

## Module 5 - Lab 5: Introduction to Azure Traffic Manager

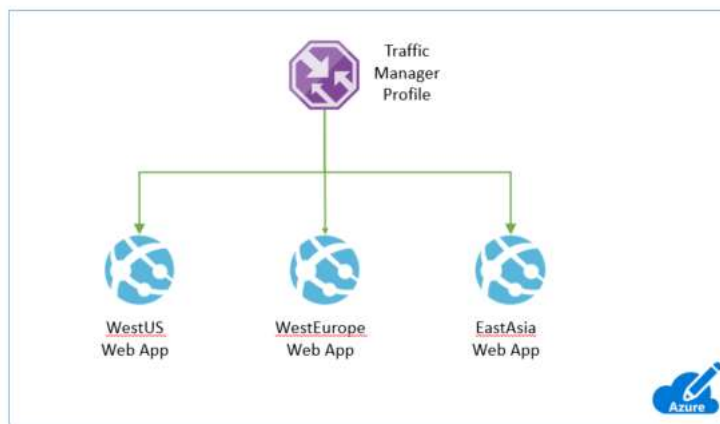
### ? Lab Overview

In this lab, you will create an Azure Traffic Manager profile, and use it to distribute traffic between 3 Azure Web App endpoints deployed to different global locations. You will learn how to use the Azure portal to configure the different ways in which Traffic Manager distributes traffic between endpoints, and how to configure endpoint health checks and test endpoint failover, for high-availability applications.

### Objectives

- Understand how to configure Traffic Manager endpoints using the Azure portal
- Understand how to configure Traffic Manager traffic routing methods using the Azure portal
- Understand how to configure Traffic Manager endpoint health checks using the Azure portal
- Understand how to test endpoint failover

### ? What you will build



## Exercise 1: Creating a Traffic Manager profile and adding endpoints

- ? In this exercise, we will create a Traffic Manager profile and add each of our Web Apps to the profile as endpoints. We will check that the profile is working, and also learn how to add and remove external (non-Azure) endpoints.

This exercise covers the following:

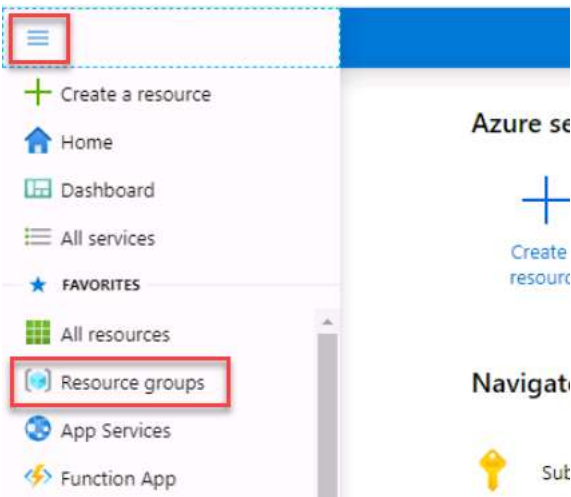
- Reviewing the Web Apps in the Lab environment
- Creating a Traffic Manager profile
- Adding endpoints to a Traffic Manager profile
- Checking that a Traffic Manager profile is working correctly

All steps will be completed using the Azure portal.

## Task 1: Review the Web Apps in the lab environment

- ? Before creating a Traffic Manager profile, let's first check the Web Apps that have been deployed to the Lab environment.

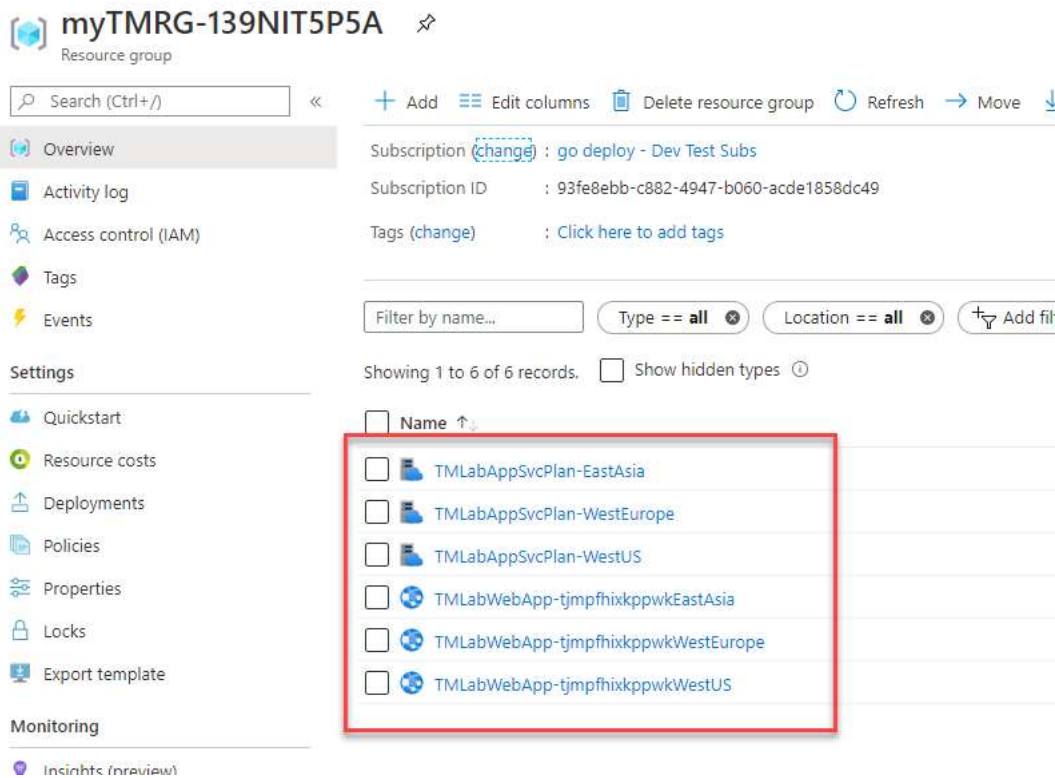
- ☐ 1. Open a browser then navigate and sign into the Azure portal <https://portal.azure.com> and login using the username [sheikhnasir06BG9@gdcs2.com](mailto:sheikhnasir06BG9@gdcs2.com) and password [aBlrCGmVWG3ZaUdQ](#)
- ☐ 2. Expand the portal's left navigation by clicking **Show portal menu** in the top left and click **Resource groups**.



☐ 3. Click the **myTMRG-9Z73IH665K** resource group.

☐ 4. The Resource Group blade should look something like this. It contains 3 App Service Plan resources, one in **East Asia**, one in **West Europe**, and one in **West US**. Each App Service Plan also contains an App Service with a name like **TMLabWebApp-xxx-EastAsia**.

