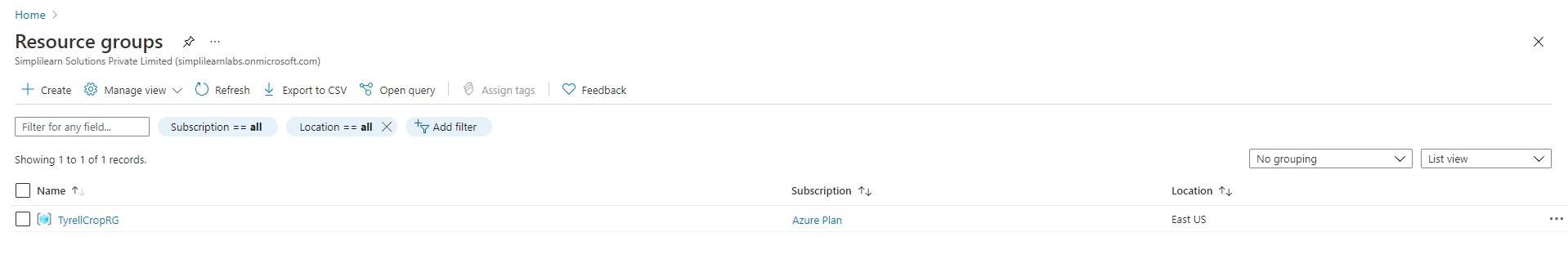
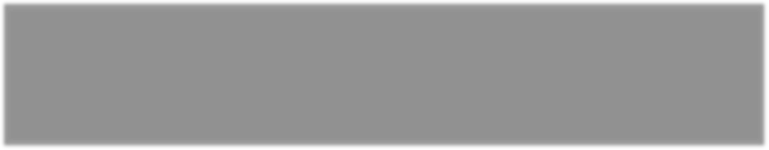
# Deploying Azure protected Geo-Redundant Solution having path-based routing.



**Developed By: Kaushik Dey**

DESCRIPTION

**Business Scenario**

The Tyrell Crop wants to build a highly secured Globally distributed application. This application serves two types of content: images and dynamically rendered webpages. As their user base comes from across the globe this must be geographically redundant. The design demands that it should serve its users from the closest (lowest latency) location to them. For distinction, Tyrell Crop has decided that any URLs that match the pattern /images/\* are served from a dedicated pool of VMs that are different from the rest of the web farm.

Design the Load Balancing architecture for Tyrell Crop.

For this sample do it in East US region, then you can select any other region and add those Application gateways on created Traffic manager.

**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 endpoint.

Solution:

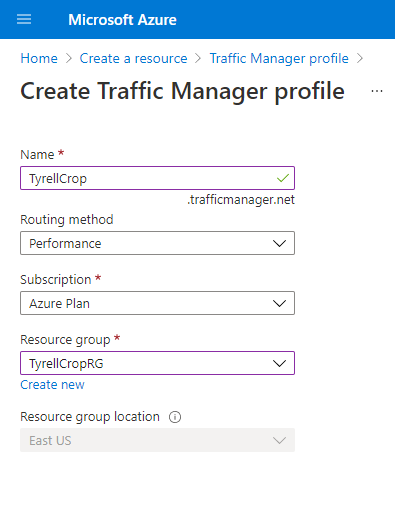
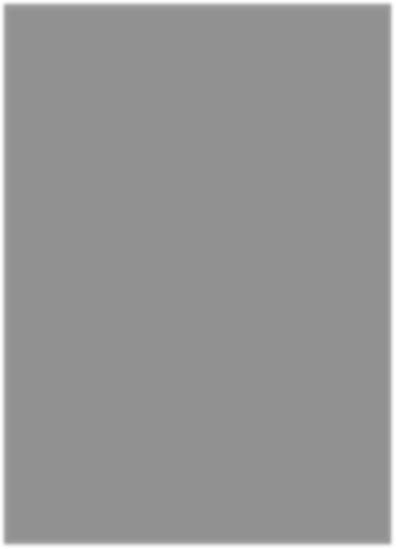
# Step 1: Configure Traffic Manager

* 1. **Login to Azure portal Creating a Resource Group**
     + Resource group name: TyrellCropRG
     + Resource group location: East US

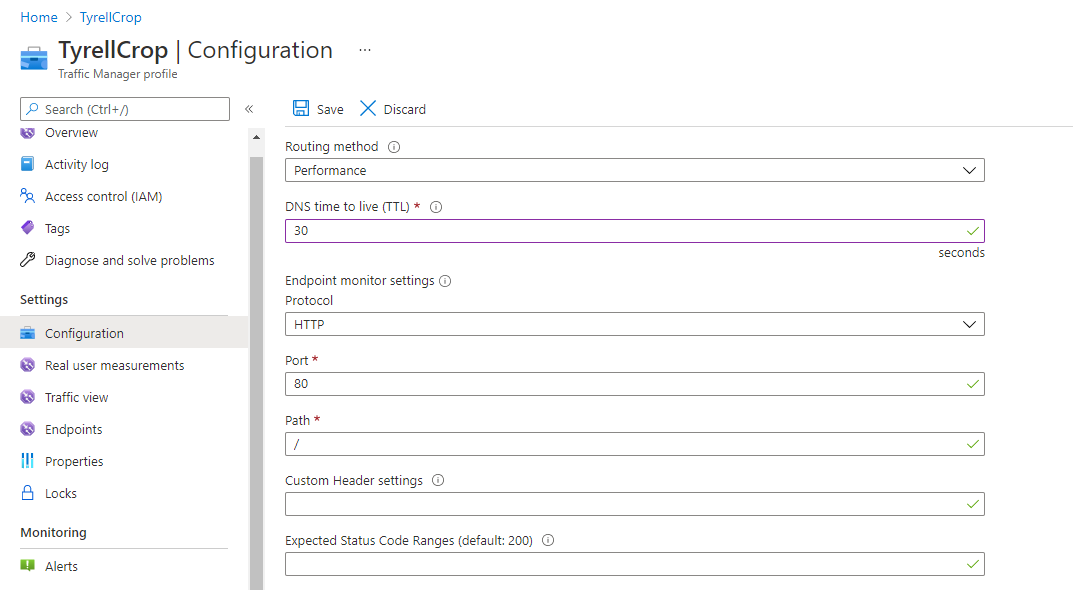
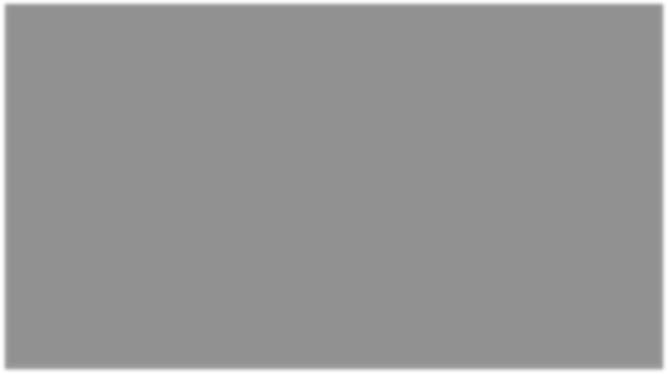
# Creating a Traffic Manager profile

In the “**Create Traffic Manager Profile** “ below are the enteries:

* + - Name: TyrellCrop
    - Routing method: Performance
    - Resource group: TyrellCropRG
    - Resource group Location: EastUS

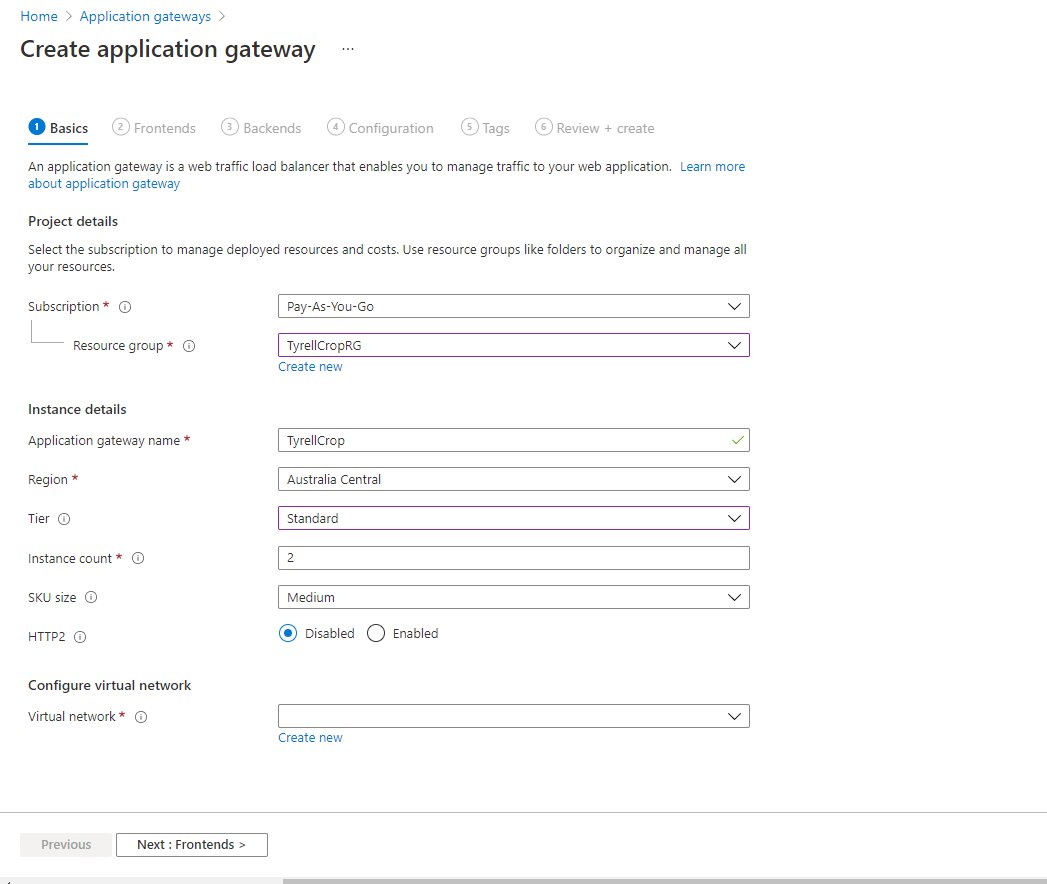
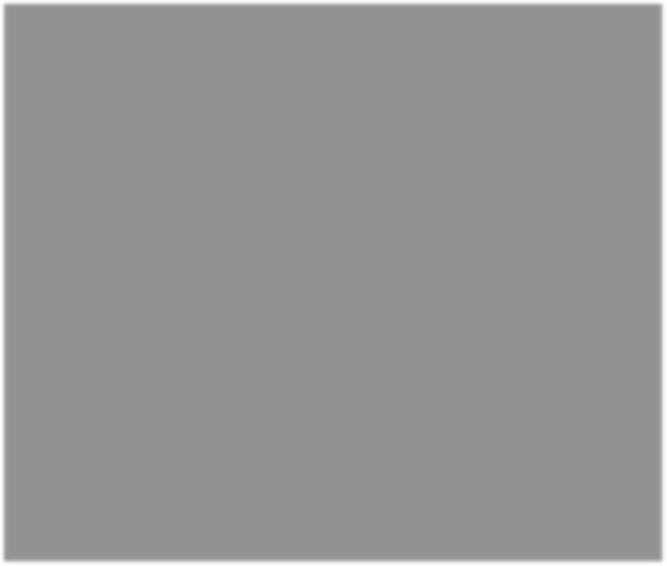


