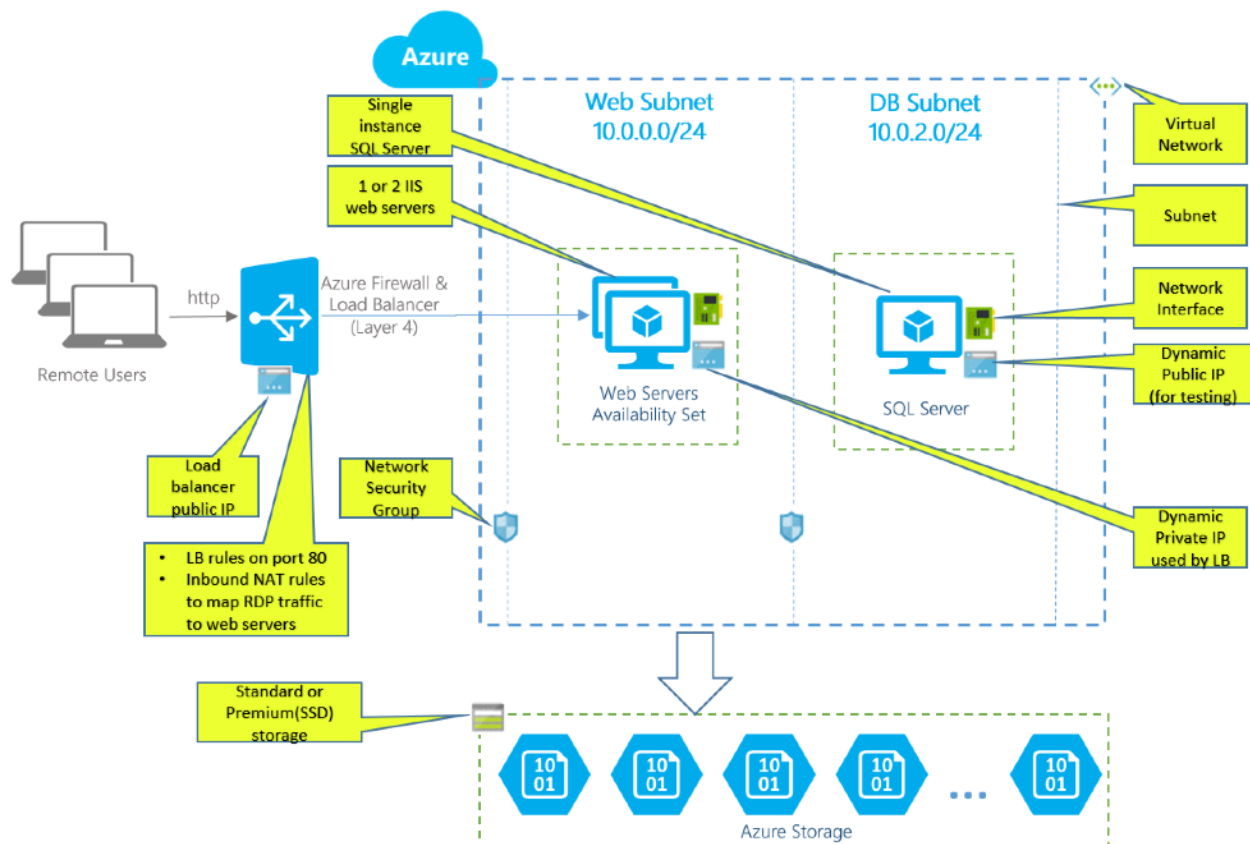


## Azure Resource Manager Template

### Step 1

Architecture diagram for ARM Template



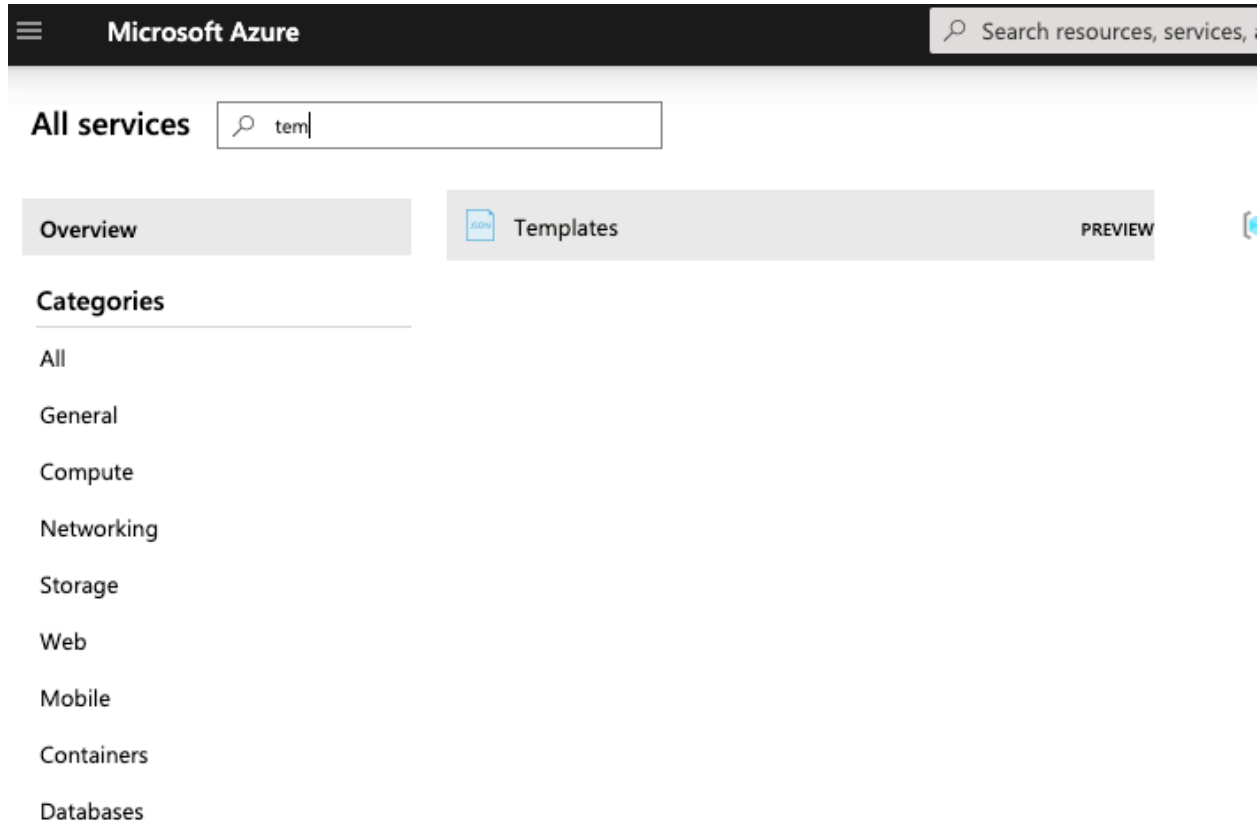
1 Availability Set for IIS servers.

