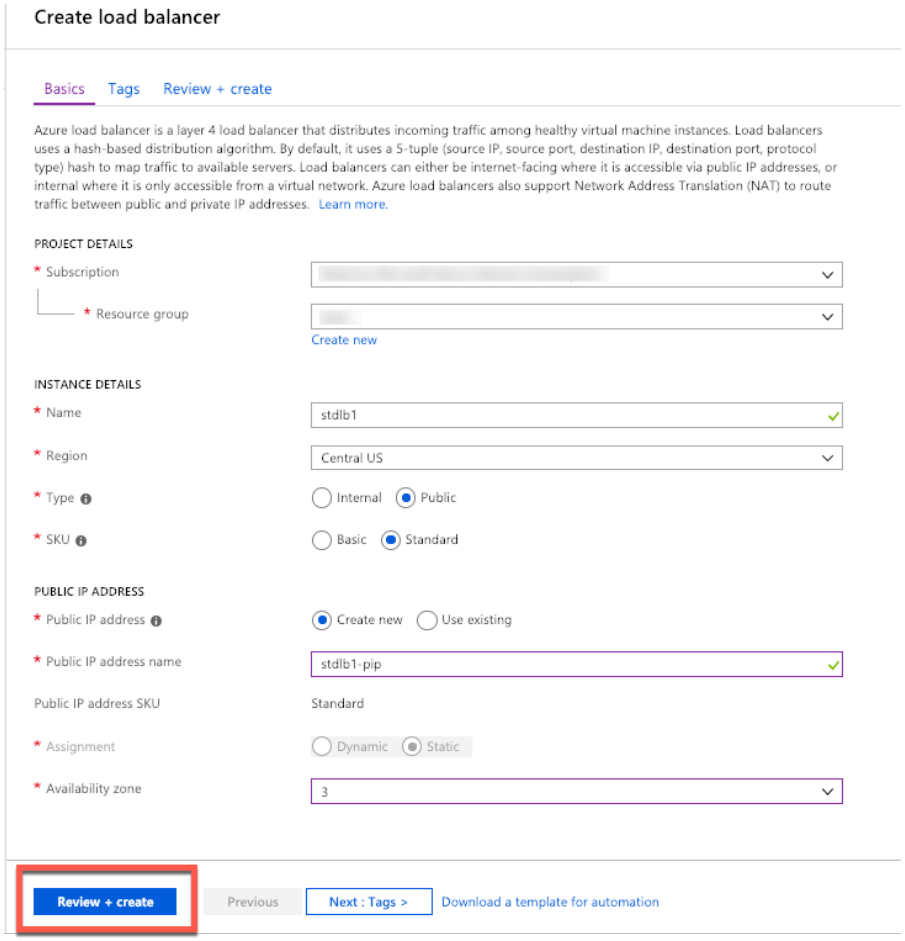
Availability Zones & Standard Load Balancer

