Deployment of KEMP LoadMaster on Microsoft Azure

Lab Guide

February 2016

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Overview

In this lab, you will configure a KEMP Virtual LoadMaster (VLM) for Azure as a layer 7 content switch. By examining application requests using pattern matching, the LoadMaster will direct traffic to the appropriate Azure PaaS applications.

This document will provide detailed step-by-step instructions that will guide you through the installation of a Kemp Server Appliance on Microsoft Azure assuming an Azure subscription has already been created. The scenarios covered are:

- Setup of the KEMP LoadMaster Appliance
- Creation of a Web App
- Creation of a Java App
- Creation of a KEMP ID for the BYOL (Bring Your Own License)
- Configuration of the KEMP LoadMaster Appliance
- Testing, Validation, and Real-time stats observation

Requirements

- Microsoft Azure Subscription
- KEMP ID (created during lab, if needed)

Technical Support

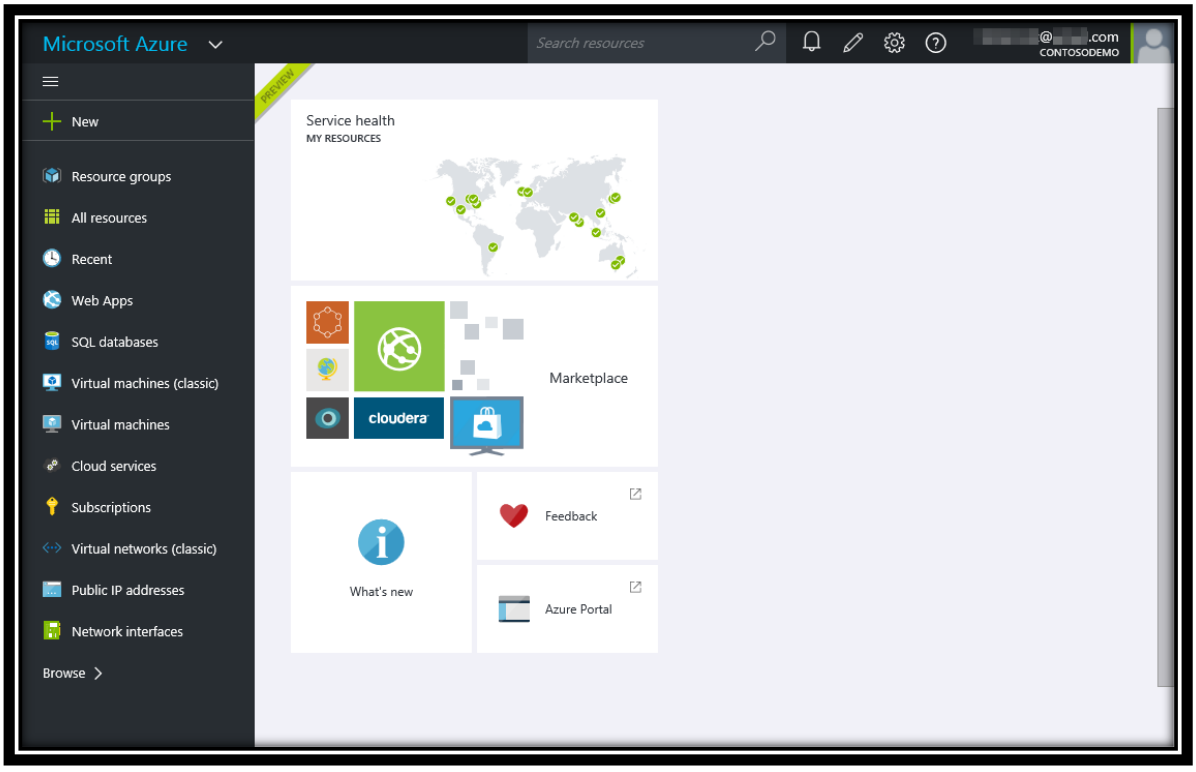
Having trouble with this lab or have a question? Please contact SuperHuman_Help@microsoft.com for technical assistance.

Exercise 1: Environment Setup

In this exercise, you will setup your KEMP LoadMaster Appliance environment for use throughout the rest of the exercises. This will involve logging into Azure, then creating the KEMP Appliance and two Web Apps for use in the configuration of the Appliance.

Task 1: Create the KEMP Load Master

1. Go to the Azure portal (**http://portal.azure.com/**), after entering your credentials, the following screen will display:

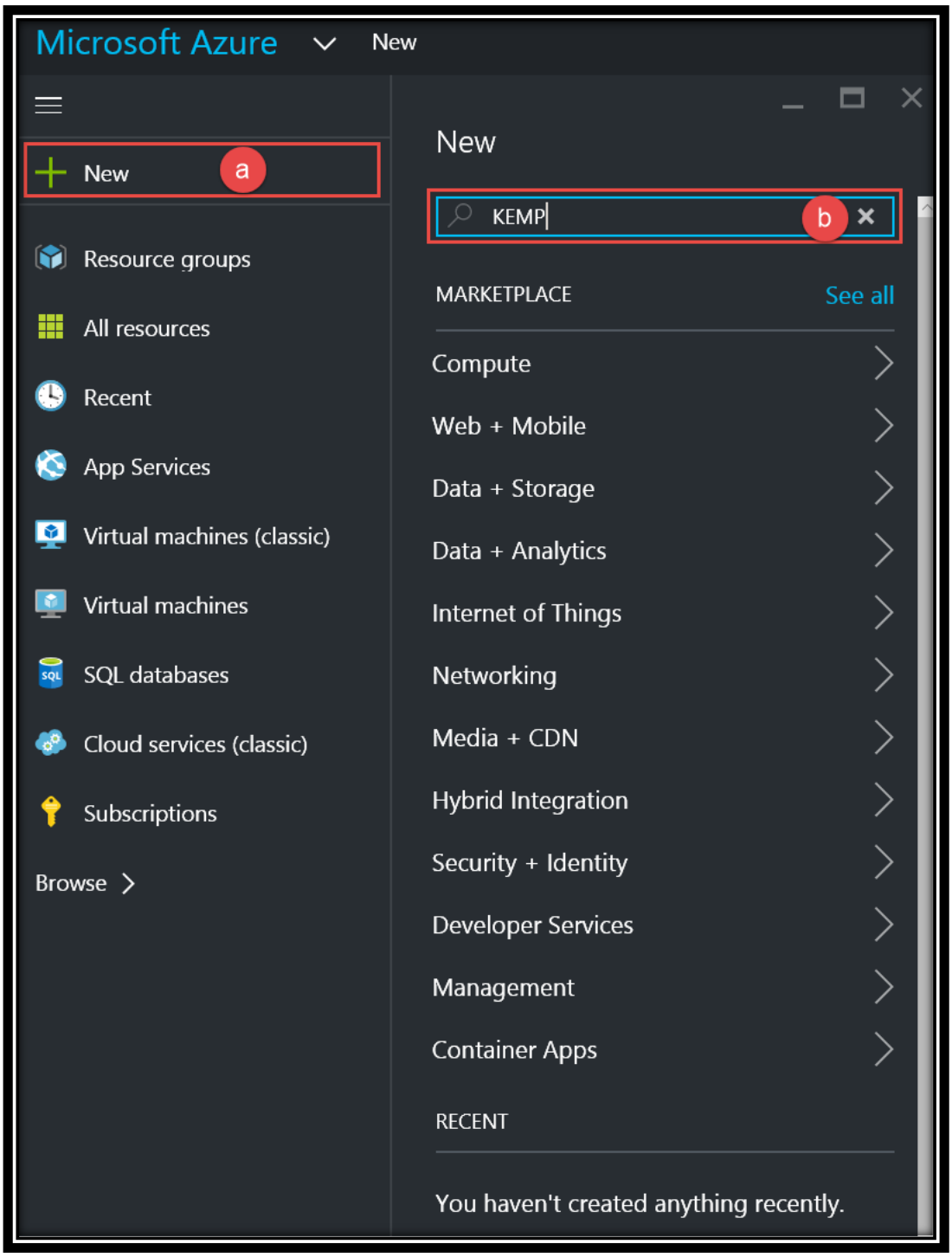


Azure Portal

2. Create the KEMP Appliance

    a. Click the **+ New** option in the left pane

    b. In the search box type in "**KEMP**" and hit enter.