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

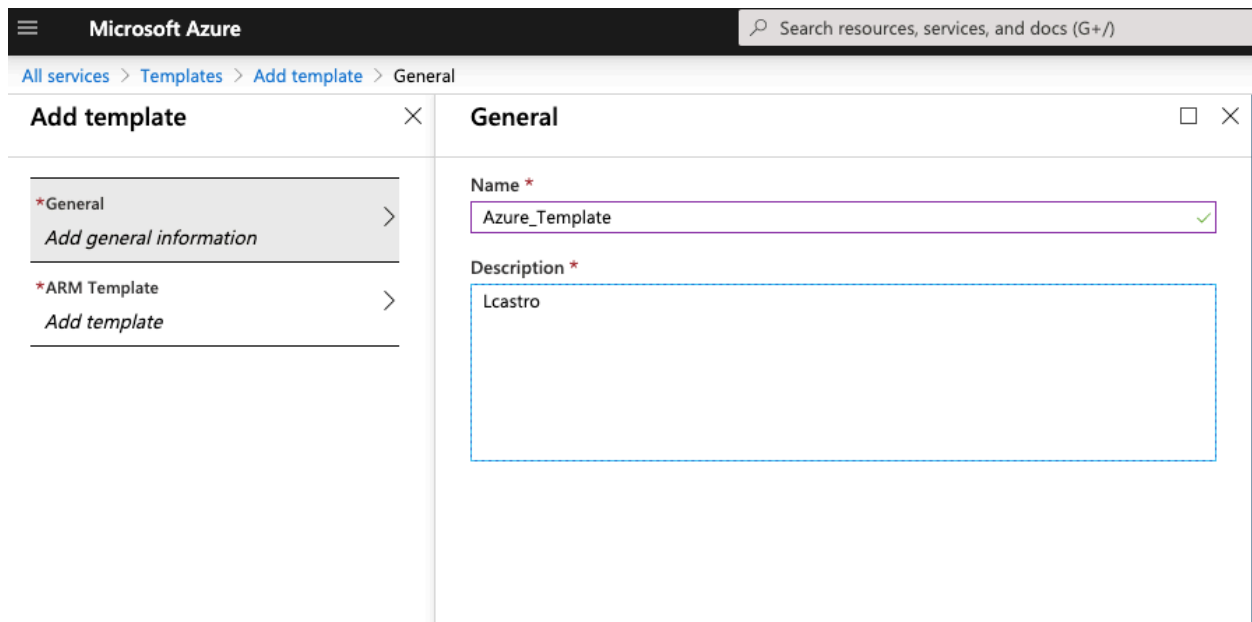
Eg: Azure\_Template\_Lcastro

Description:

Username

Eg: Lcastro

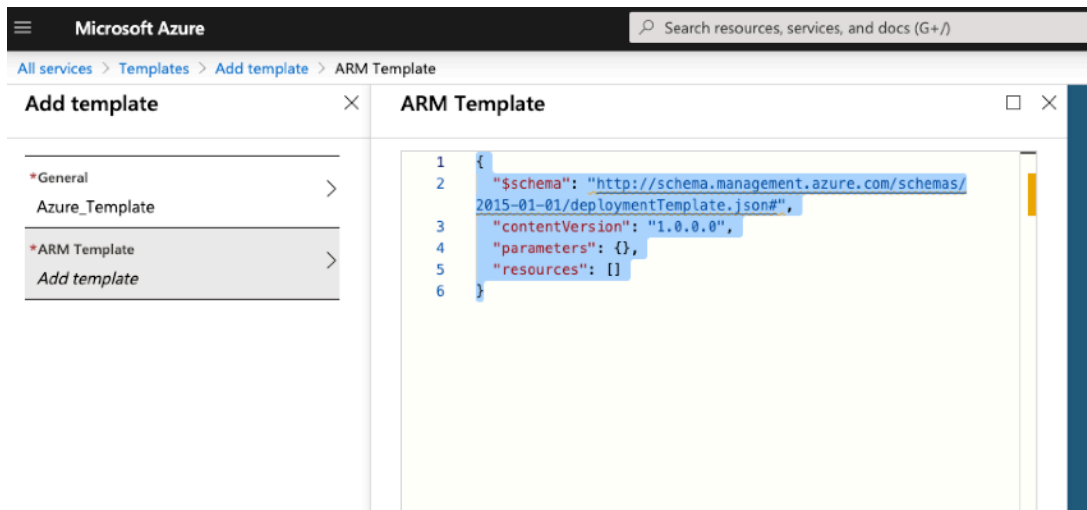
Click Ok



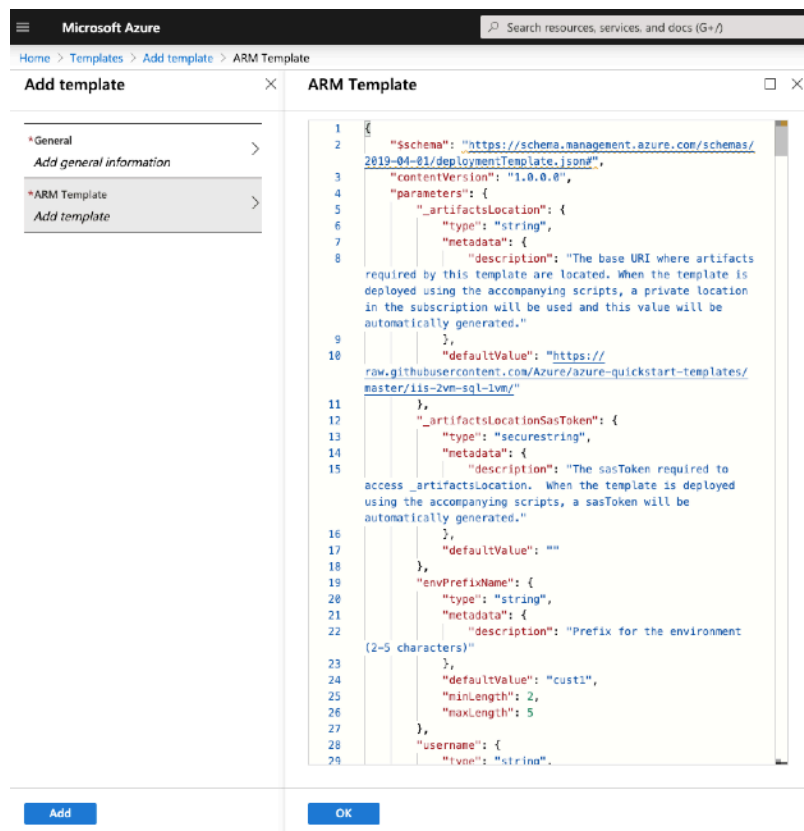
The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar with the text "Search resources, services, and docs (G+/)". Below the search bar, the breadcrumb navigation reads "All services > Templates > Add template > General". The main content area is titled "Add template"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

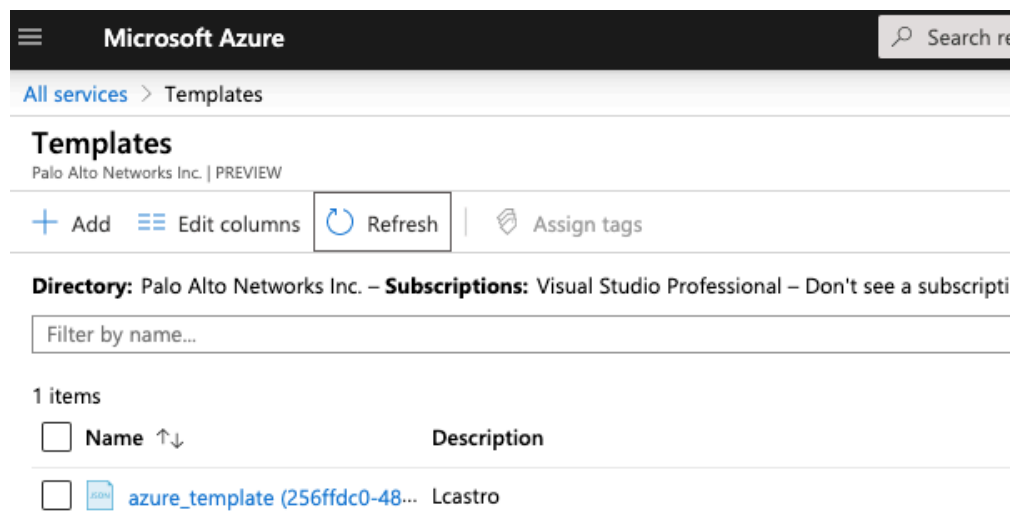


Click Ok and then Add

Agree Terms and Conditions > Purchase



Validate Template is loaded and Click on the Name



## 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**

Microsoft Azure

Search resources, services, and docs (G+)

