: Frontends > and specify the following settings (leave others with their default values). When complete, click OK.

Add new

### Add a public IP

Name \*  ✓

SKU ☐ Basic ☒ Standard

Assignment ☐ Dynamic ☒ Static

Availability zone 1

9. Click Next : Backends > and then Add a backend pool. Specify the following settings (leave others with their default values). When completed click Add.

## Add a backend pool. ×

A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machines scale sets, IP addresses, domain names, or an App Service.

Name \*  ✓

Add backend pool without targets

Backend targets

2 items

Target type	Target	
Virtual machine	az104-06-nic1	...
<input type="text" value="Virtual machine"/> ▼	<input type="text" value="az104-06-nic0 (10.60.0.4)"/> ▼	...
<input type="text" value="IP address or FQDN"/> ▼	<input type="text"/>	

10. Click Add a backend pool. This is the backend pool for images. Specify the following settings (leave others with their default values). When completed click Add.

## 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	
<a href="#">az104-appgwbe</a>	> 2 targets	...
<a href="#">az104-imagebe</a>	> 1 target	...

11. Click Add a backend pool. This is the backend pool for video. Specify the following settings (leave others with their default values). When completed click Add.

### Add a backend pool.



A backend pool is a collection of resources to which your application gateway can send traffic. A backend pool can contain virtual machines, virtual machines scale sets, IP addresses, domain names, or an App Service.

Name \*  ✓

Add backend pool without targets ☐ Yes ☒ No

Backend targets

1 item

Target type	Target	
<input type="text" value="Virtual machine"/> ▼	<input type="text" value="az104-06-nic2 (10.60.2.4)"/> ▼	...

12. Select Next : Configuration > and then Add a routing rule. Complete the information.

## 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**

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 \* ⓘ  ✓

Frontend IP \* ⓘ  ▼

Protocol ⓘ ☒ HTTP ☐ HTTPS

Port \* ⓘ  ✓

Listener type ⓘ ☒ Basic ☐ Multi site

**Custom error pages**

13. Move to the Backend targets tab. Select Add after completing the basic information.

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](#)

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 based rules**

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

14. In the Path-based routing section, select Add multiple targets to create a path-based rule. You will create two rules. Click Add after the first rule and then Add after the second rule.

## Add a routing rule



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

Target type	<input checked="" type="radio"/> Backend pool <input type="radio"/> Redirection
Path * ⓘ	<input type="text" value="/image/*"/> ✓
Target name *	<input type="text" value="images"/> ✓
	<input type="text" value="az104-http"/> ✓
Backend settings * ⓘ	<a href="#">Add new</a>
	<input type="text" value="az104-imagebe"/> ✓
Backend target * ⓘ	<a href="#">Add new</a>

## Add a path




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

Target type	<input checked="" type="radio"/> Backend pool <input type="radio"/> Redirection
Path * ⓘ	<input type="text" value="/video/*"/> ✓
Target name *	<input type="text" value="videos"/> ✓
	<input type="text" value="az104-http"/> ✓
Backend settings * ⓘ	<a href="#">Add new</a>
	<input type="text" value="az104-videobe"/> ✓
Backend target * ⓘ	<a href="#">Add new</a>


15.Be sure to Save and check your changes, then select Next : Tags >. No changes are needed.

Create routing rules that link your frontend(s) and backend(s). You can also add more backend pools, add a second frontend IP configuration if you haven't already, or edit previous configurations. ⓘ




### Frontends

[+ Add a frontend IP](#)



### Routing rules

[+ Add a routing rule](#)



### Backend pools

[+ Add a backend pool](#)

Public: (new) az104-gwpip

\*\*\* az104-gwrule

[Manage Backend settings](#)

\*\*\* az104-appgwbe

\*\*\*

\*\*\* az104-videobe

\*\*\*

16.Select Next : Review + create > and then click Create.