**Note:** The letters 'xxx' in the App Service names will be replaced by random letters giving your plan a unique name. In this guide we'll use the letters 'xxx', which you should replace with the letters assigned to your App Services.



☐ 5. Click the **TMLabWebApp-xxx-EastAsia** app service.

**myTMRG-139NIT5P5A** Resource group

Search (Ctrl+/) << + Add Edit columns Delete resource group Refresh Move

**Overview**

Subscription (change) : go deploy - Dev Test Subs

Subscription ID : 93fe8ebb-c882-4947-b060-acde1858dc49

Tags (change) : Click here to add tags

Filter by name... Type == all Location == all Add filter

Showing 1 to 6 of 6 records. Show hidden types

Name
TMLabAppSvcPlan-EastAsia
TMLabAppSvcPlan-WestEurope
TMLabAppSvcPlan-WestUS
<b>TMLabWebApp-tjmphixkppwkEastAsia</b>
TMLabWebApp-tjmphixkppwkWestEurope
TMLabWebApp-tjmphixkppwkWestUS

**Settings**

Quickstart Resource costs Deployments Policies Properties Locks Export template

**Monitoring**

Insights (preview)

6. In the **Overview** panel, click the URL.

Home > Resource groups > myTMRG-139NIT5P5A >

**TMLabWebApp-tjmphixkppwkEastAsia** App Service

Search (Ctrl+/) << Browse Stop Swap Restart Delete Get publish profile Reset publish profile

**Overview**

Activity log Access control (IAM) Tags Diagnose and solve problems

Resource group (change) myTMRG-139NIT5P5A

Status Running

Location East Asia

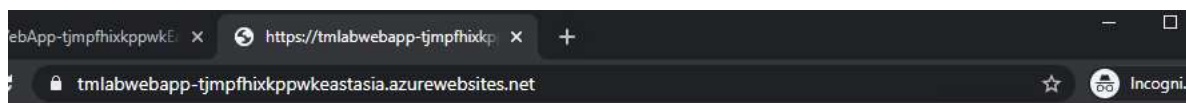
Subscription (change)

URL **https://tmlabwebapp-tjmphixkppwkeastasia.azurew...**

App Service Plan TMLabAppSvcPlan-EastAsia (S1: 1)

External Repository Project https://github.com/godeploy/TMLabWebApp

7. The web app will open in a new browser tab. The first time the Web App is accessed, it may take a few seconds for the page to load. You should see a page like this, with a text confirming the Web App region (in this case, East Asia).



## Welcome to the go deploy Traffic Manager Web App

This Web App is running in **East Asia**

[Go to health check page](#)

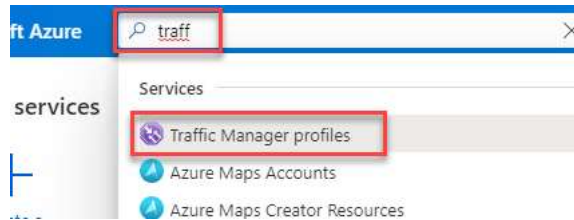
go deploy

8. Return to the Azure portal browser tab, and repeat steps 5 and 6 above to open the Web Apps in **West Europe** and **West US**. Confirm that the region displayed in the Web App matches the Web App name.

## Task 2: Create a Traffic Manager profile

? In this task, we will create a Traffic Manager profile.

- ☐ 1. In the Azure Portal search for and select **Traffic Manager profiles**.



- ☐ 2. Click + **Create**.

- ☐ 3. Enter the following information then click **Create**

- Name: **Choose a unique name for your Traffic Manager profile (for example *MyLabTMProfileNN*, where NN are random digits)**
- Routing method: **Priority**
- Subscription: **The default lab subscription**
- Resource group: **myTMRG-9Z73IH665K**

Create Traffic M... ☐

Name \*  
godeployazurelab ✓  
.trafficmanager.net

Routing method  
Priority ▼

Subscription \*  
go deploy - Dev Test Subs ▼

Resource group \*  
myTMRG-139NIT5P5A ▼  
[Create new](#)

Resource group location ⓘ  
East US ▼

- ☐ 4. The Traffic Manager profile will now be created. It should only take a few seconds.

## Task 3: Add Web App endpoints to the Traffic Manager profile

? In this task, we shall add endpoints to the Traffic Manager profile corresponding to each of the Web Apps.

- ☐ 1. Navigate back to the **myTMRG-9Z73IH665K** resource group
- ☐ 2. The resource group contents should now include the Traffic Manager profile in addition to the App Services and App Service Plans seen earlier. Note that the location of the Traffic Manager profile is *global*, since Traffic Manager is a global service and does not have a regional affinity. Click the Traffic Manager profile.

⚠ **Note:** You may need to click **Refresh** a few times to see the Traffic Manager profile

myTMRG-139NIT5P5A Resource group

Search (Ctrl+/) Add Edit columns Delete resource group Refresh Move Export to CSV

Overview

Activity log

Access control (IAM)

Tags

Events

Settings

Quickstart

Resource costs

Deployments

Policies

Properties

Locks

Export template

Monitoring

Insights (preview)

Alerts

Subscription (change)  
go deploy - Dev Test Subs

Deployments  
2 Succeeded

Subscription ID  
93fe8ebb-c882-4947-b060-acde1858dc49

Tags (change)  
Click here to add tags

Filter by name... Type == all Location == all Add filter

Showing 1 to 7 of 7 records. Show hidden types No grouping

Name	Type	Location
godeployazurelab	Traffic Manager profile	global
TMLabAppSvcPlan-EastAsia	App Service plan	East Asia
TMLabAppSvcPlan-WestEurope	App Service plan	West Europe
TMLabAppSvcPlan-WestUS	App Service plan	West US
TMLabWebApp-tjmphixkppwkEastAsia	App Service	East Asia
TMLabWebApp-tjmphixkppwkWestEurope	App Service	West Europe
TMLabWebApp-tjmphixkppwkWestUS	App Service	West US

3. In the Traffic Manager profile blade, click **Endpoints** under **Settings** on the left to display the list of endpoints (currently, an empty list) then click **+ Add**.

godeployazurelab | Endpoints Traffic Manager profile

Search (Ctrl+/) Add Refresh

Search endpoints

Name St

No results.