All services > Templates > azure\_template > Custom deployment

Custom deployment

Deploy from a custom 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

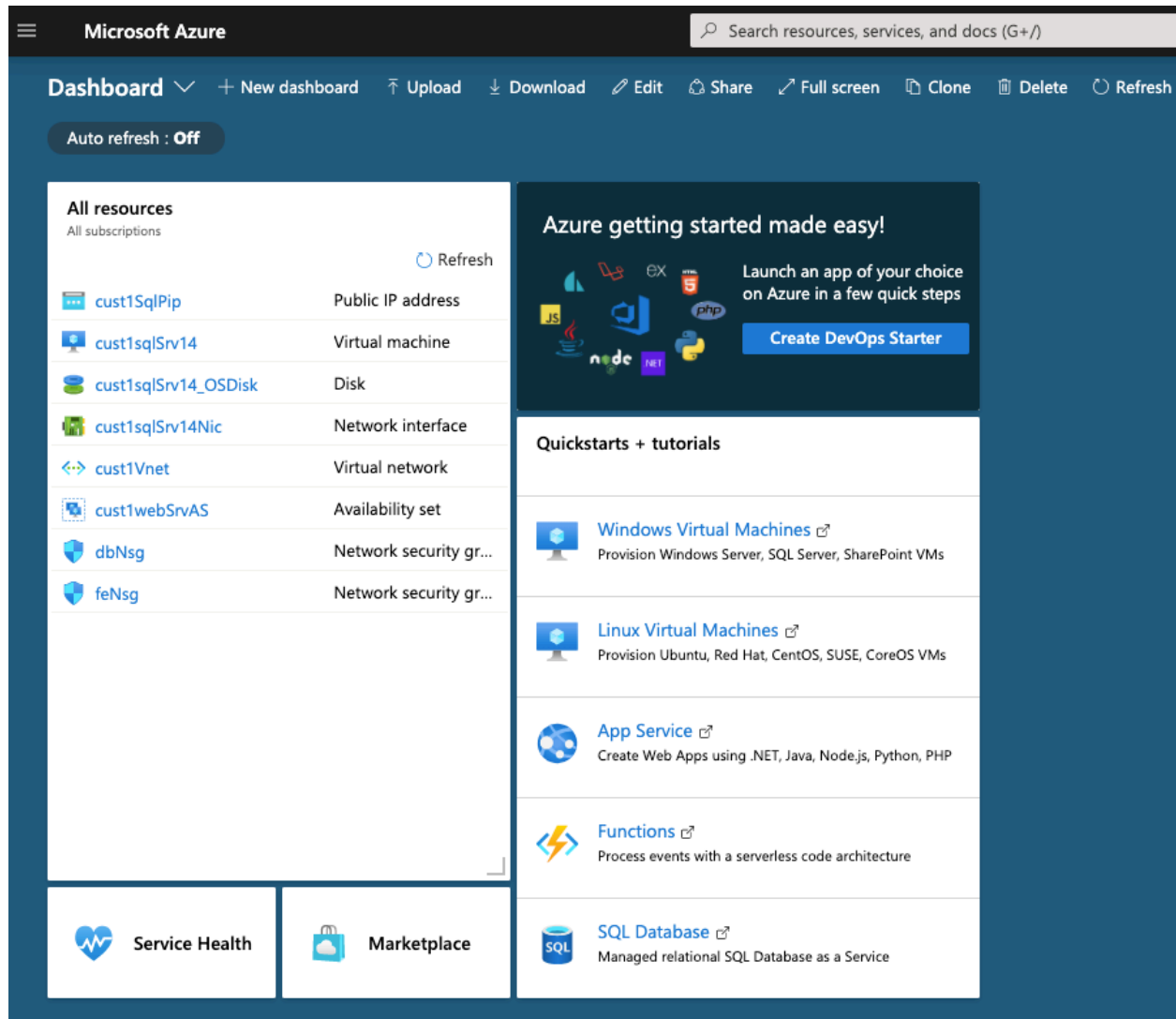
By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated with the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until 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, including a Public IP address, a Virtual machine, a Disk, a Network interface, a Virtual network, an Availability set, and two Network security groups. To the right, there's a "Quickstarts + tutorials" section with links to Windows Virtual Machines, Linux Virtual Machines, App Service, Functions, and SQL Database. At the bottom, there are links to Service Health and Marketplace.

**Microsoft Azure**

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

**Dashboard** ▾ + New dashboard ↑ Upload ↓ Download ✎ Edit 🔄 Share ↗ Full screen 📄 Clone 🗑 Delete ↻ Refresh

Auto refresh : Off

**All resources**  
All subscriptions

Refresh

cust1SqlPip	Public IP address
cust1sqlSrv14	Virtual machine
cust1sqlSrv14_OSDisk	Disk
cust1sqlSrv14Nic	Network interface
cust1Vnet	Virtual network
cust1webSrvAS	Availability set
dbNsg	Network security gr...
feNsg	Network security gr...

**Azure getting started made easy!**

Launch an app of your choice on Azure in a few quick steps

[Create DevOps Starter](#)

**Quickstarts + tutorials**

- Windows Virtual Machines** ↗  
Provision Windows Server, SQL Server, SharePoint VMs
- Linux Virtual Machines** ↗  
Provision Ubuntu, Red Hat, CentOS, SUSE, CoreOS VMs
- App Service** ↗  
Create Web Apps using .NET, Java, Node.js, Python, PHP
- Functions** ↗  
Process events with a serverless code architecture
- SQL Database** ↗  
Managed relational SQL Database as a Service

