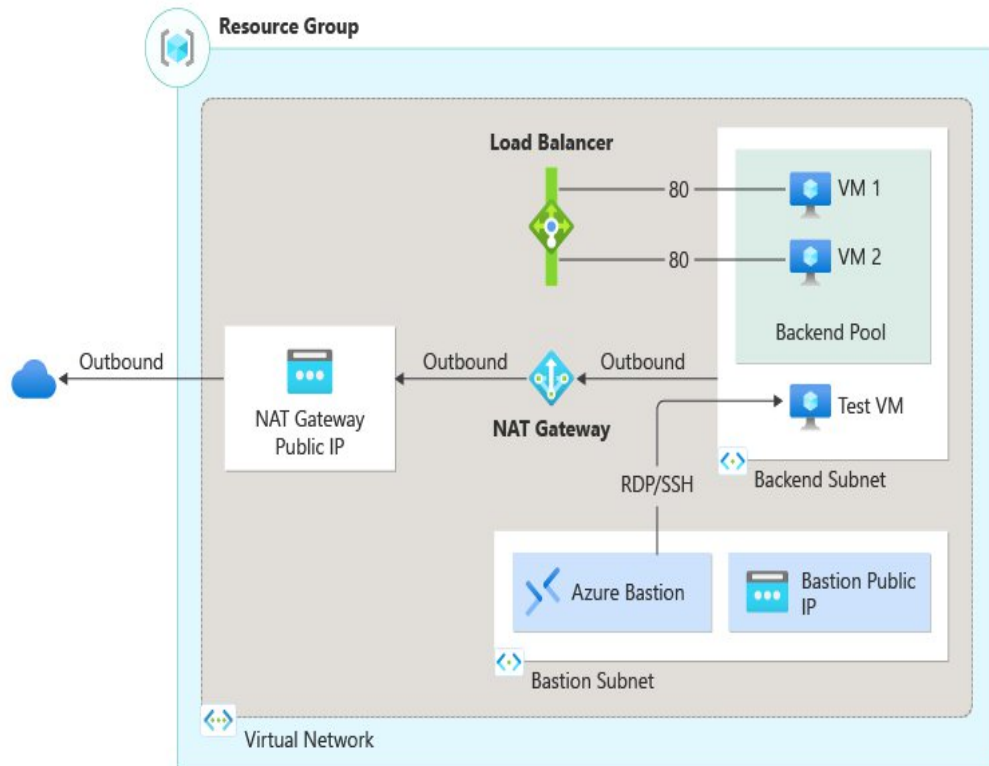


## Create an Internal & External Load balancer (Verify It's working).

Get started with Azure Load Balancer by using the Azure portal to create an internal load balancer for a backend pool with two virtual machines. Other resources include Azure Bastion, NAT Gateway, a virtual network, and the required subnets.



### Prerequisites

- An Azure account with an active subscription. Create an account for free.

### Sign in to Azure

Sign in to the Azure portal.

## 1. Create NAT gateway

2. In this section, you'll create a NAT gateway for outbound internet access for resources in the virtual network. For other options for outbound rules, check out Network Address Translation (SNAT) for outbound connections
3. Sign in to the Azure portal.
4. In the search box at the top of the portal, enter **NAT gateway**. Select **NAT gateways** in the search results.
5. Select + **Create**.
6. In the **Basics** tab of **Create network address translation (NAT) gateway** enter or select the following information:

| Setting                 | Value  |
|-------------------------|--|
| <b>Project details</b>  |  |
| Subscription            | Select your subscription.  |
| Resource group          | Select <b>Create new</b> .<br>Enter <b>load-balancer-rg</b> in Name.<br>Select <b>OK</b> . |
| <b>Instance details</b> |  |
| NAT gateway name        | Enter <b>lb-nat-gateway</b> .  |
| Region                  | Select <b>East US</b> .  |
| Availability zone       | Select <b>None</b> .   |
| Idle timeout (minutes)  | Enter <b>15</b> .  |

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## Create network address translation (NAT) gateway

Basics Outbound IP Subnet Tags Review + create

Azure NAT gateway can be used to translate outbound flows from a virtual network to the public internet. [Learn more about NAT gateways.](#)