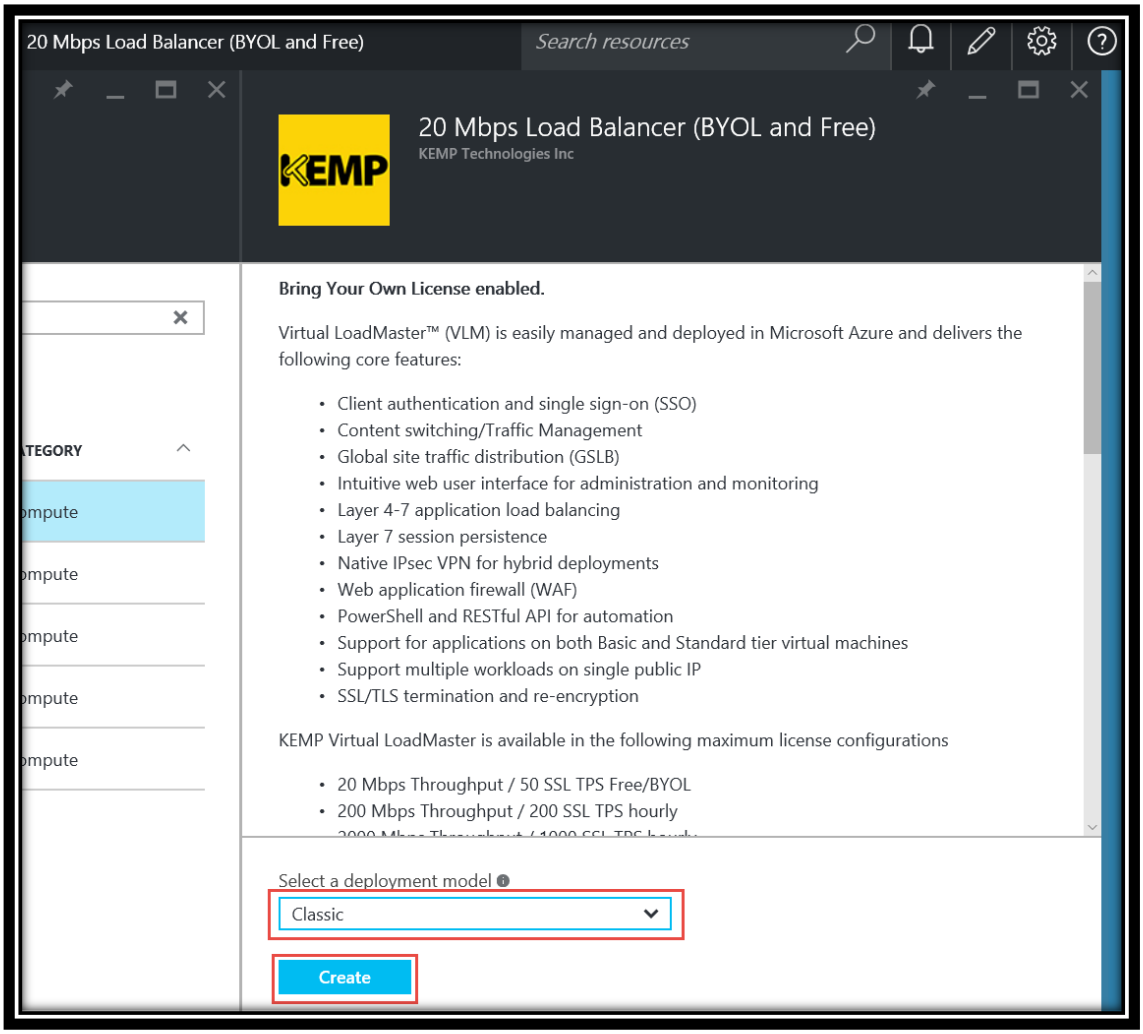


Negotiating Azure Portal

3. Click **20 Mbps Load Balancer (BYOL and Free)** in the results.

Locating KEMP BYOL and Free in the Marketplace

4. After clicking on **20 Mbps Load Balancer (BYOL and Free)**, modify the Deployment Model dropdown to read **Classic** and click on **Create**.



KEMP LoadMaster Appliance VM Creation

5. In the creation process of the KEMP LoadMaster Appliance, enter **Host Name**, **User name**, and **Password**. For the purpose of this exercise, we used:

    i. Host Name = *KEMPsite*

    NOTE: This Host Name must be unique. Make sure to receive the green check mark when typing the host name indicating uniqueness before continuing. Add four numbers at the end if needed. Example: KEMPsite6565

    ii. User name = *LMAdmin*

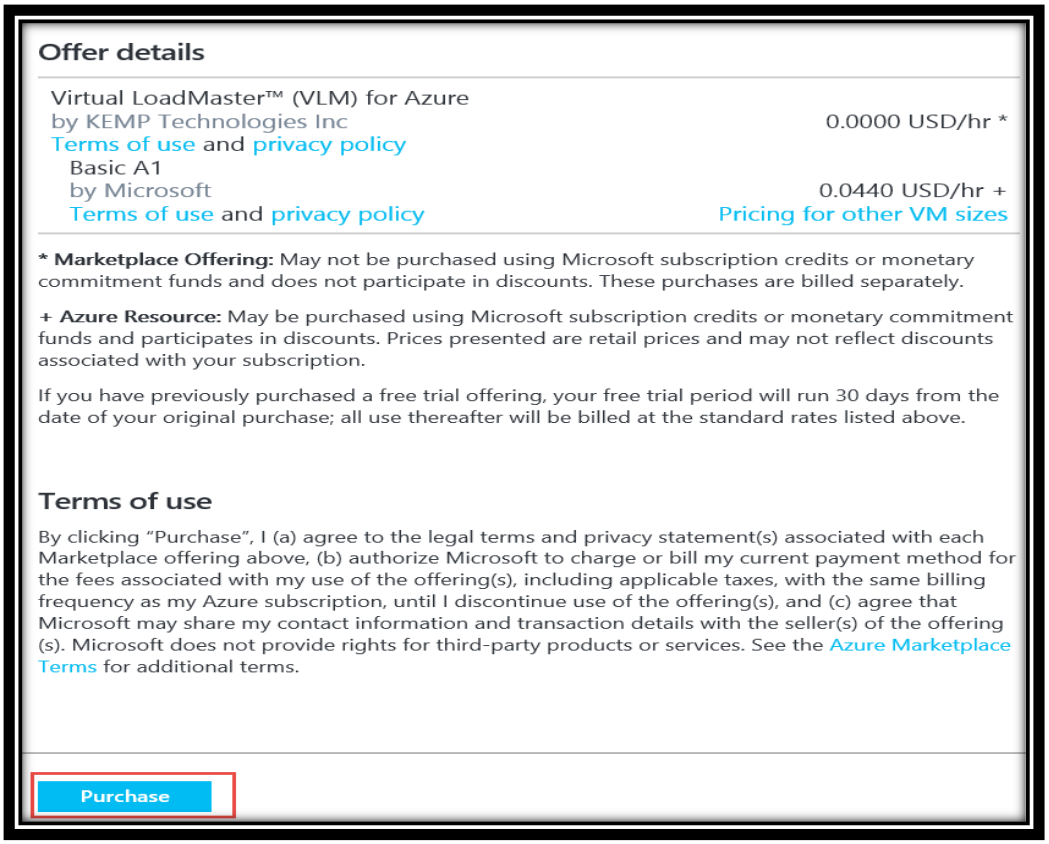
    iii. Password = *demo@pass1*

    NOTE: User Name LMAdmin not used for the lab, but is a required field when creating the device. The default login user that will be used is *bal*