* Then changing the Traffic Manager DNS TTL to 30 seconds (easier to validate a failover)

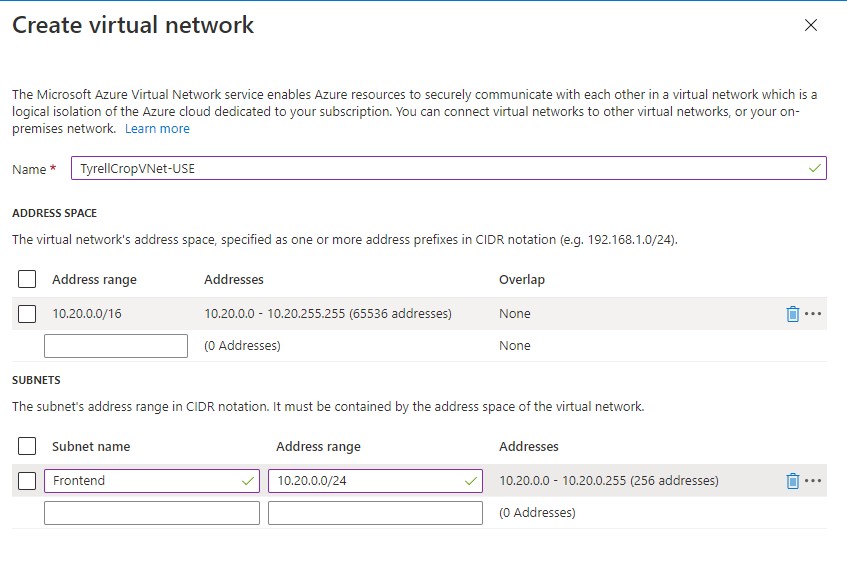
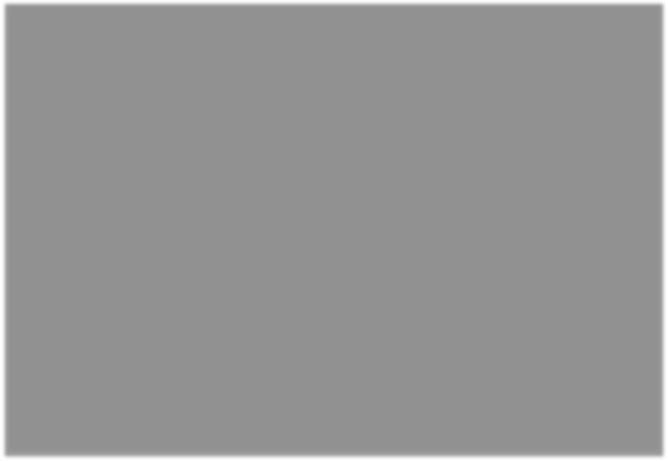


# Step 2: Creating the application gateway

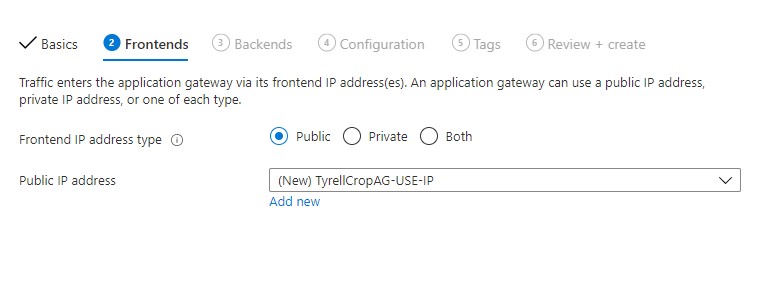
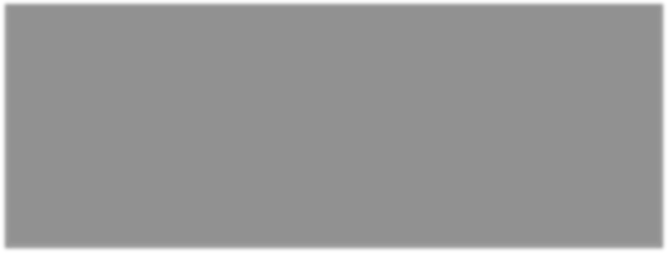
* + Create a resource > Networking > Application Gateway > Create
* In the Create Application Gateway blade basic values:
  + Name: TyrellCrop
  + SKU size: Performance
  + Instance count
  + Resource group: TyrellCropRG
  + Location: EastUS



* On the **Settings** page, under **Subnet configuration**, **Creating virtual network**.
  + Name: TyrellCropVNet-USE
  + Address: 10.20.0.0/16
  + Subnet Name: Frontend
  + Subnet address range: 10.20.0.0/24
* On the **Settings** page, below are the value
  + IP Address Type: Public
  + Public IP address: create new->TyrellCropAG-USE-IP
  + DNS Name:TyrellCrop

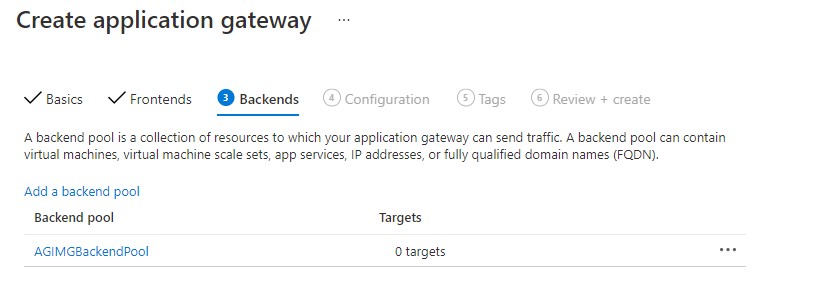
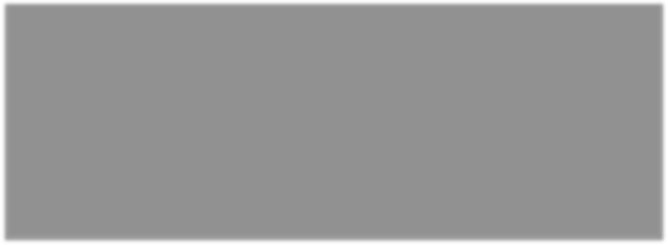


* On the **Settings** page
  + IP Address Type: Public
  + Public IP address: create new->TyrellCropAG-USE-IP
  + DNS Name:TyrellCrop



Backend Pool Values:

* From resource group- **TyrellCropRG**, went to the instance of the application gateway- **TyrellCropAG-USE**
* Then **Backend pools**. A default pool was automatically created with the application gateway- **appGatewayBackendPool**.
* Enter a name of **AGIMG*BackendPool***



# Configuration details values entered:

Create backend listener

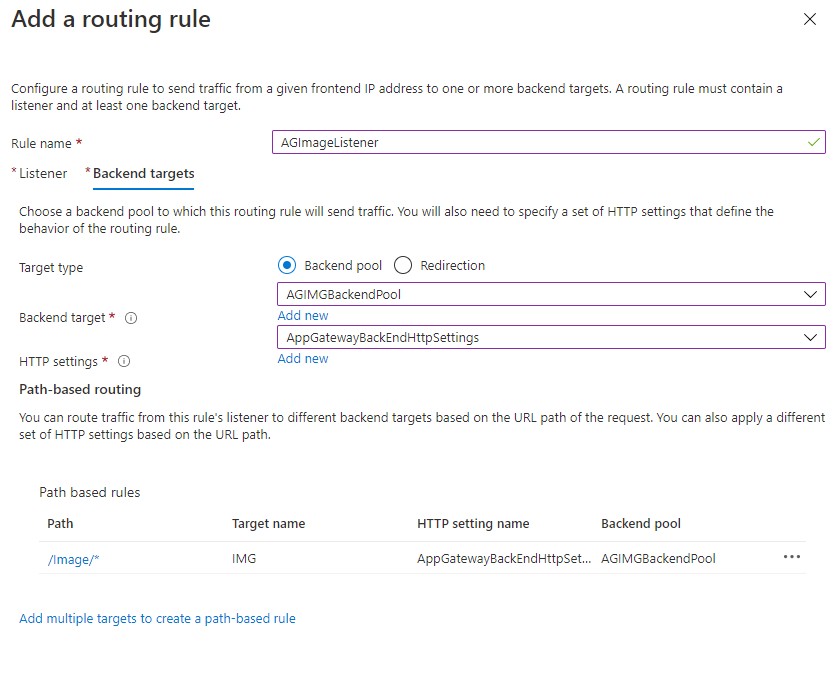
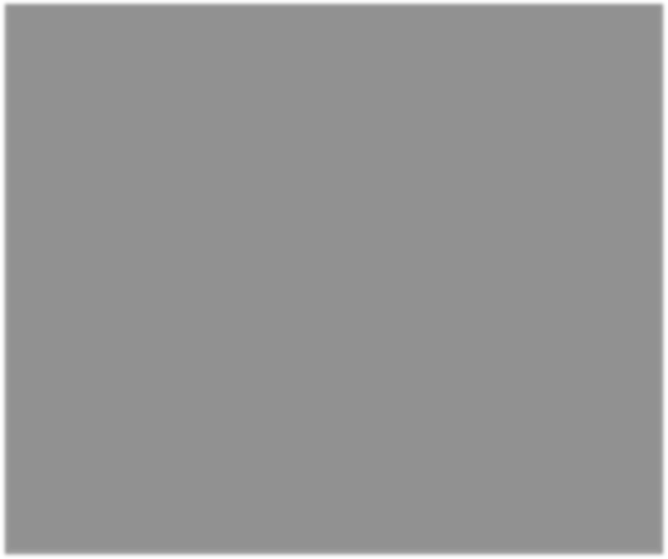
* + From resource group- **TyrellCropRG**, went to the instance of the application gateway- **TyrellCropAG-USE**
  + Entered ***AGImageListener*** for the name, *IMGPort* for the name of the frontend port, and then *8080* as the port for the listener.