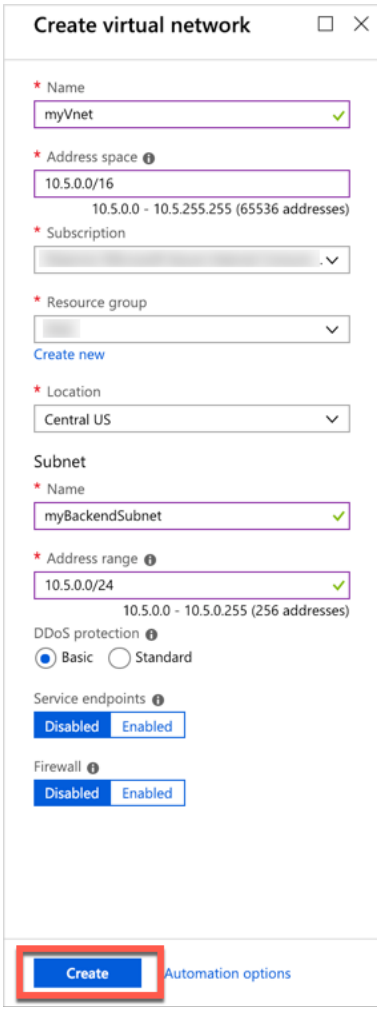
Create a Standard Load Balancer

1. On the top left-hand side of the screen, click **Create a Resource** and type in **Load Balancer**.
2. Click **+Add**.
3. Place the resources in the resource group you just created for the Azure Backup resources.
4. User the following inputs to create the load balancer:
    - **stdlb1** – load balancer name.
    - **Region** – Central US (not every region supports Availability Zones).
    - **Public** – for the type of load balancer.
    - **Standard** – for the SKU type.
    - **Create New Public IP Address**
    - **stdlb1-pip** – for the Standard Load Balancer name.
    - **3** – for the Availability Zone.
5. Click **Review + Create** to create the load balancer. You will not be creating tags.



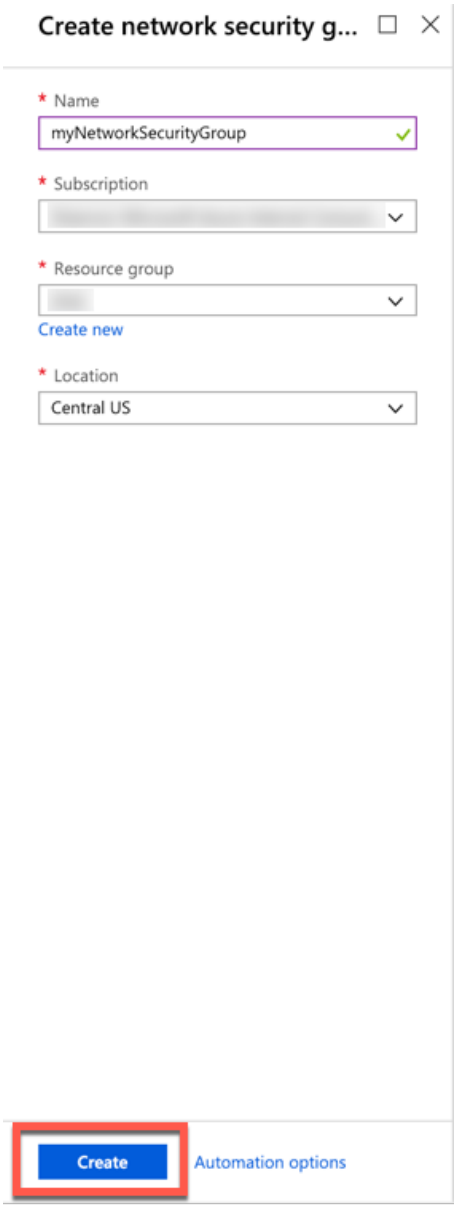
CREATE BACKEND SERVERS VIRTUAL NETWORK

1. On the top left-hand side of the screen click **Create a Resource** and type in **Virtual Network**. Enter these values for the virtual network:
   - *myVnet* - for the name of the virtual network.
   - *10.5.0.0/16* – for the address space.
   - *Choose your Existing Resource Group.*
   - *Central US* – for the location.
   - *myBackendSubnet* - for the subnet name.
   - *10*.5.0.0/24 – for the subnet address space.
   - *Leave Service Endpoints and Firewall disabled*.
2. Click **Create** to create the virtual network.



CREATE A NETWORK SECURITY GROUP

1. On the top left-hand side of the screen, click **Create a resource**, in the search box type *Network Security Group*, and in the network security group page, click **Create**.
2. In the Create network security group page, enter these values:
   - *myNetworkSecurityGroup* - for the name of the network security group.
   - *Select existing Resource Group.*
   - *Central US* – for the location.