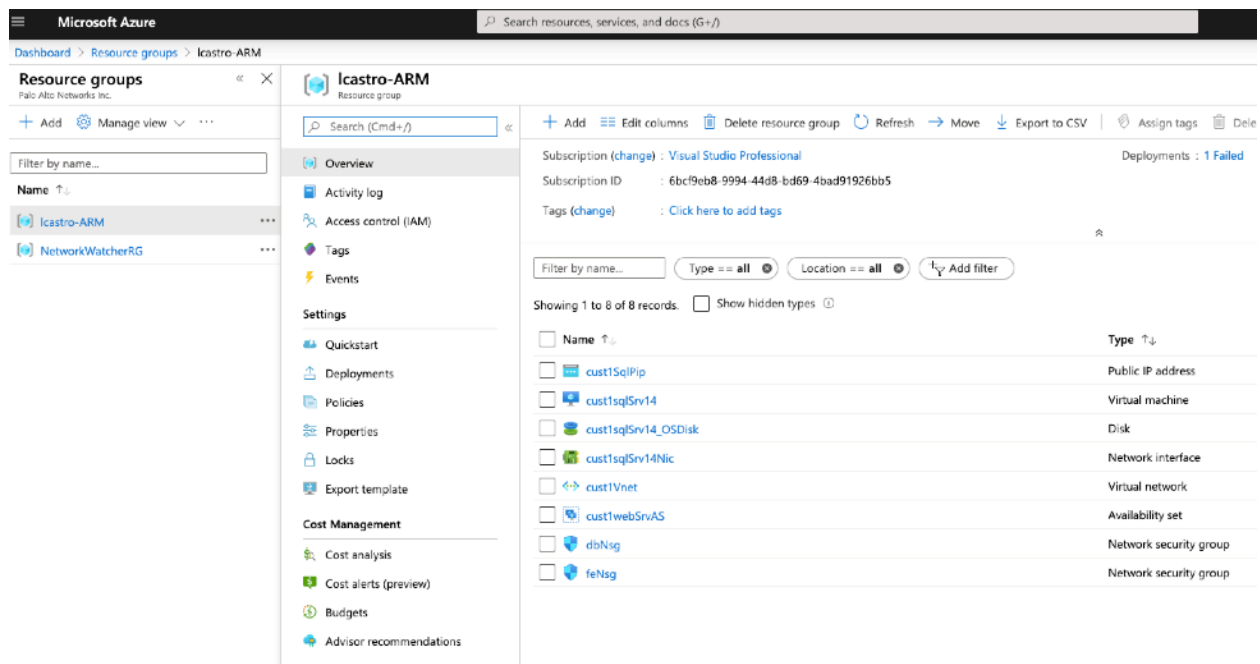
**Service Health** **Marketplace**

## 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.



The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the 'Microsoft Azure' logo and a search bar. The breadcrumb trail indicates the path: Dashboard > Resource groups > Icastro-ARM. The left sidebar, titled 'Resource groups', shows a list of resource groups: 'Icastro-ARM' (selected) and 'NetworkWatcherRG'. The main content area displays the 'Icastro-ARM' resource group details. The 'Overview' tab is active, showing the subscription name 'Visual Studio Professional', the subscription ID '6bc9eb8-9994-44d8-bd69-4bad91926bb5', and the deployment status '1 Failed'. Below this, there is a table of resources within the group. The table has columns for 'Name' and 'Type'. The resources listed are:

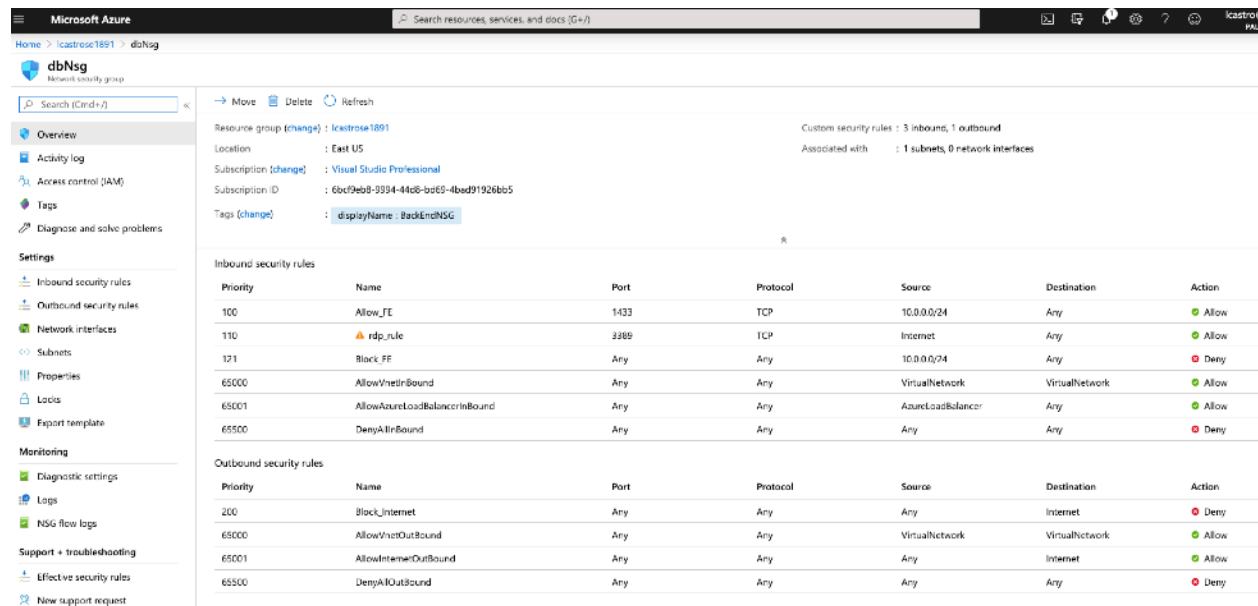
Name	Type
cust1SqlIpp	Public IP address
cust1sqlSrv14	Virtual machine
cust1sqlSrv14_OSDisk	Disk
cust1sqlSrv14Nic	Network interface
cust1Vnet	Virtual network
cust1webSrvAS	Availability set
dbNsg	Network security group
feNsg	Network security group



## 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.



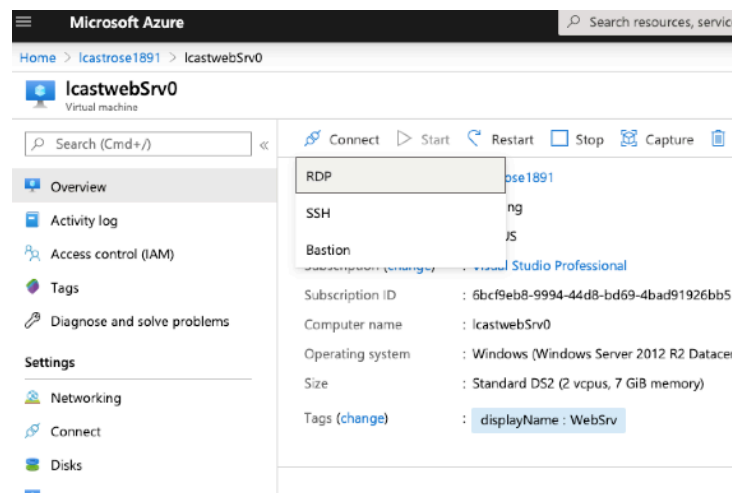
The screenshot shows the Microsoft Azure portal interface for the 'dbNsg' Network security group. The left sidebar contains navigation options like Overview, Activity log, Access control (IAM), Tags, and Settings. The main pane displays the 'dbNsg' details, including its location (East US), subscription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

Priority	Name	Port	Protocol	Source	Destination	Action
100	Allow_I_E	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 options like Overview, Activity log, Access control (IAM), Tags, and Settings. The main pane displays the 'IcastwebSrv0' details, including its location (East US), subscription (Visual Studio Professional), and associated subnets. Below this, there are two tables: 'Inbound security rules' and 'Outbound security rules'.