Createing backend Pool

* From resource group- **TyrellCropRG**, went to the instance of the application gateway- **TyrellCropAG-USE**
* **Backend pools**. A default pool was automatically created with the application gateway- **appGatewayBackendPool**.
* Name **AGIMG*BackendPool***

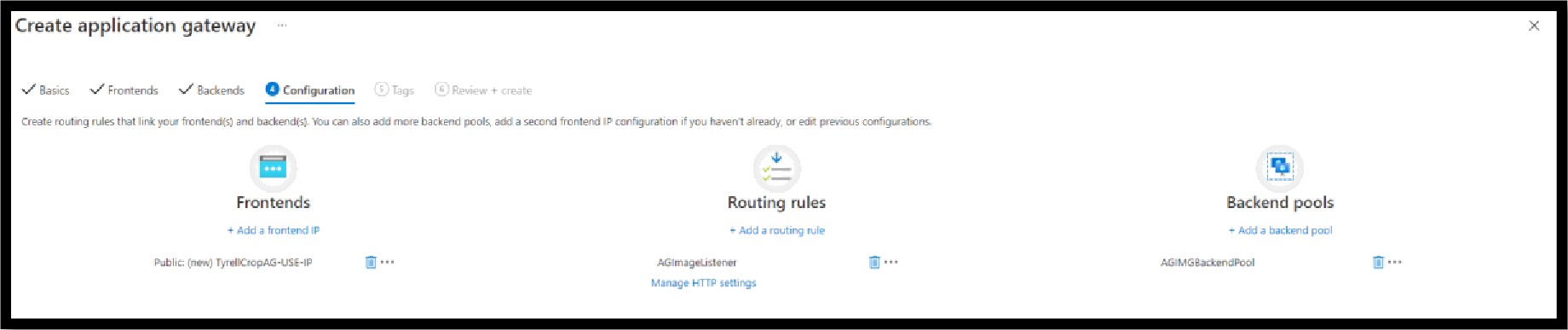
Create a path-based routing rule

* Configure URL routing for application gateways
* From resource group- **TyrellCropRG**, went to the instance of the application gateway- **TyrellCropAG-USE**
* Under **Settings** of the application gateway, select **Rules**, and then the **Path based** button to add a rule.
* Basic settings:



* Name: AGIMGPR
* Listener: AGImageListener
* Default backend pool: AGIMGBackEndPool
* Default HTTP settings: AppGatewayBackEndHttpSettings
* Path-based rules:
* **Name**: IMG
* **Paths**: /Image/\*
* **Backend Pool**: AGIMGBackEndPool

# HTTP Setting: AppGatewayBackEndHttpSettings



Home I

gateways I

Create application gateway

Validation passed

Basics

Frontends

Backends

Configuration

Tags

Review + create

Basics

S ubsc

Resourcegroup

Name Region Tier

Instance count SKU size HTTP2

Virtual network Subnet

Subnet address space

Pay-As-You—Go TyrellCropRG TyrellCrop

East US

Standard

2

Stan dard Medium Disabled

(new) TyreIICropVNet-USE (new) Frontend {1Ci.20.0.0/24a

10.20.0.0/24

FrDntends

Pu blic in d dress name

SKU

Assignment

TyrellCropAG -USE - i p Ba six

D'y namic

Tags

|uone

Create

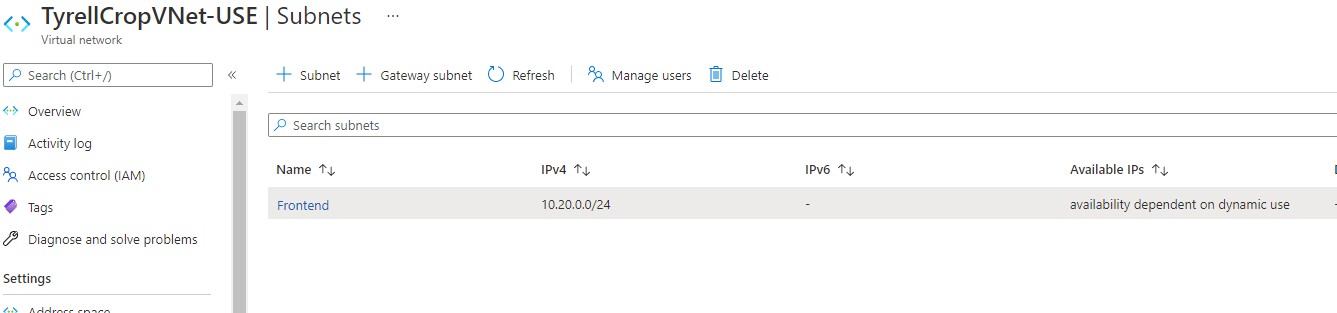
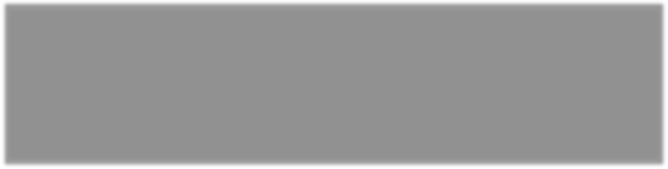
evi u

Next

Downloa d a template for a utomation

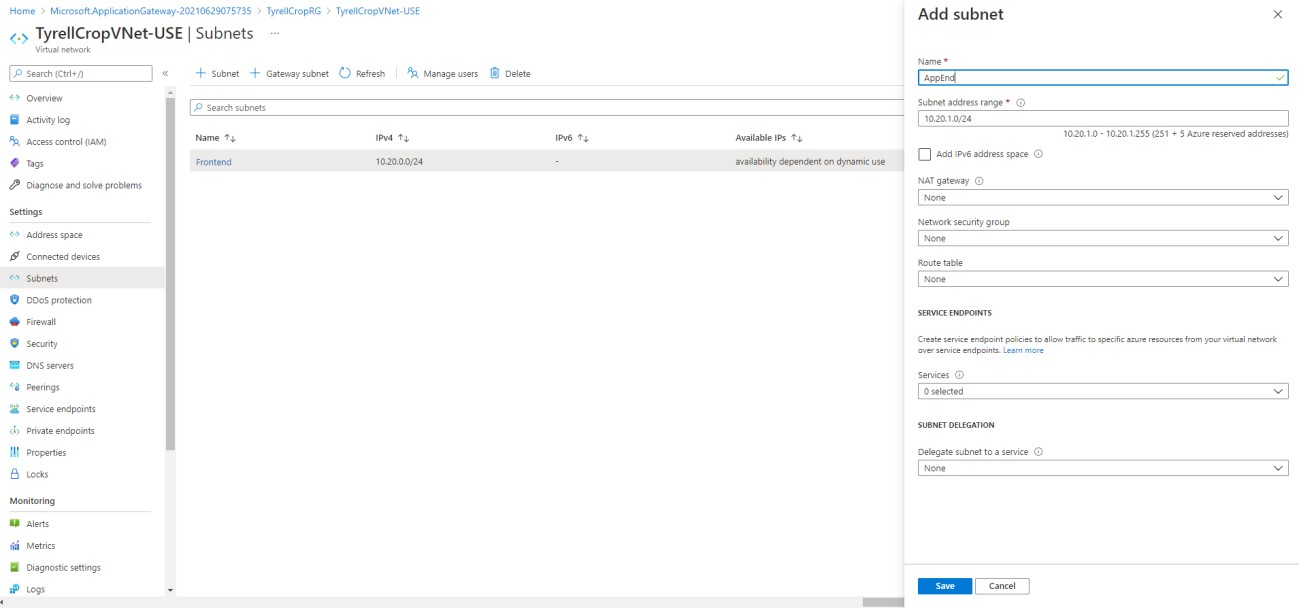
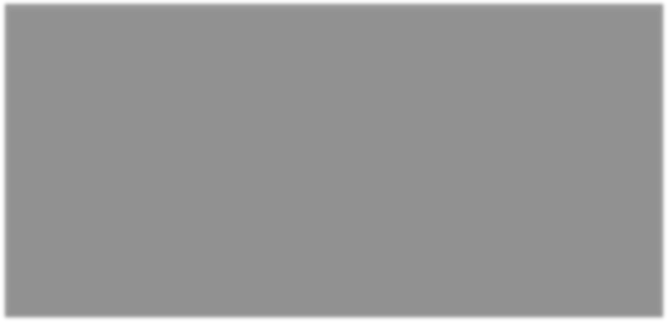
Add a subnet

* From resource group- TyrellCropRG, go to the Vistual Network - TyrellCropVnet-USE
* Click Subnets, and then click Subnet