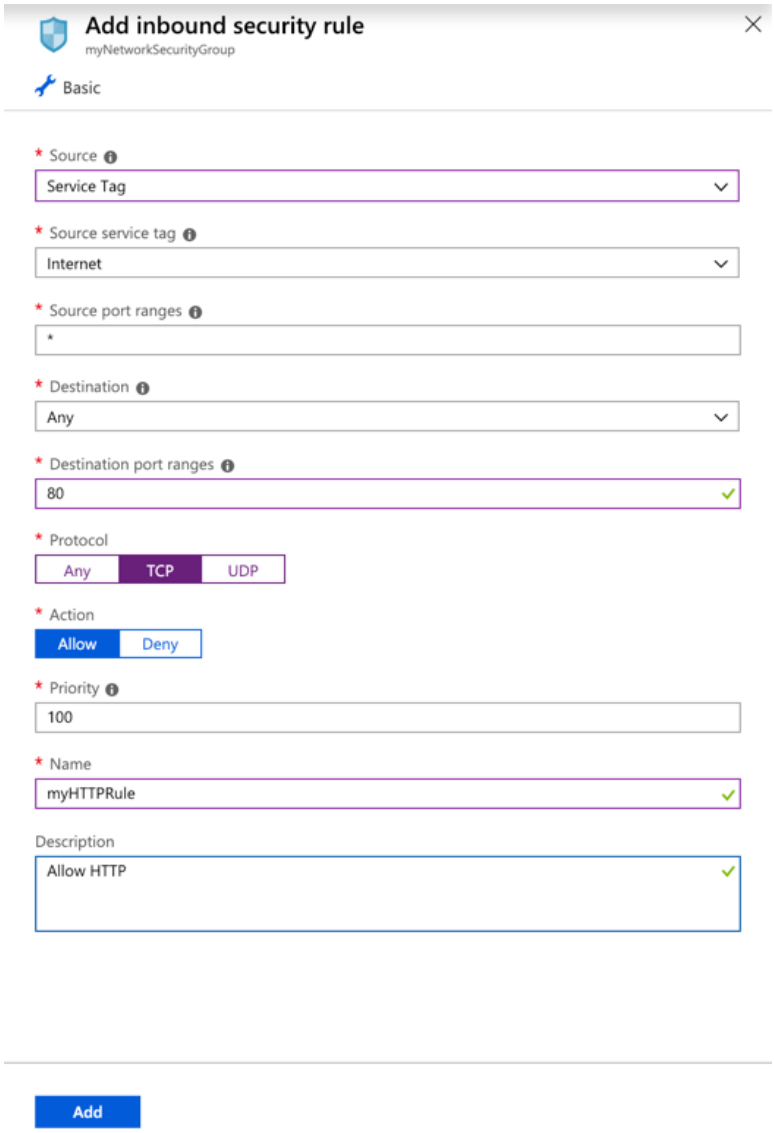


CREATE NETWORK SECURITY GROUP RULES

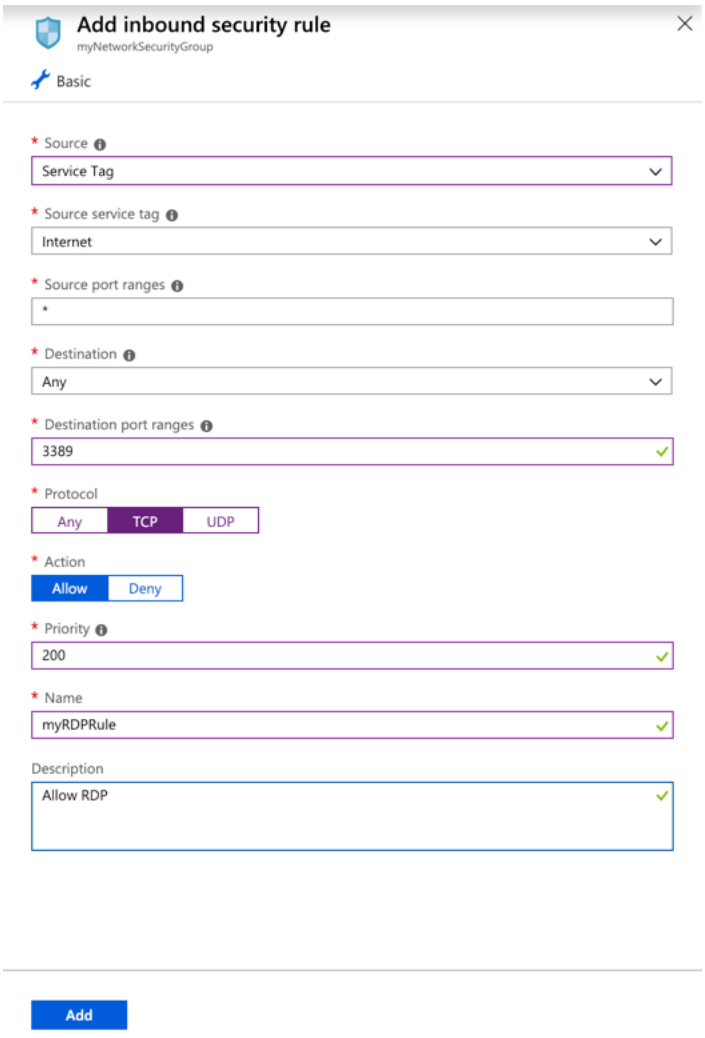
1. In the Azure portal, click **All resources** in the left-hand menu, and then search and click **myNetworkSecurityGroup** that is located in the existing you have been using resource group.
2. Under **Settings**, click **Inbound security rules.**

