

Deploying Azure protected Geo-Redundant Solution having path based routing

Overview

The main tasks for this exercise are as follows:

1. Login to Azure Portal
2. Provision Application gateway
3. Add application gateways to the Traffic Manager endpoints.

Exercise 1: Login to Azure Portal

Task 1: Sign into the Azure Portal

1. On the Start screen, click the **Internet Explorer** tile.
2. Go to (<https://portal.azure.com>).
3. Enter the email address of your Microsoft account. Click **Next**.
4. Enter the password for your Microsoft account.
5. Click **Sign In**.

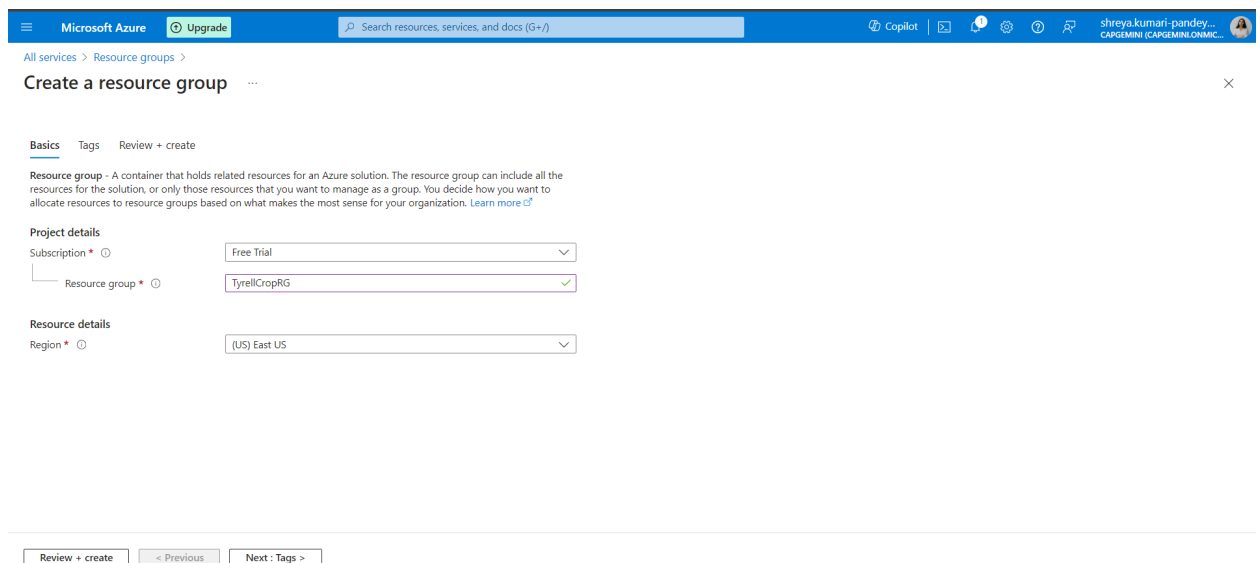
Exercise 2: Configure Traffic Manager

The main tasks for this exercise are as follows:

1. Create and setup Traffic manager profile to provides global DNS load balancing. While setting it up select Performance routing to send the requestor to the closest endpoint in terms of latency.

Task 1: Create a Resource Group

1. In the navigation pane on the left side of the Azure Portal, click **All services**.
2. In the **All services** blade that displays, click **Resource groups**.
3. In the **Resource groups** blade that displays, view your list of resource groups.
4. At the top of the **Resource groups** blade, click the **Add** button.
5. In the **Resource group** blade, perform the following steps:
 - a. In the **Resource group name** dialog box, provide the value **TyrellCropRG**.
6. In the **Resource group location** list, select **East US**.
7. In the **Resource group** blade, click **Create**.

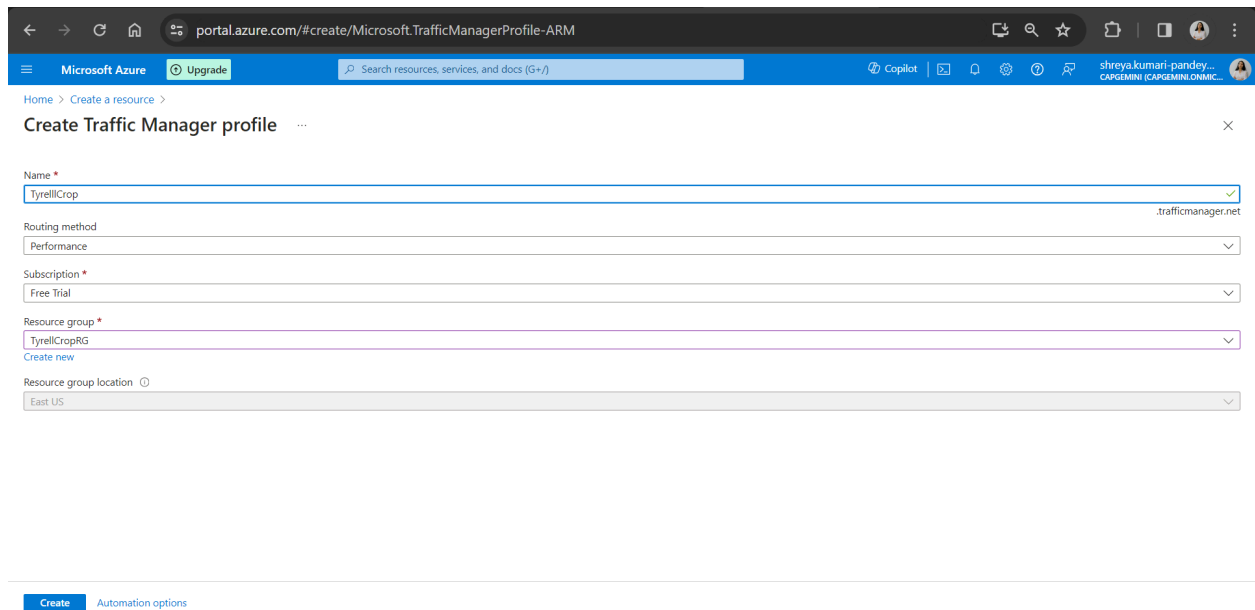


The screenshot shows the 'Create a resource group' blade in the Azure Portal. The top navigation bar includes the Microsoft Azure logo, an 'Upgrade' button, a search bar, and user information for 'shreya.kumari-pandey...'. The breadcrumb trail is 'All services > Resource groups >'. The main heading is 'Create a resource group'. Below this, there are tabs for 'Basics', 'Tags', and 'Review + create'. The 'Basics' tab is active. A descriptive paragraph explains that a resource group is a container for related resources. The 'Project details' section contains two dropdown menus: 'Subscription' (set to 'Free Trial') and 'Resource group' (set to 'TyrellCropRG'). The 'Resource details' section contains a 'Region' dropdown menu set to '(US) East US'. At the bottom, there are three buttons: 'Review + create', '< Previous', and 'Next : Tags >'.