✓ Basics   ✓ Frontends   ✓ Backends   ✓ Configuration   ✓ Tags   **6 Review + create**

### Basics

Subscription	P8-Real Hands-On Labs
Resource group	1-bb57ed1f-playground-sandbox
Name	az104-appgw
Region	East US
Tier	Standard_v2
Enable autoscaling	Disabled
Instance count	2
Availability zone	Zones 1
HTTP2	Disabled
Virtual network	az104-06-vnet1
Subnet	subnet-appgw (10.60.3.224/27)
Subnet address space	10.60.3.224/27

### Frontends

Public IPv4 address name	az104-gwpip
SKU	Standard
Assignment	Static
Availability zone	1

### Tags

None

Create

Previous

Next








[Download a template for automation](#)

17. After the application gateway deploys, search for and select az104-appgw.


Home >


## Microsoft.ApplicationGateway-20241024132727 | Overview ...

Deployment

Search    Delete  Cancel  Redeploy  Download  Refresh

- Overview
- Inputs
- Outputs
- Template

 **Your deployment is complete**



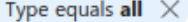
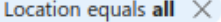
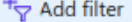
Deployment name : Microsoft.ApplicationGateway-20241024132727  
Subscription : P8-Real Hands-On Labs  
Resource group : 1-bb57ed1f-playground-sandbox  
Start time : 10/24/2024, 1:37:49 PM  
Correlation ID : 9292b149-f342-4f5d-b000-93c89e12fe41



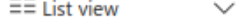
> Deployment details





∨ Next steps

Go to resource group

Resources Recommendations

az104-app   

Showing 1 to 1 of 1 records. ☐ Show hidden types   





<input type="checkbox"/> Name 	Type 	Location 	
<input type="checkbox"/>  az104-appgw	Application gateway	East US	...

18. In the Application Gateway resource, in the Monitoring section, select Backend health.



Home > Microsoft.ApplicationGateway-20241024132727 | Overview > 1-bb57ed1f-playground-sandbox > az104-appgw

## az104-appgw | Backend health ...


Application gateway

Backend settings    Refresh  Feedback

Settings


-  Backend pools
-  Backend settings

Monitoring

-  Backend health

**Backend health**

By default, Azure Application Gateway probes backend servers to check their health and whether they're ready to serve requests. You can also create custom [Health Probes](#) to mention a specific hostname and path to be probed or a response code to be accepted as Healthy.

 The Backend health report is updated based on the respective probe's refresh interval and doesn't depend on the page refresh.

19. Ensure both servers in the backend pool display Healthy.



22. Verify you are directed to the image server (vm1).

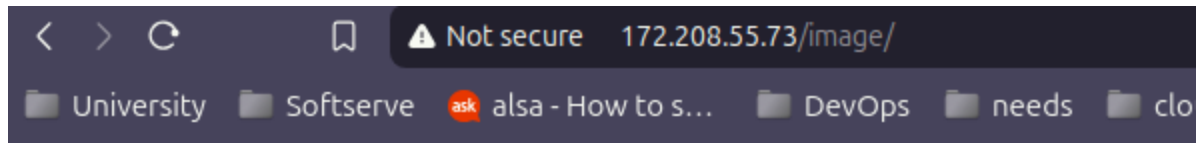
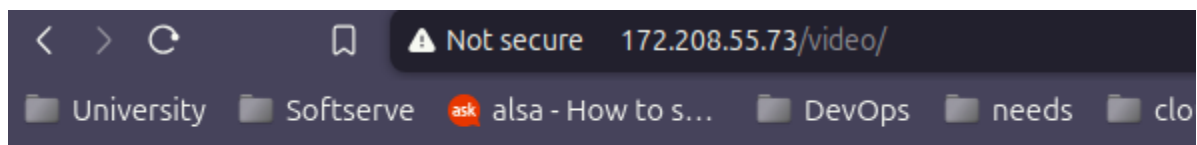


Image from: az104-06-vm1

23. Start another browser window and test this URL - <http://<frontend ip address>/video/>.

<http://172.208.55.73/video/>

24. Verify you are directed to the video server (vm2).



Video from: az104-06-vm2