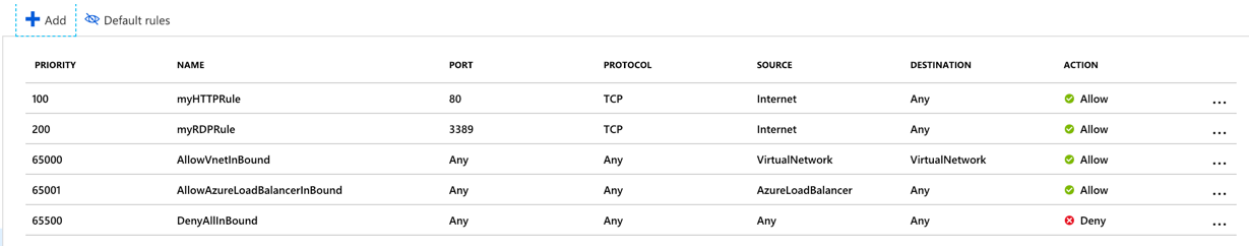
3. Click **Add**.

4. Enter these values for the inbound security rule named *myHTTPRule* to allow for an inbound HTTP connections using port 80:
    - *Service Tag* - for **Source**.
    - *Internet* - for **Source service tag**
    - *80* - for **Destination port ranges**
    - *TCP* - for **Protocol**
    - *Allow* - for **Action**
    - *100* for **Priority**
    - *myHTTPRule* - for name of the load balancer rule.
    - *Allow HTTP* - for description of the load balancer rule.
5. Click **OK**.



6. Repeat steps 2 to 4 to create another rule named *myRDPRule* to allow for an inbound RDP connection using port 3389 with the following values:
    - *Service Tag* - for **Source**.
    - *Internet* - for **Source service tag**
    - *3389* - for **Destination port ranges**
    - *TCP* - for **Protocol**
    - *Allow* - for **Action**
    - *200* for **Priority**
    - *myRDPRule* for name
    - *Allow RDP* - for description





CREATE VIRTUAL MACHINES

Create virtual machines in different zones (zone 1, zone 2, and zone 3) for the region that can act as backend servers to the load balancer.

1. On the top left-hand side of the screen, click **Create a resource** > **Compute** > **Windows Server 2016 Datacenter** and enter these values for the virtual machine:
    - *myVM1* - for the name of the virtual machine.
    - *azureuser* - for the administrator user name.
    - *Select existing Resource Group.*
2. Click **OK**.
3. Select **DS1_V2** for the size of the virtual machine and click **Select**.
4. Enter these values for the VM settings:
    - *zone 1* - for the zone where you place the VM.
    - *myVNet* - ensure it is selected as the virtual network.
    - *myBackendSubnet* - ensure it is selected as the subnet.
    - *myNetworkSecurityGroup* - for the name of network security group (firewall).
5. Click **Disabled** to disable boot diagnostics.
6. Click **OK**, review the settings on the summary page, and then click **Create**.

