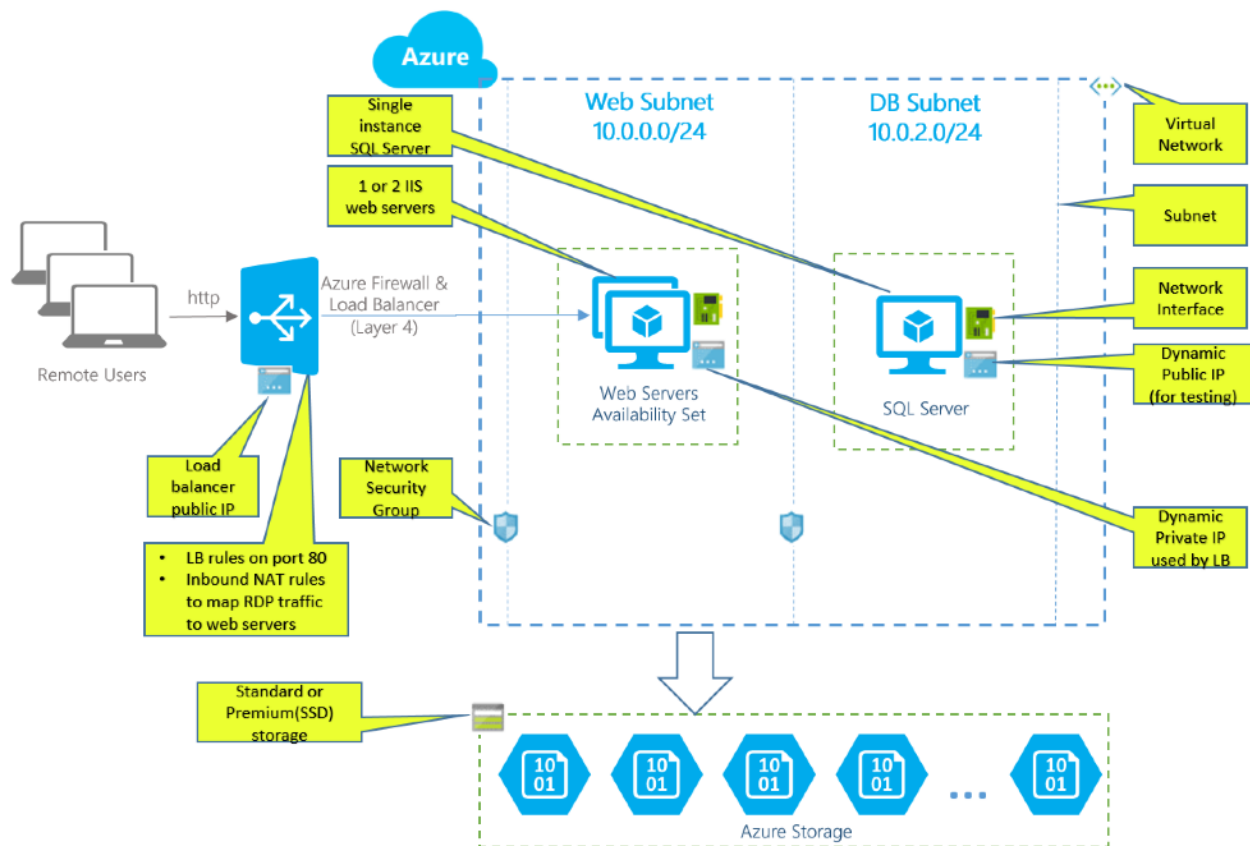


## Azure Resource Manager Template

### Step 1

Architecture diagram for ARM Template



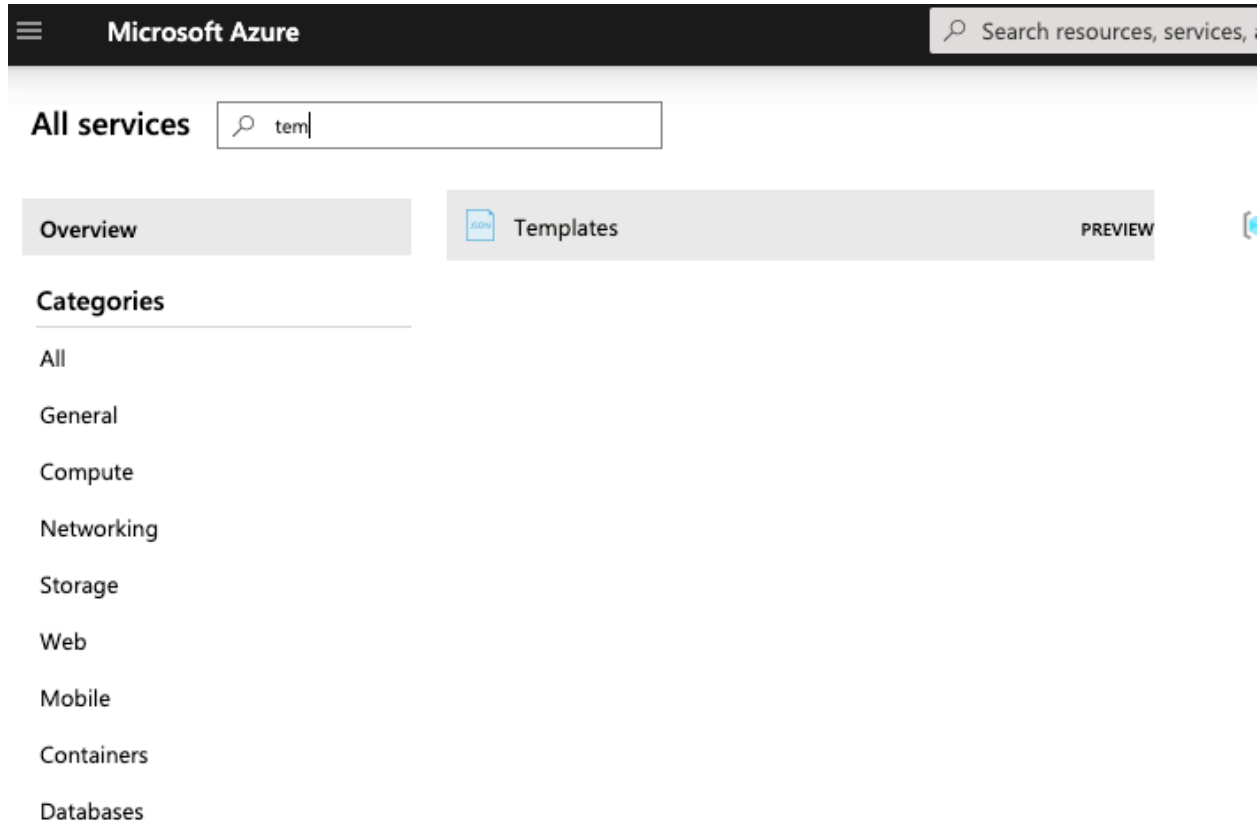
1 Availability Set for IIS servers.