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Real user measurements

Traffic view

Endpoints

Properties

4. Enter the following information into the **Add endpoints** blade then click **Add**. The endpoint will take a few seconds to create and show up in the list.
- Type: **Azure endpoint**
  - Name: **EastAsia**
  - Target resource type: **App Service**
  - Target resource: Click the **Choose an app service**, then select **TMLabWebApp-xxx-EastAsia**
  - Priority: **1**

**Add endpoint** ×

godeployazurelab

Type \* ⓘ  
Azure endpoint

Name \*  
EastAsia ✓

Target resource type  
App Service

Target resource \*  
TMLabWebApp-tjimpfhixkppwkEastAsia (East Asia)

Priority \*  
1

Custom Header settings ⓘ

☐ Add as disabled

- ☐ 5. Now repeat the steps above for the **TMLabWebApp-xxx-WestEurope** endpoint. Choose **WestEurope** as the endpoint name, and **2** as the endpoint priority (two endpoints cannot share the same priority). Use **TMLabWebApp-xxx-WestEurope** as the target resource.
- ☐ 6. Now repeat the steps above *again*, for the **TMLabWebApp-xxx-WestUS** endpoint. Choose **West US** as the endpoint name, and 3 as the endpoint priority. Use **TMLabWebApp-xxx-WestUS** as the target resource.
- ☐ 7. The endpoint list in the Portal should now look like this. Initially, each endpoint will have the Monitor Status value **Checking endpoint**. After around 30 seconds, the status for each endpoint should update to show **Online**.

**godeployazurelab | Endpoints** ↗

Traffic Manager profile

Search (Ctrl+/) << + Add ↻ Refresh

Search endpoints

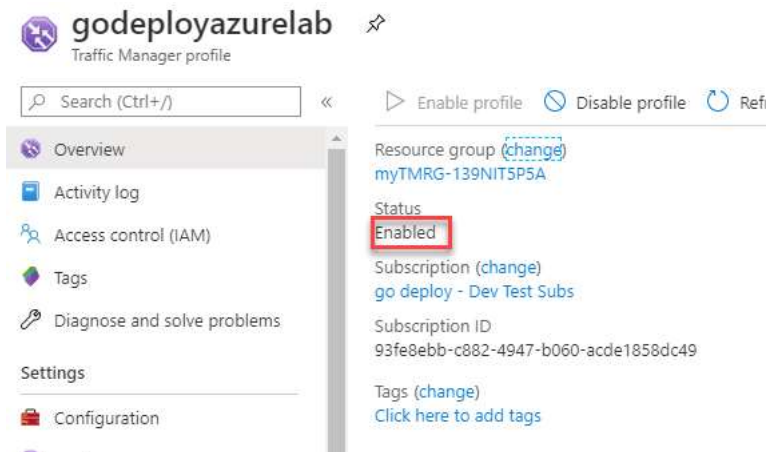
Name ↑↓	Status ↑↓	Monitor status ↑↓	Type ↑↓	Priority ↑↓
EastAsia	Enabled	Checking endpoint	Azure endpoint	1
WestEurope	Enabled	Checking endpoint	Azure endpoint	2
West US	Enabled	Checking endpoint	Azure endpoint	3

Overview  
Activity log  
Access control (IAM)  
Tags  
Diagnose and solve problems  
Settings  
Configuration

#### Task 4: Check that the Traffic Manager profile is working correctly

❓ In this task, we'll confirm that our geo-distributed Web App is now available via Traffic Manager.

- ☐ 1. In the Azure portal, in the Traffic Manager profile blade, click **Overview**. Confirm the following:
  - The Status of each endpoint is **Enabled**
  - The Status at the profile level is also **Enabled**
  - The Monitor Status of each endpoint is **Online**
  - The Monitor Status at the profile level is also **Online**



- ☐ 2. Copy the **DNS name:** link and navigate to it in a new browser tab, in this case **godeployazurelab.trafficmanager.net**. This will open the corresponding URL in a new browser tab. Confirm that the Web App page shows **This Web App is running in East Asia**.

**Note:** Since we're using the **Priority** traffic-routing method, and since all endpoints are Online, Traffic Manager should direct us to the Web App endpoint with the lowest *Priority* value---in this case, East Asia.



## Welcome to the go deploy Traffic Manager Web App

This Web App is running in **East Asia**

[Go to health check page](#)

# go deploy

- ☐ 3. Close the Web App browser tab and return to the Azure portal. Navigate again to the **myTMRG-9Z73IH665K** resource group blade, and click the **TMLabWebApp-xxx-EastAsia** Web App, to open the Web App blade.



Search (Ctrl+/) << + Add Edit columns Delete resource group Refresh Move

Overview

Activity log

Access control (IAM)

Tags

Events

Settings

Quickstart

Resource costs

Deployments

Policies

Properties

Locks

Export template

Monitoring

Insights (preview)

Alerts

Subscription (change)  
go deploy - Dev Test Subs

Subscription ID  
93fe8ebb-c882-4947-b060-acde1858dc49

Tags (change)  
Click here to add tags

Deployments  
2 Succeeded

Filter by name... Type == all Location == all Add filter

Showing 1 to 7 of 7 records. Show hidden types

Name	Type
godeployazurelab	Traffic Manager profile
TMLabAppSvcPlan-EastAsia	App Service plan
TMLabAppSvcPlan-WestEurope	App Service plan
TMLabAppSvcPlan-WestUS	App Service plan
TMLabWebApp-tjmphixkppwkEastAsia	App Service
TMLabWebApp-tjmphixkppwkWestEurope	App Service
TMLabWebApp-tjmphixkppwkWestUS	App Service

4. Click **Custom Domains** under **Settings** on the left.
5. Confirm that the Traffic Manager profile DNS name (in this case, **mylabtmprofile11.trafficmanager.net**) has been automatically added to the list of custom host names for the Web App.

## TMLabWebApp-tjmphixkppwkEastAsia | Custom domains

App Service

Search (Ctrl+/) << Refresh Troubleshoot FAQs

You have custom domains that are not secured and will cause browser warnings/errors when accessed. "Add binding" to secure your custom domains.

### Custom Domains

Configure and manage custom domains assigned to your app [Learn more](#)

IP address: 65.52.168.70

Custom Domain Verification ID: 9E192D4EC9E2011046041727E8BE2CB8B40B657F7B1E197B7F0FE195F8779FCB

HTTPS Only: Off

+ Add custom domain

Status Filter: All (2) Not Secure (1) Secure (1)

SSL STATE	ASSIGNED CUSTOM DOMAINS	SSL Binding
Not Secure	godeployazurelab.trafficmanager.net	Add binding
Secure	tmlabwebapp-tjmphixkppwkEastAsia.azure...	

6. Repeat steps 3 to 5 above for the other two Web Apps, in **West Europe** and **West US**. Note that the same Traffic Manager custom domain is assigned to all three Web Apps.



**Note:** Each custom domain used to access a Web App must be registered with the Web App. When using Traffic Manager, the Traffic Manager DNS name is registered for you, automatically. Since Web Apps do not support using the same custom domain across more than one subscription, it is not possible to use Web Apps from more than one subscription in a single Traffic Manager profile.