Task 2: Create a Traffic Manager profile

1. In the Azure portal, click **Create a resource > Networking > Traffic Manager profile > Create**
2. In the **Create Traffic Manager Profile** blade, perform the following steps:
 - **Name:** TyrellIIICrop
 - **Routing method:** Performance

- **Resource group:** TyrellCropRG
- **Resource group Location:** EastUS

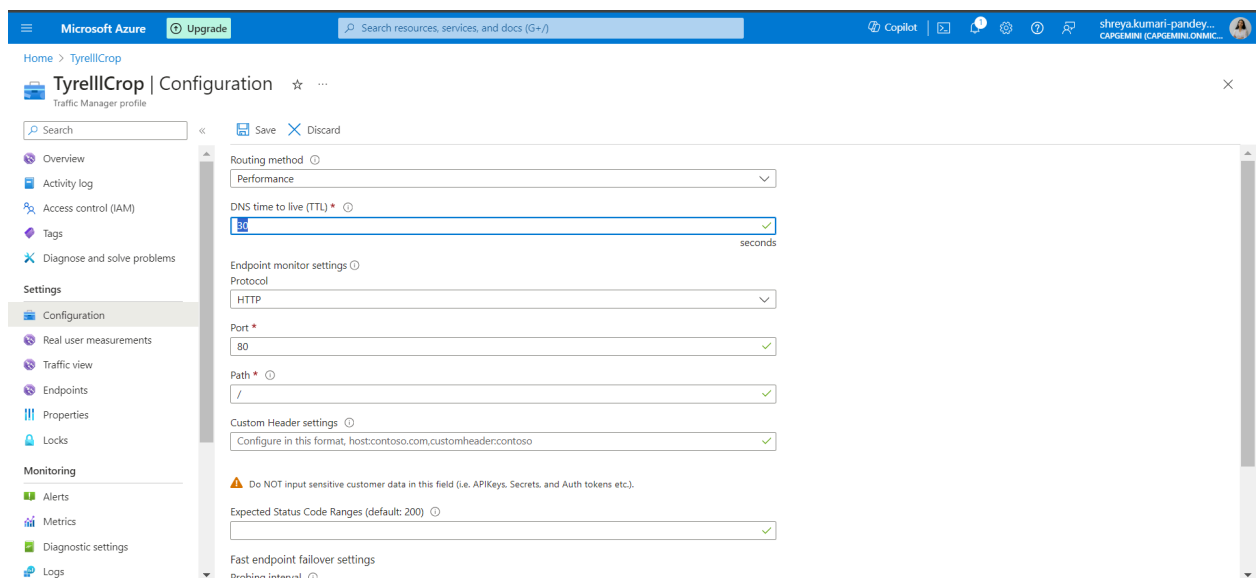


The screenshot shows the 'Create Traffic Manager profile' form in the Azure portal. The form is titled 'Create Traffic Manager profile' and has a close button (X) in the top right corner. The form fields are as follows:

- Name ***: TyrellCrop (with a checkmark icon)
- Routing method**: Performance (with a dropdown arrow)
- Subscription ***: Free Trial (with a dropdown arrow)
- Resource group ***: TyrellCropRG (with a dropdown arrow and a 'Create new' link)
- Resource group location**: East US (with a dropdown arrow)

At the bottom of the form, there is a 'Create' button and a link for 'Automation options'.

3. Click **Create** to create the Traffic Manager profile.
4. Change the Traffic Manager DNS TTL to 30 seconds (easier to validate a failover)



The screenshot shows the 'TyrellCrop | Configuration' page in the Azure portal. The page has a left sidebar with navigation links: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Configuration, Real user measurements, Traffic view, Endpoints, Properties, Locks, Monitoring, Alerts, Metrics, Diagnostic settings, and Logs. The main content area is titled 'TyrellCrop | Configuration' and has a 'Save' button and a 'Discard' button. The configuration settings are as follows:

- Routing method**: Performance (with a dropdown arrow)
- DNS time to live (TTL) ***: 30 (with a dropdown arrow and a checkmark icon, and 'seconds' text below)
- Endpoint monitor settings**:
 - Protocol**: HTTP (with a dropdown arrow)
 - Port ***: 80 (with a checkmark icon)
 - Path ***: / (with a checkmark icon)
 - Custom Header settings**: Configure in this format, host:contoso.com,customheader:contoso (with a checkmark icon)
- Expected Status Code Ranges (default: 200)**: (with a checkmark icon)
- Fast endpoint failover settings**:
 - Probing interval**: (with a dropdown arrow)

Below the settings, there is a warning icon and text: 'Do NOT input sensitive customer data in this field (i.e. APIKeys, Secrets, and Auth tokens etc.).'

Exercise 3: Create the application gateway

Task 1: Create application gateway

1. In the Azure portal, click **Create a resource > Networking > Application Gateway > Create**.
2. In the **Create Application Gateway** blade, perform the following steps on Basic tab:
 - **Name:** TyrellCrop
 - **SKU size:** Performance
 - **Instance count**
 - **Resource group:** TyrellCropRG
 - **Location:** EastUS