1 Load balancer with NATing rules.

## Step 2

The below **Deploy to Azure** button embeds an Azure ARM template which creates one or two Windows Server 2012R2 VM(s) with IIS configured using DSC. It also installs one SQL Server 2014 standard edition VM, a VNET with two subnets, NSG, loader balancer, NATing and probing rules.

### Go to All Services and write Templates



The screenshot shows the Microsoft Azure portal interface. At the top, there's a navigation bar with the Microsoft Azure logo and a search bar. Below the navigation bar, the 'All services' section is active, displaying a search bar with the text 'tem'. To the left, there's a list of categories: All, General, Compute, Networking, Storage, Web, Mobile, Containers, and Databases. On the right, there's a 'Templates' tab with a 'PREVIEW' button.

### Step 3

#### General

Name:

Azure\_Template\_Username

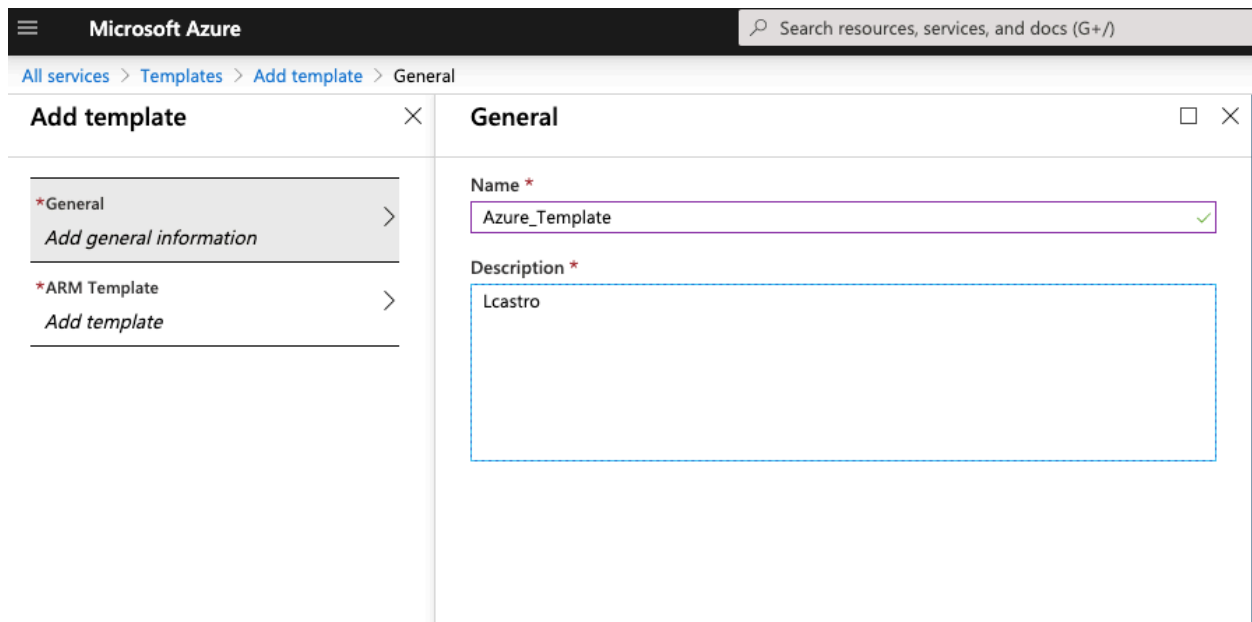
Eg: Azure\_Template\_Lcastro

Description:

