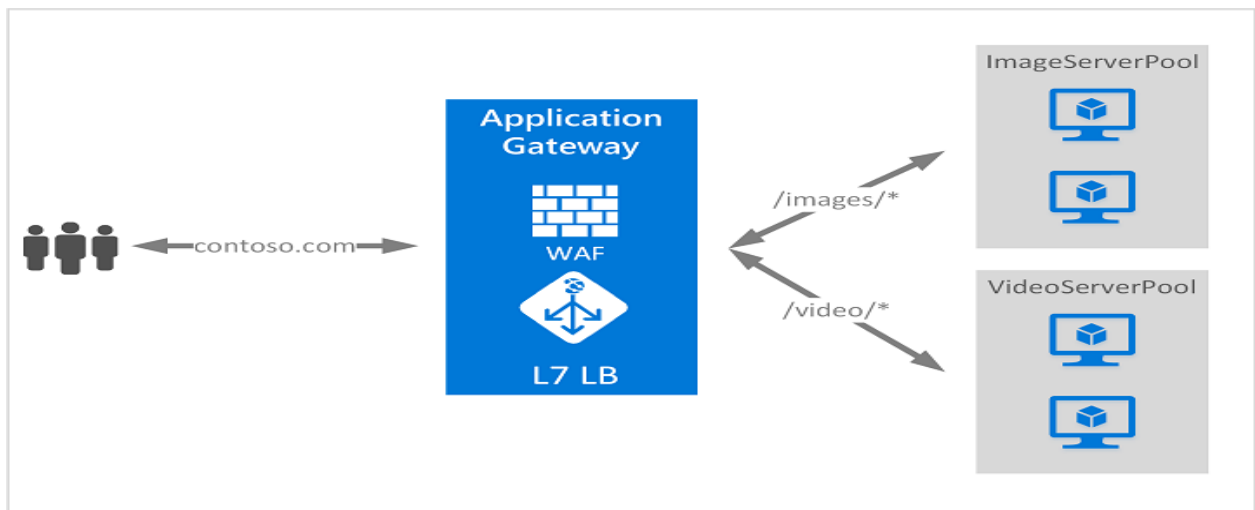


Application Gateways in Azure

- What is Application Gateway in Azure?
- Azure Application Gateway is a web traffic load balancer that enables you to manage traffic to your web applications. Traditional load balancers operate at the transport layer (OSI layer 4 - TCP and UDP) and route traffic based on source IP address and port, to a destination IP address and port.
- Application Gateway can make routing decisions based on additional attributes of an HTTP request, for example URI path or host headers. For example, you can route traffic based on the incoming URL. So if `/images` is in the incoming URL, you can route traffic to a specific set of servers (known as a pool) configured for images. If `/video` is in the URL, that traffic is routed to another pool that's optimized for videos.



This type of routing is known as application layer (OSI layer 7) load balancing. Azure Application Gateway can do URL-based routing and more.

Now Lets try with an example how Application GateWays work in the Azure.

1. Login into Azure Portal with the credentials.
2. Here to work with Application Gateway's basically we require the following details.
 - A) One Resource Group
 - B) One Virtual Network
 - C)Two Virtual Machines
3. Now, in the First step we are going to create a Resource Group with Name RG and Location East US.
 - A) For this search the Resource Group in Search Box dashboard.
 - B) Then Click on the Add button and Create the New Resource Group as shown in the below picture.

Create a resource group

The screenshot shows the 'Create a resource group' form in the Azure Portal. At the top, there are three tabs: 'Basics' (selected), 'Tags', and 'Review + create'. Below the tabs is a description of a resource group. The form is divided into two sections: 'Project details' and 'Resource details'. In the 'Project details' section, there is a 'Subscription' dropdown menu set to 'Free Trial' and a 'Resource group' text input field containing 'RG'. In the 'Resource details' section, there is a 'Region' dropdown menu set to '(US) East US'. At the bottom of the form, there are three buttons: 'Review + create' (highlighted in blue), '< Previous', and 'Next : Tags >'.