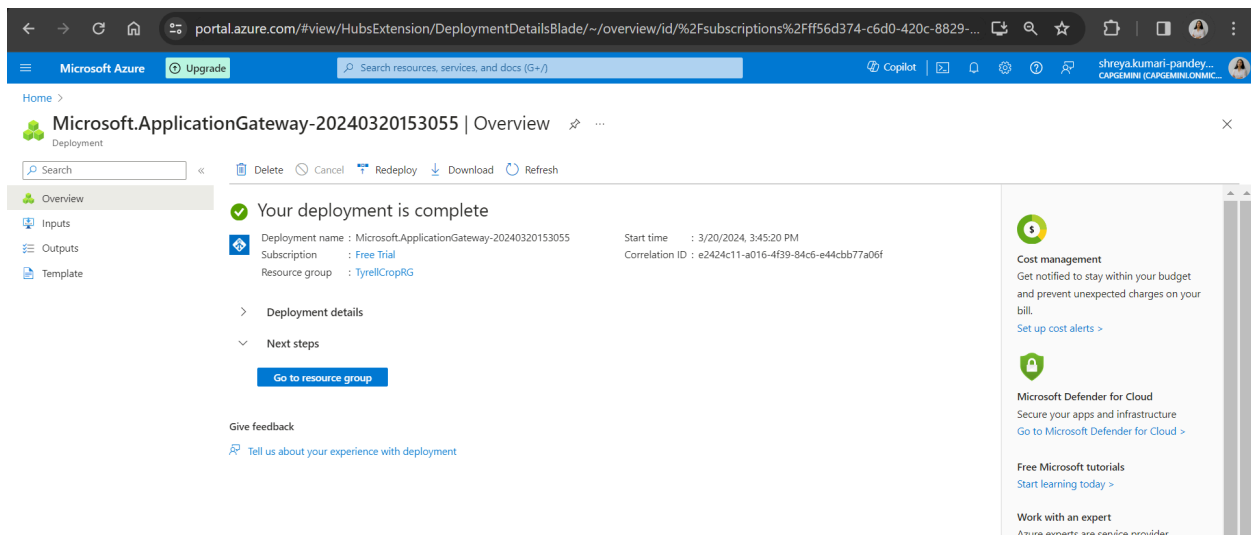
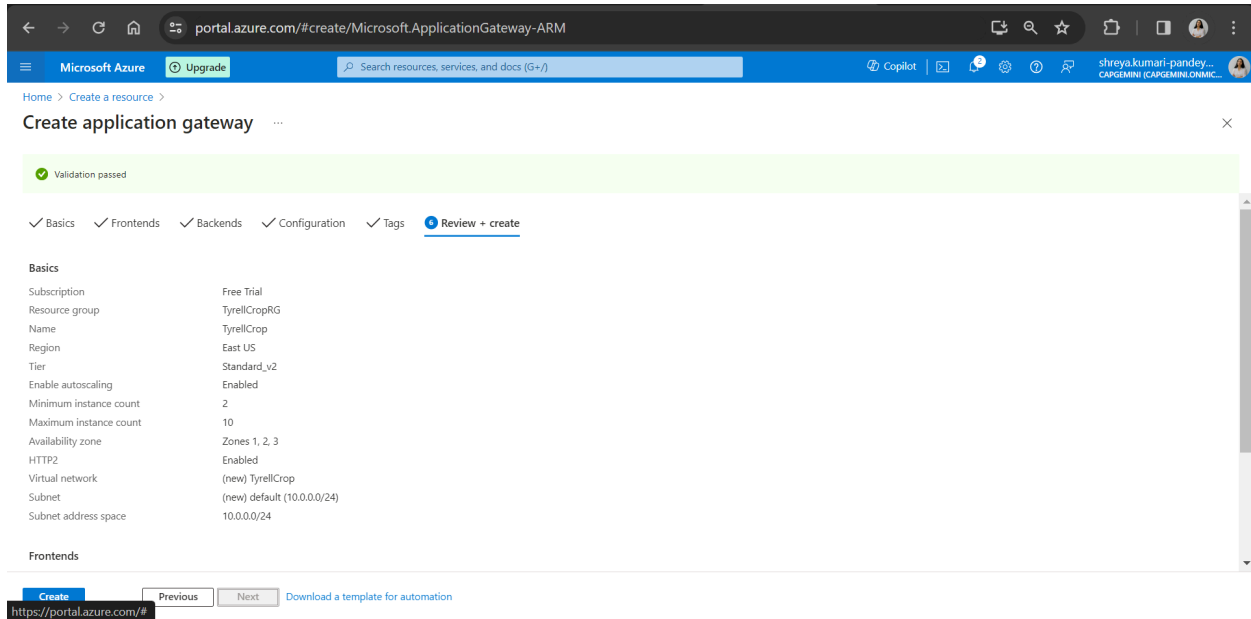
The screenshot shows the 'Create application gateway' blade in the Azure portal. The top navigation bar includes the Microsoft Azure logo, an 'Upgrade' button, a search bar, and user information. The breadcrumb trail is 'Home > Create a resource >'. The main heading is 'Create application gateway'. A warning message states: 'Changes you make on this tab may affect any configuration you've done on other tabs. Review all options prior to creating the application gateway.' Below this is a progress bar with tabs: 'Basics' (selected), 'Frontends', 'Backends', 'Configuration', 'Tags', and 'Review + create'. A description of an application gateway is provided with a link to 'Learn about creating application gateway'. The 'Project details' section includes a dropdown for 'Subscription' (Free Trial) and a dropdown for 'Resource group' (TyrellCropRG). The 'Instance details' section includes a text input for 'Application gateway name' (TyrellCrop), a dropdown for 'Region' (East US), a dropdown for 'Tier' (Standard V2), and a radio button for 'Enable autoscaling' (Yes selected). At the bottom are 'Previous' and 'Next: Frontends >' buttons.

3. On the **Settings** page, under **Subnet configuration**, select **Create virtual network**.
 - a. **Name:** TyrellCrop
 - b. **Address:** 10.0.0.0/24
 - c. **Subnet Name:** Frontend (need a separate/exclusive subnet with any resource inside it)
 - d. **Subnet address range:** 10.0.0.0/24

4. On the **Settings** page, provide below value and click okay

- a. **IP Address Type:** Public
- b. **Public IP address:** create new->TyrellCrop
- c. **DNS Name:** TyrellCrop

5. on the **summary** page, validate the entries and click **ok**



Task 2: Create backend listener

1. From resource group- **TyrellCropRG**, go to the instance of the application gateway- **TyrellCrop**
2. Click **Listeners** and then click **Basic**.
3. Enter **TyrellCropListen** for the name, *Frontend* for the name of the frontend port, and then **8080** as the port for the listener.
4. Click **OK**.

The screenshot shows the 'TyrellCropListen' configuration page in the Azure portal. The breadcrumb trail is: Home > MicrosoftApplicationGateway-20240320153055 | Overview > TyrellCropRG > TyrellCrop | Listeners > TyrellCropListen. The configuration fields are as follows:

- Listener name:** TyrellCropListen
- Frontend IP:** Public (dropdown menu)
- Protocol:** HTTP (selected), HTTPS
- Port:** 8080 (with a green checkmark icon)
- Associated rule:** Route
- Listener type:** Basic (selected), Multi site
- Custom error pages:** A section with a link 'Learn more' and a text area for 'Bad Gateway - 502' containing 'Enter Html file URL'.

At the bottom, there are 'Save' and 'Cancel' buttons.

Task 3: Create backend Pool

1. From resource group- **TyrellCropRG**, go to the instance of the application gateway- **TyrellCrop**
2. Click **Backend pools** and then click **Add**
3. Enter a name of **Backend**
4. Click **OK**.

portal.azure.com/#view/Microsoft_Azure_HybridNetworking/ApplicationGatewayBackendPoolBladeV2/backendPoolId/%2Fsubscri...

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Home > MicrosoftApplicationGateway-20240320153055 | Overview > TyrellCropRG > TyrellCrop | Backend pools >

Edit 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
Backend

Add backend pool without targets
☐ Yes ☒ No

Backend targets
0 items

Target type	Target
IP address or FQDN	

Associated rule
[Route](#)

Save Cancel

Task 4: Create a path-based routing rule

Configure URL routing for application gateways

1. From resource group- **TyrellCropRG**, go to the instance of the application gateway- **TyrellCropAG-USE**
2. Under **Settings** of the application gateway, select **Rules**, and then click the **Path based** button to add a rule.

portal.azure.com/#@capgemini.onmicrosoft.com/resource/subscriptions/ff56d374-c6d0-420c-8829-a9f7587bbf23/resourceGrou...