Username

Eg: Lcastro

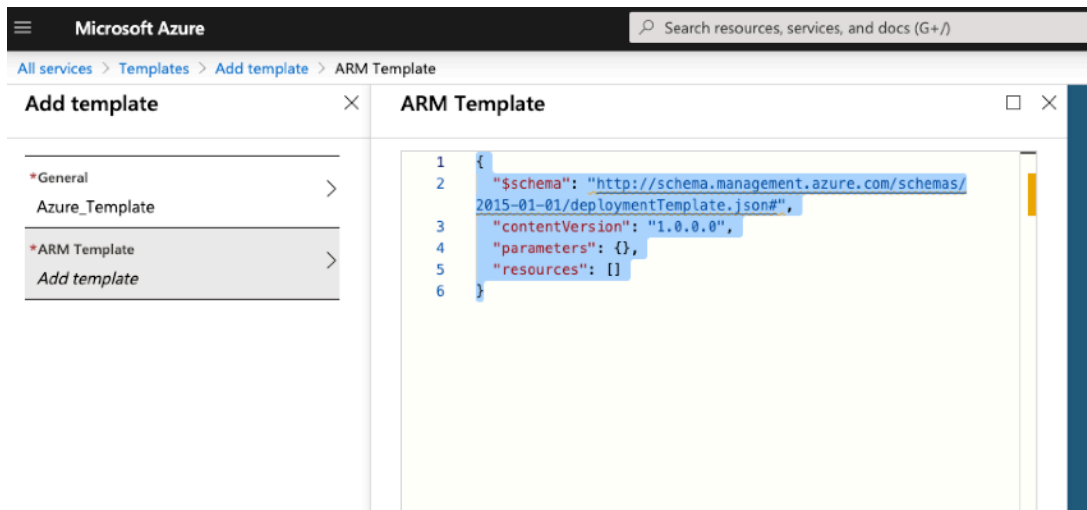
Click Ok



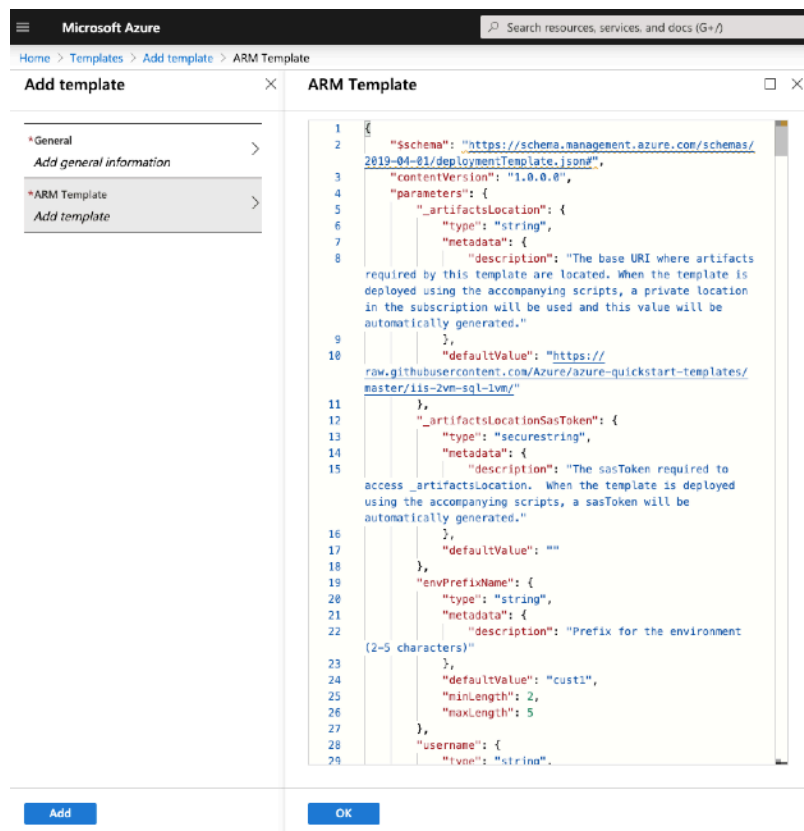
The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar with the text "Search resources, services, and docs (G+/)". Below the search bar, the breadcrumb navigation reads "All services > Templates > Add template > General". The main content area is titled "Add template" and is split into two panes. The left pane, titled "Add template", contains two sections: "\*General" with the subtext "Add general information" and a right-pointing chevron, and "\*ARM Template" with the subtext "Add template" and a right-pointing chevron. The right pane, titled "General", contains two form fields: "Name \*" with a text input containing "Azure\_Template" and a green checkmark icon, and "Description \*" with a text area containing "Lcastro".

## ARM Template

### Delete everything inside ARM Template



Go to GitHub and search for the **Azure\_ARM.json** File, copy and paste inside ARM Template Field



**Agree Terms and Conditions > Purchase**



**Directory:** Palo Alto Networks Inc. – **Subscriptions:** Visual Studio Professional – Don't see a subscripti



Filter by name...

1 items

☐ Name  Description

azure\_template (256ffdc0-48... Lcastro



Click the template generated and then Click **Deploy**, to deploy the template

 **Microsoft Azure**  Search resources, servi



[Dashboard](#) > [Templates](#) > [azure\\_template](#) > View Template




### Templates




Palo Alto Networks Inc. | PREVIEW

 Add  Edit columns ...

☐ **Name** ↑↓

☐  **azure\_template** (256ffdc0-48... 


 **azure\_template**  

 Deploy  Edit  Delete ...


Description

Lcastro

Publisher



Modified



[View Template](#)

400-253-4000 | 2020 © Palo Alto Networks, Inc. All rights reserved.

## Add the following Parameters

**Resource Name > Create New:** username-ARM Eg: lcastro-ARM

**Location:** Region designated by the instructions

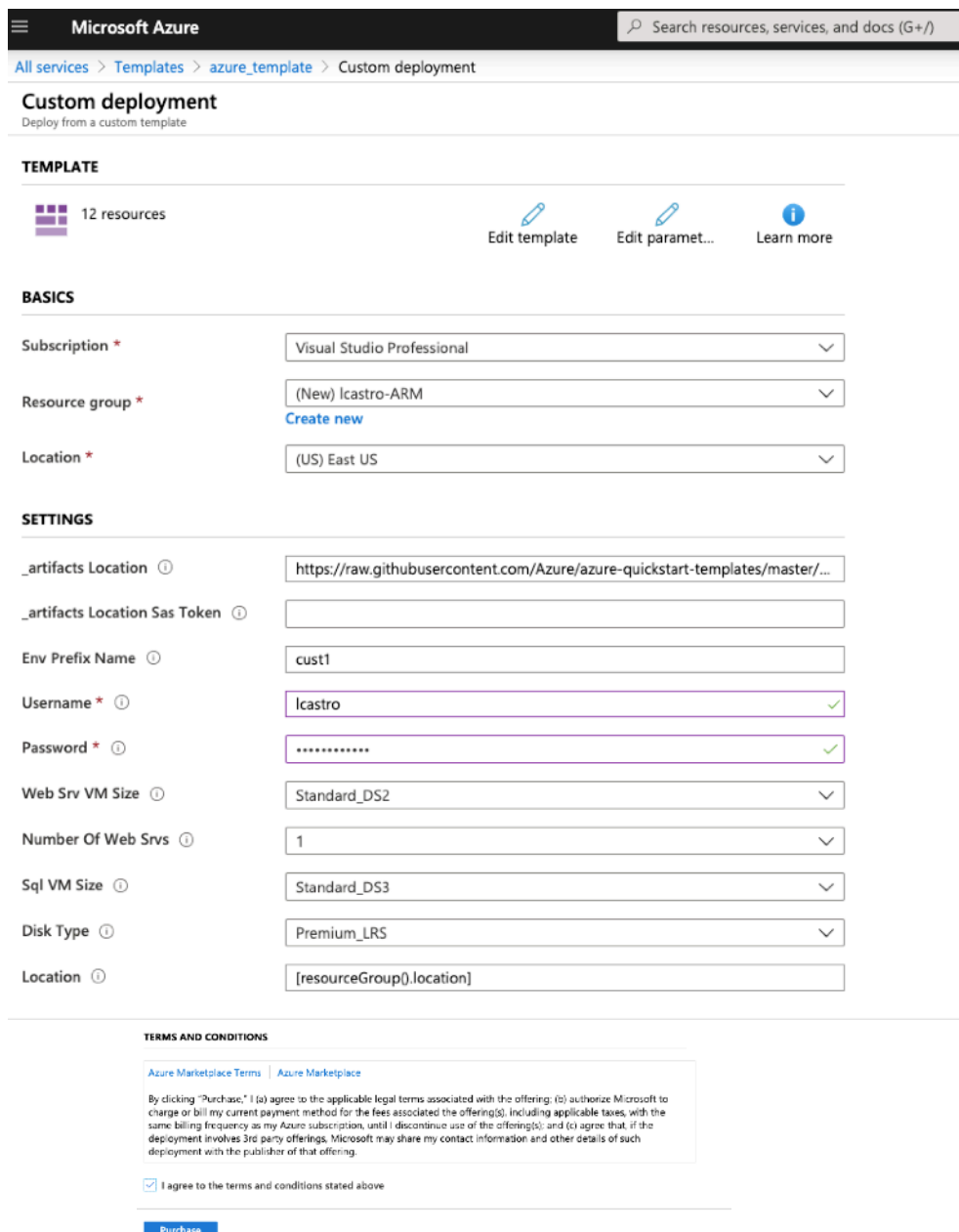
**Env Prefix Name:** First 5 letters of your username - Eg: lcast