## Exercise 2: Configuring Traffic Manager endpoint failover

In this exercise, we will learn how to (and how not to!) configure and test automatic endpoint failover and fail-back using Azure Traffic Manager.

This exercise covers the following:

- Configuring Traffic Manager endpoint failover parameters
- Testing endpoint failover using a 'health check' page to simulate endpoint failure
- Automatic fail-back when endpoints return to health
- Common mistakes with Traffic Manager endpoint failover

All steps will be completed using the Azure portal.

## Task 1: Configure Traffic Manager endpoint failover

Traffic Manager performs continuous health checks against each endpoint, and will automatically stop directing traffic towards endpoints that are unhealthy. In this task, we will review and configure the Traffic Manager settings relating to endpoint failover.

1. In the Azure portal, close the Web App blade to return to the **myTMRG-9Z73IH665K** resource group blade. Click the created Traffic Manager profile.

myTMRG-139NIT5P5A  
Resource group

Search (Ctrl+ /) << + Add Edit columns Delete resource group Refresh Move >>

Overview  
Activity log  
Access control (IAM)  
Tags  
Events

Settings  
Quickstart  
Resource costs  
Deployments  
Policies  
Properties  
Locks  
Export template

Monitoring  
Insights (preview)  
Alerts

Subscription (change)  
go deploy - Dev Test Subs  
Deployments  
2 Succeeded

Subscription ID  
93fe8ebb-c882-4947-b060-acde1858dc49

Tags (change)  
Click here to add tags

Filter by name... Type == all Location == all Add filter

Showing 1 to 7 of 7 records. Show hidden types

Name	Type
godeployazurelab	Traffic Manager profile
TMLabAppSvcPlan-EastAsia	App Service plan
TMLabAppSvcPlan-WestEurope	App Service plan
TMLabAppSvcPlan-WestUS	App Service plan
TMLabWebApp-tjmpfhixkppwkEastAsia	App Service
TMLabWebApp-tjmpfhixkppwkWestEurope	App Service
TMLabWebApp-tjmpfhixkppwkWestUS	App Service

2. Click **Configuration** under **Settings** on the left.

Save Discard

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
  - Configuration**
  - Real user measurements
  - Traffic view
  - Endpoints
  - Properties
  - Locks
  - Export template
- Monitoring

**Routing method** ⓘ

Priority

**DNS time to live (TTL) \*** ⓘ

60

**Endpoint monitor settings** ⓘ

**Protocol**

HTTP

**Port \***

80


**Path \***

/

**Custom Header settings** ⓘ

**Expected Status Code Ranges (default)**

☐ 3. Update the Traffic Manager profile configuration settings with the following then click **Save**.

- Routing method: **Priority**
- DNS time to live (TTL): **5 seconds**
- Path:  **/healthcheck.aspx** This is a dedicated page in our Web App, which we will use to simulate application failures.
- Probing interval: **10 seconds**
- Tolerated number of failures: **1**
- Probe timeout: **5 seconds**

Save Discard

**Routing method** ⓘ

Priority

**DNS time to live (TTL) \*** ⓘ

5

**Endpoint monitor settings** ⓘ

**Protocol**

HTTP

**Port \***

80

**Path \***

/healthcheck.aspx

**Custom Header settings** ⓘ

**Expected Status Code Ranges (default: 200)** ⓘ

**Fast endpoint failover settings**

**Probing interval** ⓘ

10

**Tolerated number of failures \*** ⓘ

1

**Note:** We have chosen a set of parameters designed to make endpoint failover happen quickly, so that the lab will be quicker to complete. In a production environment, these settings may increase your Azure bill (for example, a short TTL may result in more DNS queries). The correct settings for your application will depend on the speed of failover you require.

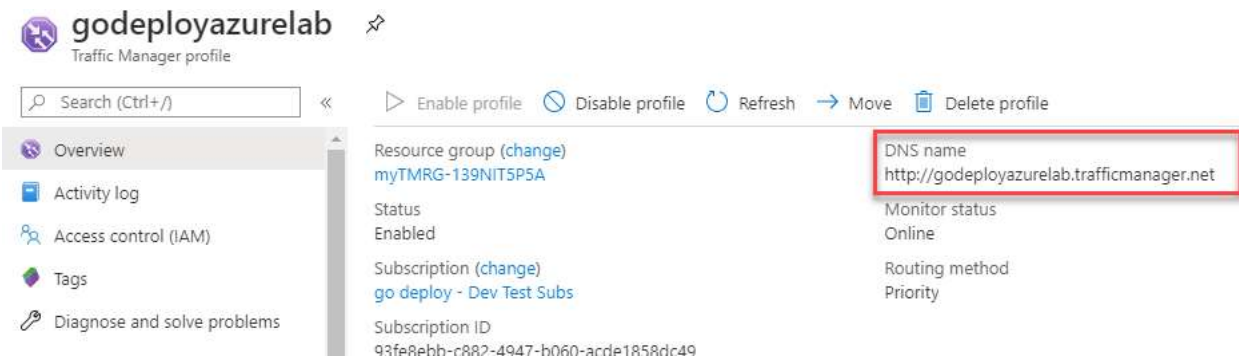
## Task 2: Test Traffic Manager endpoint failover

In this task, we will simulate an endpoint failure to test Traffic Manager's ability to detect the failure and to re-direct traffic to a different, available endpoint.

1. Return to the Traffic Manager profile **Overview** blade. Check again that all three endpoints show as **Online**. (If not, re-check the Configuration settings updated in the previous task, especially the protocol/port/path.)

Name	↑↓	Status	↑↓	Monitor status	↑↓	Type	↑↓	Priority	↑↓
EastAsia		Enabled		Online		Azure endpoint		1	
WestEurope		Enabled		Online		Azure endpoint		2	
West US		Enabled		Online		Azure endpoint		3	

2. Hover over the DNS name in the upper half of the overview panel. Click on the icon to copy the DNS name to the clipboard. We'll use this later.



3. Navigate to the DNS link in a new browser tab to open the Web App. As shown previously, the **East Asia** Web App should be shown.
4. Click the **Go to health check page** link.

## Welcome to the go deploy Traffic Manager Web App

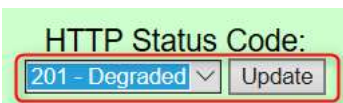
This Web App is running in East Asia

[Go to health check page](#)

go deploy

5. The health check page of the Web App can be used to return HTTP status codes other than the '200' value expected by Traffic Manager. In Task 1, we configured the Traffic Manager health checks to use this page. By returning **any** value other than 200, we can simulate a failed health check and trigger an endpoint failover.