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Home > TyrellCrop

TyrellCrop | Rules

Application gateway

Search

Routing rule Backend health Feedback

Name	Type	Listener	Priority
Route	Basic	TyrellCropListen	500

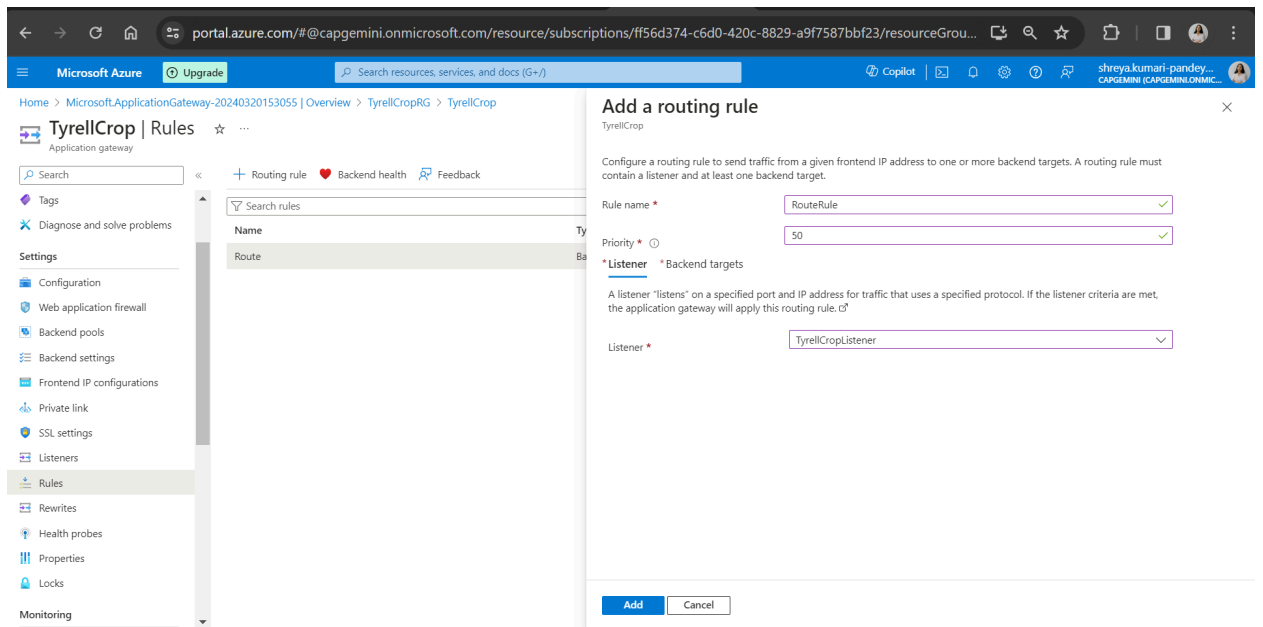
Create the rule with below details-

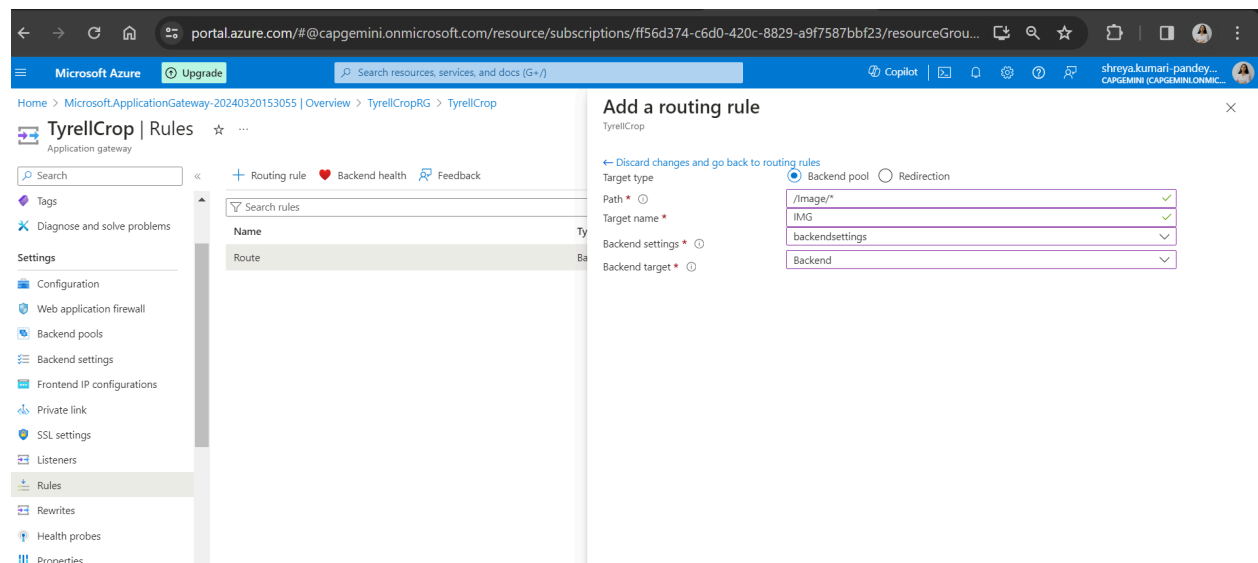
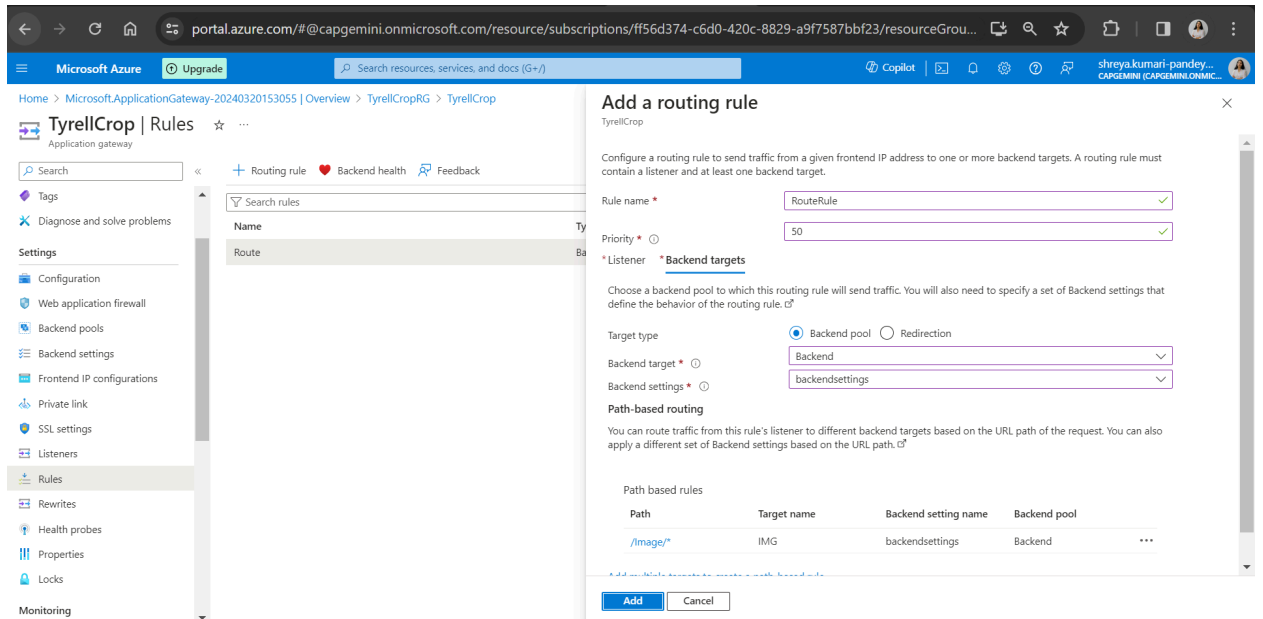
Basic settings:

- **Name:** RouteRule
- **Listener:** TyrellCropListen
- **Default backend pool:** Backend
- **Default HTTP settings:** Backendsettings

Path-based rules:

- **Name:** IMG
- **Paths:** /Image/*
- **Backend Pool:** Backend
- **HTTP Setting:** Backendsettings





Task 4: Add a subnet

1. From resource group- **TyrellCropRG**, go to the Virtual Network – **TyrellCrop**
2. Click **Subnets**, and then click **Subnet**

portal.azure.com/#@capgemini.onmicrosoft.com/resource/subscriptions/ff56d374-c6d0-420c-8829-a9f7587bbf23/resourceGrou...

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Home > TyrellCropRG > TyrellCrop

TyrellCrop | Subnets Virtual network

Search

+ Subnet + Gateway subnet Refresh Manage users Delete

Search subnets

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓	Available IPs ↑↓	Delegated to ↑↓	Security group ↑↓	Route table ↑↓	
default	10.0.0/24	-	availability dependent on dy...	-	-	-	...

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Address space

Connected devices

Subnets

Bastion

DDoS protection

Firewall

Microsoft Defender for Cloud

Network manager

DNS servers

Peerings

Service endpoints

Give feedback

3. Provide the Value-

1. **Name:**AppEnd

2. **Address Space:**10.0.1.0/24

AppEnd

TyrellCrop

Name

AppEnd

Copy to clipboard

Subnet address range * ⓘ

10.0.1.0/24

10.0.1.0 - 10.0.1.255 (251 + 5 Azure reserved addresses)

☐ Add IPv6 address space ⓘ

NAT gateway ⓘ

None

Network security group

None

Route table

None

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific azure resources from your virtual network over service endpoints. [Learn more](#)

Services ⓘ

0 selected

Save

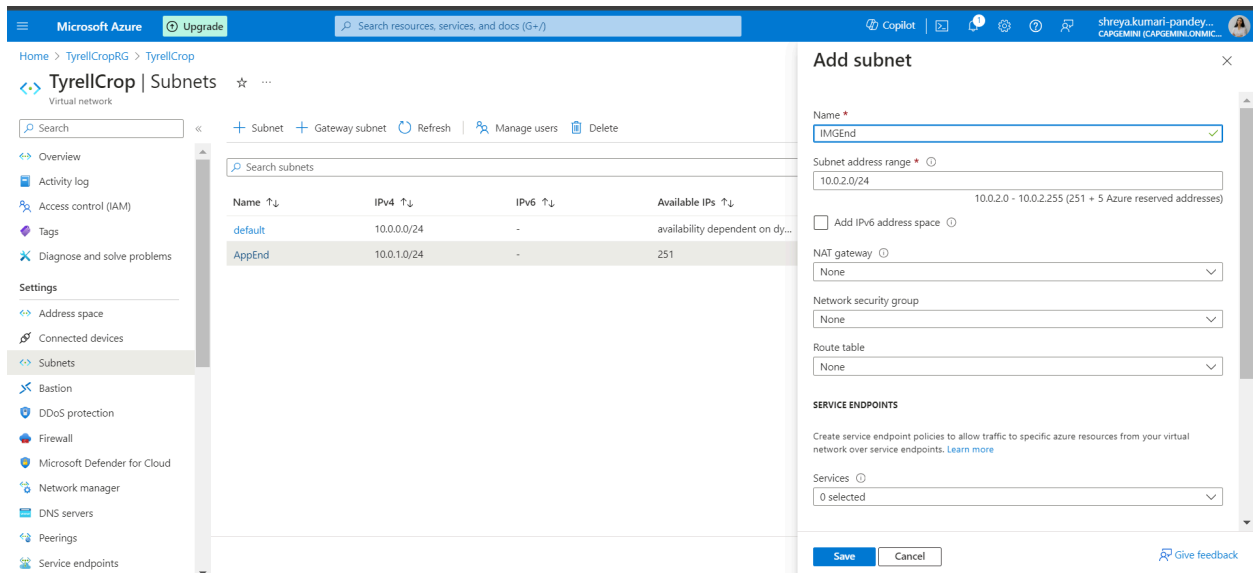
Cancel

Give feedback

1. Provide the Value-

1. **Name:**IMGEnd

2. **Address Space:**10.0.2.0/24



Task 4: Create Availability Set

1. From the “+” **Create a Resource** blade, Search for **Availability Set** and click **Create**.

- A. Name: TyrellApp-AS
- B. Resource Group: TyrellCropRG
- C. Location: East US

*with 2 fault domains and 5 update domains

Project details

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

Subscription *

Resource group *

[Create new](#)

Instance details

Name *

Region *

Fault domains

Update domains

Use managed disks ☒ No (Classic) ☐ Yes (Aligned)

[Review + create](#) [< Previous](#) [Next : Advanced >](#)

- From the **Create a Resource** blade, Search for Availability Set and click **Create to add another Availability Set**.

- A. Name: TyrellIMG-AS
- B. Resource Group: TyrellCropRG
- C. Location:East US

***with 2 fault domains and 5 update domains**

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Home > Availability Set > Create availability set ...

Validation passed

Basics Advanced Tags Review + create

Basics

Subscription	Free Trial
Resource group	TyrellCropRG
Region	East US
Name	TyrellIMG-AS
Fault domain count	2
Update domain count	5
Use managed disks	No (Classic)

Advanced

Proximity placement group	None
---------------------------	------

Tags

(none)

Create < Previous Next > Download a template for automation

Submitting deployment... Submitting the deployment template for resource group 'TyrellCropRG'.

Task 5: Add VM's – For Application

- From the **Create a Resource** blade, click on **Compute** and select **Windows Server 2016 Datacenter**.