**Username:** username Eg: lcastro

**Password:** Defined by each user

Agree Terms

Click Purchase - Deployment start creating Assets



The screenshot shows the Microsoft Azure portal's 'Custom deployment' page. The breadcrumb trail is 'All services > Templates > azure\_template > Custom deployment'. The page title is 'Custom deployment' with the subtitle 'Deploy from a custom template'. Under the 'TEMPLATE' section, there are 12 resources, and links for 'Edit template', 'Edit paramet...', and 'Learn more'. The 'BASICS' section contains three dropdown menus: 'Subscription' (Visual Studio Professional), 'Resource group' ((New) lcastro-ARM, with a 'Create new' link), and 'Location' ((US) East US). The 'SETTINGS' section contains several fields: '\_artifacts Location' (https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/...), '\_artifacts Location Sas Token' (empty), 'Env Prefix Name' (cust1), 'Username' (lcastro, with a green checkmark), 'Password' (masked with dots, with a green checkmark), 'Web Srv VM Size' (Standard\_DS2), 'Number Of Web Srvs' (1), 'Sql VM Size' (Standard\_DS3), 'Disk Type' (Premium\_LRS), and 'Location' ([resourceGroup()].location). At the bottom, the 'TERMS AND CONDITIONS' section includes links for 'Azure Marketplace Terms' and 'Azure Marketplace', a paragraph of legal text, a checked checkbox for 'I agree to the terms and conditions stated above', and a blue 'Purchase' button.

Microsoft Azure

Search resources, services, and docs (G+/)

All services > Templates > azure\_template > Custom deployment

### Custom deployment

Deploy from a custom template

#### TEMPLATE

12 resources

Edit template Edit paramet... Learn more

#### BASICS

Subscription \* Visual Studio Professional

Resource group \* ((New) lcastro-ARM) [Create new](#)

Location \* ((US) East US)

#### SETTINGS

\_artifacts Location ⓘ https://raw.githubusercontent.com/Azure/azure-quickstart-templates/master/...

\_artifacts Location Sas Token ⓘ

Env Prefix Name ⓘ cust1

Username \* ⓘ lcastro ✓

Password \* ⓘ \*\*\*\*\*\* ✓

Web Srv VM Size ⓘ Standard\_DS2

Number Of Web Srvs ⓘ 1

Sql VM Size ⓘ Standard\_DS3

Disk Type ⓘ Premium\_LRS

Location ⓘ [resourceGroup()].location

#### TERMS AND CONDITIONS

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

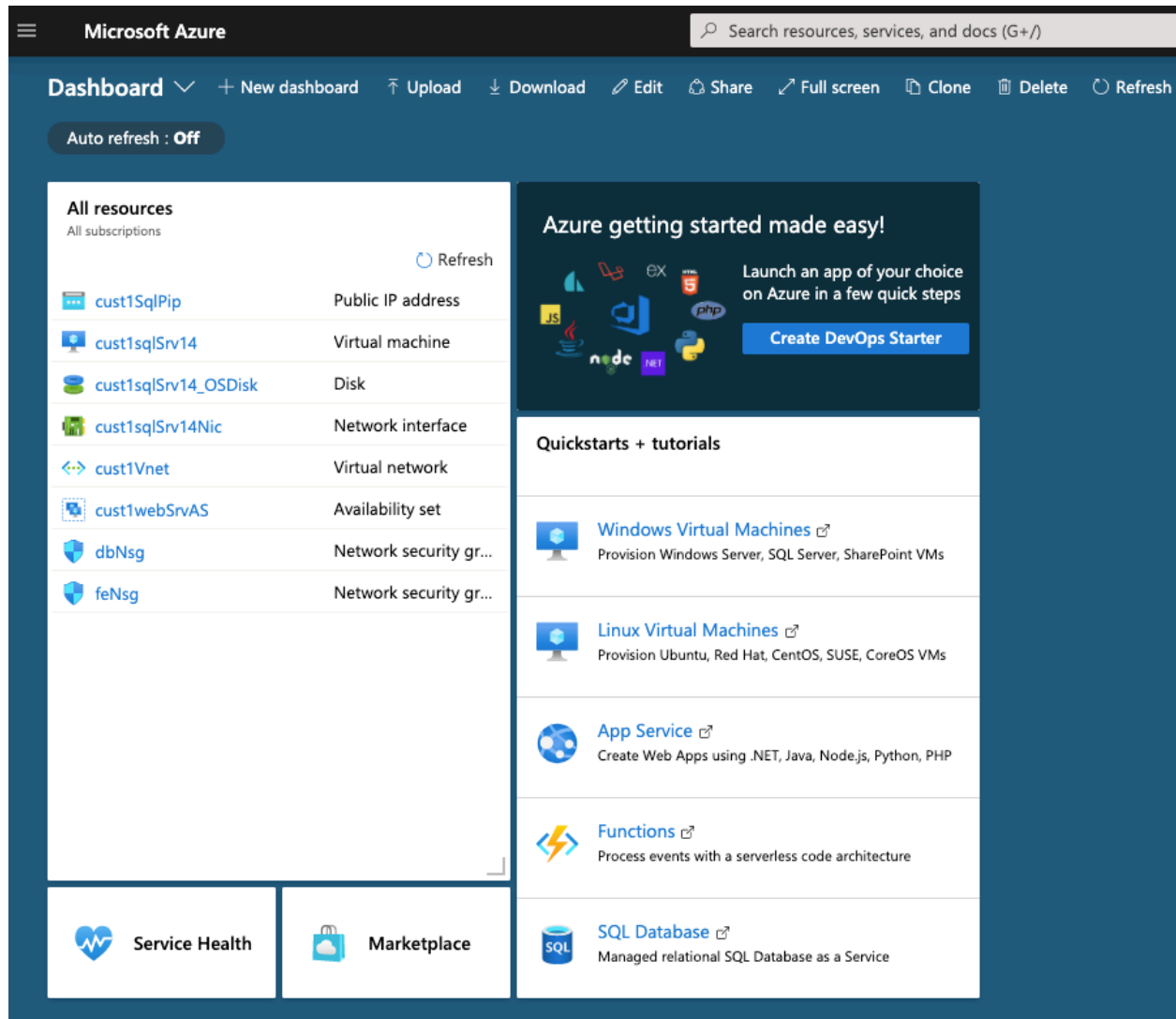
By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated with the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree that, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