6. Choose **Basic A1** for Pricing Tier

    NOTE: You might have to click on View All to see the Basic Pricing Options

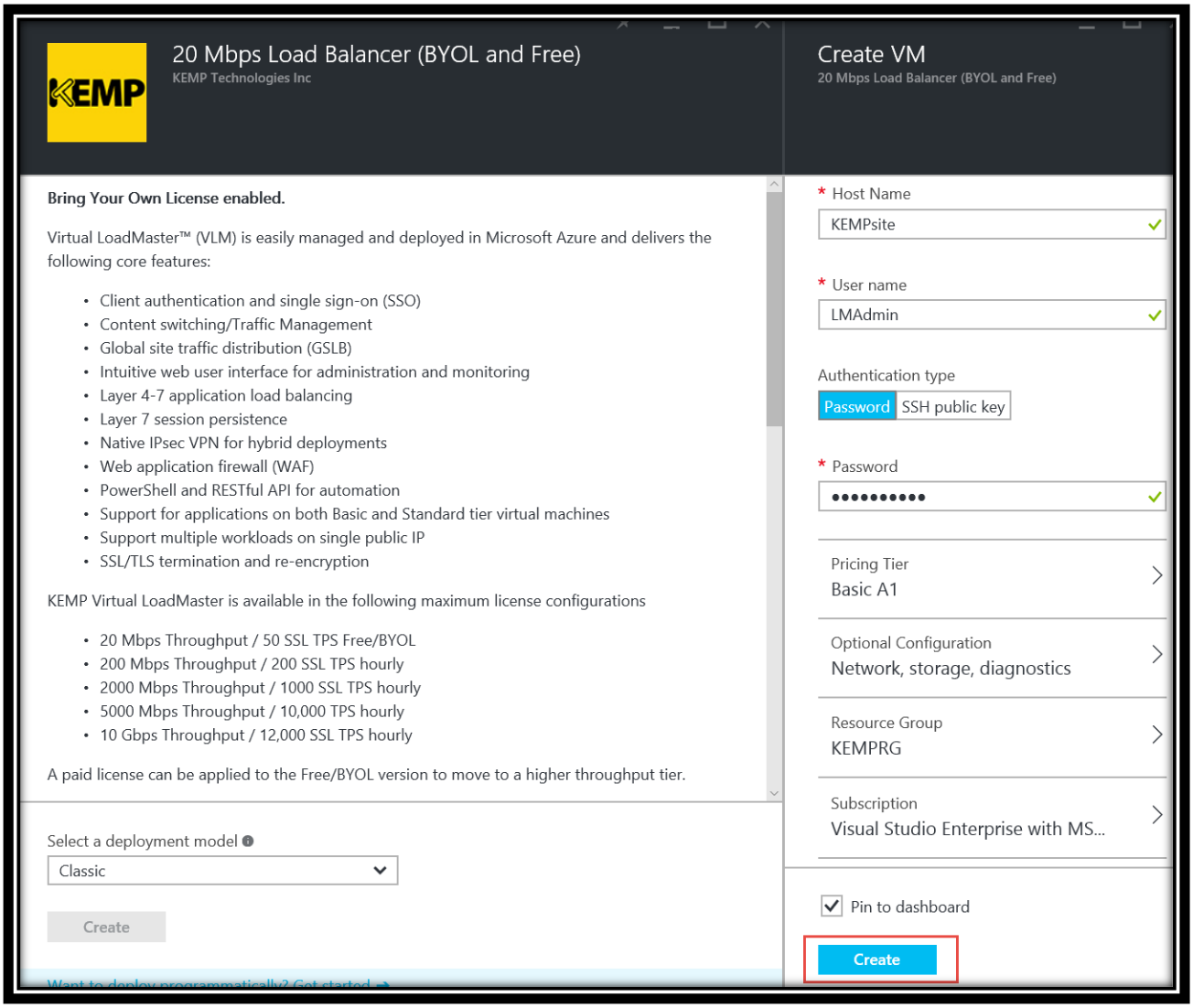
7. Leave **Networking** settings at the Defaults
8. Resource Group: **Create a new resource group >** KEMPRG
9. Review the **Legal Terms** and click **Purchase**.



Purchase KEMP LoadMaster Appliance BYOL

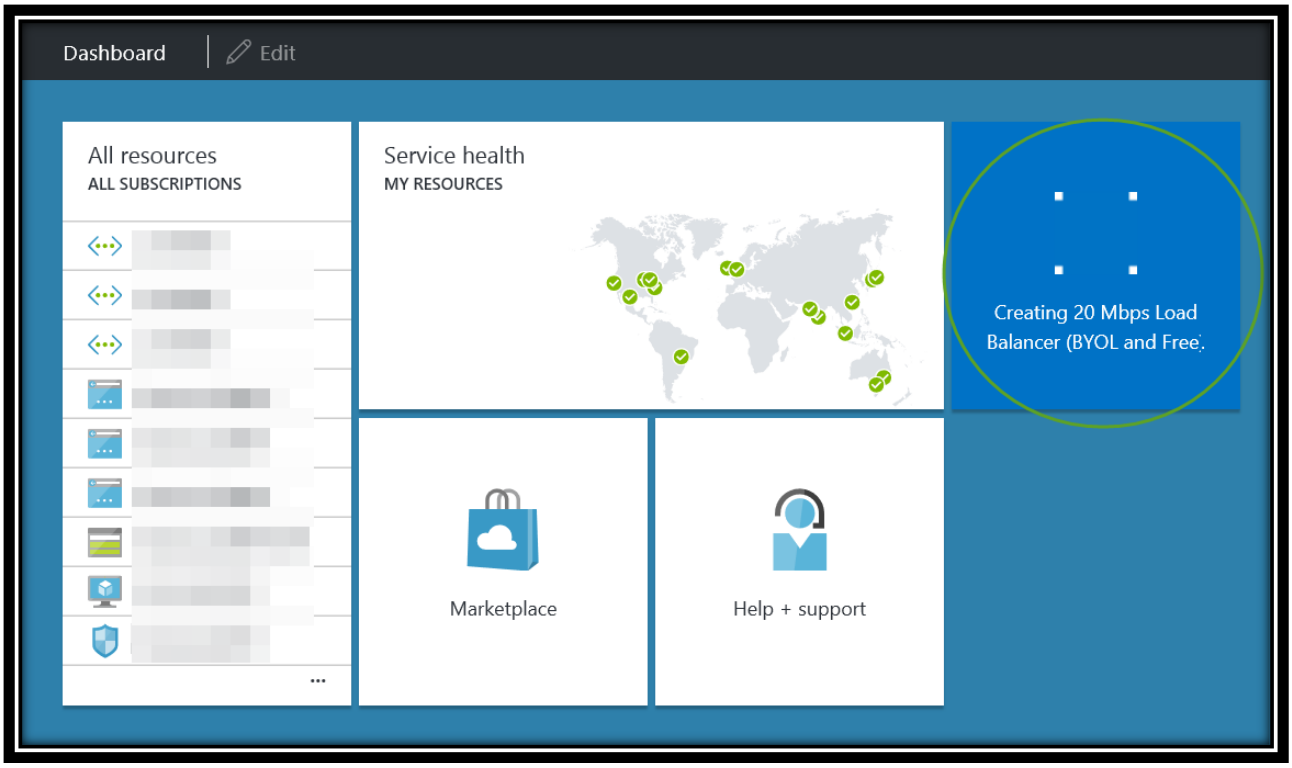
NOTE: When you click on the Purchase button, it will take you back to the Azure Preview portal where you will finish creation of the VM.

10. Click on the **Create** button.



KEMP LoadMaster Appliance VM Creation

NOTE: When you click on the *Create* button, it will take you back to the Azure portal where you will see the VM for KEMP LoadMaster being created.

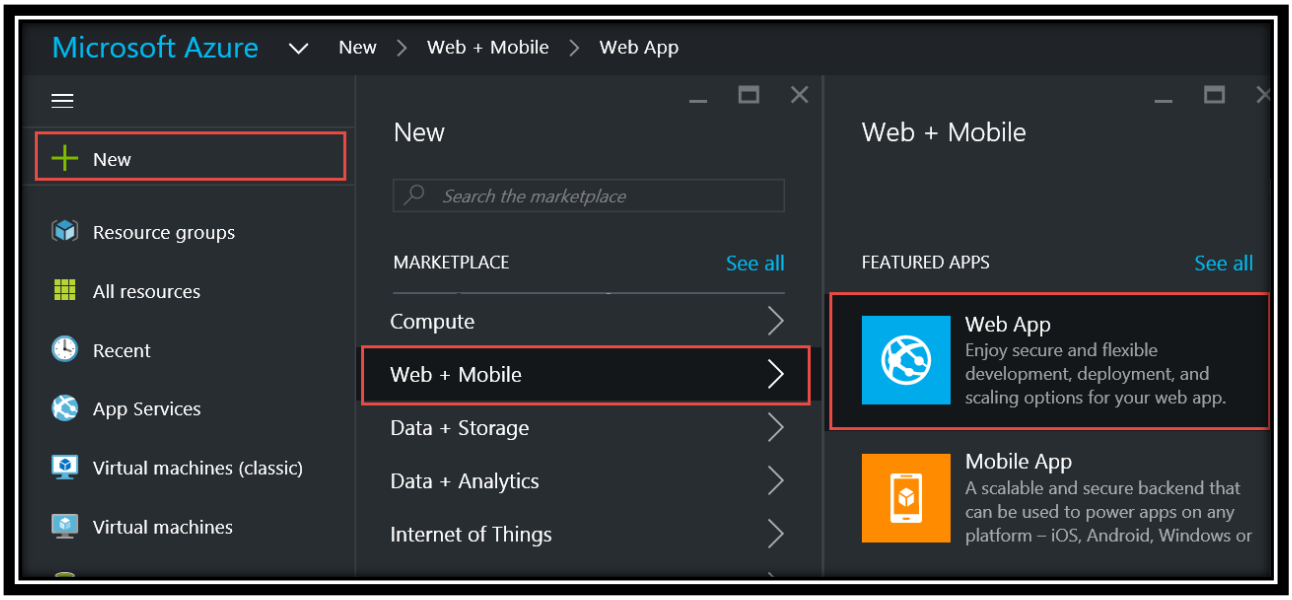


Azure Preview portal creating KEMP LoadMaster Appliance BYOL VM

NOTE: While the VM creation is completing, continue with Task 2 and Task 3 to create the Web Apps