Basics Disks Networking Management Guest config Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization.
Looking for classic VMs? Create VM from Azure Marketplace

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: myVM1
* Region: Central US
Availability options: Availability zone
* Availability zone: 1
* Image: Windows Server 2016 Datacenter
Browse all images and disks
* Size: **Standard DS1 v2**
1 vcpu, 3.5 GB memory
Change size

ADMINISTRATOR ACCOUNT

* Username: azureuser
* Password: ••••••••••••••••
* Confirm password: ••••••••••••••••

Create a virtual machine

Basics Disks Networking Management Guest config Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. Learn more

NETWORK INTERFACE

When creating a virtual machine, a network interface will be created for you.

CONFIGURE VIRTUAL NETWORKS

* Virtual network: myVnet
Create new
* Subnet: myBackendSubnet (10.5.0.0/24)
Manage subnet configuration
Public IP: (new) myVM1-ip
Create new
NIC network security group: None / Basic / Advanced
* Public inbound ports: None / Allow selected ports
* Select inbound ports: RDP

These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.

Accelerated networking: On / Off
The selected VM size does not support accelerated networking.

LOAD BALANCING

You can place this virtual machine in the backend pool of an existing Azure load balancing solution. Learn more

Place this virtual machine behind an existing load balancing solution? Yes / No

7. Create a second VM, named, *VM2* in Zone 2, and third VM in Zone 3, and with *myVnet* as the virtual network, *myBackendSubnet* as the subnet, and **myNetworkSecurityGroup* as the network security group using steps 1-6.

Install IIS on VMs

1. Click **All resources** in the left-hand menu, and then from the resources list click **myVM1** that is located in the *myResourceGroupLBAZ* resource group.
2. On the **Overview** page, click **Connect** to RDP into the VM.
3. Log into the VM with username *azureuser*.
4. On the server desktop, navigate to **Windows Administrative Tools**>**Windows PowerShell**.
5. In the PowerShell Window, run the following commands to install the IIS server, remove the default iisstart.htm file, and then add a new iisstart.htm file that displays the name of the VM:

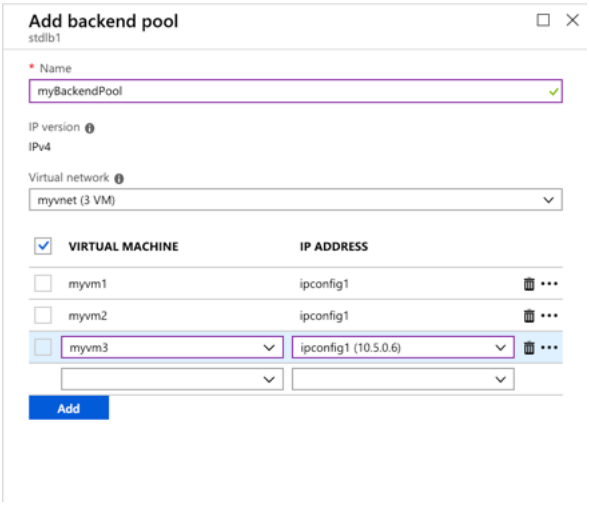
```
# Install IIS server role
Install-WindowsFeature -name Web-Server -IncludeManagementTools
# Remove default htm file
Remove-Item C:\inetpub\wwwroot\iisstart.htm
# Add a new htm file that displays server name
Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $("Hello World from " +
$env:computername)
```

6. Close the RDP session with *myVM1*.
7. Repeat steps 1 to 6 to install IIS and the updated iisstart.htm file on *myVM2* and *myVM3*.

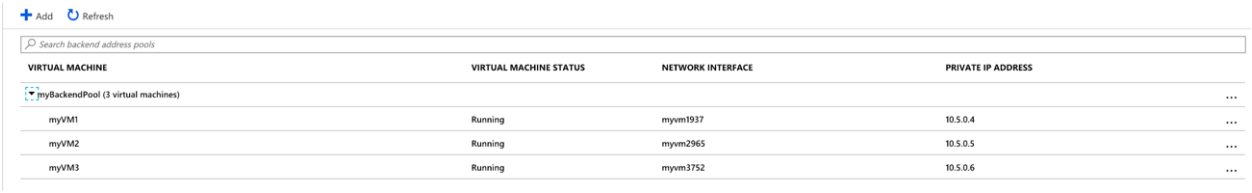
Create a Backend Address Pool

To distribute traffic to the VMs, a back-end address pool contains the IP addresses of the virtual (NICs) connected to the load balancer. Create the backend address pool *myBackendPool* to include *VM1*, *VM2*, and *VM3*.