☒ I agree to the terms and conditions stated above

[Purchase](#)

## Step 4

Go to Dashboard and review the assets created



The screenshot shows the Microsoft Azure portal dashboard. At the top, there's a search bar and navigation links. The main section is titled "All resources" and lists several resources created in the lab:

Resource Name	Type
cust1SqlPip	Public IP address
cust1sqlSrv14	Virtual machine
cust1sqlSrv14_OSDisk	Disk
cust1sqlSrv14Nic	Network interface
cust1Vnet	Virtual network
cust1webSrvAS	Availability set
dbNsg	Network security group
feNsg	Network security group

Below the resources list, there are links to "Service Health" and "Marketplace". To the right, there's a section titled "Azure getting started made easy!" with a "Create DevOps Starter" button. Below that, there's a "Quickstarts + tutorials" section with links to "Windows Virtual Machines", "Linux Virtual Machines", "App Service", "Functions", and "SQL Database".

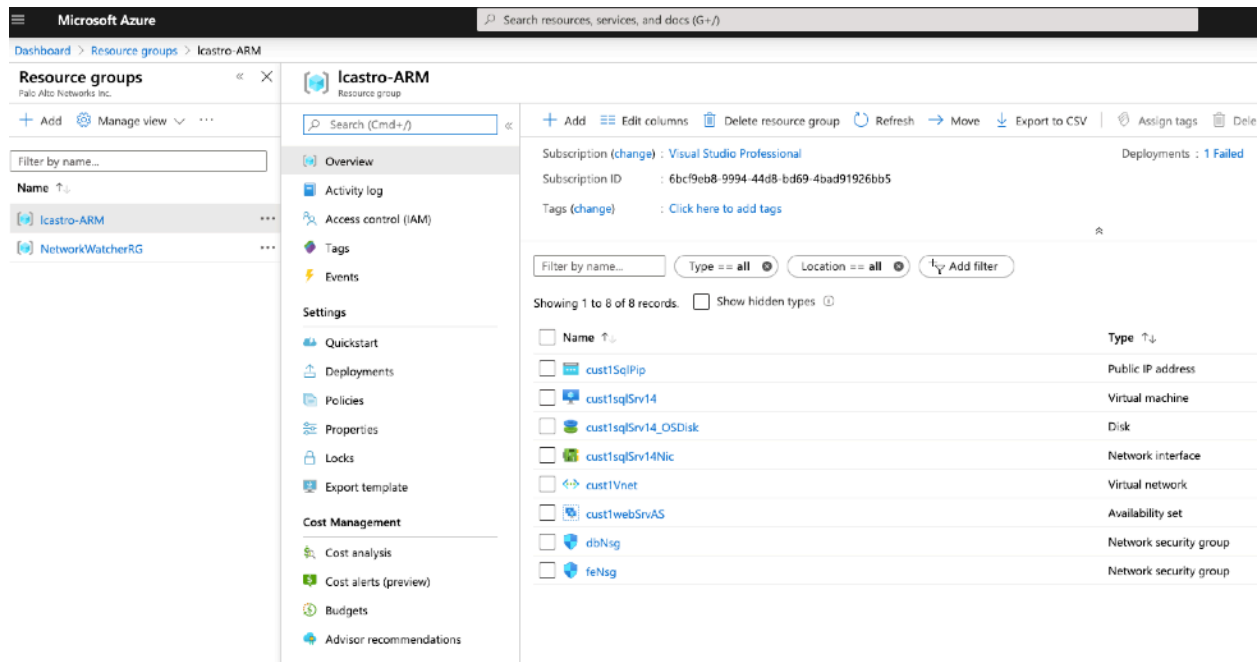


## Step 5

Go to the Resource Group created under your name:

Once the Template Deployment succeeds, you will have WebServer with IIS Installed and SQL Server 2014 Standard deployed on a Virtual Network with 2 subnets with NSG rules and a Load Balancer with NATing rules.

Click on the Resource Group Tile pinned on the dashboard and then click on each resource for more details.



Microsoft Azure

Dashboard > Resource groups > Icastro-ARM

**Resource groups**

Palo Alto Networks Inc.

+ Add Manage view

Filter by name...

Name ↑

- Icastro-ARM
- NetworkWatcherRG

**Icastro-ARM**

Resource group

Search (Cmd+/)

+ Add Edit columns Delete resource group Refresh Move Export to CSV Assign tags Delete

Subscription (change): Visual Studio Professional Deployments: 1 Failed

Subscription ID: 6bcl9eb8-9994-44d8-bd69-4bad91926bb5

Tags (change): Click here to add tags

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

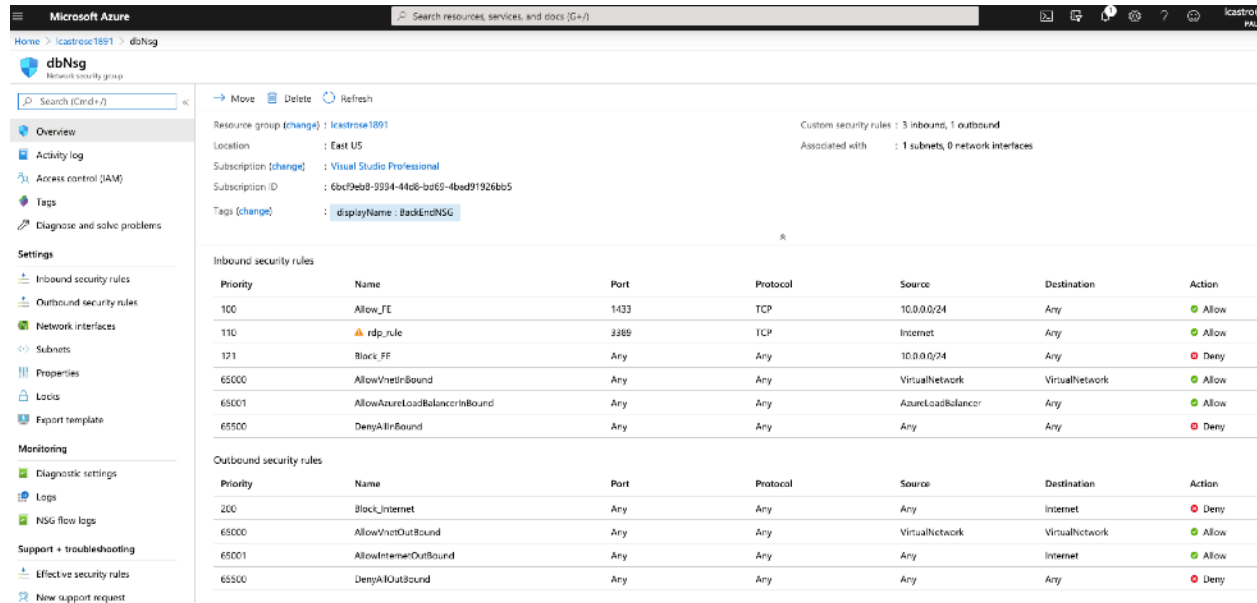
Showing 1 to 8 of 8 records. Show hidden types