Change the **HTTP status code** drop down to **201 -- Degraded** and click **Update**. The page will turn from green to red to indicate that it is no longer 'healthy'.



6. Return to the browser tab containing the Azure portal. After a few seconds, the **Monitor Status** for the EastAsia endpoint should change from **Online** to **Degraded**. You may have to refresh the page.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Degraded	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

- ☐ 7. Close all existing browser windows, then open a new browser window.

**Note:** Many browsers cache DNS entries, and do so for longer than the TTL duration specified in the DNS record. Using a DNS entry from the cache prevents us from detecting the DNS failover. To avoid using cached DNS entries, the above instructions **MUST** be followed precisely.

- ☐ 8. In the new browser window or tab, navigate to the Traffic Manager URL copied earlier. You should see that since the **EastAsia** endpoint is degraded, you are directed to the next available endpoint in the priority list, in this case **WestEurope**.

## Welcome to the go deploy Traffic Manager Web App

This Web App is running in **West Europe**

[Go to health check page](#)

# go deploy

### Task 3: Automatic fail-back when endpoints return to health

**?** In this task, we will see how Traffic Manager behaves when endpoints return to health after being previously marked as degraded.

- ☐ 1. Navigate back to the Azure portal <https://portal.azure.com> and login with the username [sheikhnasir06BG9@gdcs2.com](#) and password [aBlrCGmVWG3ZaUdQ](#)
- ☐ 2. Navigate back to the **myTMRG-9Z73IH665K** resource group, and open the **TMLabWebApp-xxx-EastAsia** Web App blade.

**myTMRG-139NIT5P5A** Resource group

Search (Ctrl+/) << + Add Edit columns Delete resource group Refresh

**Overview**

Subscription (change) : [go deploy - Dev Test Subs](#)

Subscription ID : 93fe8ebb-c882-4947-b060-acde1858dc49

Tags (change) : [Click here to add tags](#)

Filter by name... Type == all Location == all

Showing 1 to 7 of 7 records. ☐ Show hidden types

☐ Name ↑

- ☐ godeployazurelab
- ☐ TMLabAppSvcPlan-EastAsia
- ☐ TMLabAppSvcPlan-WestEurope
- ☐ TMLabAppSvcPlan-WestUS
- ☐ TMLabWebApp-tjmphixkppwkEastAsia
- ☐ TMLabWebApp-tjmphixkppwkWestEurope
- ☐ TMLabWebApp-tjmphixkppwkWestUS

**Settings**

- Quickstart
- Resource costs
- Deployments
- Policies
- Properties
- Locks
- Export template

**Monitoring**

- Insights (preview)

- ☐ 3. Click the Web App URL to open the Web App in a new browser tab.

**TMLabWebApp-tjmphixkppwkEastAsia** App Service

Search (Ctrl+/) << Browse Stop Swap Restart Delete Get publish profile ...

**Overview**

Resource group (change) [myTMRG-139NIT5P5A](#)

Status Running

Location East Asia

Subscription (change) [go deploy - Dev Test Subs](#)

URL <https://tmlabwebapp-tjmphixkppwkeastas...>

App Service Plan TMLabAppSvcPlan-EastAsia (S1: 1)

External Repository Project <https://github.com/godeploy/TMLabWebA...>

**Note:** We simulated endpoint failure by returning an HTTP status code other than 200 from the healthcheck.aspx page, which we configured Traffic Manager to use for its endpoint health checks. Using a dedicated page like this is a recommended best practice, since the page logic can embed tests on back-end systems such as database availability. The Web App is still running, hence we can navigate to it in our browser.

- ☐ 4. Click the **Go to health check page** link.
- ☐ 5. On the health check page, select **200 -- healthy** from the drop-down and click **Update**. The health check page should turn green.

**HTTP Status Code:**

200 - Healthy

- ☐ 6. Close the Web App browser window or tab and return to the Azure portal. Navigate back to the **myTMRG-9Z73IH665K** resource group, and then to the Traffic Manager profile.
- ☐ 7. Check that the 'Monitor Status' for the EastAsia endpoint returns to **Online** (it may take a few seconds).

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Online	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

- ☐ 8. Clear the browser DNS cache again by closing all browser windows/tabs then opening a new one.
- ☐ 9. In the new browser window or tab, navigate to the Traffic Manager profile URL (this URL should still be on your clipboard)



## Welcome to the go deploy Traffic Manager Web App

This Web App is running in **East Asia**

[Go to health check page](#)

go deploy

### Task 4: Common mistakes with Traffic Manager endpoint failover

**?** In this task, we will review some common mistakes that are often made when configuring or testing Traffic Manager endpoint failover. The first mistake we'll look at is failing to recognize successful endpoint failover due to browser DNS caching or persistent connections.

- ☐ 1. Return to the **Azure portal**, and to the Traffic Manager profile blade. Confirm that all endpoints show as **Online**.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Online	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

- ☐ 2. Copy the DNS URL and navigate to it in a new browser tab.

- ☐ 3. Confirm that the tab shows the **EastAsia** Web App. Simulate endpoint failure in the same way as in Task 2: click on the **Go to health check page** link, change the HTTP status code to **201 -- Degraded**, and click **Update**.

HTTP Status Code:

201 - Degraded
Update

- ☐ 4. Keep the Web App browser tab open, and return to the Azure portal tab. Wait for the Azure portal to show the EastAsia endpoint as **Degraded**. You may have to click **Refresh**.



NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Degraded	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

- ☐ 5. Return to the Web App browser tab, and click the **Go to home page** link. The browser will continue to show the EastAsia Web App.

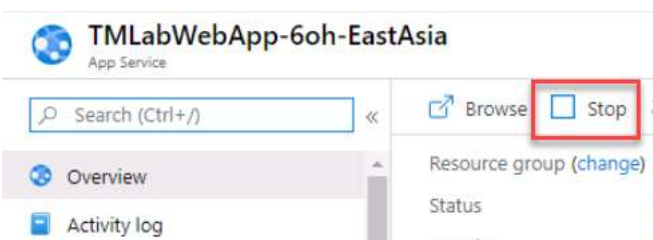
**Note:** Traffic Manager has detected that the East Asia Web App has failed its health checks, and is no longer returning this endpoint in response to DNS queries. So why is the EastAsia Web App still shown? This is because the earlier DNS response has been cached by the browser, or the browser is using a persistent connection to the Web App. Correct failover testing requires that you bypass the browser DNS cache and terminate existing connections, using the instructions provided earlier.