Priority	Name	Port	Protocol	Source	Destination	Action
100	Allow_I_E	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

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

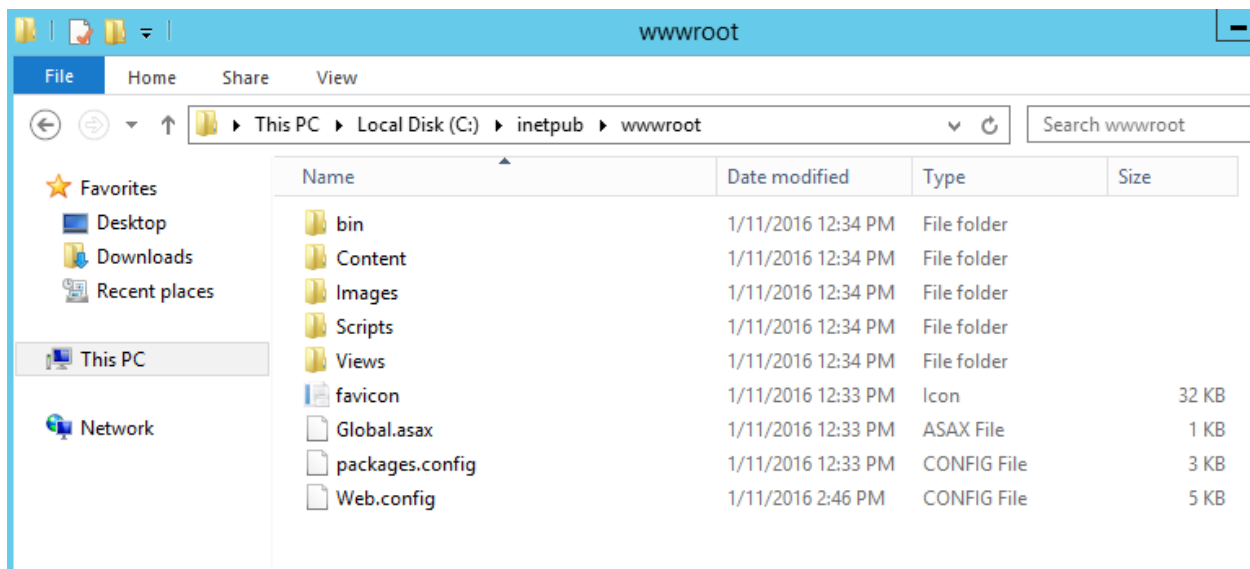
A sample ASP.NET Application content can be downloaded here:

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

Sample Database can be downloaded here :

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

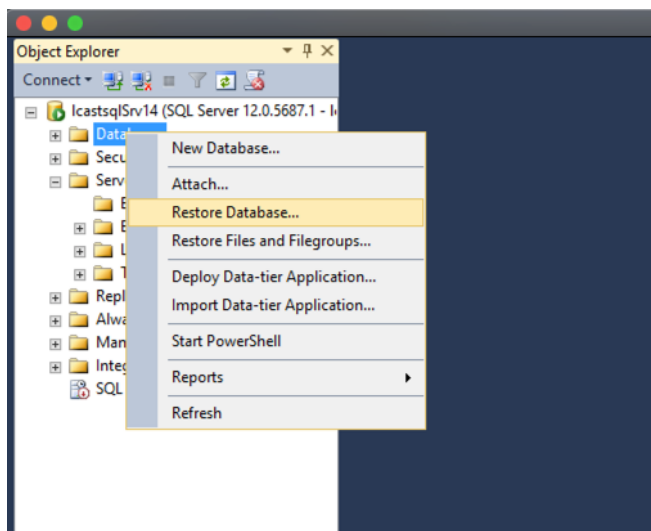
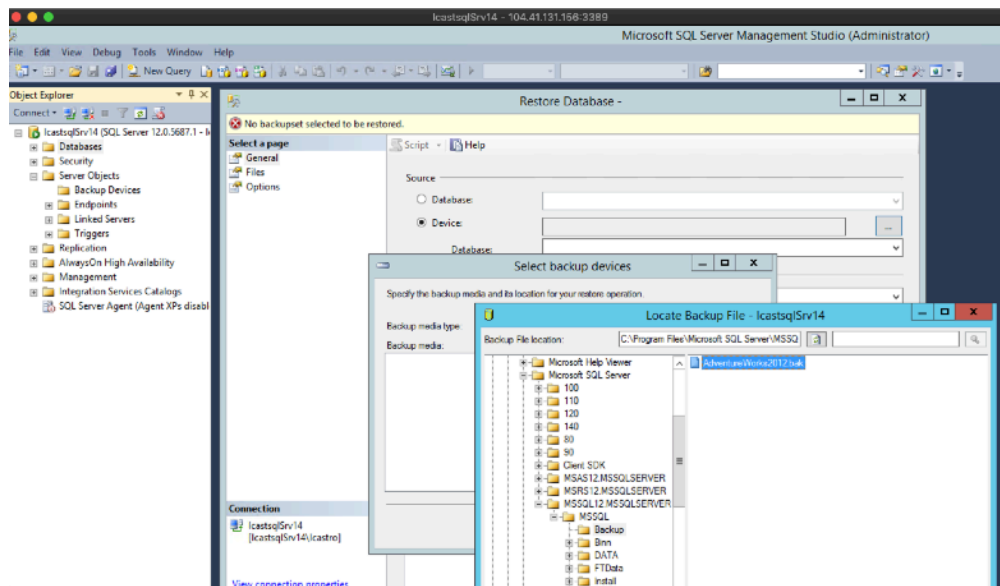
Once you download application content onto app server extract the .zip file and copy the content and past in C:\inetpub\wwwroot.