Name ↑	Type ↑
cust1SqlIpp	Public IP address
cust1SqlSrv14	Virtual machine
cust1SqlSrv14_OSDisk	Disk
cust1SqlSrv14Nic	Network interface
cust1Vnet	Virtual network
cust1WebSrvAS	Availability set
dbNsg	Network security group
feNsg	Network security group

## Step 6

Now, the 2-tier architecture is created with all necessary resources, to check whether all the rules are applied we will deploy an ASP.NET application and a Sample Database(AdventureWorks2012).

Click on dbNsg which is a Network security group and delete the outbound Security rules (Priority - 200) - We do this step to download the below AdventureWorks2012 database.



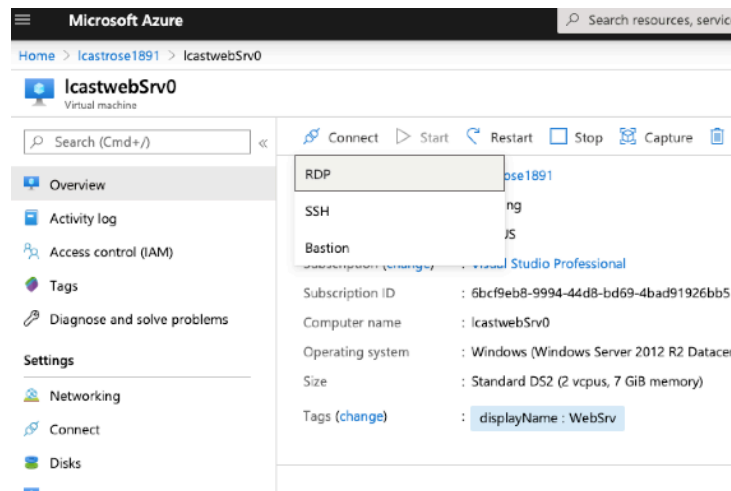
The screenshot shows the Microsoft Azure portal interface for the 'dbNsg' Network security group. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Monitoring, and Support. The main content area displays the 'dbNsg' details, including its location (East US), subscription (Visual Studio Professional), and associated subnets and network interfaces. Below this, there are two tables: 'Inbound security rules' and 'Outbound security rules'.

Priority	Name	Port	Protocol	Source	Destination	Action
100	Allow_IG	1433	TCP	10.0.0.0/24	Any	Allow
110	rdp_rule	3389	TCP	Internet	Any	Allow
121	Block_FF	Any	Any	10.0.0.0/24	Any	Deny
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

Priority	Name	Port	Protocol	Source	Destination	Action
200	Block_Internet	Any	Any	Any	Internet	Deny
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

Download RDPs for both Database server and Application server and login with the credentials and download the ASP.NET application content into app server and AdventureWorks2012 database into Database server.



The screenshot shows the Microsoft Azure portal interface for the 'IcastwebSrv0' Virtual machine. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Networking, Connect, and Disks. The main content area displays the 'IcastwebSrv0' details, including its location (East US), subscription (Visual Studio Professional), and associated subnets and network interfaces. Below this, there are two tables: 'Inbound security rules' and 'Outbound security rules'.

Priority	Name	Port	Protocol	Source	Destination	Action
100	Allow_IG	1433	TCP	10.0.0.0/24	Any	Allow
110	rdp_rule	3389	TCP	Internet	Any	Allow
121	Block_FF	Any	Any	10.0.0.0/24	Any	Deny
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

Priority	Name	Port	Protocol	Source	Destination	Action
200	Block_Internet	Any	Any	Any	Internet	Deny
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

lcastsqlSrv14 | Connect  
Virtual machine

Search (Cmd+ /) <<

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

## Settings

- Networking
- Connect
- Disks
- Size
- Security
- Extensions
- Continuous delivery
- Availability set

 To improve security, enable just-in-time access on this VM. →

RDP SSH BASTION

## Connect with RDP

To connect to your virtual machine via RDP, select an IP address, optionally change the pc the RDP file.

IP address ★Public IP address (104.41.131.156)Port number ★3389[Download RDP File](#)

### Can't connect?

- [Test your connection](#)
- [Troubleshoot RDP connectivity issues](#)

## Step 7

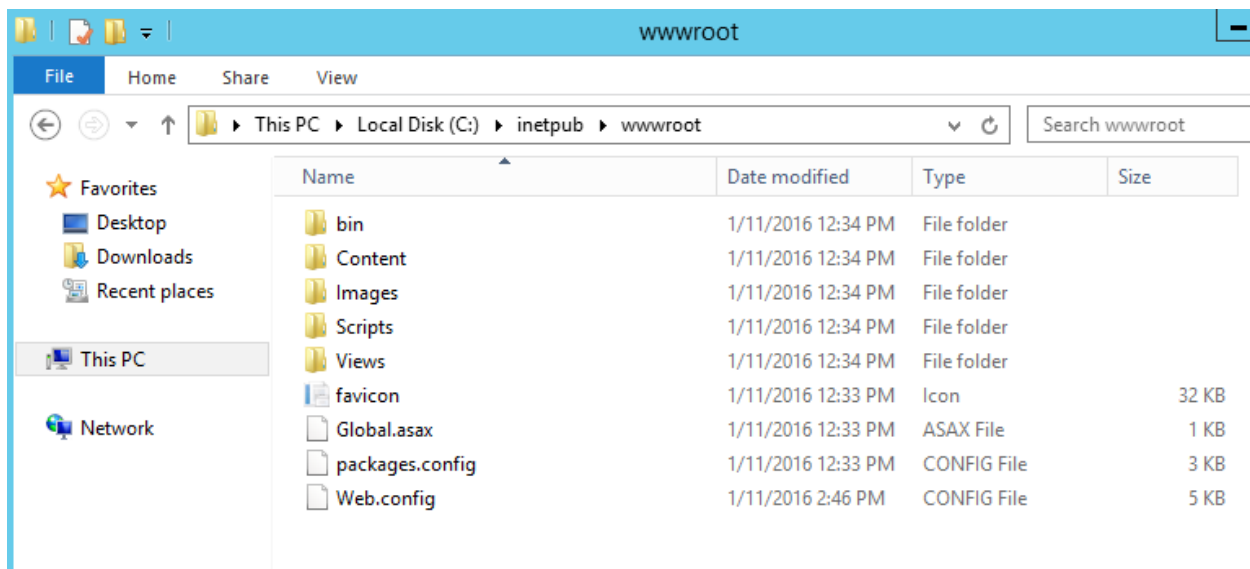
A sample ASP.NET Application content can be downloaded here:

<https://github.com/lcastrose/AZURE-Training/blob/master/CloudShop.zip>

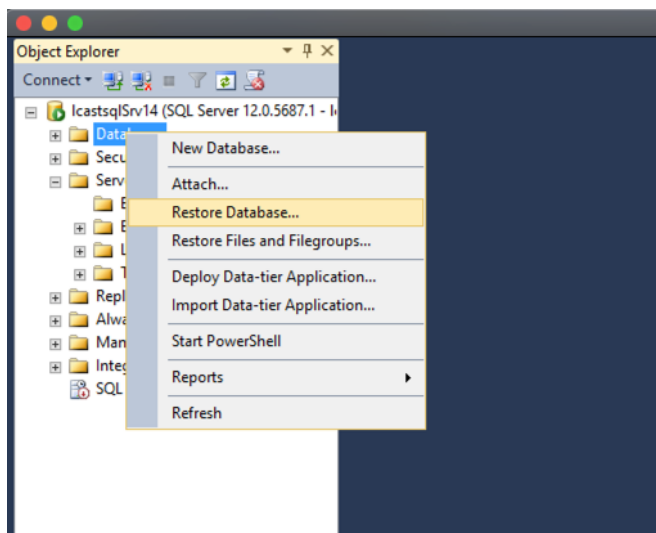
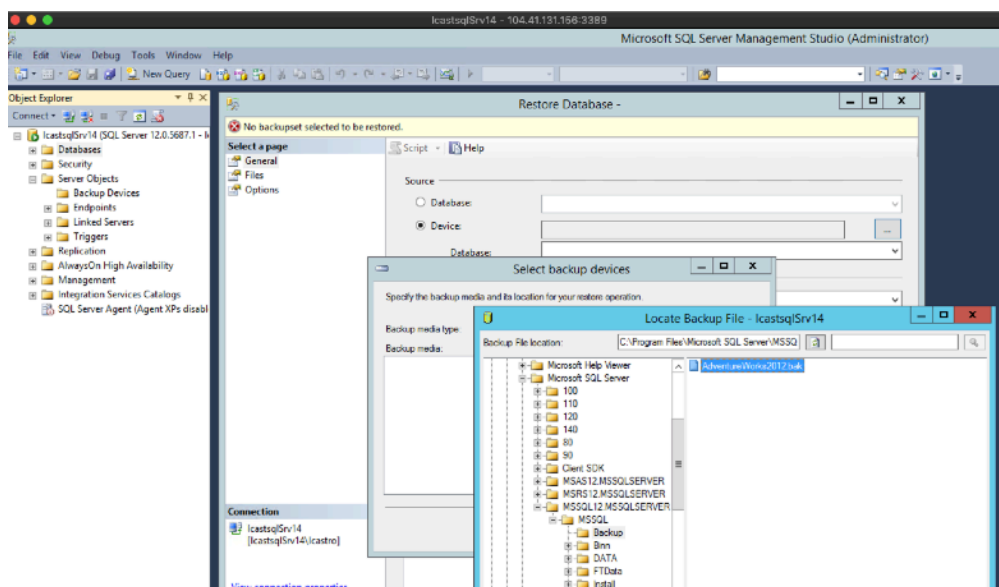
Sample Database can be downloaded here :

<https://dblcastro.s3.amazonaws.com/AdventureWorks2012.bak>

Once you download application content onto app server extract the .zip file and copy the content and past in C:\inetpub\wwwroot.



Copy the .bak file to the Backup location "C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\Backup" and click OK.

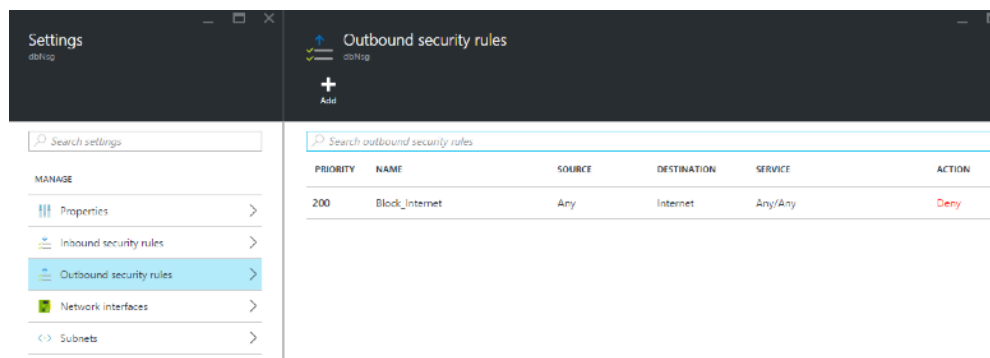




On Left side you have Server Roles -> Select public and sysadmin and check in User Mapping whether public is selected or not and click OK

So till now we have an application content in appserver and database in Database Server. Fianlly we have to setup the NSG Outbound rule which we have deleted earlier to Database Server through portal.

In Azure Portal Click on the resource group which we just created and in the resources click on dbNsg and click on All Settings and Outbound security rules and click on add and fill the details as below:



## Adding a Outbound NSG rule

And Finally login into AppServer and open inetpub\wwwroot and Open Web.Config in notepad and replace the ConnectionString with the below code:

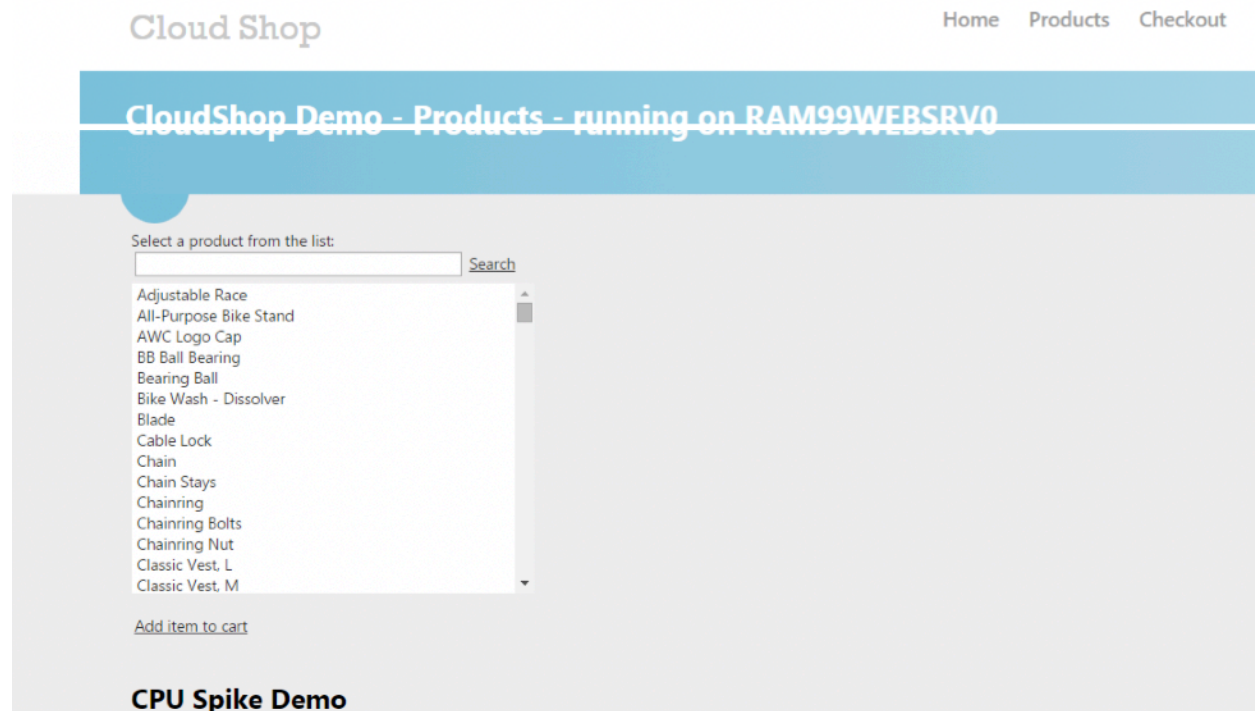
```
<add name="AdventureWorksEntities" connectionString="metadata=res://*/
Models.AdventureWorks.csdl;res://*/Models.AdventureWorks.ssdl;res://*/
Models.AdventureWorks.msl;provider=System.Data.SqlClient;provider connection
string='Data Source=tcp:{SQL Server Private IP},1433;Initial
Catalog=AdventureWorks2012;Uid={DB User};Password={Password
Created};multipleactiveresultsets=True;App=EntityFramework'/"
providerName="System.Data.EntityClient"/>
```

```
<add name="DefaultConnection" connectionString="Data Source=tcp:{SQL Server Private IP},
1433;initial catalog=AdventureWorks2012;Uid={DB User};Password={Password
Created};MultipleActiveResultSets=True" providerName="System.Data.SqlClient"/>
```

NOTE: Before replacing the connection string, do change the following text with respective values

- 1) Destination IP address : {Destination-Internal-IP} -> SQL Server Internal IP
- 2) User ID: {User-created-DbServer} -> User ID for SQL Authentication
- 3) Password: {password} -> Password for SQL Authentication

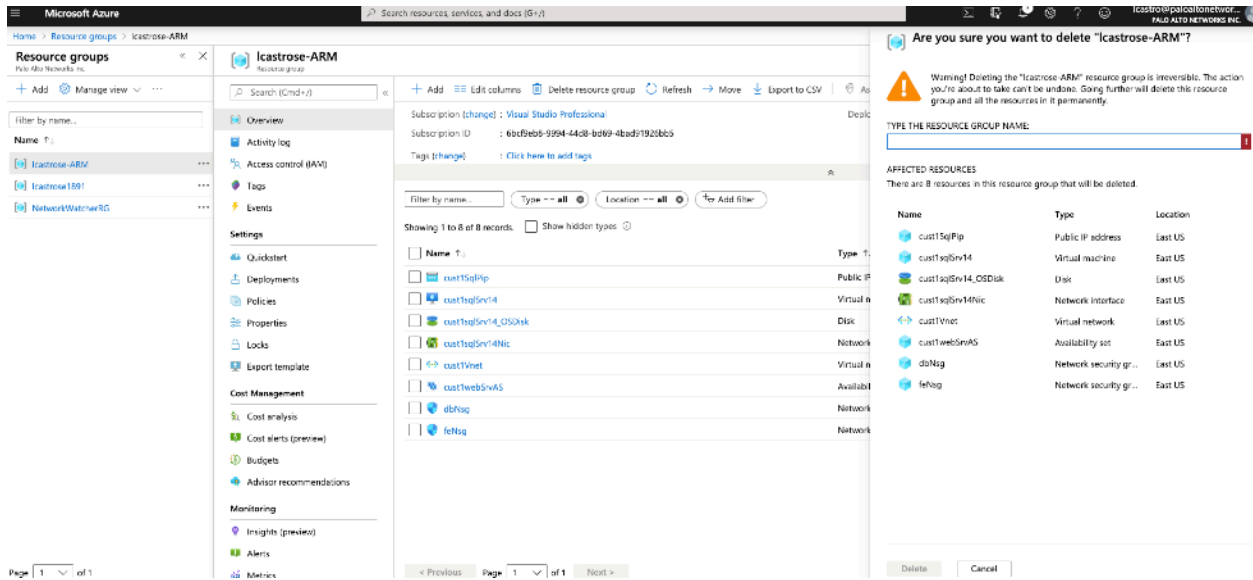
Now you can verify by copying the Loadbalancer IP address onto browser and you will see an asp.net application with data populating from the DB Server.





## Step 9

### Remove Resource Group using Azure Portal



**Are you sure you want to delete "Icastrose-ARM"?**

Warning! Deleting the "Icastrose-ARM" resource group is irreversible. The action you're about to take can't be undone. Going further will delete this resource group and all the resources in it permanently.

TYPE THE RESOURCE GROUP NAME

**AFFECTED RESOURCES**  
There are 8 resources in this resource group that will be deleted.

Name	Type	Location
cust1sqlPip	Public IP address	East US
cust1sqlSrv14	Virtual machine	East US
cust1sqlSrv14_OSDisk	Disk	East US
cust1sqlSrv14Nic	Network interface	East US
cust1Vnet	Virtual network	East US
cust1webSrvAS	Availability set	East US
db1sql	Network security group	East US
fe1sql	Network security group	East US

Buttons: Delete, Cancel