- ☐ 6. Before looking at the next common mistake, we must reset our environment so all endpoints are **Online**. To do so, close all browser windows/tabs then return to the Azure portal. Navigate to the **myTMRG-9Z73IH665K** resource group, then to the **TMLabWebApp-xxx-EastAsia** Web App. Click the **Web App URL** to open the Web App in a new browser tab, then click on the **Go to health check** page link. Select **200 -- Healthy** from the HTTP status code drop down, and click **Update**. Close the Web App tab and return to the Azure Portal. Return to the Traffic Manager profile blade, and confirm that all endpoints are **Online**.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Online	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

The next common mistake we will look at is testing endpoint failure by stopping/starting the underlying Web App, rather than changing the HTTP status code returned to the Traffic Manager health checks.

- ☐ 7. Navigate again to the **myTMRG-9Z73IH665K** resource group, and from there to the **TMLabWebApp-xxx-EastAsia** Web App blade.
- ☐ 8. Click **Stop** to stop the Web App and click **Yes** on the confirmation prompt.

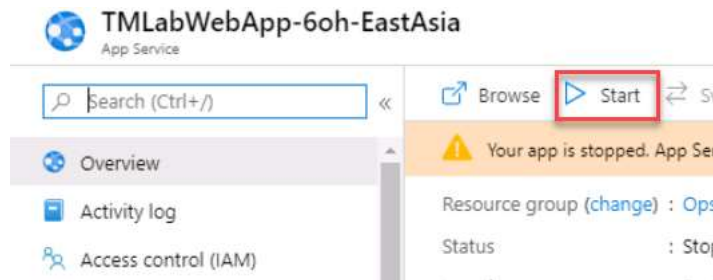


- ☐ 9. Navigate again to the **myTMRG-XXXXXX** resource group, and from there to the Traffic Manager profile blade.
- ☐ 10. Check the **Monitor Status** of the EastAsia endpoint. It will show as **Stopped**.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Stopped	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

**Note:** Traffic Manager and Web Apps are integrated, so that Traffic Manager knows when a Web App is started and stopped, and Traffic Manager automatically stops directing traffic to Stopped endpoints. (In addition, Traffic Manager stops sending health checks to Stopped endpoints, and these endpoints are not billed.) Whilst stopping the Web App will re-direct traffic to the next available endpoint, it does not properly test endpoint failover. The health checks have not detected an endpoint failure, and the time taken to re-direct traffic will be different.

11. Before looking at the next common mistake, we must again reset our environment so all endpoints are 'Online'. Navigate back to the **myTMRG-9Z73IH665K** resource group blade, and from there to the **TMLabWebApp-xxx-EastAsia** Web App blade. Click **Start** to re-start the Web App.

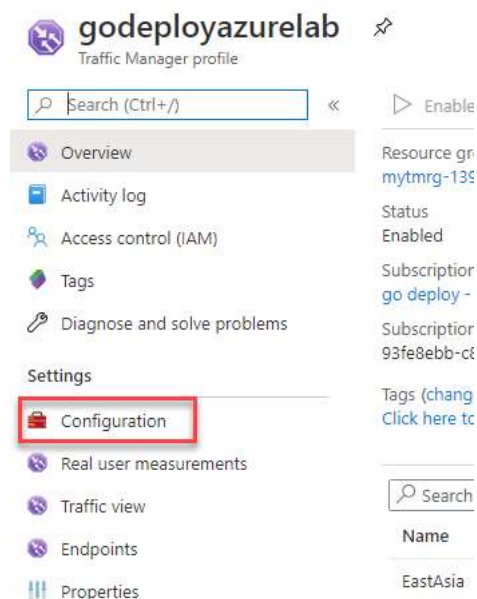


12. Navigate back to the **myTMRG-9Z73IH665K** resource group blade, and from there to the Traffic Manager blade. Whilst the Web App starts, the 'Monitor Status' for the EastAsia endpoint may temporarily show as **Degraded**. Wait until it is **Online** once more.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Online	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

The last common mistake we will look at is mis-configuration of the health check settings within the Traffic Manager profile.

13. From the Traffic Manager blade, click **Configuration** under **Settings** on the left.



14. Edit the **Path** to introduce a typo, for example change the value to **/healthcheckx.aspx**. Then click **Save** (you need to click away from the input field to enable the **Save** button).

Save
 Discard

Routing method ⓘ  
 Priority ▼

\* DNS time to live (TTL) ⓘ  
 5 seconds

Endpoint monitor settings ⓘ  
 Protocol  
 HTTP ▼

\* Port  
 80

\* Path  
 /healthcheck.aspx ✓

- ☐ 15. Click **Overview** on the left. Initially, the **Monitor Status** for each endpoint will continue to show as **Online**. After a few seconds, this will change to **Degraded**. You may have to click **Refresh**. This is because Traffic Manager health checks are now attempting to access a page of the Web App that does not exist, and hence are receiving an HTTP 404 response.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Degraded	Azure endpoint	1
WestEurope	Enabled	Degraded	Azure endpoint	2
WestUS	Enabled	Degraded	Azure endpoint	3

- ☐ 16. Copy the DNS link in the Overview panel and navigate to it in a new browser tab.
- ☐ 17. The tab will open showing the Lab Web App in EastAsia, as if everything is working as normal.

**Note:** Misconfiguring the Traffic Manager health check settings causes the health checks to fail for all endpoints, and so all endpoints show as 'Degraded' in the Azure portal. However, when all endpoints are 'Degraded', the Traffic Manager behavior is to return endpoints as if all endpoints are 'Online'. (This excludes Stopped/Disabled endpoints.)

- ☐ 18. The reason for this behavior is that in the absence of a healthy **Online** endpoint, it is generally better for Traffic Manager to make a *best effort* and attempt to connect the user to the application, than to return a DNS failure.
- ☐ 19. A common mistake is to deploy Traffic Manager without verifying the endpoint Monitor Status. It is easy to think that Traffic Manager is working correctly, if you only verify access via the Traffic Manager URL. However, having all health checks failing means that Traffic Manager is unable to detect a genuine endpoint failure, and the application is not getting the high availability benefit of automatic endpoint failover.
- ☐ 20. Before proceeding to the next Exercise, we must again reset our environment so all endpoints are **Online**. Close the Web App browser tab to return to the Azure portal tab, on the Traffic Manager profile blade. Click **Configuration**, and fix the typo in the **Path** parameter, so it shows the correct value **/healthcheck.aspx**. Then click away and **Save** the changes. Click **Overview** and wait for the endpoints to show as **Online**.

NAME	STATUS	MONITOR STATUS	TYPE	PRIORITY
EastAsia	Enabled	Online	Azure endpoint	1
WestEurope	Enabled	Online	Azure endpoint	2
WestUS	Enabled	Online	Azure endpoint	3

### Exercise 3: Configuring the Traffic Manager traffic-routing method

- ?** In this exercise, we will learn how to configure each of the Traffic Manger traffic-routing methods, which determine how Traffic Manager chooses which endpoint to direct traffic to for each user.