Task 2: Create First Web App

1. **+ New** > **Web + Mobile** > **Web App**

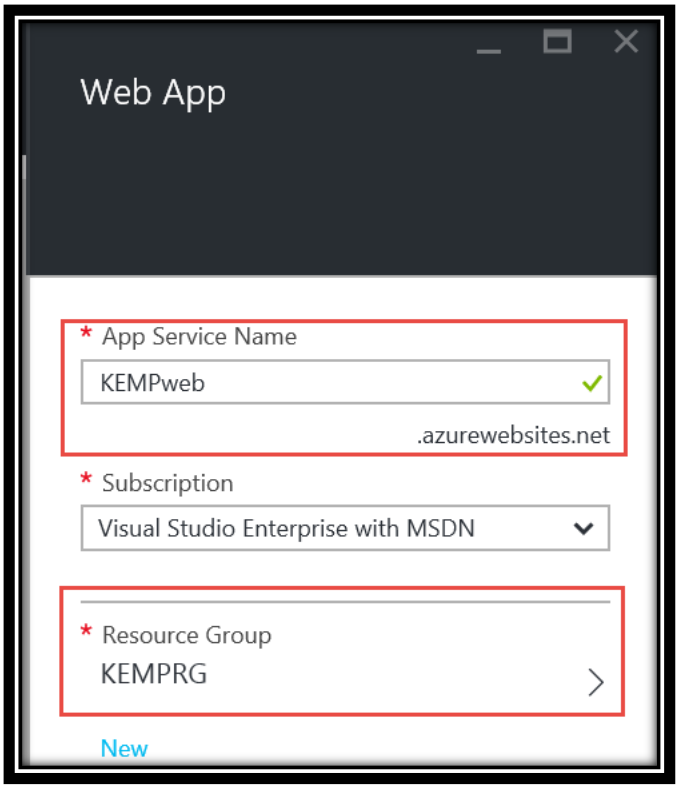


Creation of Web App

2. Give it a name: **KEMPweb**

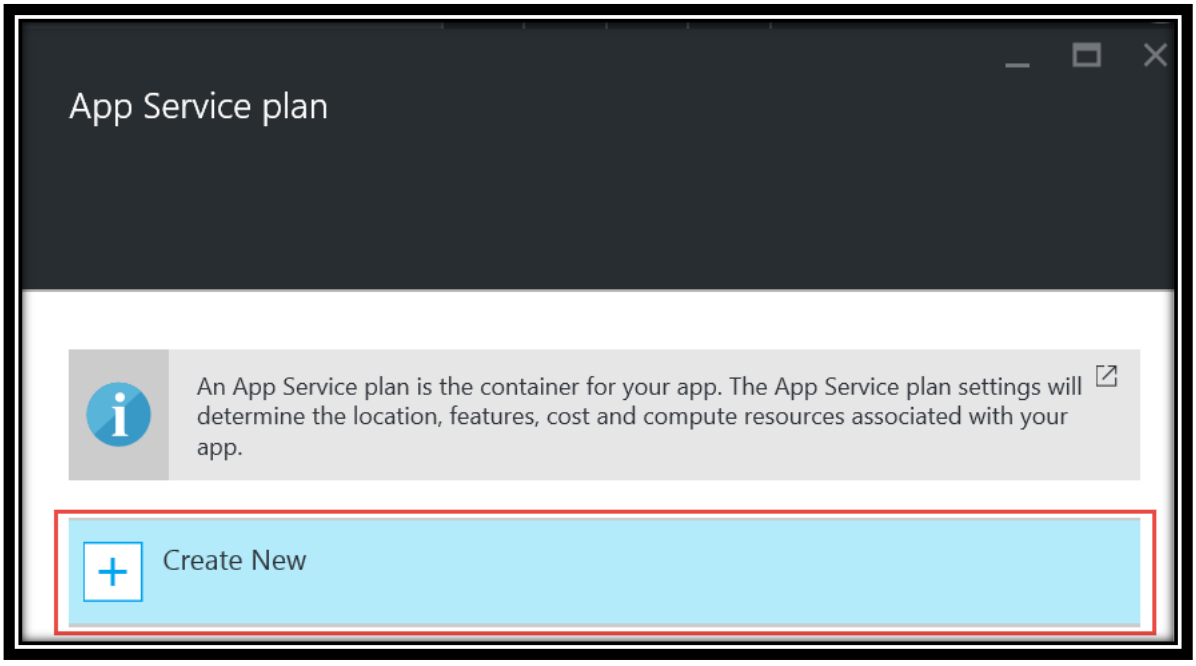
NOTE: This App Service Name must be unique. Make sure to receive the green check mark when typing the App Service Name indicating uniqueness before continuing. Add four numbers at the end if needed. Example: KEMPweb6565

3. **KEMPRG** that was just created for **Resource Group**



Web App Properties

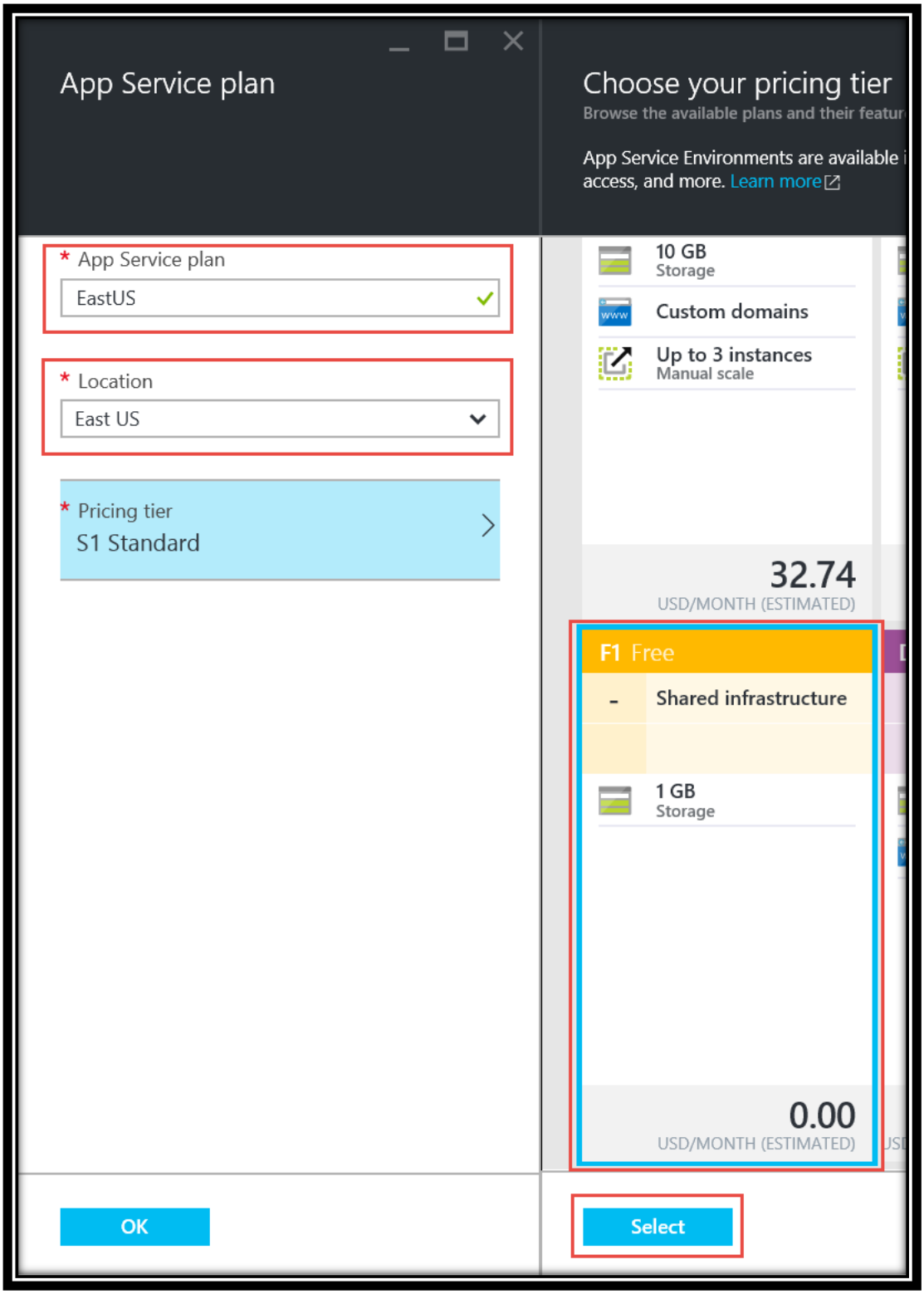
4. App Service plan/Location: **Create New**



Creating New App Service Plan

5. App Service Plan: **EastUS**

6. Location: **East US**
7. Pricing tier: **Show All** and find **F1 Free**
8. Click the **Select** button
9. Click the **Create** button