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Home > Create a resource > Marketplace > Windows Server >

Create a virtual machine

Click here to try out the Azure Copilot for additional recommendations while creating a virtual machine →

Image: Complete the basic VM view → Create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

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 * ⓘ TyrellCropRG
[Create new](#)

Instance details

Virtual machine name * ⓘ TyrellApp/VM01 ✓

Region * ⓘ (US) East US

Availability options ⓘ Availability set

< Previous | Next: Disks > | Review + create

[Give feedback](#)

2. Use the **Create a virtual machine** blade to deploy a virtual machine with the following settings:

Basic:

- A. Resource group: **TyrellCropRG**
- B. Virtual machine name: **TYrellAppVM01**
- C. Region: **east us**
- D. Availability options: **Availability set ->TyrellApp-AS**
- E. Image: **Windows Server 2016 Datacenter**
- F. Size: **Standard DS1 v2**
- G. Username: **sysadmin**
- H. Password: **Pa55w.rd!234**
- I. Public inbound ports: **Allow Selected Ports**
- J. Selected Inbound ports: **rdp**
- K. Already have a Windows license? **No**

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Home > Create a resource > Marketplace > Windows Server >

Create a virtual machine

Click here to try out the Azure Copilot for additional recommendations while creating a virtual machine →

You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size * Standard_DS1_v2 - 1 vcpu, 3.5 GiB memory (₹7,652.25/month) [See all sizes](#)

Enable Hibernation (preview) ☐
 To enable Hibernation, you must register your subscription. [Learn more](#)

Administrator account

Username * sysadmin ✓

Password * ***** ✓

Confirm password * ***** ✓

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

< Previous Next : Disks > Review + create Give feedback

Disk:

A. OS disk type: **Standard HDD**

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Create a resource > Marketplace > Windows Server >

Create a virtual machine

Basics **Disks** Networking Management Monitoring Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

VM disk encryption

Azure disk storage automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ☐
 Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)

OS disk

OS disk size Image default (127 GiB)

OS disk type * Standard HDD (locally-redundant storage)
 The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM ☒

Key management Platform-managed key

< Previous Next : Networking > Review + create Give feedback

Networking:

A. Virtual network: **TyrellCrop**

- Subnet name: **AppEnd**

B. Public IP: **TYrellAppVM01-ip**

C. NIC Network security group: **Basic**

D. Public inbound ports: **Allow Selected Ports**

E. Selected Inbound ports: **rdp**

F. Accelerated networking: **Off**

G. Load balancing: **No**

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal, specifically the 'Networking' tab. The page is for creating a Windows Server VM. The 'Virtual network' is set to 'TypeICorp'. The 'Subnet' is 'AppEnd (10.0.1.0/24)'. The 'Public IP' is 'jnhvi1TtHsAppVM01up'. The 'NIC network security group' is set to 'Basic'. The 'Public inbound ports' are set to 'Allow selected ports'. The 'Selected inbound ports' are 'RDP (3389)'. A warning message states: 'This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.' The 'Load balancing' section is set to 'None'. The 'Next: Management' button is highlighted.

Management:

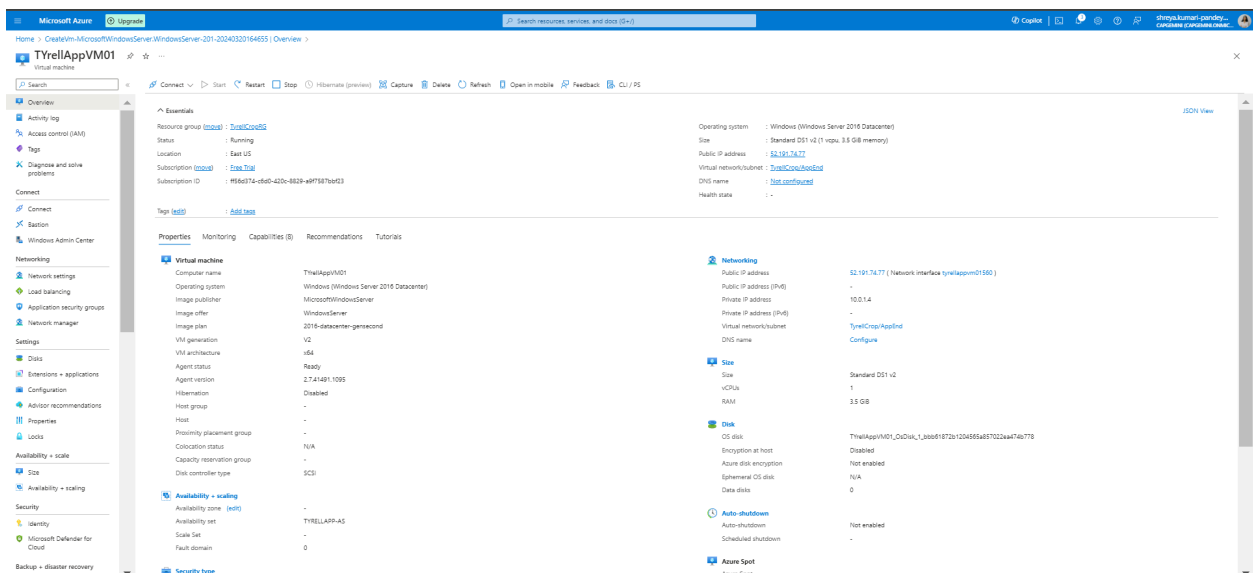
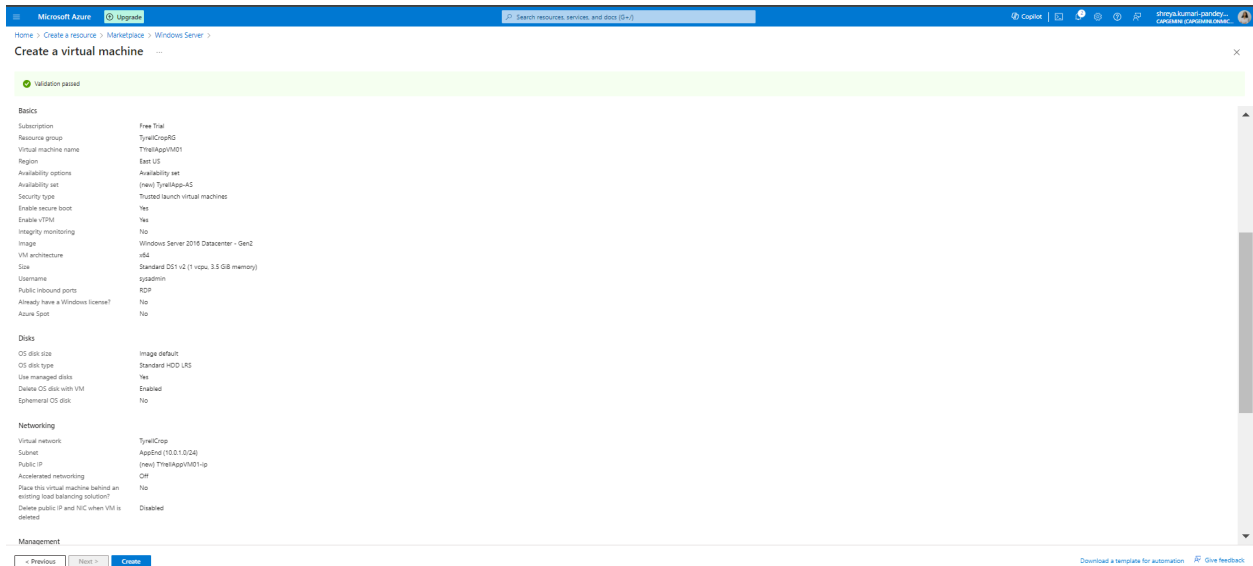
A. Boot diagnostics: **Off**