1. Click **All resources** in the left-hand menu, and then click **myLoadBalancer** from the resources list.
2. Under **Settings**, click **Backend pools**, then click **Add**.
3. On the **Add a backend pool** page, do the following:
   - For name, type *myBackEndPool*, as the name for your backend pool.
   - For **Virtual network**, in the drop-down menu, click **myVNet**
   - For **Virtual machine**, in the drop-down menu, click, **myVM1**.
   - For **IP address**, in the drop-down menu, click the IP address of myVM1.
4. Click **Add new backend resource** to add each virtual machine (*myVM2* and *myVM3*) to add to the backend pool of the load balancer.
5. Click **Add**.



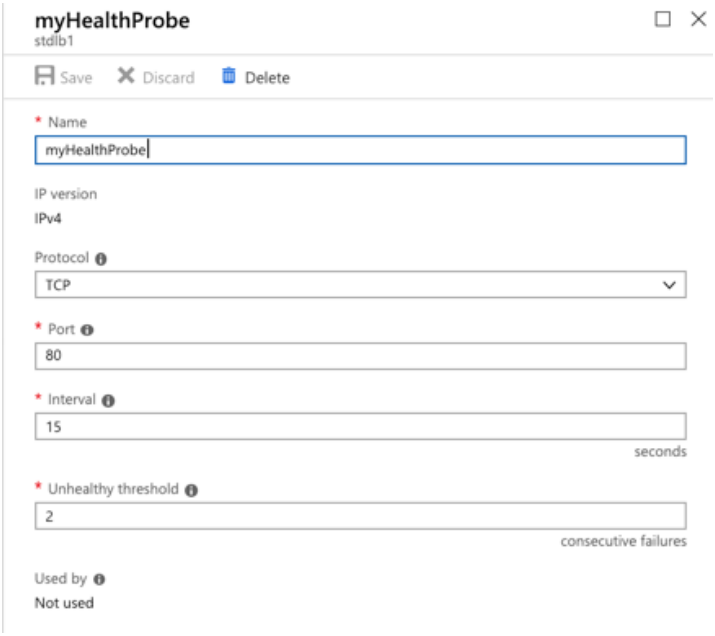
6. Check to make sure your load balancer backend pool setting displays all the three VMs - **myVM1**, **myVM2** and **myVM3**.



CREATE A HEALTH PROBE

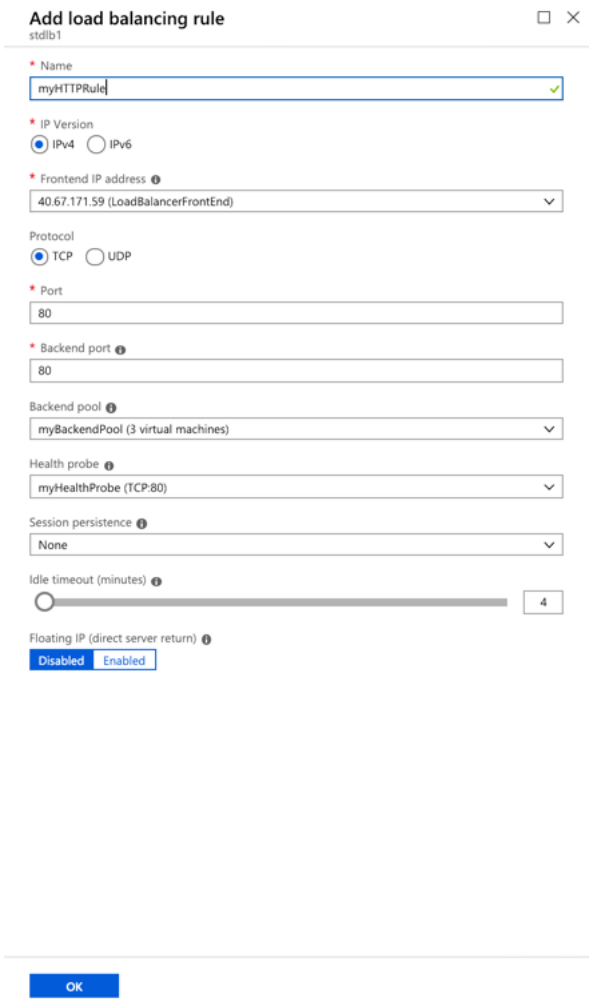
To allow the load balancer to monitor the status of your app, you use a health probe. The health probe dynamically adds or removes VMs from the load balancer rotation based on their response to health checks. Create a health probe *myHealthProbe* to monitor the health of the VMs.