Creation of First Web App in Azure Portal

Task 3: Create Second Web App

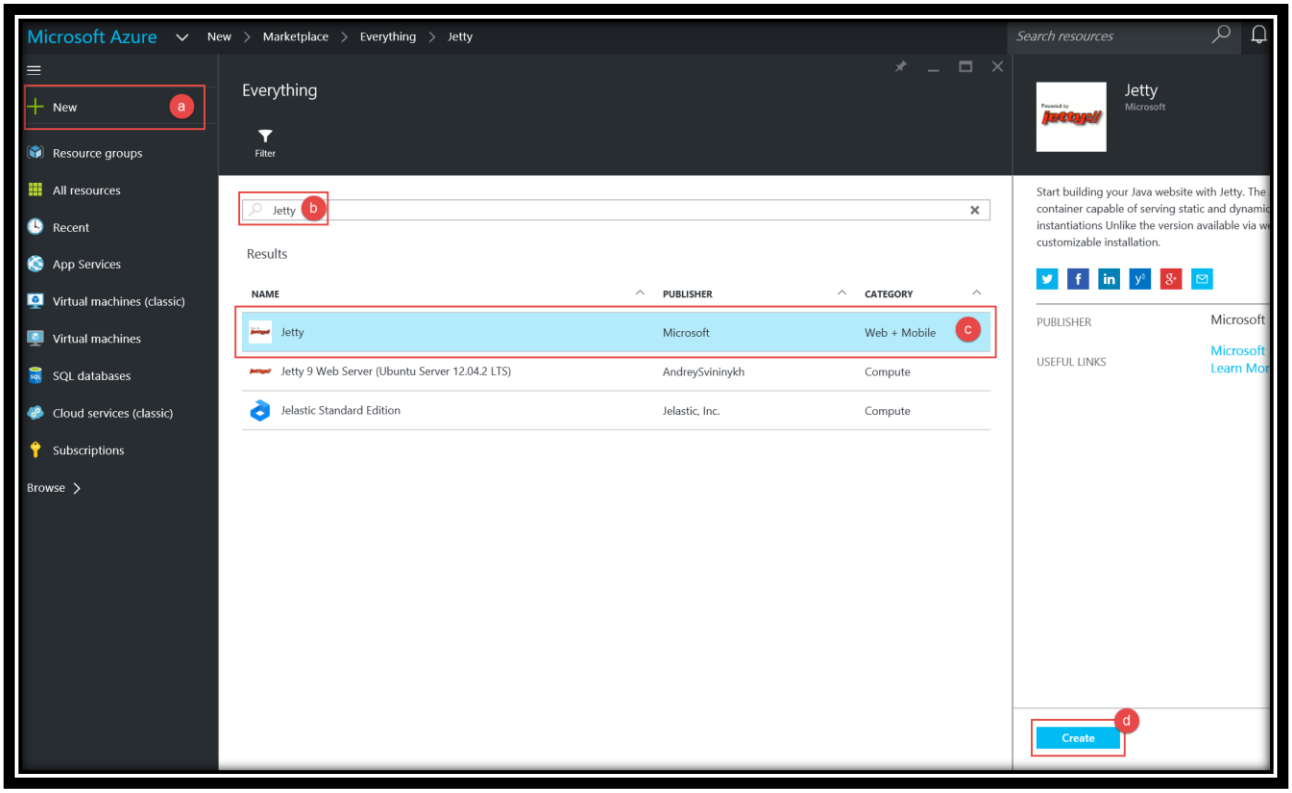
1. To create the Second Web App, follow the same steps from the first Web App with some modifications:

    a. **+ New**

    b. **Search** "**Jetty**"

    c. Select **Jetty Web + Mobile** resource

    d. Click the **Create** button



Create Java Web App

2. Give it a name: **KEMPjava**

NOTE: This App Service Name must be unique. Make sure to receive the green check mark when typing the App Service Name indicating uniqueness before continuing. Add four numbers at the end if needed. Example: KEMPjava6565

3. **KEMPRG** that was just created for **Resource Group**

4. App Service plan/Location: **Create New**

5. App Service Plan: **WestUS**
6. Location: **West US**
7. Pricing tier: **Show All** and find **F1 Free**
8. Click the **Select** button
9. Click the **Create** button

NOTE: Allow Time for Web Apps and Load Master to be created (approx. 10-15 minutes)

Exercise 2: LoadMaster Configuration

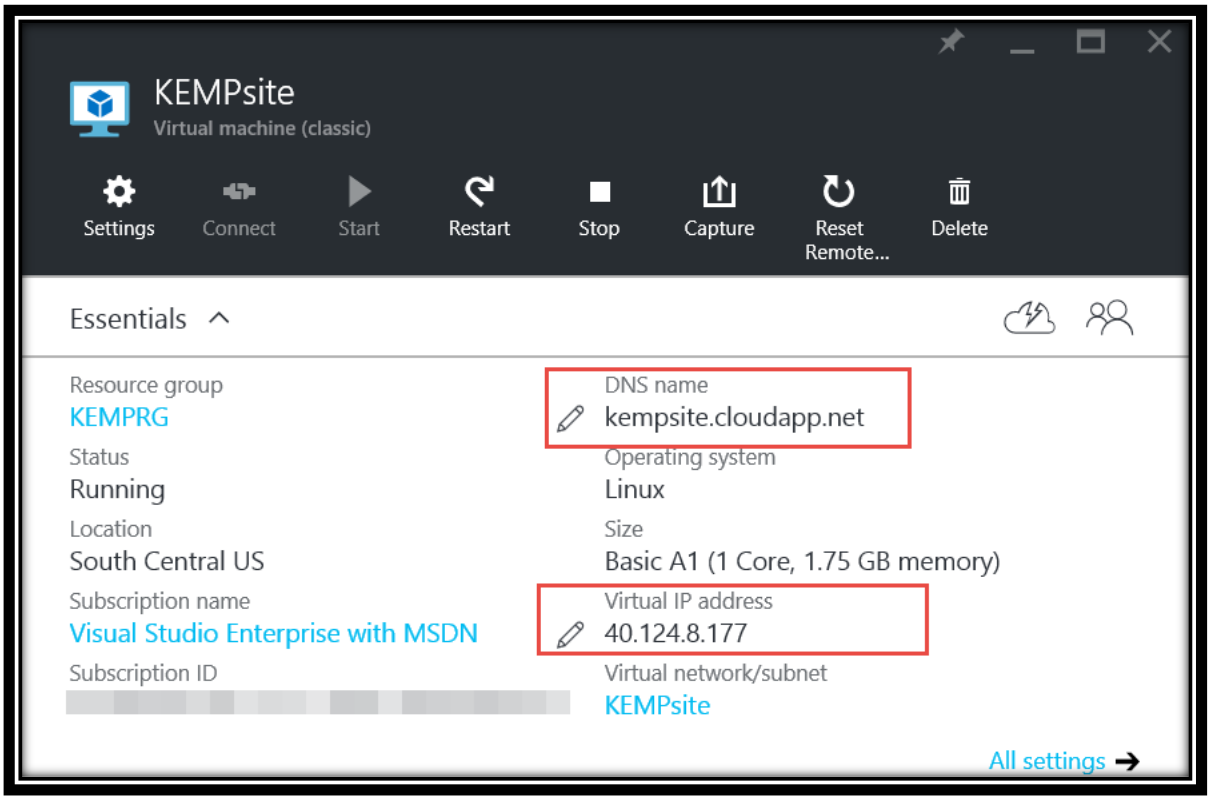
In this exercise, you will setup your KEMP LoadMaster Appliance via the KEMP Configuration Web Interface. This will involve gathering needed IP information, creating a KEMP ID (if needed), creating an endpoint, creating six content matching rules, enabling real servers, and creating a virtual service for the Appliance to use.

Task 1: Build a Table with Information needed for LoadMaster Configuration

1. Go to the Azure portal (**http://portal.azure.com/**) dashboard. The newly created VM and Web Apps are shown as tiles on the main page.