**Project details**

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

Subscription \* azure subscription

Resource group \* (New) load-balancer-rg [Create new](#)

**Instance details**

NAT gateway name \* lb-nat-gateway ✓

Region \* East US

Availability zone ⓘ No Zone

TCP idle timeout (minutes) \* ⓘ 15 ✓ 4-120

[Review + create](#) < Previous Next : Outbound IP > [Download a template for automation](#)

7. Select the **Outbound IP** tab or select the **Next: Outbound IP** button at the bottom of the page.
8. Select **Create a new public IP address** under **Public IP addresses**.
9. Enter **nat-gw-public-ip** in **Name** in **Add a public IP address**.
10. Select **OK**.
11. Select the blue **Review + create** button at the bottom of the page, or select the **Review + create** tab.
12. Select **Create**.

## Create a virtual network and bastion host

In this section, you create a virtual network with a resource subnet, an Azure Bastion subnet, and an Azure Bastion host.

1. In the portal, search for and select **Virtual networks**.
2. On the **Virtual networks** page, select **+ Create**.
3. On the **Basics** tab of **Create virtual network**, enter or select the following information:

| Setting          | Value  |
|------------------|--|
| Project details  |  |
| Subscription     | Select your subscription.  |
| Resource group   | Select <b>Create new</b> .<br>Enter <b>load-balancer-rg</b> in Name.<br>Select <b>OK</b> . |
| Instance details |  |
| Name             | Enter <b>lb-vnet</b> .   |
| Region           | Select <b>East US</b> .  |

Microsoft Azure

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...

» Home > Virtual networks >

Create virtual network ...

Basics

Security

IP addresses

Tags

Review + create

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation.  
[Learn more.](#)

Project details

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

Subscription \*

azure subscription

Resource group \*

(New) load-balancer-rg

[Create new](#)

Instance details

Virtual network name \*

lb-vnet

Region ⓘ \*

(US) East US

[Deploy to an edge zone](#)

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4. Select the **Security** tab or **Next** button at the bottom of the page.
5. Under **Azure Bastion**, enter or select the following information:

| Setting                         | Value   |
|---------------------------------|---|
| <b>Azure Bastion</b>            |   |
| Enable Azure Bastion            | Select checkbox.  |
| Azure Bastion host name         | Enter <b>lb-bastion</b> .   |
| Azure Bastion public IP address | Select <b>Create new</b> .<br>Enter <b>lb-bastion-ip</b> in Name.<br>Select OK. |

1. Select the **IP addresses** tab, or **Next** at the bottom of the page.
2. On **Create virtual network** page, enter or select the following information:

| Setting                       | Value  |
|-------------------------------|--|
| <b>Add IPv4 address space</b> |  |
| IPv4 address space            | Enter <b>10.0.0.0/16 (65,356 addresses)</b> .  |
| <b>Subnets</b>                |  |
| Subnet template               | Select the <b>default</b> subnet link to edit. |
| Name                          | Leave the default <b>Default</b> .             |
| Starting address              | Enter <b>10.0.0.0</b> .                        |
| Subnet size                   | Enter <b>/24(256 addresses)</b> .              |
| <b>Security</b>               |  |
| NAT Gateway                   | Select <b>lb-nat-gateway</b> .                 |

## Edit subnet



Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. [Learn more](#)

IP address space ⓘ

10.0.0.0/16



10.0.0.0 - 10.0.255.255 (65536 addresses)

### Subnet details

Subnet template ⓘ

Default



Name \* ⓘ

backend-subnet

Starting address \* ⓘ

10.0.0.0

Subnet size ⓘ

/24 (256 addresses)



IP address space ⓘ

10.0.0.0 - 10.0.0.255 (256 addresses)

### Security

Simplify internet access for virtual machines by using a network address translation gateway. Filter subnet traffic using a network security group. [Learn more](#)

NAT gateway ⓘ

lb-nat-gateway



[Create new](#)

Network security group ⓘ

None



[Create new](#)

Route table

None



Save

Cancel

8. Select **Save**.

9. Select **Review + create** at the bottom of the screen, and when validation passes, select **Create**.

## Create load balancer

In this section, you create a load balancer that load balances virtual machines.