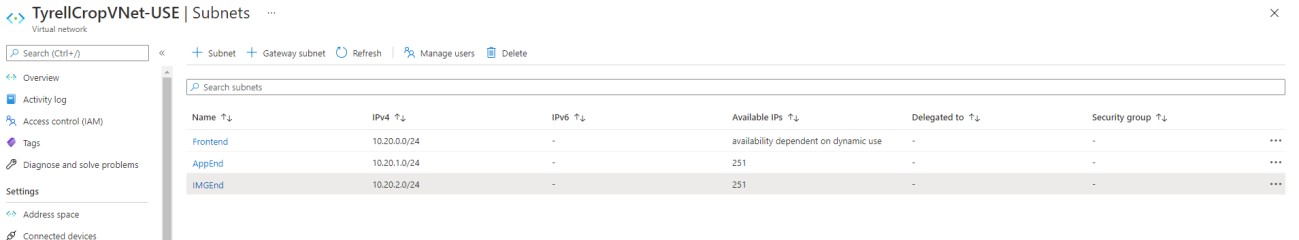
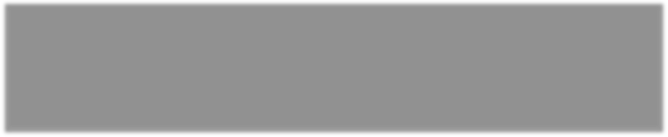
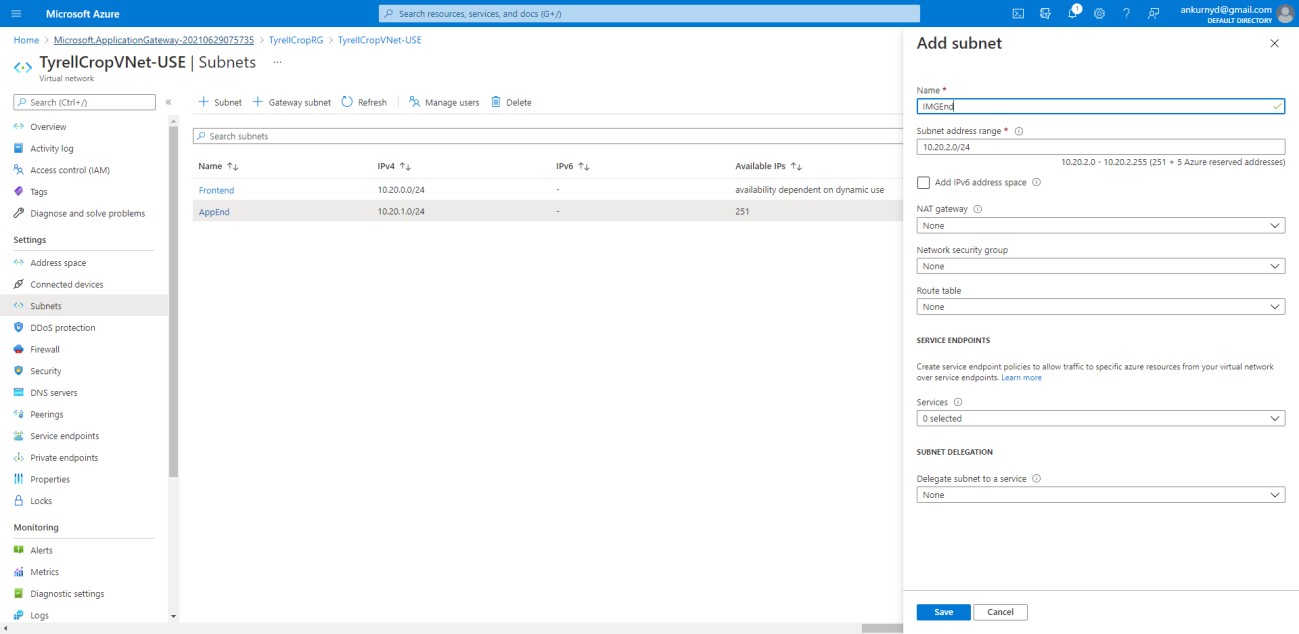
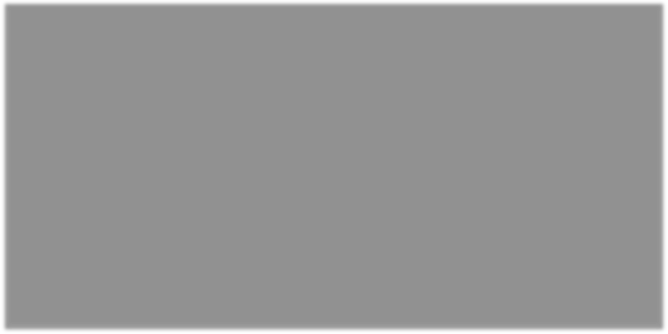


Values Provided:

* Name:AppEnd
* Address Space:10.20.1.0/24



* Provided this Value-
* Name:IMGEnd
* Address Space:10.20.2.0/24



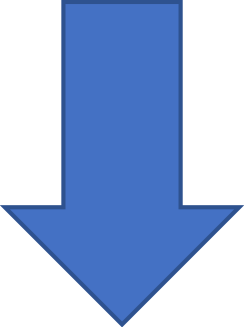
Created Availability Set

* From the Create a Resource blade, Searched for Availability Set and Create.
* Name: TyrellApp-AS
* Resource Group: TyrellCropRG
* Location:East US (\*with 2 fault domains and 5 update domains)

|  |  |  |  |
| --- | --- | --- | --- |
| Home Availability sets  Create availability set  Basics Advanced Tags Review + create  An Availability Set is a logical grouping capability for isolating VM resources from each other when they're deployed. Azure makes sure that the VMs you place within an Availability Set run across multiple physical servers, compute raclcs, storage units, and neMDrk S\bitches. If a hardware or software failure happens, only a subset of your VMs are impacted and HDMI overall solution stays operational. Availability Sets are essential for building reliable cloud solutiDDS.  Learn more about availability sets.  Project details  Select the subscription to manage deployed resources and costs. Use resource groups like folders tD organize and manage all yDur resources.  Subscription \* O Pay-As-You -GD  “ Resource group • TyrellCropRG Create new  Instance details  Name ^ TyrelApp-AS    Fault domains  Update dDmains  Use managed disks O N (C assic) | | | |
| Review + create | < Previous | denNe t : | ed |







Howe Availability sets

Create availability set

Microsoft Azure

O Validation pa sEed

Basics Advanced Tags Review + create

Basics

Subscription Resource group Region

Name

Fault domain count Update domain count

Use managed disks

Pay-As-You-Go TyrellCropRG East US TyreIIApp-AS

2

5

Yes (Aligned)

Advanced

Proximity placement group

None

Tags

(none)

Create

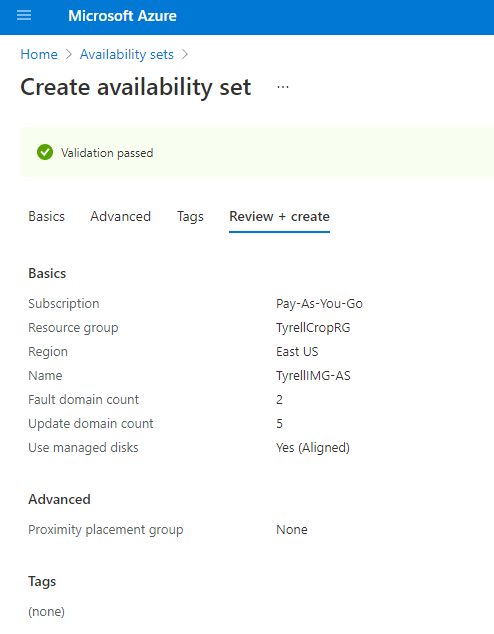
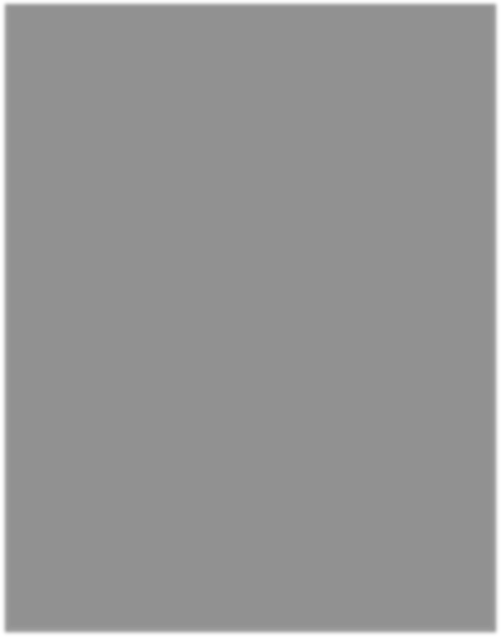
Pro

s

Nekt

DC \‹'iJIoacI a template fcr autcmaticn

* From the Create a Resource blade, Searched for Availability Set and Created another Availability Set.
* Name: TyrellIMG-AS
* Resource Group: TyrellCropRG
* Location:East US (\*with **2** fault domains and **5** update domains)