This exercise covers the following:

- Monitoring the effect of Traffic Manager configuration changes
- Configuring the Priority traffic-routing method
- Configuring the Weighted traffic-routing method
- Configuring the Performance traffic-routing method
- Configuring the Geographic traffic-routing method

All Traffic Manager configuration steps will be completed using the Azure portal. To monitor changes in Traffic Manager DNS responses, the 'Cloud Shell' embedded within the Azure portal will be used.

## Task 1: Using Cloud Shell to monitor DNS changes

**?** In this task, we will show how to use the Cloud Shell embedded within the Azure portal to monitor for changes in DNS responses returned by Traffic Manager. This approach is quicker than continually opening and closing browser tabs (as used in Exercise 3) and avoids any possibility of DNS caching.

1. From the Azure portal, click the Cloud Shell button in the top navigation bar to open the Cloud Shell and choose **Bash** when prompted. Then click advanced settings and then create the storage account and file share as in previous labs using the Advanced Settings option.
2. To avoid DNS caching, we will direct DNS queries to the Traffic Manager nameservers directly. To do so, we'll use the **dig** command to look up the DNS names of the Traffic Manager name servers. Enter the following command into the Cloud Shell:

```
dig +noall +answer NS trafficmanager.net.
```

```
jonathan@Azure:~$ dig +noall +answer NS trafficmanager.net
trafficmanager.net. 4276 IN NS tm2.msft.net.
trafficmanager.net. 4276 IN NS tm1.msft.net.
```

3. Make a note of one of the Traffic Manager name server names. From the screenshot above, we'll use **tm1.msft.net**.
4. We'll now start an infinite loop, checking the DNS response for the MyLabTMPProfileNN Traffic Manager profile directly from the Traffic Manager name server, once each second. Enter the following command, all on a single line (remember to replace **[your traffic manager name]** with your **Traffic Manager profile** name):

```
while true; do dig @tm1.msft.net +noall +answer [your traffic manager name].trafficmanager.net; sleep 1; done
```

```
jonathan@Azure:~$ while true; do dig @tm1.msft.net +noall +answer mylabtmpprofile11.trafficmanager.net; sleep 1; done
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
```

5. You should see a stream of DNS responses scrolling up the console. Each response shows the **DNS CNAME** record returned by Traffic Manager for this profile. In the above example, the DNS name **mylabtmpprofile11.trafficmanager.net** is mapped to **tmlabwebapp-6wg-eastasia.azurewebsites.net**, which represents our East Asia endpoint.

## Task 2: Configuring the Priority traffic-routing method

**?** In this task, we shall review and modify the Traffic Manager 'Priority' traffic routing configuration, and monitor the effect of our changes.

1. In the Azure portal, navigate to the Traffic Manager profile blade. Confirm that the current routing method is **Priority**.

The screenshot shows the Azure portal interface for a Traffic Manager profile named 'godeployazurelab'. The left sidebar contains navigation links: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, and Configuration. The main content area displays the profile's configuration. A red box highlights the 'Routing method' field, which is set to 'Priority'. Other visible fields include 'Resource group' (mytmrg-139nit5p3a), 'Status' (Enabled), 'Subscription' (go deploy - Dev Test Subs), 'Subscription ID' (93fe8ebb-c882-4947-b060-acde1858dc49), 'Tags' (change), and 'DNS name' (http://godeployazurelab.trafficmanager.net). At the top, there are buttons for 'Enable profile', 'Disable profile', 'Refresh', 'Move', and 'Delete profile'.

2. In the Cloud Shell, confirm that the **EastAsia** endpoint is currently being returned. This is because all endpoints are **Online**, and **EastAsia** is configured with the lowest priority. We'll now change the priority order of the endpoints, and observe the change in DNS response. In the endpoints list, click the **EastAsia** endpoint.
3. On the **EastAsia** endpoint configuration blade, change the **Priority** from 1 to **10**. (Note: priorities can be any value from 1 to 1000, no two endpoints can share the same priority.)



- ☐ 4. Click outside the **Priority** input field to enable the **Save** button, then click **Save**.
- ☐ 5. Watch the output in the Cloud Shell. After a few seconds, the DNS response will change from the **EastAsia** endpoint to the **WestEurope** endpoint, since **WestEurope** now has the lowest priority value. (You may see the DNS response change more than once before it settles---this is because Traffic Manager distributes DNS queries across a cluster of physical servers, which are not all updated at exactly the same moment.)

```

mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.

```

- ☐ 6. Close the **EastAsia** endpoint configuration blade to return to the Traffic Manger profile blade.

### Task 3: Configuring the Weighted traffic-routing method

In this task, we shall update our Traffic Manager profile to use Weighted traffic routing, modify endpoint weights, and monitor the effect of our changes.

- ☐ 1. In the Traffic Manager profile blade, click **Configuration** to show the Traffic Manager profile configuration settings.
- ☐ 2. Change the **Routing method** from **Priority** to **Weighted**, then click **Save**.

The screenshot shows the Azure portal interface for a Traffic Manager profile named 'godeployazurelab'. The 'Configuration' tab is selected. In the 'Essentials' panel, the 'Routing method' is set to 'Weighted'. Other details include: Resource group 'mytmrg-139nit5p5a', Status 'Enabled', Subscription 'go deploy - Dev Test Subs', and Subscription ID '93fe8ebb-c882-4947-b060-acde1858dc49'.

- ☐ 3. Click **Overview**. Note that the **Routing method** shown in the Essentials panel is now **Weighted**. Also, where previously the endpoint list showed the priority assigned to each endpoint (as used by the **Priority** traffic-routing method), it now displays the weight (as used by the **Weighted** traffic-routing method).
- ☐ 4. Watch the Cloud Shell. You will see each of the three Web Apps being returned. The Weighted traffic-routing method chooses an endpoint at random from the available endpoints, with probability based on the weights assigned to each endpoint.

```

mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westeuropa.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.

```

- ☐ 5. Click on the WestUS endpoint to open the endpoint configuration blade.

NAME	STATUS	MONITOR ST...	TYPE	WEIGHT
WestEurope	Enabled	Online	Azure endpoint	1
WestUS	Enabled	Online	Azure endpoint	1
EastAsia	Enabled	Online	Azure endpoint	1

- ☐ 6. Note that in Task 2, this blade showed the Priority assigned to each endpoint. Now, since we are using Weighted traffic routing, the Weight is shown instead. Change the **Weight** from 1 to 10.