Basics Tags Review + create

Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

Project details

Subscription * ⓘ Free Trial

Resource group * ⓘ RG

Resource details

Region * ⓘ (US) East US

Review + create < Previous Next : Tags >

C)After adding the details click on Review + Create and then create button.

D)Now your new Resource Group was created with Name RG.

4. Now we are going to create a Application Gateway with the Name RGTest.

A) To do this, search the Application Gateways in the search box in the dashboard.

Application gateways

Default Directory

+ Add Edit columns Refresh Assign tags

Subscriptions: Free Trial

All resource groups All locations All tags No grouping

1 items

<input type="checkbox"/> Name ↑↓	Public IP address	Private IP address	Resource group ↑↓	Location ↑↓	Subscription ↑↓	
<input type="checkbox"/> AG	52.186.47.171	-	AG	East US	Free Trial	...

C) Now Click on the Add button to create a New Application Gateway.

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 more about 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 * ⓘ

Free Trial

Resource group * ⓘ

Create new

Instance details

Application gateway name *

Region *

East US 2

Tier ⓘ

Standard V2

Enable autoscaling	<input checked="" type="radio"/> Yes <input type="radio"/> No
Minimum scale units * ⓘ	<input type="text" value="0"/>
Maximum scale units	<input type="text" value="10"/>
Availability zone ⓘ	<input type="text" value="None"/> ▼
HTTP2 ⓘ	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Configure virtual network	
Virtual network * ⓘ	<input type="text"/> ▼
	Create new

[Previous](#)[Next : Frontends >](#)

In the above screens enter the following details

A) Resource Group- Select RG

B) Application gateway name: TestRG

C) Region : East US

D)Tier: Standard V2

[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 more about 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 * ⓘ	<input type="text" value="Free Trial"/> ▼
Resource group * ⓘ	<input type="text" value="RG"/> ▼
	Create new

Instance details

Application gateway name *	<input type="text" value="TestRG"/> ✓
Region *	<input type="text" value="East US"/> ▼
Tier ⓘ	<input type="text" value="Standard V2"/> ▼

E) Enable autoscaling: Yes

F) Minimum scale units : 2

G) Maximum scale units : Make it empty

H) Availability Zone : None

I) HTTP2: Disabled

Enable autoscaling	<input checked="" type="radio"/> Yes <input type="radio"/> No
Minimum scale units * ⓘ	<input type="text" value="2"/> ✓
Maximum scale units	<input type="text"/> ✓
Availability zone ⓘ	<input type="text" value="None"/> ▼
HTTP2 ⓘ	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Configure virtual network	
Virtual network * ⓘ	<input type="text"/> ▼

[Create new](#)

J) Virtual Network :

Till now we are not created any virtual network for the Resource Group RG. So here we are going to create a new virtual network.

1) Click on the Create New link

2) The below window will be opened

Create virtual network



The Microsoft Azure Virtual Network service enables Azure resources to securely communicate with each other in a virtual network which is a logical isolation of the Azure cloud dedicated to your subscription. You can connect virtual networks to other virtual networks, or your on-premises network. [Learn more](#)

Name *

ADDRESS SPACE

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

<input type="checkbox"/>	Address range	Addresses	Overlap	
<input type="checkbox"/>	10.1.0.0/16	10.1.0.0 - 10.1.255.255 (65536 addresses)	None	...
	<input type="text"/>	(0 Addresses)	None	

SUBNETS

The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

<input type="checkbox"/>	Subnet name	Address range	Addresses	
<input type="checkbox"/>	default	10.1.0.0/24	10.1.0.0 - 10.1.0.255 (256 addresses)	...
	<input type="text"/>	<input type="text"/>	(0 Addresses)	

OK

Discard

3)Enter the following details

A) Name: REVN

B) Address Space: Leave it as it is

C)Subnets: Modify the Default name as frontend and mention the Address range as 10.1.1.0/24 and add one more subnet with the name

Backend with Address range 10.1.2.0/24.