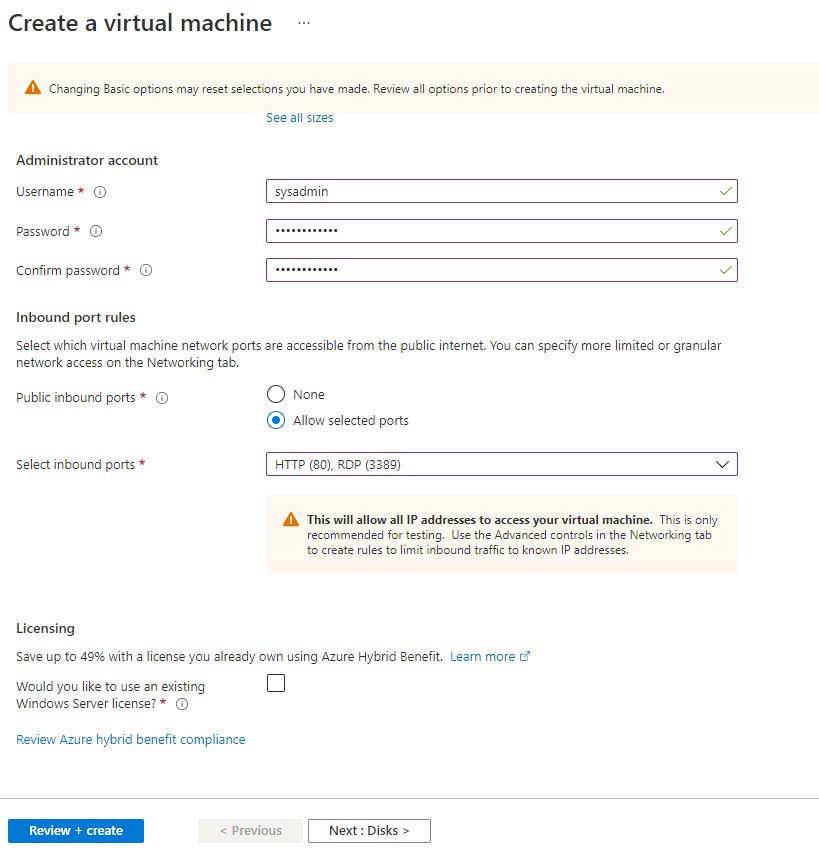
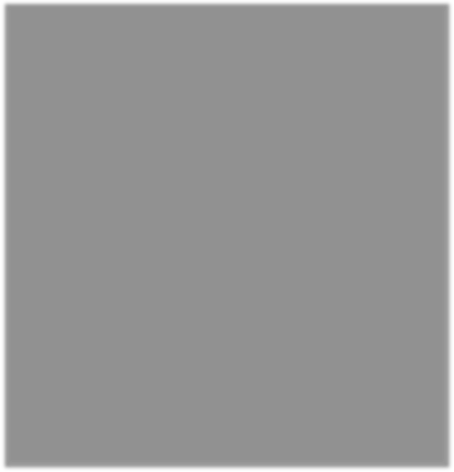
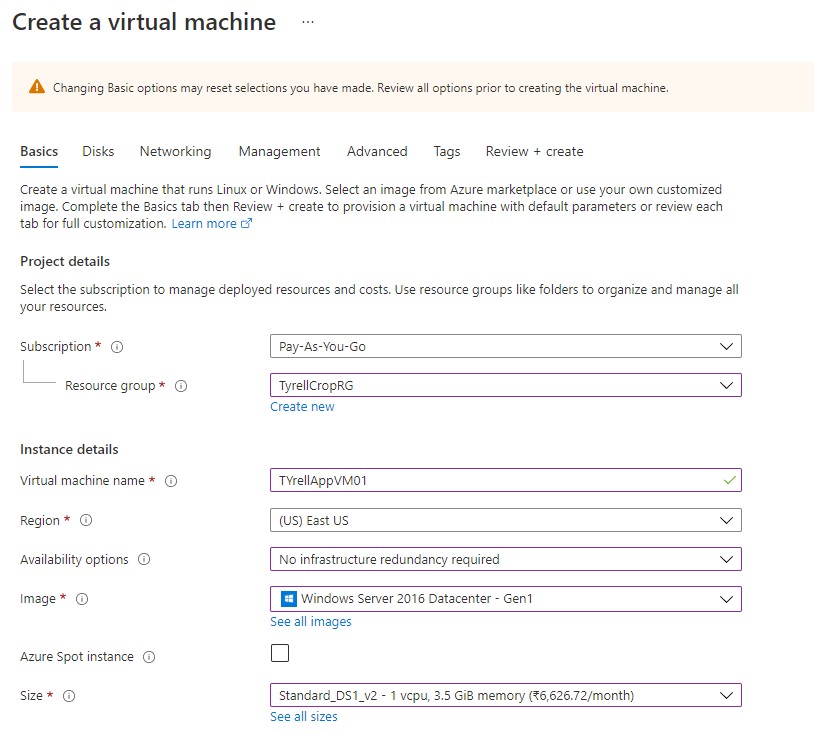
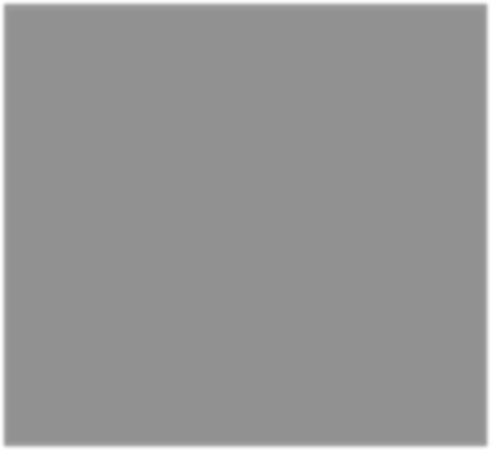


Add VM’s – For Application

* From the **Create a Resource** blade, On Compute and selected **Windows Server 2016 Datacenter**.

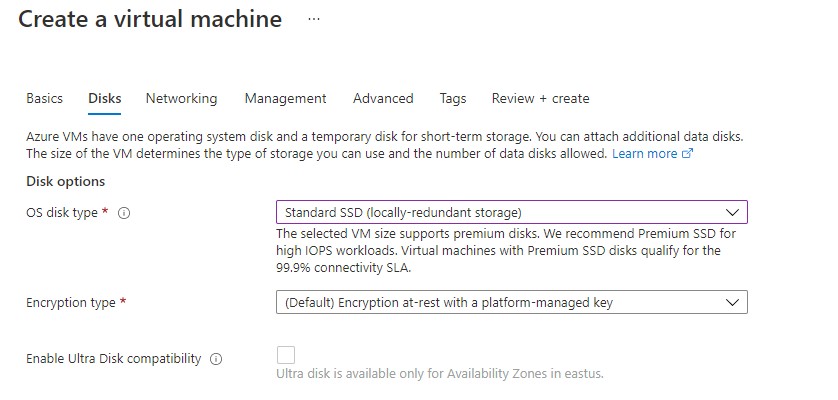
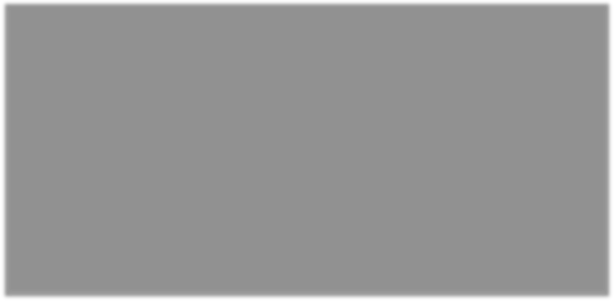
# Basic:

* Resource group: TyrellCropRG
* Virtual machine name: TYrellAppVM01
* Region: east us
* Availability options: Availability set ->TyrellApp-AS
* Image: Windows Server 2016 Datacenter
* Size: Standard DS1 v2
* Username: sysadmin
* Password: Wow01qwerty!
* Public inbound ports: Allow Selected Ports
* Selected Inbound ports:http,rdp
* Already have a Windows license? No



# Disk:

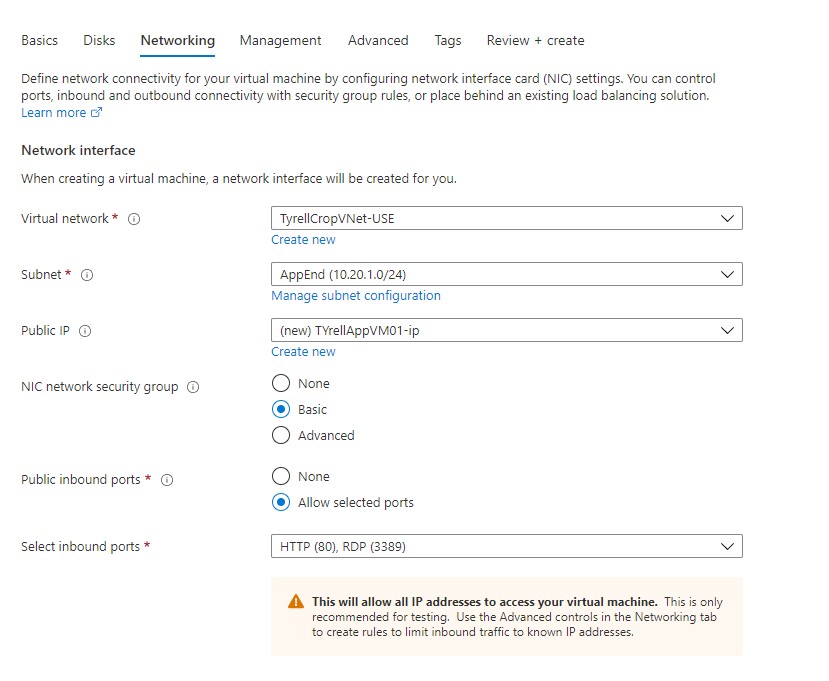
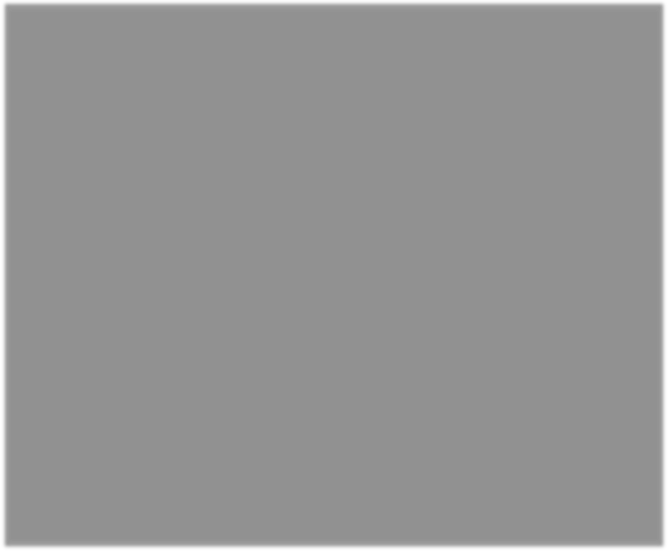
a. OS disk type: **Standard HDD**



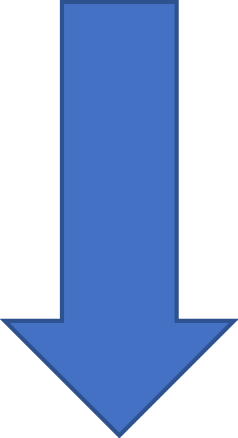
# Networking:

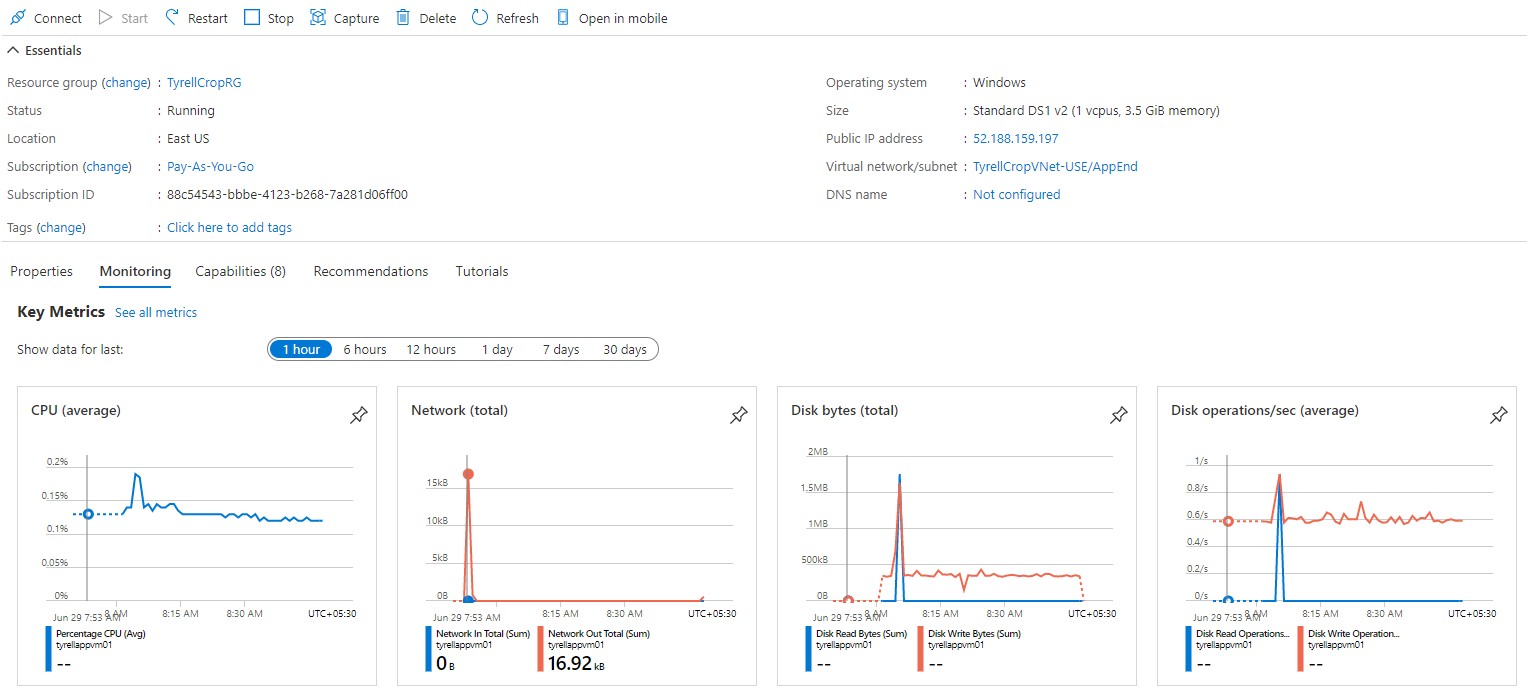
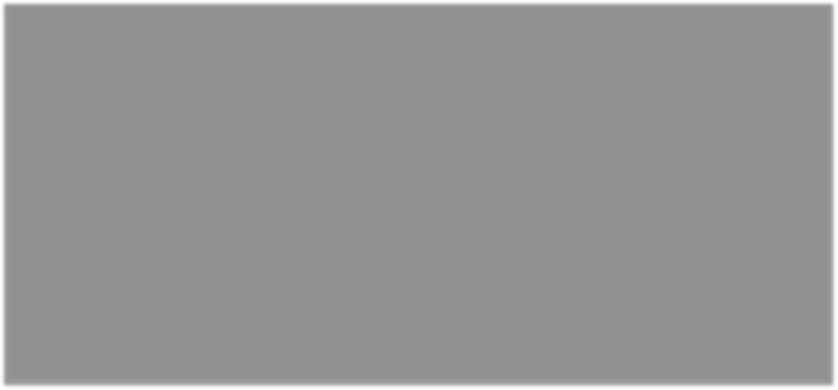
* Virtual network: TyrellCropVNet-USE
* Subnet name: **AppEnd**
* Public IP: **TYrellAppVM01-ip**
* NIC Network security group: **Basic**
* Public inbound ports: **Allow Selected Ports**
* Selected Inbound ports**:http,rdp**
* Accelerated networking: **Off**

# Load balancing: No



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Create a virtual machine  Validation passed  Basics  Subscription Pay-As-You-GD  Resource group TyrellCropRG  Virtual machine name TYreIIAppVMO 1  Region East US  Availability options No infrastructure redundancy required  Image Windows Server 2016 Datacenter - Gen1  Size Standard DS1 v2 (1 vcpu, 3.5 GiB memory)  Username sysadmin  Public inbound ports RDP, HTTP  Already have a Windows licensed No  Azure Spot No  Disks  OS disk type Standard SSD LRS  Use managed disks Yes  Ephemeral OS disk No  **Networking**  Virtual network TyrellCropVNet-USE  Subnet AppEnd (10.20.1.0/24)  Public IP (new) TYreIIAppVM01-ip  Accelerated networking Ofi  Place this virtual machine behind an NO existing load balancing solution?  Management | | | | | |
| Create | bus | Next | Download | a | template for automation |





Add VM’s – For Images

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

# Basic:

* Resource group: TyrellCropRG
* Virtual machine name: TyrellIMGVM01
* Region: east us
* Availability options: Availability set ->TyrellIMG-AS
* Image: Windows Server 2016 Datacenter
* Size: Standard DS1 v2
* Username: sysadmin
* Password: Pa55w.rd!234
* Public inbound ports: Allow Selected Ports
* Selected Inbound ports: http,rdp
* Already have a Windows license? No



Create a virtual machine

Changing Basic optk+ns may reset selections you have made. Review all options prior to creating the virtual machine.

Basics Disks Networking Management Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized ima ge. Complete the Ba sics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Learn more

Project details

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

Subscription \* @

Resource group \*

Create new

Instance details

Virtual machine name \* @ Region ^ O•

Availability options O•

lma9e \*

See all images

Azure Spot instance @

Size\* @

See all sizes

Standard\_D51\_v2 - 1 vcpu, 3.5 GiB memory (T6,626.72/month)

Windows Server 2O1d Datacenter - Gen1

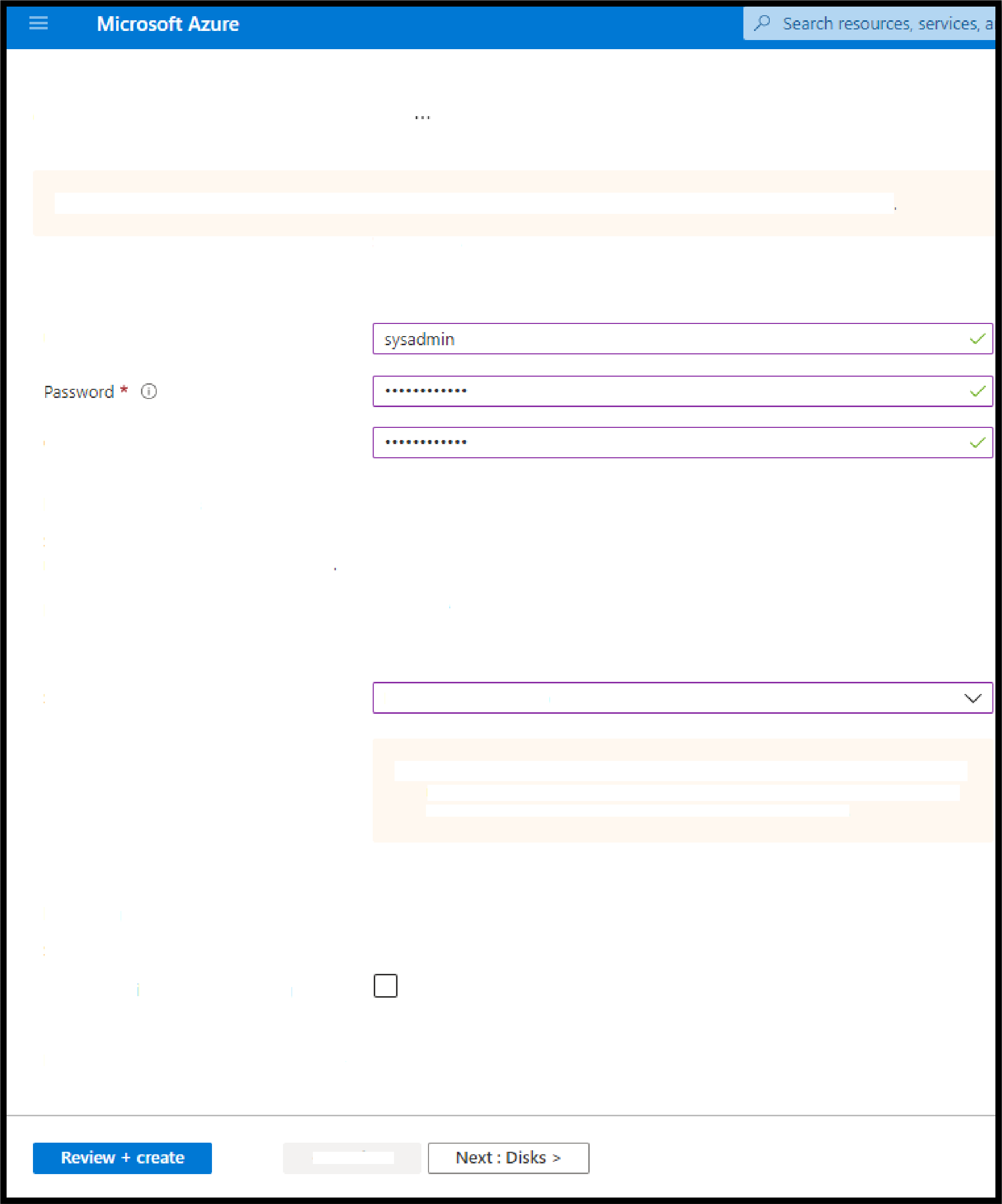
No infrastructure redundancy required

Tyrelll MGVMO1

TyrellCropRG

Pay-As-You-Go (88c34A3-bbbe-4123-bZ68-7a281d06ff00)

Home Create a resource



Create a virtual machine

Chang inq Basic options may reset selections you have made. Review all options prior to creating the virtual machine

S ee all sizes

Administrator account

Username \* @

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 acoess on the Networking tab

Public inbound ports \*

Select inbound ports \*

O None

Allow selected ports

HTTP (80), RDP (3389)

his vdll allow all IP addr ~~-~~ to aces:s your virtual machine. This is on ly recommended for testing. use the Advanced controls in the Networking tab to create rules to lim it Inbound traffic to known IP addresses.