Azure Portal Dashboard Tiles

2. Click on the tile for the KEMPsite VM to access the properties of the newly created Load Master
3. Gather **Virtual IP address** and **DNS name** in the properties



DNS Name and Virtual IP address location for the KEMP Appliance

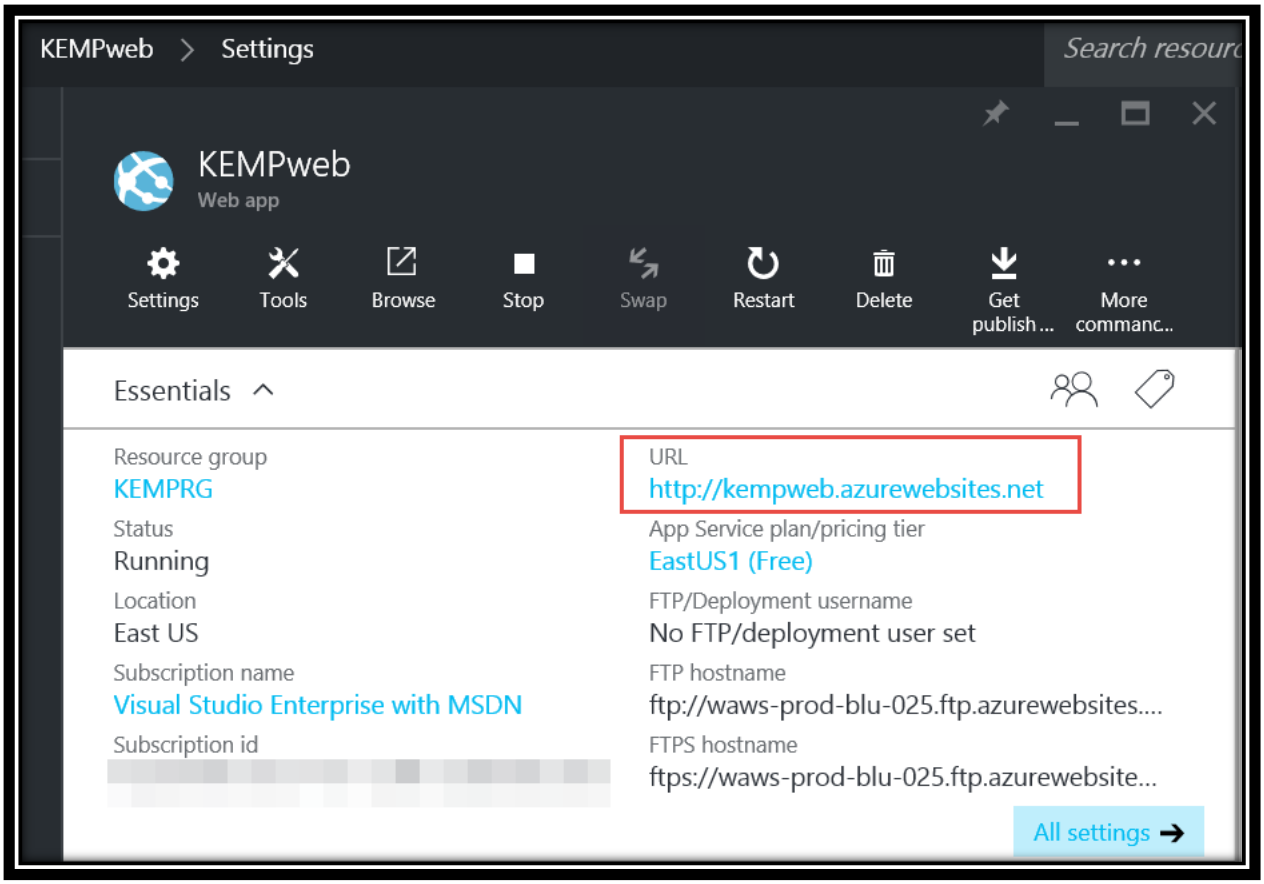
4. Write down **DNS name** and **IP address** of Load Master in the following table:

Service	IP Address	DNS Name
LoadMaster		
(Lab example)	40.124.8.177	Kempsite.cloudapp.net

Table for recording LoadMaster DNS Name and IP Address

NOTE: The IP address and DNS Name for the student's VM will be different. The second line is just for an example.

5. Return to the Azure Portal Dashboard and click on the **KEMPweb** Web App to display the properties
6. Make note of the **URL**



URL Location in the properties page of the KEMP Web App

7. Record the **URL** in the table below
8. Go into the **KEMPjava** web app properties and gather **URL** in the properties via the same method above
9. Record this **URL** in the table below

Service	IP Address	URL
KEMPweb		
(Lab example)	191.237.24.89	kempweb.azurewebsites.net
KEMPjava		
(Lab example)	104.40.92.107	kempjava.azurewebsites.net

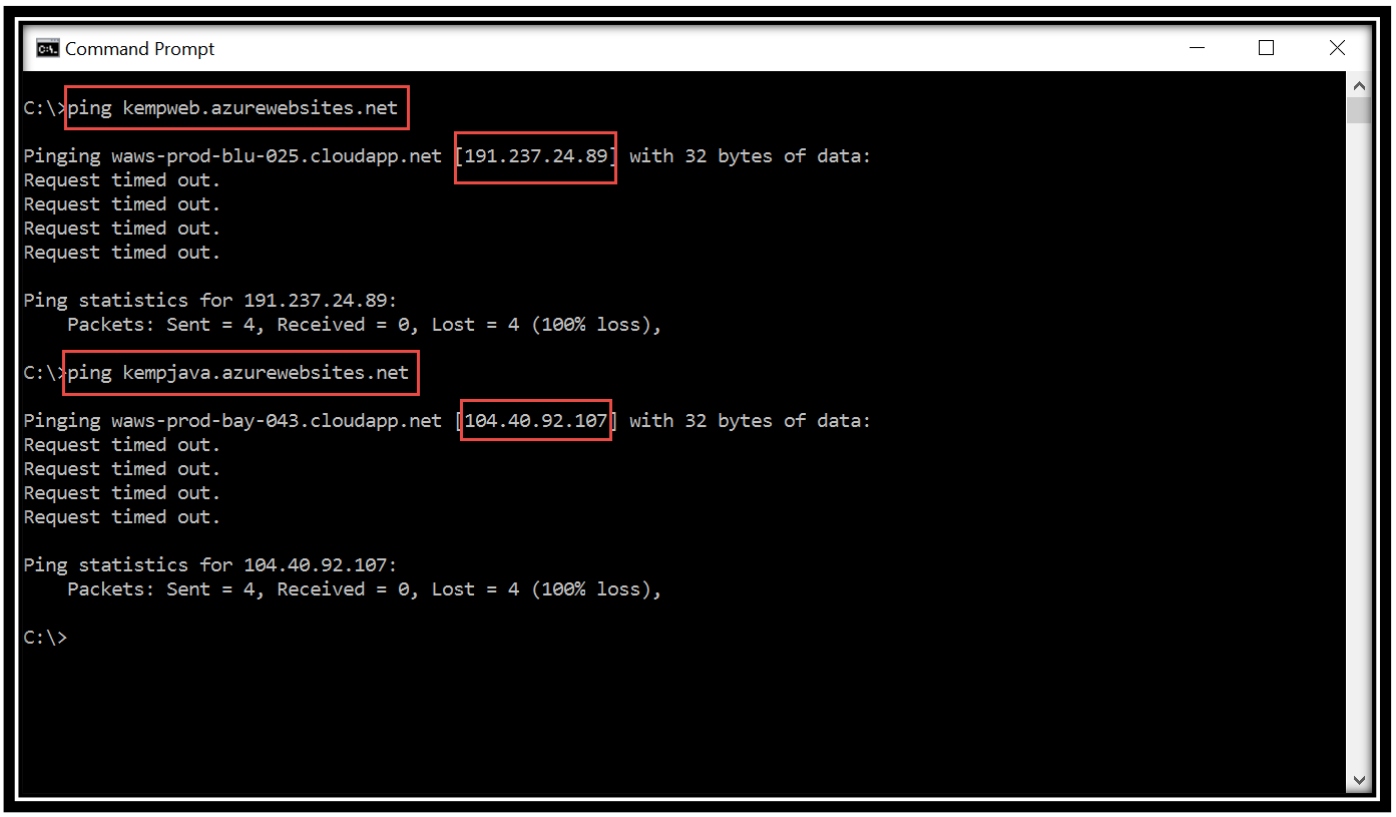
Table for recording Web Application URLs and IP Addresses

NOTE: The IP address and URLs for the student's Web Applications will be different. The second line is just for an example.