During the creation of the load balancer, you configure:

- Frontend IP address
  - Backend pool
  - Inbound load-balancing rules
1. In the search box at the top of the portal, enter **Load balancer**. Select **Load balancers** in the search results.
  2. In the **Load balancer** page, select **Create**.
  3. In the **Basics** tab of the **Create load balancer** page, enter, or select the following information:

| Setting          | Value                                  |
|------------------|--|
| Project details  |  |
| Subscription     | Select your subscription.              |
| Resource group   | Select <b>load-balancer-rg</b> .       |
| Instance details |  |
| Name             | Enter <b>load-balancer</b> .           |
| Region           | Select <b>East US</b> .                |
| SKU              | Leave the default <b>Standard</b> .    |
| Type             | Select <b>Internal</b> .               |
| Tier             | Leave the default of <b>Regional</b> . |



## Create load balancer ...



**Basics** Frontend IP configuration Backend pools Inbound rules Outbound rules Tags Review + create

Azure load balancer is a layer 4 load balancer that distributes incoming traffic among healthy virtual machine instances. Load balancers uses a hash-based distribution algorithm. By default, it uses a 5-tuple (source IP, source port, destination IP, destination port, protocol type) hash to map traffic to available servers. Load balancers can either be internet-facing where it is accessible via public IP addresses, or internal where it is only accessible from a virtual network. Azure load balancers also support Network Address Translation (NAT) to route traffic between public and private IP addresses. [Learn more.](#)

### Project details

Subscription \*

Resource group \*  [Create new](#)

### Instance details

Name \*

Region \*

SKU \* ⓘ ☒ Standard ☐ Gateway ☐ Basic

Type \* ⓘ ☐ Public ☒ Internal

Tier \* ☒ Regional ☐ Global

[Review + create](#) [< Previous](#) **Next : Frontend IP configuration >** [Download a template for automation](#) [Give feedback](#)

4. Select **Next: Frontend IP configuration** at the bottom of the page.
5. In **Frontend IP configuration**, select + **Add a frontend IP configuration**, then enter or select the following information:

| Setting                    | Value   |
|----------------------------|---|
| Name                       | Enter lb-frontend.                                  |
| Private IP address version | Select IPv4 or IPv6 depending on your requirements. |

| Setting           | Value                  |
|-------------------|------------------------|
| Name              | Enter lb-frontend.     |
| Virtual network   | Select lb-vnet.        |
| Subnet            | Select backend-subnet. |
| Assignment        | Select Dynamic.        |
| Availability zone | Select Zone-redundant. |

1. Select **Add**.
2. Select **Next: Backend pools** at the bottom of the page.
3. In the **Backend pools** tab, select + **Add a backend pool**.
4. Enter **lb-backend-pool** for **Name** in **Add backend pool**.
5. Select **IP Address** for **Backend Pool Configuration**.
6. Select **Save**.
7. Select the **Next: Inbound rules** button at the bottom of the page.
8. In **Load balancing rule** in the **Inbound rules** tab, select + **Add a load balancing rule**.
9. In **Add load balancing rule**, enter or select the following information:

| Setting                | Value   |
|------------------------|---|
| Name                   | Enter <b>lb-HTTP-rule</b> .   |
| IP Version             | Select <b>IPv4</b> or <b>IPv6</b> depending on your requirements.   |
| Frontend IP address    | Select <b>lb-frontend</b> .   |
| Backend pool           | Select <b>lb-backend-pool</b> .   |
| Protocol               | Select <b>TCP</b> .   |
| Port                   | Enter <b>80</b> .   |
| Backend port           | Enter <b>80</b> .   |
| Health probe           | Select <b>Create new</b> .<br>In <b>Name</b> , enter <b>lb-health-probe</b> .<br>Select <b>TCP</b> in <b>Protocol</b> .<br>Leave the rest of the defaults, and select <b>OK</b> . |
| Session persistence    | Select <b>None</b> .  |
| Idle timeout (minutes) | Enter or select <b>15</b> .   |

1. Select **Save**.
2. Select the blue **Review + create** button at the bottom of the page.
3. Select **Create**.

## Create virtual machines

In this section, you create two VMs (**lb-vm1** and **lb-VM2**) in two different zones (**Zone 1** and **Zone 2**).