The Microsoft Azure Virtual Network service enables Azure resources to securely communicate with each other in a virtual network which is a logical isolation of the Azure cloud dedicated to your subscription. You can connect virtual networks to other virtual networks, or your on-premises network. [Learn more](#)

Name * ✓

ADDRESS SPACE

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

<input type="checkbox"/>	Address range	Addresses	Overlap	
<input type="checkbox"/>	10.1.0.0/16	10.1.0.0 - 10.1.255.255 (65536 addresses)	None	...
<input type="checkbox"/>	<input type="text"/>	(0 Addresses)	None	

SUBNETS

The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

<input type="checkbox"/>	Subnet name	Address range	Addresses	
<input type="checkbox"/>	frontend	10.1.1.0/24	10.1.1.0 - 10.1.1.255 (256 addresses)	...
<input type="checkbox"/>	backend ✓	10.1.2.0/24 ✓	10.1.2.0 - 10.1.2.255 (256 addresses)	...
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	(0 Addresses)	

4) Now Click on the Ok button.

Configure virtual network

Virtual network * ⓘ ✓
[Create new](#)

Subnet * ⓘ ✓

*In the subnet dropdown select the Subnet as frontend

K) Now click on the Frontends, you will navigate to another screen

1) Frontend IP address type : Public

2) Firewall IP address : Click on the Add New

✓ 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

Firewall public IP address * Choose public IP address ▼

[Add new](#)

Add a public IP

Name *

SKU

☐ Basic
☒ Standard

Assignment

☐ Dynamic
☒ Static

Previous

Next : Backends >

OK

Cancel

3)Enter Name as RGIP and click on OK.

✓ 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

Firewall public IP address * (New) RGIP ▼

[Add new](#)

Previous

Next : Backends >

4) Now click on the Backends you will navigate to another screen

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
No results	

5) Now, Click on the backend pool click

1) Name : BackendPool

2) Add backend pool without targets: By Default, it is in No mode for time being we are making it Yes. After creating the Virtual Machines we will add the backend pools.

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

3)Now Click on the Add button

6)Then Click on the Configuration button

1) In the below screen we are seeing Frontends, Routing rules and Backend pools

2) Frontends and Backend pools are created in the earlier steps.

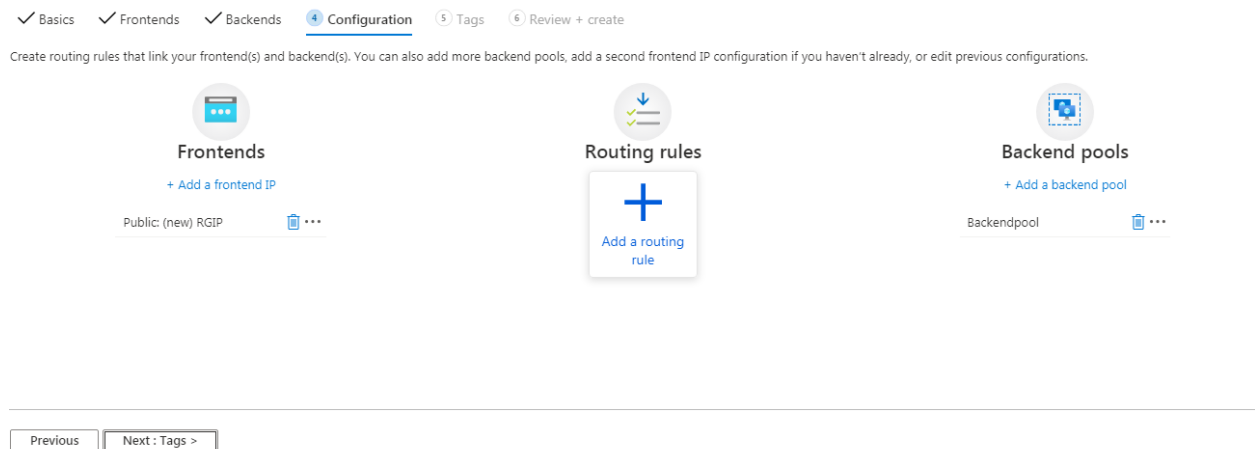
*Here you will get one doubt

-> what is Front end?