10. Open a CMD prompt and ping the FQDNs of both Web Applications (e.g. **ping KEMPweb.azurewebsites.net** and **ping KEMPjava.azurewebsites.net**)

NOTE: The requests *will* time out, but the commands will return the IP addresses of the Web Apps

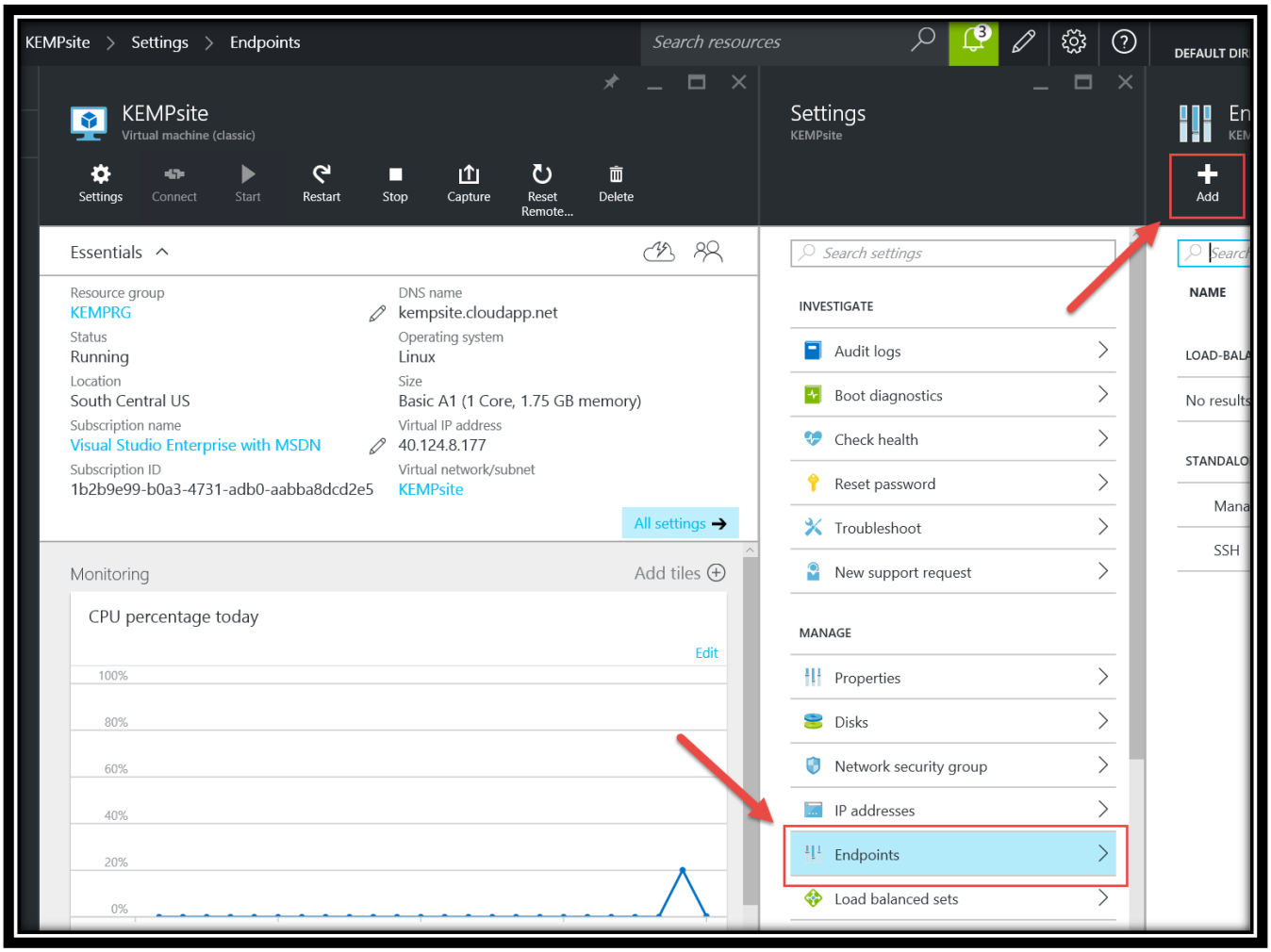
11. Note the IP Address for each Web App and add them to the table above



Ping Results showing IP addresses for both Web Apps

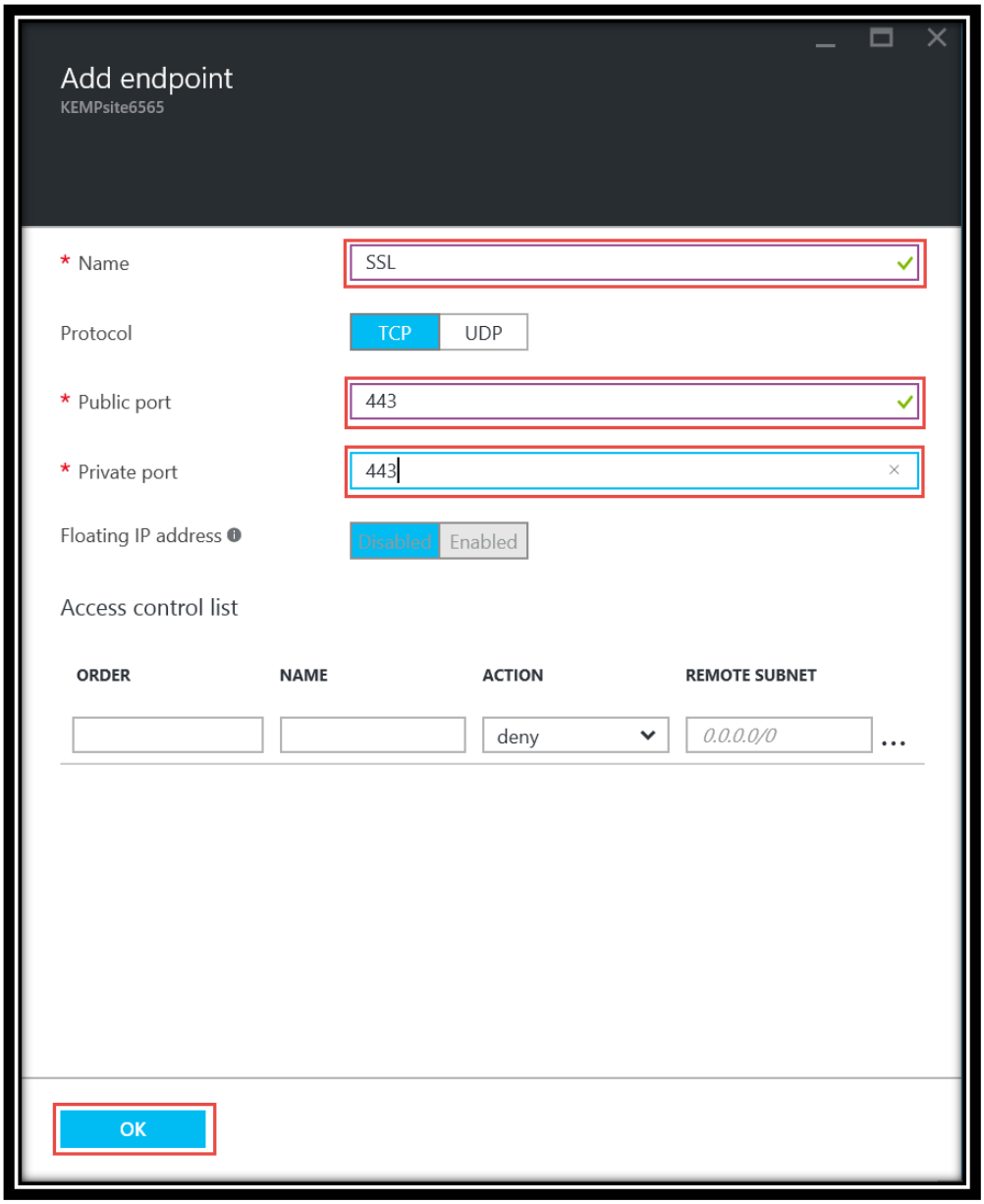
Task 2: Create New Endpoint for the KEMP Appliance

1. Go to the Azure portal (**http://portal.azure.com/**) dashboard
2. Go to Settings of the **KEMPsite** LoadMaster VM
3. Select **Endpoints**
4. Click the **+ Add** sign



Creating a New Endpoint in the Azure Portal for the KEMP Appliance

5. Name: **SSL**
6. Public Port: **443**
7. Private Port: **443**
8. Click **OK**



Properties for New Endpoint Creation

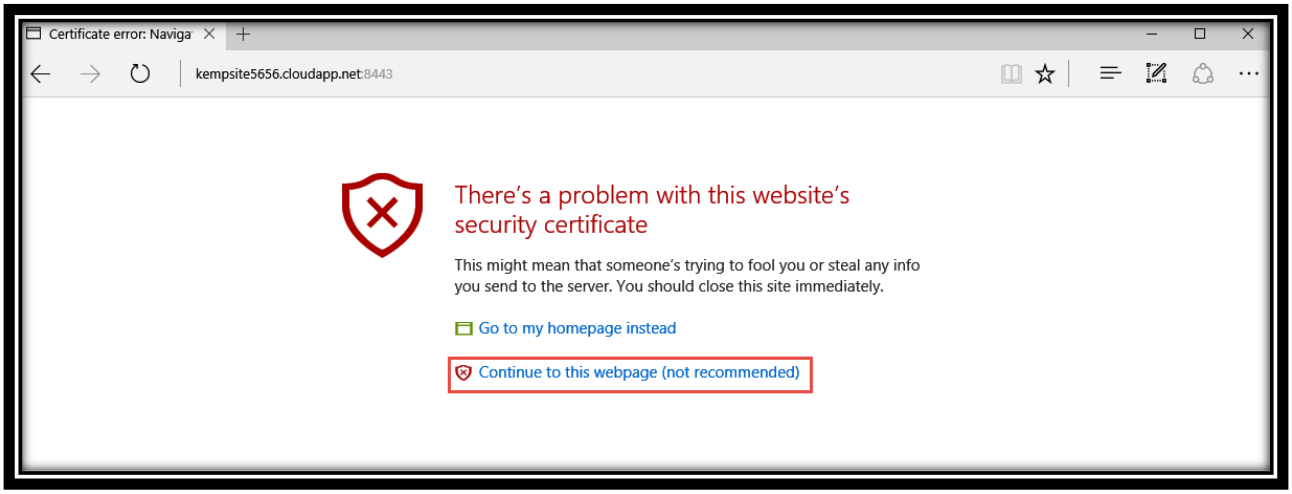
Allow time for this Endpoint to build within the device configuration

Task 3: Browse to KEMP Appliance Configuration Web Interface

1. Using the DNS Name recorded above for the LoadMaster, open a web browser and connect to the configuration web application
2. https://KEMPsite.cloudapp.net:8443

NOTE: This will be the DNS Name recorded in the table earlier in the lab. This is just the example for this document.