\* Weight

- ☐ 7. Click outside the **Priority** input field to enable the **Save** button, then click **Save**.
- ☐ 8. Close the endpoint configuration blade to return to the Traffic Manager profile blade. Note the updated weight assigned to the **WestUS** endpoint.

NAME	STATUS	MONITOR ST...	TYPE	WEIGHT
WestEurope	Enabled	Online	Azure endpoint	1
WestUS	Enabled	Online	Azure endpoint	10
EastAsia	Enabled	Online	Azure endpoint	1

- ☐ 9. Watch the output in the Cloud Shell. You should observe that while all three endpoints are still returned, the WestUS endpoint is returned far more frequently.

```
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-eastasia.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
mylabtmprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-westus.azurewebsites.net.
```

#### Task 4: Configuring the Performance traffic-routing method

**?** In this task, we'll configure our Traffic Manager profile for Performance traffic-routing and monitor the effect of our changes.

- ☐ 1. In the Azure portal, on the Traffic Manager profile blade, click **Configuration** under **Settings** on the left to show the Traffic Manager profile configuration panel.
- ☐ 2. Change the **Routing method** to **Performance**, then click **Save**.
- ☐ 3. Click **Overview**. Note that the Routing method in the Overview panel now shows 'Performance' and that the endpoint list now shows the location of each endpoint.
- ☐ 4. Click **Endpoints** on the left, followed by **+ Add**.
- ☐ 5. Change the **Type** to **External endpoint**. Note how the blade requires you to specify the endpoint location in this case. Click on the Location drop-down and note that the only available options are the Azure region locations.



**Add endpoint**  
MyLabTMPProfile98

Type ⓘ  
External endpoint

Name \*

Fully-qualified domain name (FQDN) or IP \*

Location  
East Asia

East Asia  
Southeast Asia  
Central US  
East US  
East US 2  
West US  
North Central US  
South Central US

OK

**Note:** The 'Location' for each endpoint is populated automatically for Web Apps because Azure knows where the underlying service is running. When using 'External' (or 'Nested') endpoints, you need to specify the endpoint location manually. Traffic Manager measures network latency from Azure data centers, hence the only available locations are Azure regions.

- ☐ 6. Close the **Add endpoint** blade without adding an additional endpoint.
- ☐ 7. Watch the output in the Cloud Shell. You should see just one endpoint being returned---this should be the endpoint closest to you.

**Note:** What you will actually see is the endpoint with lowest network latency to the Azure data center in which your Cloud Shell is running. Since Azure uses Traffic Manager to route your Azure portal experience to your closest Azure data center, this will usually also be the endpoint closest to you.

## Task 5: Configuring the Geographic traffic-routing method

**?** In this task, we will configure our Traffic Manager profile for Geographic traffic routing, including defining which global regions map to each endpoint, and monitor the effect of our changes.

- ☐ 1. In the Azure portal, in the Traffic Manager profile blade, click **Configuration**.
- ☐ 2. Change the **Routing method** to **Geographic**, then click **Save**.

Save Discard

Routing method ⓘ  
Geographic

- ☐ 3. You will see an error notification.

**!** Failed to save Traffic Manager profile chan... 14:59

Failed to save configuration changes to Traffic Manager profile 'MyLabTMPProfile11'. Error: Endpoint 'WestEurope' has an empty geoMapping list. .

**Note:** The 'Geographic' traffic-routing method requires that a geo-mapping be assigned to each endpoint. Since our endpoint are assigned when the Traffic Manager profile was configured for 'Priority' traffic routing, no such assignment has been made. Hence the operation failed.

- ☐ 4. As a workaround, we shall remove our endpoints, change the traffic-routing method, then re-add our endpoints. An alternative is to use the Azure CLI or PowerShell to assign the geo-mapping to each endpoint before changing the traffic-routing method (this is not currently possible via the Azure portal).
- ☐ 5. A similar problem can arise when changing an existing profile to use the Performance traffic-routing method, if the profile contains External or Nested endpoints which do not have a **Location** assigned.
- ☐ 6. Click **Endpoints** on the left to show the endpoint list, then click the **WestEurope** endpoint to show the endpoint configuration blade.
- ☐ 7. On the **WestEurope** endpoint configuration blade, click **Delete**.
- ☐ 8. At the confirmation prompt, click **Yes**.
- ☐ 9. Repeat the steps above to delete the **EastAsia** and **WestUS** endpoints.
- ☐ 10. Click **Configuration**, change the **Routing method** to **Geographic**, then click **Save** again. This time, the Traffic Manager profile will be updated successfully.
- ☐ 11. Now, we need to re-add our endpoints, assigning geo-mapping information for each endpoint. Click **Endpoints**, followed by **+ Add**.
- ☐ 12. Enter the following information into the **Add endpoint** blade then click **OK**.

- Type: **Azure endpoint**
- Name: **USA**
- Target resource type: **App Service**
- Target resource: **TMLabWebApp-xxx-WestUS**
- Geo-mapping:
- Regional grouping: **North America / Central America / Caribbean**

(The Portal currently has a bug that hides the selected value when the 'Country/Region' is selected. This is a UI issue only, the selection still works.)

- Country/Region: **United States**
- State/Province:

**Add endpoint**  
MyLabRMProfile98

Type: **Azure endpoint**

Name \*: **USA**

Target resource type: **App Service**

Target resource: **TMLabWebApp-6oh-WestUS**

Geo-mapping  
You may choose to distribute traffic based on specific geographic locations. The same location can't be specified in two endpoints.

Regional grouping \*: **North America / Central America / Caribbean**

Country/Region: **United States**

State/Province:

**+ Add geo-mapping**

**OK**

- ☐ 13. Click **+ Add** again, enter the following configuration then click **OK**.
- Type: **Azure endpoint**
- Name: **Europe**
- Target resource type: **App Service**
- Target resource: **TMLabWebApp-xxx-WestEurope**

- Geo-mapping:
- Regional grouping: **Europe**
- Country/Region:

☐ 14. Click + **Add** again, enter the following configuration then click **OK**.

- Type: **Azure endpoint**
- Name: **RestOfWorld**
- Target resource type: **App Service**
- Target resource: **TMLabWebApp-xxx-EastAsia**
- Geo-mapping:
- Regional grouping: **All (World)**

☐ 15. Watch the output in the Cloud Shell. The endpoint you see in the output you see will depend on your location (or rather, the location of the Azure region hosting your Cloud Shell). Users in the US should see the WestUS endpoint; users in Europe should see the WestEurope endpoint, and users elsewhere should see the EastAsia endpoint.

```
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-west europe.azurewebsites.net.  
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-west europe.azurewebsites.net.  
mylabtmpprofile11.trafficmanager.net. 5 IN CNAME tmlabwebapp-6wg-west europe.azurewebsites.net.
```

---