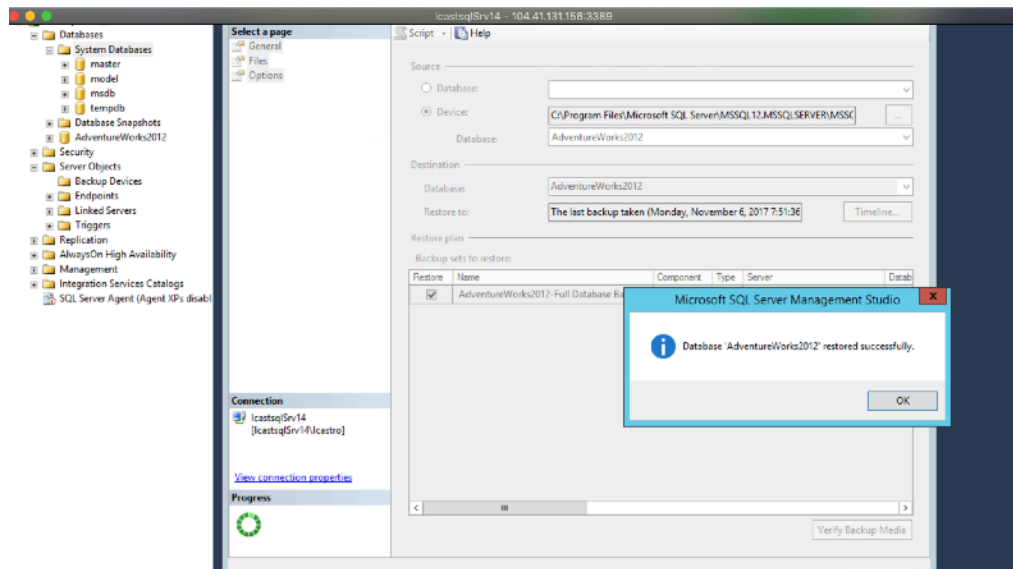
## Step 8

Open Database Server, and Open SQL Server Management Studio 2014 login with Windows Authentication for restoring the AdventureWorks2012 database.

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

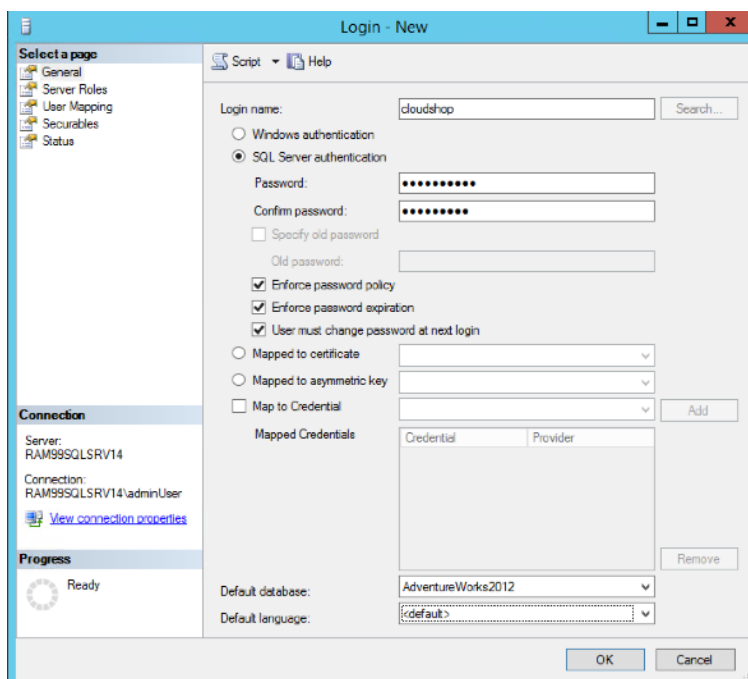


## Restoring Backup database file

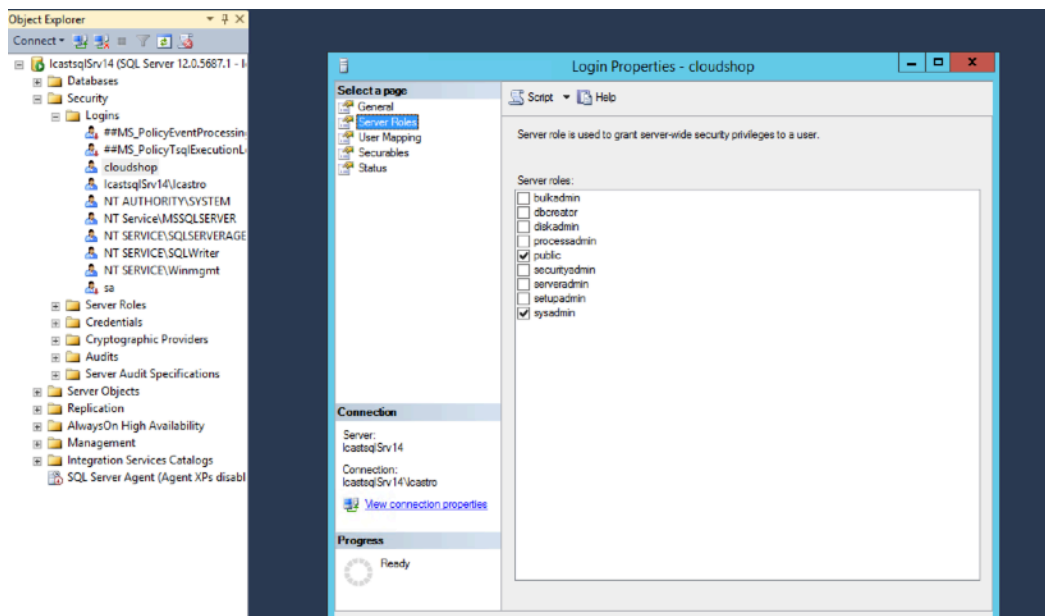


In object explorer go to Security section and Login subsection Right Click and New Login and create a user with SQL Server authentication and in the default database select as AdventureWorks2012