Licensing

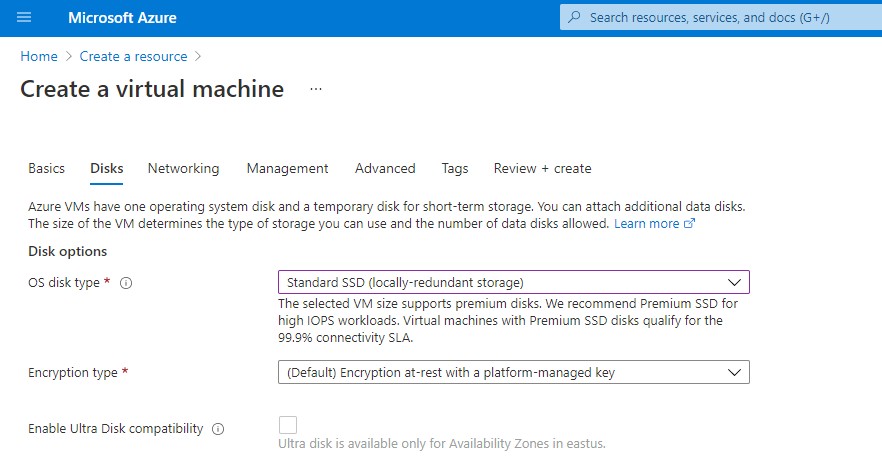
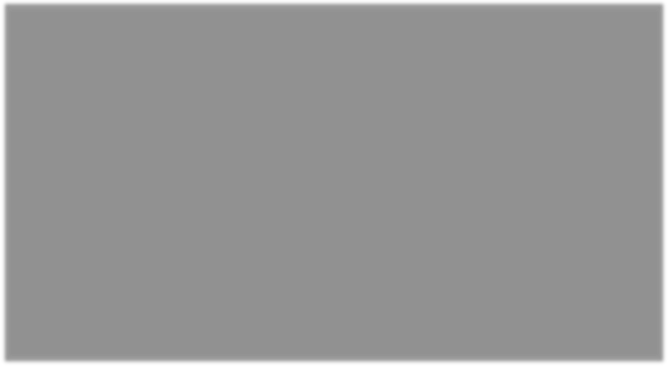
Save up to 4996 with a lioense you already own usinp Azure Hybrid Benefit. Learn more6 Would you like to use an existing

Windows Server license? \* @

Review Azure hybrid benefit

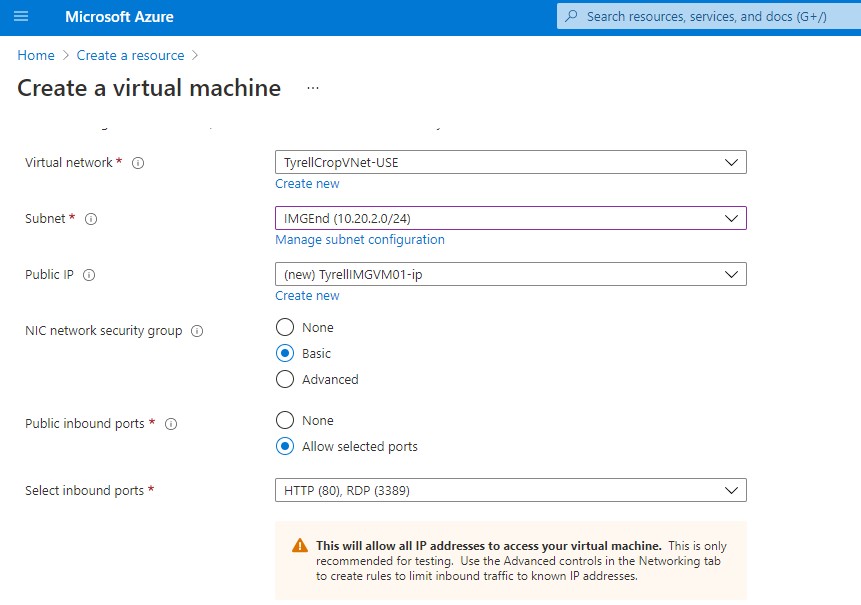
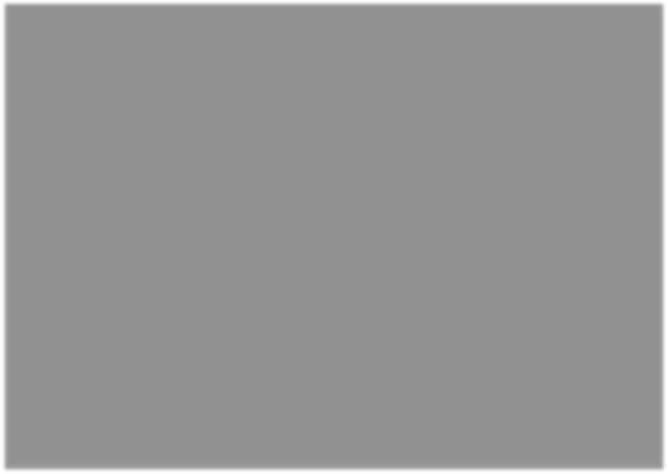
# Disk:

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



# Networking:

* Virtual network: TyrellCropVNet-USE
* Subnet name: IMGNet
* Public IP: TYrellIMGVM01-ip
* NIC Network security group: Basic
* Public inbound ports: Allow Selected Ports
* Selected Inbound ports:http,rdp
* Accelerated networking: Off
* Load balancing: No



# Management:

* Boot diagnostics: Off
* OS guest diagnostics: Off
* System assigned managed identity: Off
* Enable auto-shutdown: Off
* Enable Backup: Off

Create a virtual machine

Basics Disks Networking Management Advanced Tags Review + create

Configure monitoring and m ana gement options for your VM.

Azure Securi Center

Azure Security Center provides unified security management and advanced threat protection across hybrid cloud workloads. Learn more

@ Your subscription is protected by Azure Securiy Center basic plan.

Monitoring

Boot diagnostics

0 Enable with managed storage account (recommended) Enable with custom storage account

Disable

Enable OS guest diagnostics @

Identity

System assigned managed identity @

Azure AD

Login with Azure AD @

this image does not support Login with Azure AD.

Microsoft Azure

Home Create a resource

Create a virtual machine

Validation passed

Basics

Subscription Resource group Virtual machine name Region

Availability options

Image Size Username

Public inbound ports

Already have a Windows license\*

Azure Spot

Disks

*OS* disk type

Use managed disks

Ephemeral OS disk

Networking

virtual network Subnet

Public IN

Accelerated networking

Place this virtual machine behind an existing load balancing solution?

Pay-As-You-Go TyrellCropRG Tyrelll MGVM01 East US

No infrastructure redundancy required

Windows Server 201d Datacenter - Gen1 Standard DSI v2 (1 vcpu, 3.5 GiB memory sysadmin

RDP, HTTP

No No

Standard SSD LRS

Yes

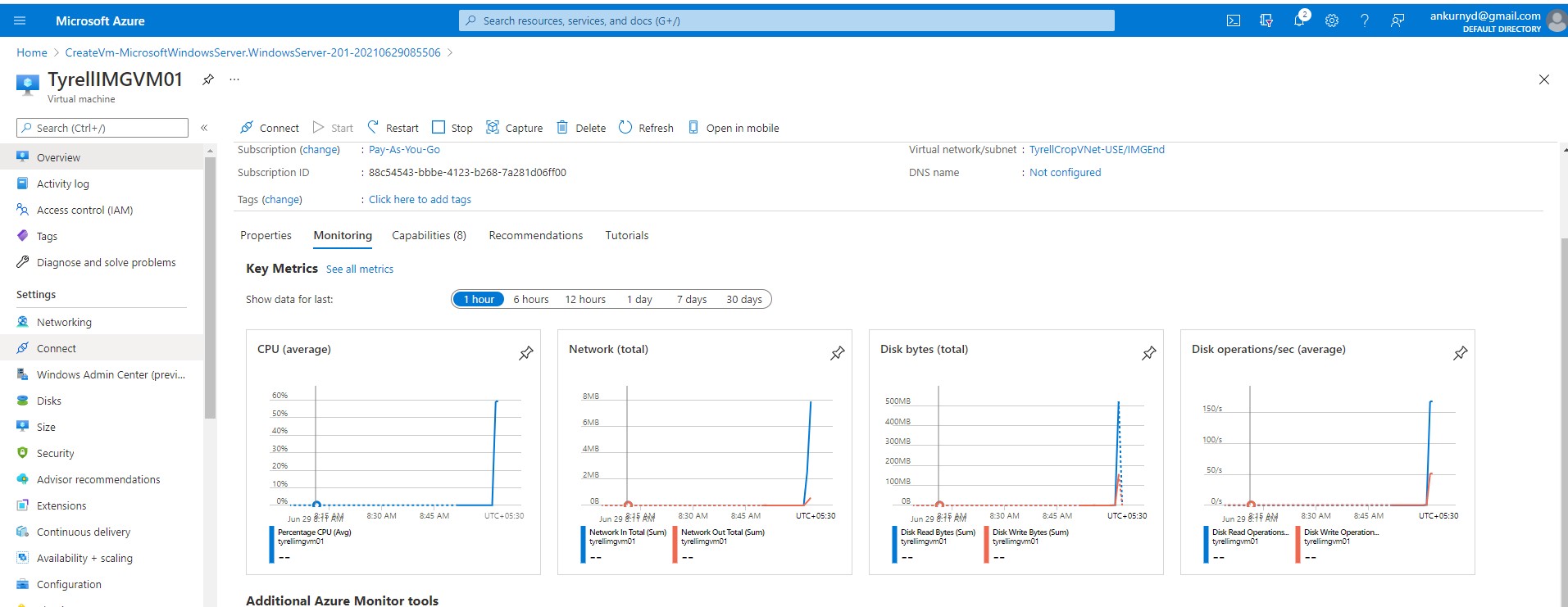
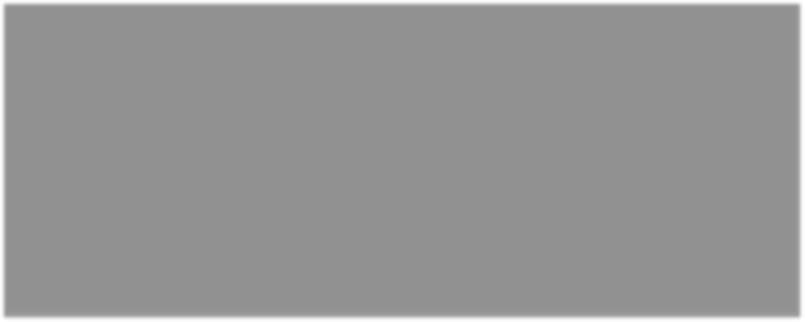
No