These VMs are added to the backend pool of the load balancer that was created earlier.

1. In the search box at the top of the portal, enter **Virtual machine**. Select **Virtual machines** in the search results.
2. In **Virtual machines**, select **+ Create > Azure virtual machine**.
3. In **Create a virtual machine**, enter or select the following values in the **Basics** tab:

| Setting                 | Value  |
|-------------------------|--|
| <b>Project Details</b>  |  |
| Subscription            | Select your Azure subscription                                     |
| Resource Group          | Select <b>load-balancer-rg</b>                                     |
| <b>Instance details</b> |  |
| Virtual machine name    | Enter <b>lb-VM1</b>  |
| Region                  | Select <b>((US) East US)</b>                                       |
| Availability Options    | Select <b>Availability zones</b>                                   |
| Availability zone       | Select <b>Zone 1</b>   |
| Security type           | Select <b>Standard</b> .   |
| Image                   | Select <b>Windows Server 2022 Datacenter: Azure Edition - Gen2</b> |
| Azure Spot instance     | Leave the default of unchecked.                                    |

1. Select the **Networking** tab, or select **Next: Disks**, then **Next: Networking**.
2. In the Networking tab, select or enter the following information:

| Setting                          | Value   |
|----------------------------------|---|
| <b>Network interface</b>         |   |
| Virtual network                  | Select <b>lb-vnet</b>   |
| Subnet                           | Select <b>backend-subnet</b>  |
| Public IP                        | Select <b>None</b> .  |
| NIC network security group       | Select <b>Advanced</b>  |
| Configure network security group | Skip this setting until the rest of the settings are completed. Complete after <b>Select a backend pool</b> . |
| Delete NIC when VM is deleted    | Leave the default of <b>unselected</b> .  |
| Accelerated networking           | Leave the default of <b>selected</b> .  |
| <b>Load balancing</b>            |   |
| <b>Load balancing options</b>    |   |
| Load-balancing options           | Select <b>Azure load balancer</b>   |

1. Select **Review + create**.
2. Review the settings, and then select **Create**.
3. Follow the steps 1 through 7 to create another VM with the following values and all the other settings the same as **lb-VM1**:

| Setting                | VM 2                       |
|------------------------|----------------------------|
| Name                   | lb-VM2                     |
| Availability zone      | Zone 2                     |
| Network security group | Select the existing lb-NSG |

## Create test virtual machine

In this section, you create a VM named **lb-TestVM**. This VM is used to test the load balancer configuration.

1. In the search box at the top of the portal, enter **Virtual machine**. Select **Virtual machines** in the search results.
2. In **Virtual machines**, select **+ Create > Azure virtual machine**.
3. In **Create a virtual machine**, enter or select the values in the **Basics** tab:

| Setting                 | Value   |
|-------------------------|---|
| <b>Project Details</b>  |   |
| Subscription            | Select your Azure subscription.                           |
| Resource Group          | Select <b>load-balancer-rg</b> .                          |
| <b>Instance details</b> |   |
| Virtual machine name    | Enter <b>lb-TestVM</b> .                                  |
| Region                  | Select (US) East US.                                      |
| Availability Options    | Select <b>No infrastructure redundancy required</b> .     |
| Security type           | Select <b>Standard</b> .                                  |
| Image                   | Select <b>Windows Server 2022 Datacenter - x64 Gen2</b> . |
| Azure Spot instance     | Leave the default of unselected.                          |
| Size                    | Choose VM size or take default setting.                   |

1. Select the **Networking** tab, or select **Next: Disks**, then **Next: Networking**.
2. In the **Networking** tab, select or enter:

| Setting                          | Value  |
|----------------------------------|--|
| <b>Network interface</b>         |  |
| Virtual network                  | lb-vnet.   |
| Subnet                           | backend-subnet.                                    |
| Public IP                        | Select <b>None</b> .                               |
| NIC network security group       | Select <b>Advanced</b> .                           |
| Configure network security group | Select <b>lb-NSG</b> created in the previous step. |