## Create a login user

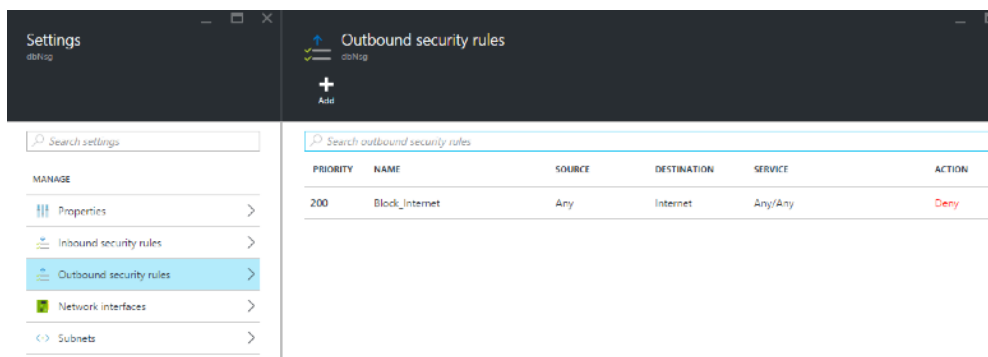


On Left side you have Server Roles -> Select public and sysadmin and check in User Mapping whether public is selected or not and click OK



So till now we have an application content in appserver and database in Database Server. Finally 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:

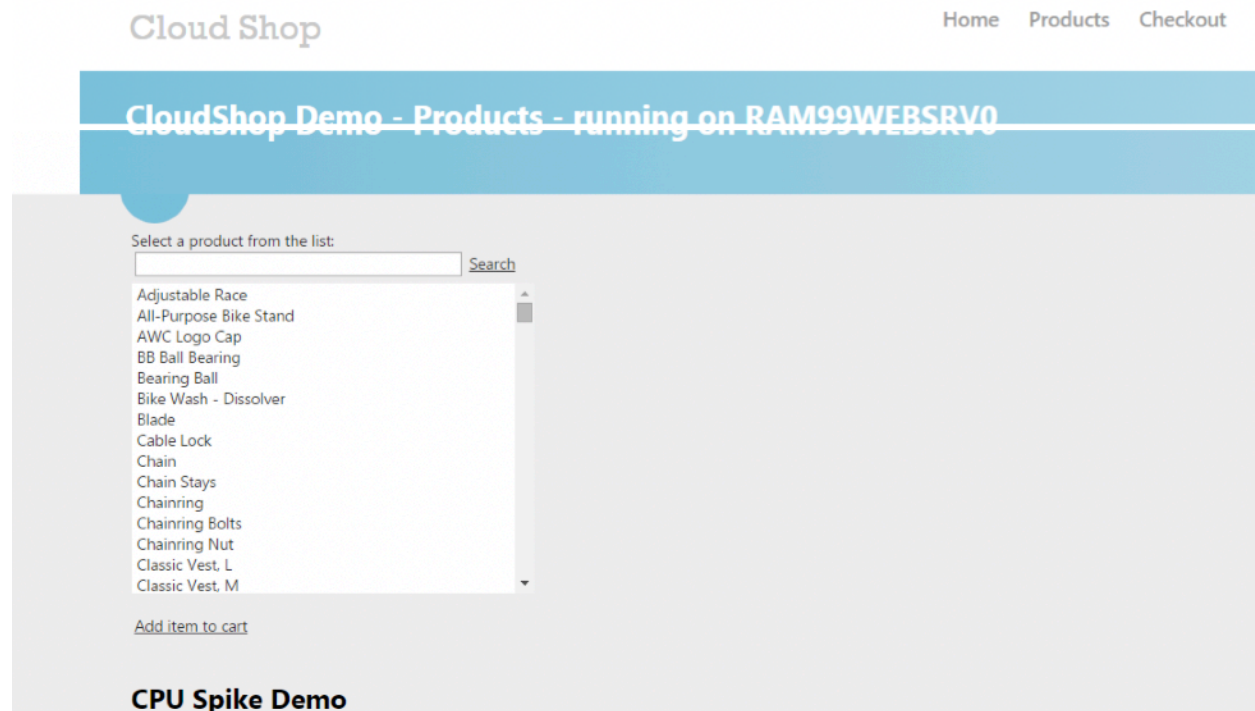
```
<add name="AdventureWorksEntities" connectionString="metadata=res://*/
Models.AdventureWorks.csdl;res://*/Models.AdventureWorks.ssdl;res://*/
Models.AdventureWorks.msl;provider=System.Data.SqlClient;provider connection
string='Data Source=tcp:{SQL Server Private IP},1433;Initial
Catalog=AdventureWorks2012;Uid={DB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

The screenshot shows the Microsoft Azure portal interface. On the left, the 'Resource groups' list includes 'Icastrose-ARM'. The main pane displays the details for the 'Icastrose-ARM' resource group, including its subscription and tags. The 'Delete resource group' button is highlighted. On the right, a confirmation dialog is open, asking 'Are you sure you want to delete "Icastrose-ARM"?'. The dialog includes a warning that deleting the resource group is irreversible and lists the affected resources.

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
dbNsg	Network security group	East US
feNsg	Network security group	East US