1. Click **All resources** in the left-hand menu, and then click **myLoadBalancer** from the resources list.
2. Under **Settings**, click **Health probes**, then click **Add**.
3. Use these values to create the health probe:
   - *myHealthProbe* - for the name of the health probe.
   - **HTTP** - for the protocol type.
   - *80* - for the port number.
   - *15* - for number of **Interval** in seconds between probe attempts.
   - *2* - for number of **Unhealthy threshold** or consecutive probe failures that must occur before a VM is considered unhealthy.
4. Click **OK**.



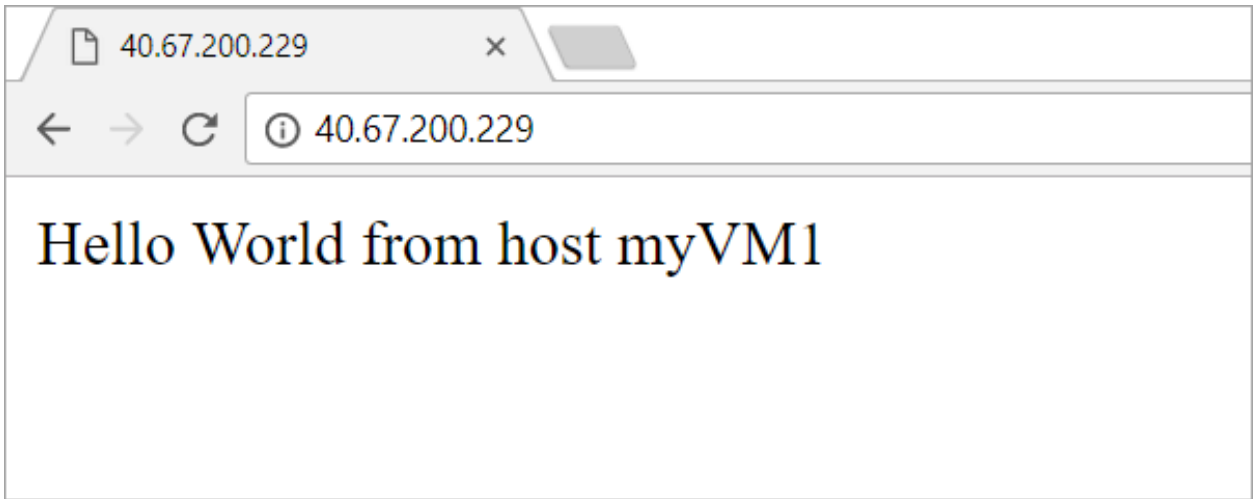
CREATE A LOAD BALANCER RULE

1. Click **All resources** in the left-hand menu, and then click **myLoadBalancer** from the resources list.
2. Under **Settings**, click **Load balancing rules**, then click **Add**.
3. Use these values to configure the load balancing rule:
    - *myHTTPRule* - for the name of the load balancing rule.
    - **TCP** - for the protocol type.
    - *80* - for the port number.
    - *80* - for the backend port.
    - *myBackendPool* - for the name of the backend pool.
    - *myHealthProbe* - for the name of the health probe.
4. Click **OK**.



TEST THE LOAD BALANCER

1. Find the public IP address for the Load Balancer on the **Overview** screen. Click **All resources** and then click **myPublicIP**.
2. Copy the public IP address, and then paste it into the address bar of your browser. The default page of IIS Web server is displayed on the browser.



To see the load balancer distribute traffic across the VMs distributed across the zone you can force-refresh your web browser. If you do not see web traffic disperse between the VMs, simply power off each VM and note the change that happens automatically (without downtime).