TyrellCropVNet-USE IMGEnd (10.TO.2.0/24)

(new) TyreIIIMGVM01-ip

*OF*

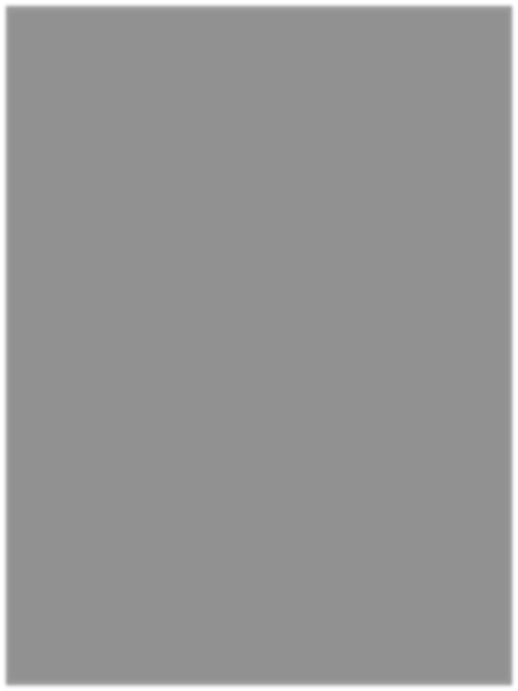
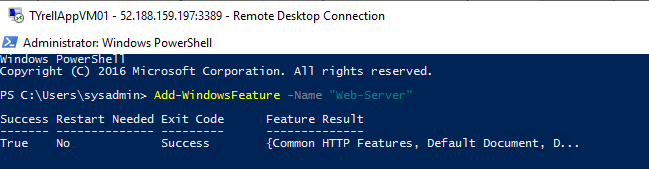
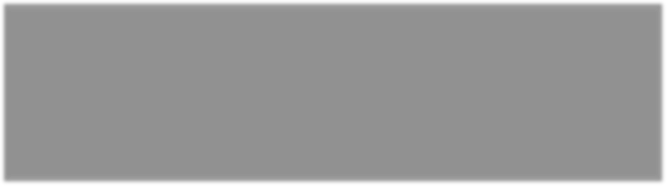
No



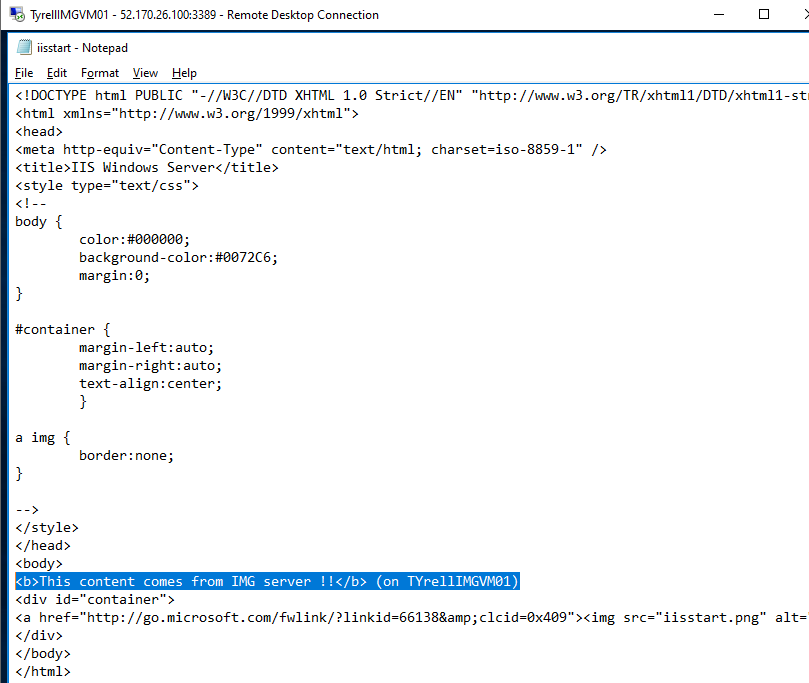
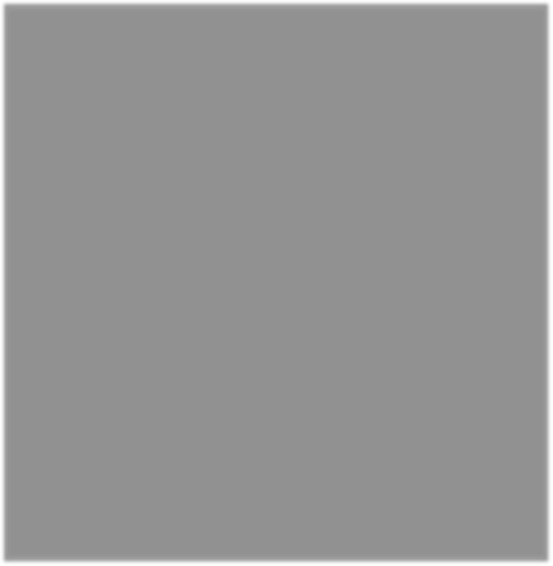
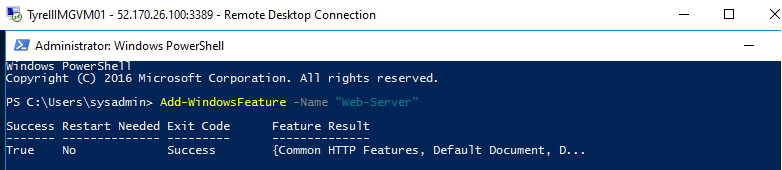
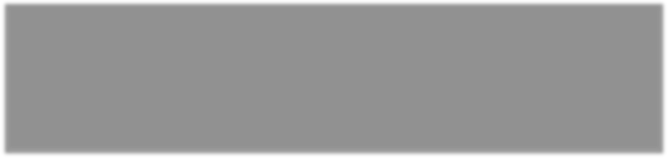
Adding IIS role to the Windows Servers.

* After each virtual machine is provisioned logged in using remote desktop by clicking the Connect button on the virtual machine configuration blade and logging in with the administrative credentials.
* Once inside the VM, opended the PowerShell.
* In the PowerShell console executed this command: **Add-WindowsFeature - Name "Web-Server"**
* Once IIS has completed installation opened the file at C:\InetPub\wwwroot\iisstart.htm in notepad on each server.
* Inside the <body> tag insert-
* <b>This content comes from App server !!</b> (on TYrellAppVM01)
* <b>This content comes from IMG server !!</b> (on TYrellIMGVM01)
* Repeated the steps in both virtual machines to install IIS.

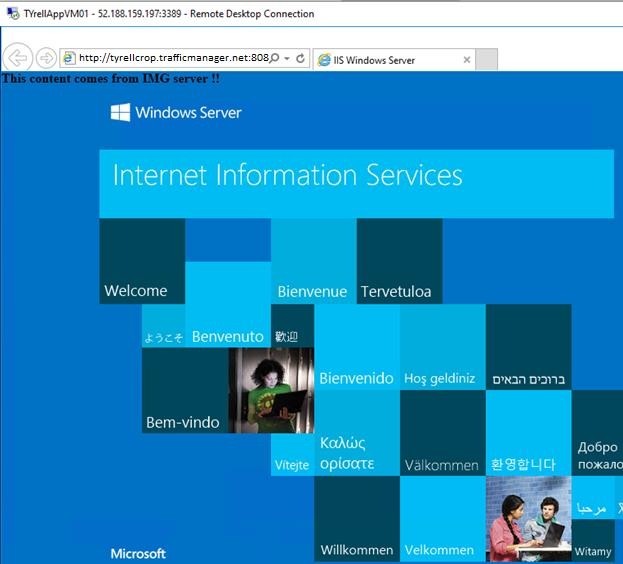
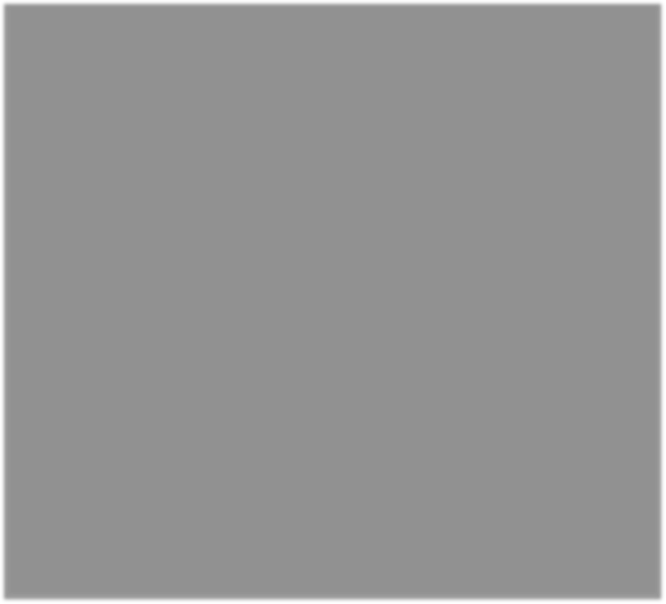
TyrellAppVM01 – Adding IIS role



TYrellIMGVM01 – Adding IIS Role



Test Successful at VM01



Test Successful at IMGM01