1. Select **Review + create**.
2. Review the settings, and then select **Create**.

## Install IIS

1. In the search box at the top of the portal, enter **Virtual machine**. Select **Virtual machines** in the search results.
2. Select **lb-vm1**.
3. In the **Overview** page, select **Connect**, then **Bastion**.
4. Enter the username and password entered during VM creation.
5. Select **Connect**.
6. On the server desktop, navigate to **Windows Administrative Tools > Windows PowerShell > Windows PowerShell**.
7. In the PowerShell Window, execute the following commands to:
8. Install the IIS server.
9. Remove the default iisstart.htm file.
10. 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

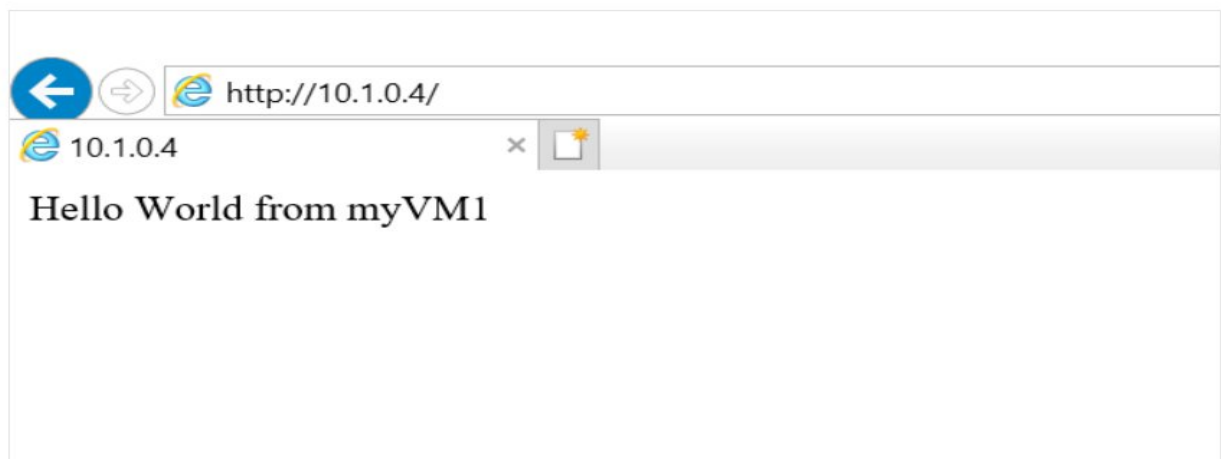
```
Add-Content -Path "C:\inetpub\wwwroot\iisstart.htm" -Value $("Hello World from " + $env:computername)
```

1. Close the Bastion session with **lb-vm1**.
2. Repeat steps 1 through 8 to install IIS and the updated iisstart.htm file on **lb-VM2**.

## Test the load balancer

In this section, you test the load balancer by connecting to the **lb-TestVM** and verifying the webpage.

1. In the search box at the top of the portal, enter **Load balancer**. Select **Load balancers** in the search results.
2. Select **load-balancer**.
3. Make note or copy the address next to **Private IP address** in the **Overview** of **load-balancer**. If you can't see the **Private IP address** field, select **See more** in the information window.
4. In the search box at the top of the portal, enter **Virtual machine**. Select **Virtual machines** in the search results.
5. Select **lb-TestVM**.
6. In the **Overview** page, select **Connect**, then **Bastion**.
7. Enter the username and password entered during VM creation.
8. Open **Microsoft Edge** on **lb-TestVM**.
9. Enter the IP address from the previous step into the address bar of the browser. The custom page displaying one of the backend server names is displayed on the browser. In this example, it's **10.1.0.4**.



1. To see the load balancer distribute traffic across both VMs, navigate to the VM shown in the browser message, and stop the VM.
2. Refresh the browser window. The page should still display the customized page. The load balancer is now only sending traffic to the remaining VM.

## Clean up resources

When no longer needed, delete the resource group, load balancer, and all related resources. To do so, select the resource group **load-balancer-rg** that contains the resources and then select **Delete**.

## Next steps

In this quickstart, you:

- Created an internal Azure Load Balancer
- Attached 2 VMs to the load balancer
- Configured the load balancer traffic rule, health probe, and then tested the load balancer