B. OS guest diagnostics: **Off**

C. System assigned managed identity: **Off**

D. Enable auto-shutdown: **Off**

E. **Enable Backup: Off**



Task 6: Add VM's – For Images

1. From the **Create a Resource** blade, click on Compute and select **Windows Server 2016 Datacenter**.
2. Use the **Create a virtual machine** blade to deploy a virtual machine with the following settings:

Basic:

A. Resource group: **TyrellCropRG**

- B. Virtual machine name: **TyrellIMGVM01**
- C. Region: **east us**
- D. Availability options: **Availability set ->TyrellIMG-AS**
- E. Image: **Windows Server 2016 Datacenter**
- F. Size: **Standard DS1 v2**
- G. Username: **sysadmin**
- H. Password: **Pa55w.rd!234**
- I. Public inbound ports: **Allow Selected Ports**
- J. Selected Inbound ports: **rdp**
- K. Already have a Windows license? **No**

home > / Create VM > Microsoft Windows Server 2016 Datacenter - x64 Gen2 (Free trial) > / Create VM

Create a virtual machine

Click here to try out the Azure Capitan for additional recommendations while creating a virtual machine ->

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

Subscription *
Resource group *
[Create new](#)

Instance details

Virtual machine name *
Region *
Availability options

Based on your input, you might want to consider creating this resource as a virtual machine scale set, which allows you to manage, configure and scale load balanced virtual machines. [Create a VMSS](#)

Availability set *
[Create new](#)

Security type
[Configure security features](#)

Image *
[See all images](#) | [Configure VM generation](#)

VM architecture ☐ AMD64
☒ x64
AMD64 is not supported with the selected image.

Run with Azure Spot discount ☐

You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size *
[Previous](#) [Next: Disks](#) [Review & create](#)

[Give feedback](#)

Disk:

- B. OS disk type: **Standard HDD**

Networking:

- H. Virtual network: **TyrellCrop**
 - Subnet name: **IMGNet**
- I. Public IP: **TyrellIMGVM01-ip**

J. NIC Network security group: **Basic**

K. Public inbound ports: **Allow Selected Ports**

L. Selected Inbound ports: **rdp**

M. Accelerated networking: **Off**

N. Load balancing: No

Management:

F. Boot diagnostics: **Off**

G. OS guest diagnostics: **Off**

H. System assigned managed identity: **Off**

I. Enable auto-shutdown: **Off**

J. Enable Backup: Off

Create a virtual machine

Validation passed

Basics

Subscription	Free Trial
Resource group	TyrellCaspRG
Virtual machine name	TyrellMGVM01
Region	Ireland US
Availability options	Availability set
Availability set	TyrellApp-A5
Security type	Trusted launch virtual machines
Enable secure boot	Yes
Enable vTPM	Yes
Integrity monitoring	No
Image	Windows Server 2016 Datacenter - Gen2
VM architecture	x64
Size	Standard_DS1_v2 (1 vcpu, 3.5 GB memory)
Username	cyadmin
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

Disks

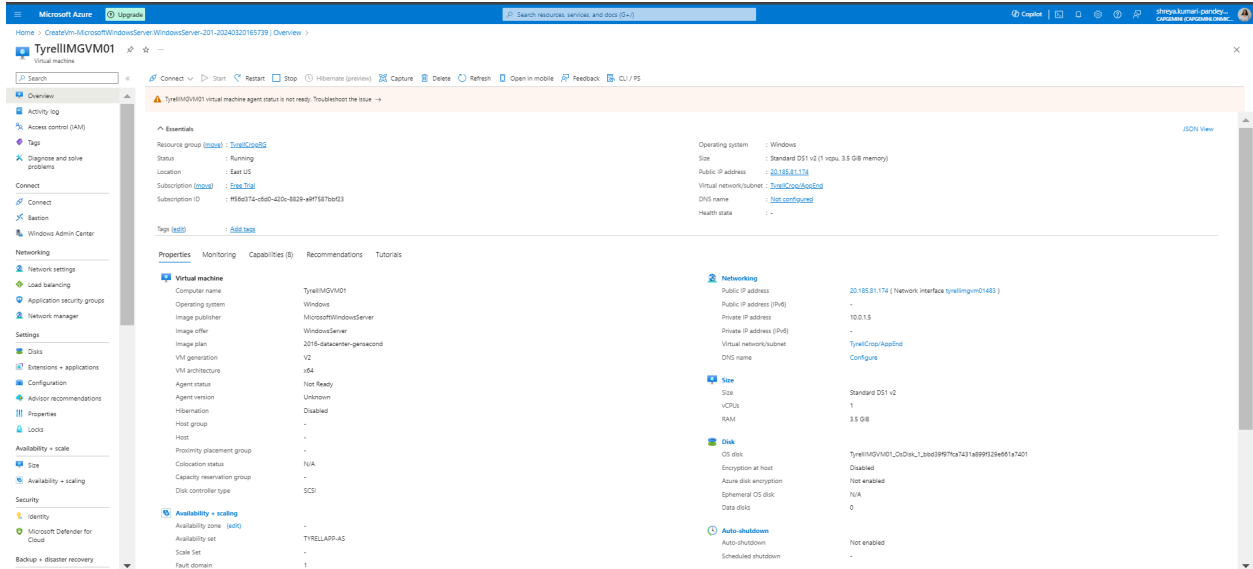
OS disk size	Image default
OS disk type	Standard HDD-LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	TyrellCasp
Subnet	AppEnd (10.0.1.0/24)
Public IP	(New) TyrellMGVM01-ip
Accelerated networking	Off
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is deleted	Disabled

Management

[Download a template for automation](#) [Give feedback](#)



Task 7: Add IIS role to the Windows Servers.

1. After each virtual machine is provisioned login using remote desktop by clicking the Connect button on the virtual machine configuration blade and logging in with the administrative credentials.
2. Once inside the VM, click the PowerShell icon on the task bar.
3. In the PowerShell console execute the following command to install IIS:

```
Add-WindowsFeature -Name "Web-Server"
```

4. After Once IIS has completed installation open the file C:\InetPub\wwwroot\iisstart.htm in notepad on each server. Inside the <body> tag insert-
 - This content comes from App server !! (on TYrellAppVM01)
 - This content comes from IMG server !! (on TYrellIMGVM01)
5. Repeat the steps for both virtual machines to install IIS.