-> What is Backend pool?

Front end means after completing the Application Gateway Deployment one public IP is generated, with that IP we will check the traffic.

Backend pool means our VMs.



7) Now we are going to add the Routing rules and click on the Add a routing rule

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 *

* 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 *

80

✓

Additional settings

Listener type

☒ Basic

☐ Multi site

Error page url

☐ Yes

☒ No

Add

Cancel

1)Rule Name: RGRouting

2)Listener Name: RoutingListener

3)Frontend IP :Public

*Remaining fields as it is.

4)Click on Backend targets

* Listener * Backend targets

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

Target type

☒ Backend pool ☐ Redirection

Backend target * ⓘ

Backendpool ▼

[Add new](#)

HTTP 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 HTTP settings based on the URL path.

Add

Cancel

1) Select the Backend target as Backendpool

2) HTTP settings : Click on the new

Add a HTTP setting

×

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

HTTP settings name *

Backend protocol

☒ HTTP ☐ HTTPS

Backend port *

80

Additional settings

Cookie-based affinity ⓘ

☐ Enable ☒ Disable

Connection draining ⓘ

☐ Enable ☒ Disable

Request time-out (seconds) * ⓘ

20

Override backend path ⓘ

Host name

By default, Application Gateway does not change the incoming HTTP host header from the client and sends the header unaltered to the backend. Multi-tenant services like App service or API management rely on a specific host header or SNI extension to resolve to the correct endpoint. Change these settings to overwrite the incoming HTTP host header.

I) HTTP settings name : RGHTTP

II) Leave it remaining fields as it is.

III) Click on Add Button and click on Add button

✓ Basics

✓ Frontends


✓ Backends


4 Configuration


5 Tags


6 Review + create


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](#)
Public: (new) RGIIP 



Routing rules
[+ Add a routing rule](#)
RGRouting 
[Manage HTTP settings](#)



Backend pools
[+ Add a backend pool](#)
Backendpool 

Previous

Next : Tags >

✓ Basics

✓ Frontends


✓ Backends


4 Configuration


5 Tags


6 Review + create


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](#)
Public: (new) RGIIP 



Routing rules
[+ Add a routing rule](#)
RGRouting 
[Manage HTTP settings](#)



Backend pools
[+ Add a backend pool](#)
Backendpool 

Previous

Next : Tags >

8)Now click on Tags and click on Review + Create after Validation passed Click on the Create Button.

9)Mean while we can create two VMS With Names RGVM1 and RGVM2 under the RG Recourse Group Location East Us.

For VM1

```
set-AzVMExtension -ResourceGroupName "RG" -ExtensionName IIS -VMName RGVM1 -
Publisher microsoft.compute -ExtensionType CustomScriptExtension -TypeHandlerVersion 1.4 -
SettingString '{"commandToExecute": "powershell add-windowsfeature web-server; powershell
add-content -path \"C:\\inetpub\\wwwroot\\default.htm\" -value $($env:Computername)}' -
Location eastus
```

For Vm2:

```
set-AzVMExtension -ResourceGroupName "RG" -ExtensionName IIS -VMName RGVM2 -
Publisher microsoft.compute -ExtensionType CustomScriptExtension -TypeHandlerVersion 1.4 -
SettingString '{"commandToExecute": "powershell add-windowsfeature web-server; powershell
add-content -path \"C:\\inetpub\\wwwroot\\default.htm\" -value $($env:Computername)}' -
Location eastus
```