Task8: Add VM's to backend pools

1. From resource group- **TyrellCropRG**, go to the instance of the application gateway- **TyrellCrop**
2. Click **Backend pools**-> Click **Backend**.
3. Click **Add target** to add **TYrellAppVM01** to Backend.

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Home > TyrellCropRG > TyrellCrop > Backend pools >

Edit 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
Backend

Add backend pool without targets
Yes No

Backend targets
2 items

Target type	Target
Virtual machine	tyrellappvm01560
Virtual machine	tyrellimgvm01483 (10.0.1.3)
IP address or FQDN	

Associated rule
Route
RouteRule

Save Cancel

4. On **Backend pools**-> Click **Backend**.

5. Click **Add target** to add *TYrellIMGVM01* to **Backend**.

Microsoft Azure Upgrade Search resources, services, and docs (2+)

Home > TyrellCropRG > TyrellCrop > Backend pools >

Edit 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
Backend

Add backend pool without targets
Yes No

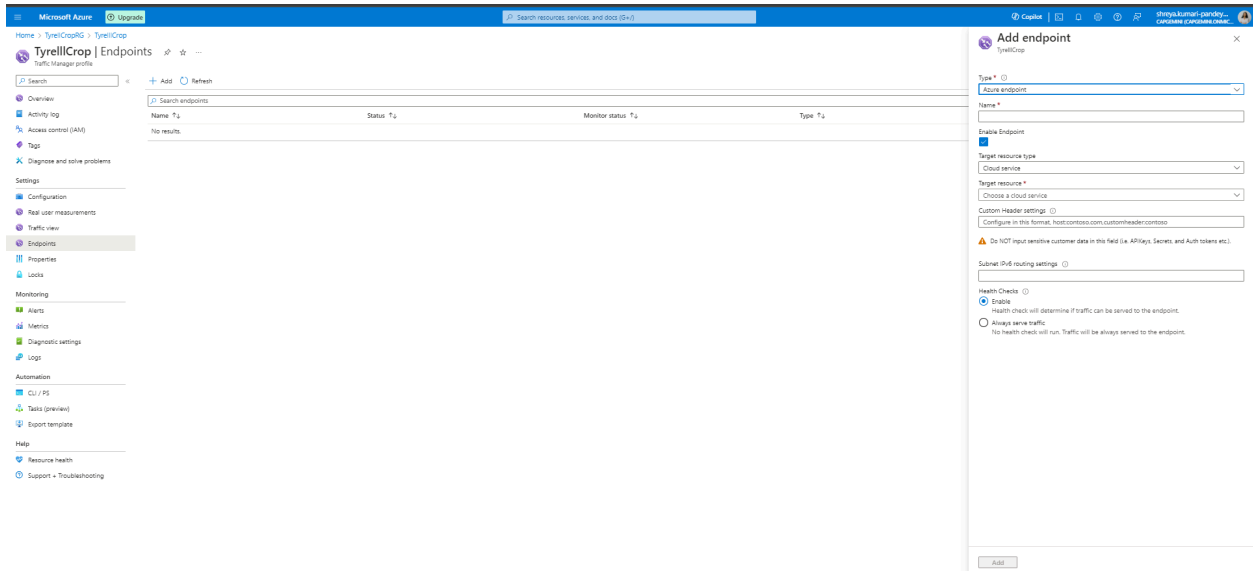
Backend targets
2 items

Target type	Target
Virtual machine	tyrellappvm01560
Virtual machine	tyrellimgvm01483
IP address or FQDN	

Associated rule
Route
RouteRule

Save Cancel

Task 9: Add application gateways to the Traffic Manager endpoints

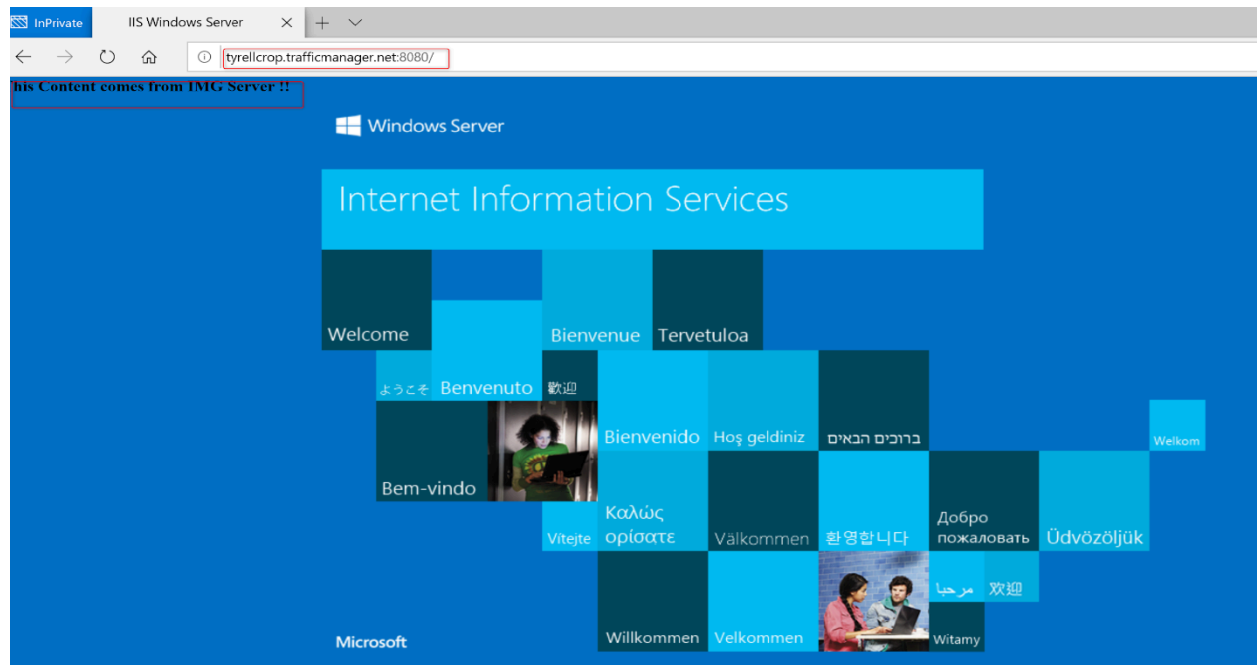


1. Create an endpoint by entering the following information-

- **Type: Azure endpoint**
- **Name: TyrellCropAG1.**
- **Target resource type: Public IP address** and then, under **Target resource**, select the public IP of the application gateway

Test the Functionality

<http://tyrellcrop.trafficmanager.net:8080/> (response from TYrellAppVm01)



<http://tyrellcrop.trafficmanager.net> (response from TYrellIMGVm01)