16) If IIS are created in the VMS the following status will be displayed in command prompt

```
PS /home/azureuser> set-AzVMExtension -ResourceGroupName "RG" -ExtensionName IIS -VMName RGVM1 -Publisher microsoft.compute -ExtensionType CustomScriptExtension -TypeHandlerVersion 1.4 -SettingString '{"commandToExecute": "powershell add-windowsfeature web-server; powershell add-content -path \"C:\\inetpub\\wwwroot\\default.htm\" -value $($env:Computername)}' -Location eastus


RequestId IsSuccessStatusCode StatusCode ReasonPhrase
-----
True      OK OK

PS /home/azureuser> set-AzVMExtension -ResourceGroupName "RG" -ExtensionName IIS -VMName RGVM2 -Publisher microsoft.compute -ExtensionType CustomScriptExtension -TypeHandlerVersion 1.4 -SettingString '{"commandToExecute": "powershell add-windowsfeature web-server; powershell add-content -path \"C:\\inetpub\\wwwroot\\default.htm\" -value $($env:Computername)}' -Location eastus

RequestId IsSuccessStatusCode StatusCode ReasonPhrase
-----
True      OK OK
```

17) Pending part is configuring the Application Gateway with backend pools that means the VMS.

18) For this goto the TESTRG Application Gateway and click on the BankEnd pool


TestRG
 Application gateway

[Delete](#) [Refresh](#)


- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
 - Configuration
 - Web application firewall
 - Backend pools**
 - HTTP settings
 - Frontend IP configurations
 - Listeners
 - Rules
 - Rewrites

Resource group [\(change\)](#) : [RG](#)
 Location : East US
 Subscription [\(change\)](#) : [Free Trial](#)
 Subscription ID : 1686da83-b00d-4e9d-8f9f-130dfb63f05d
 Tags [\(change\)](#) : [Click here to add tags](#)


Virtual network/subnet : [RGV](#)
 Frontend public IP address : [52.2](#)
 Frontend private IP addr... : -
 Tier : Stan

Show data for last
 [1 hour](#)
[6 hours](#)
[12 hours](#)
[1 day](#)
[7 days](#)
[30 days](#)

Sum Total Requests



Sum Failed Requests



19)Then select BackEndPool

+ Add Refresh			
<input type="text" value="Search backend pools"/>			
Name	Rules associated	Targets	
Backendpool	1	0	...

20)Now select Target Type as Virtual Machine and Target as RGVM1 and repeat the same for second Vm also.

Name

Backendpool

Add backend pool without targets

Yes No

Backend targets

2 items

Target type	Target
Virtual machine	rgvm1755
Virtual machine	rgvm2540 (10.1.2.5)
IP address or FQDN	

Associated rule

Save Cancel

21) And Click On Save.

22) Now you can see two targets are created for TestRG Application GateWay

+ Add Refresh

Search backend pools

Name	Rules associated	Targets
Backendpool	1	2

23)Now goto the OverView of TestRG and copy the FrontEnd Public IP.

TestRG
Application gateway

Search (Ctrl+/)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Web application firewall

Backend pools

HTTP settings

Frontend IP configurations

Listeners

Rules

Delete Refresh

Resource group (change) : RG

Location : East US

Subscription (change) : Free Trial

Subscription ID : 1686da83-b00d-4e9d-8f9f-130dfb63f05d

Tags (change) : Click here to add tags

Virtual network/subnet : RGVN/frontend

Frontend public IP address : 52.224.72.220 (RGIP)

Frontend private IP addr... : -

Tier : Standard V2

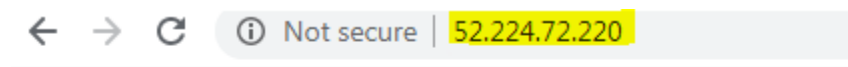
Show data for last 1 hour 6 hours 12 hours 1 day 7 days 30 days

Sum Total Requests

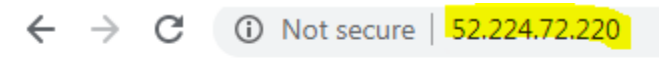
Sum Failed Requests

24)Paste the IP in Browser and Press Fn+f5.

25)Now you can see



RGVM2



RGVM1