3. Accept the Secure Prompt (as we know it is safe)

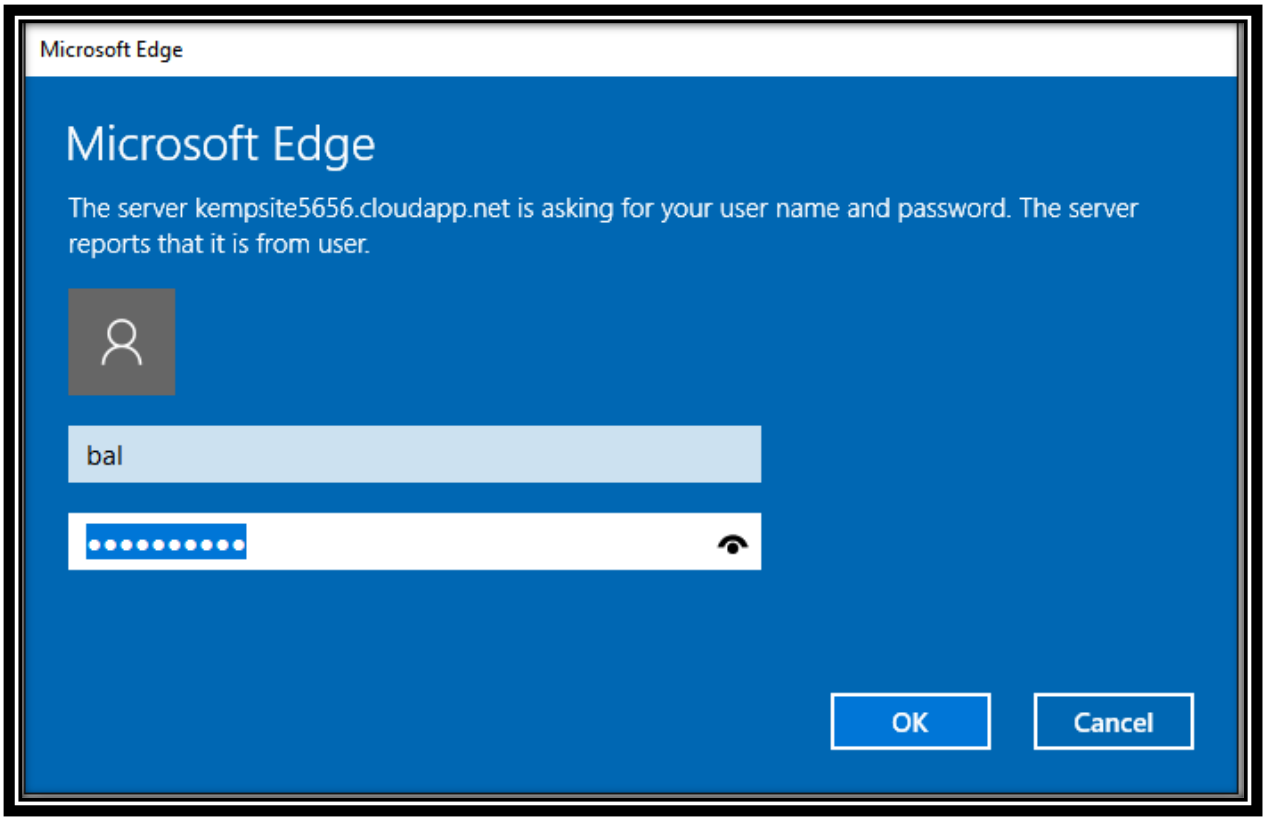


Security Prompt example

4. When prompted for credentials, enter the default credentials mentioned earlier in the Lab

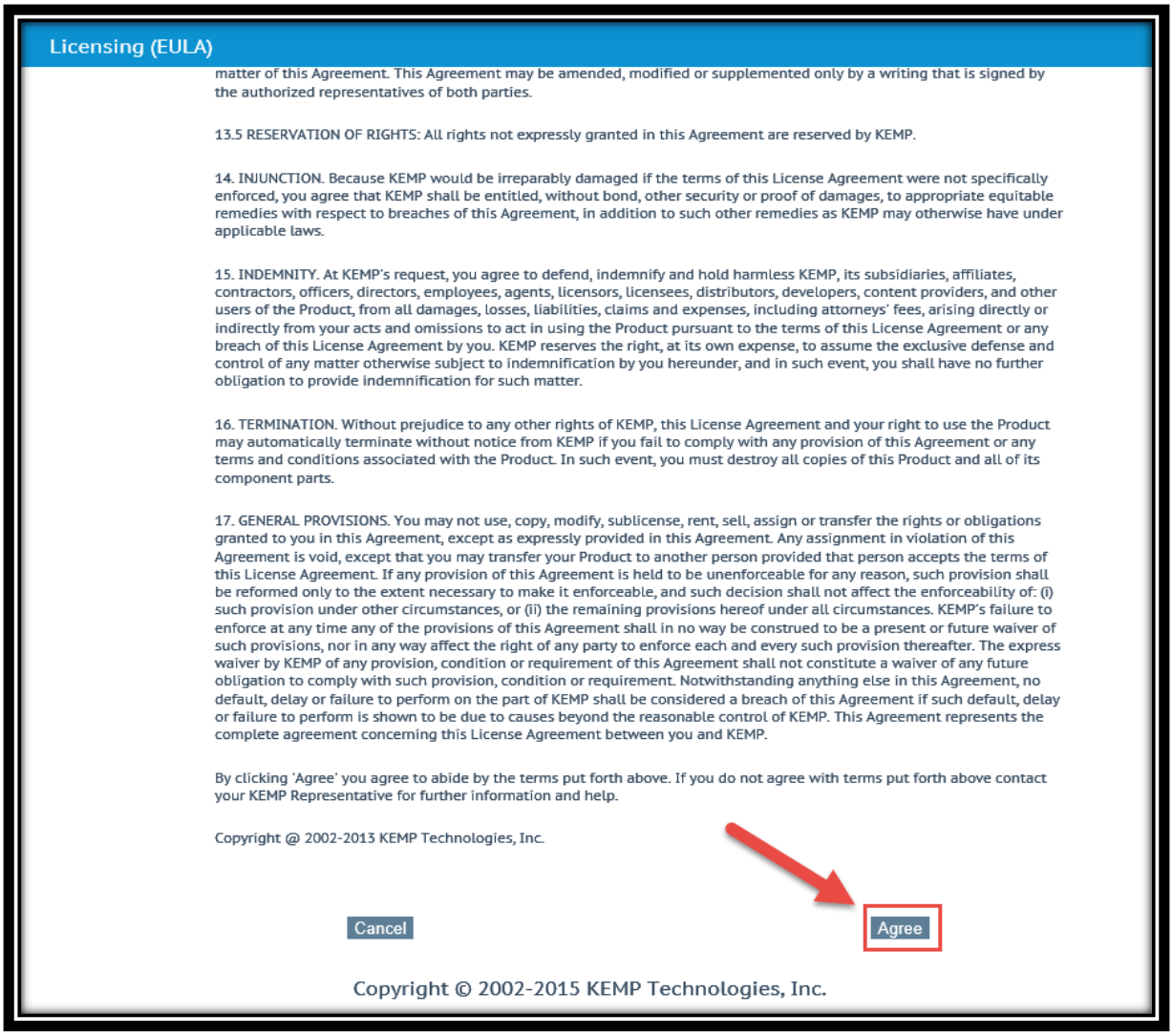
    i. User name = *bal*

    ii. Password = *demo@pass1*



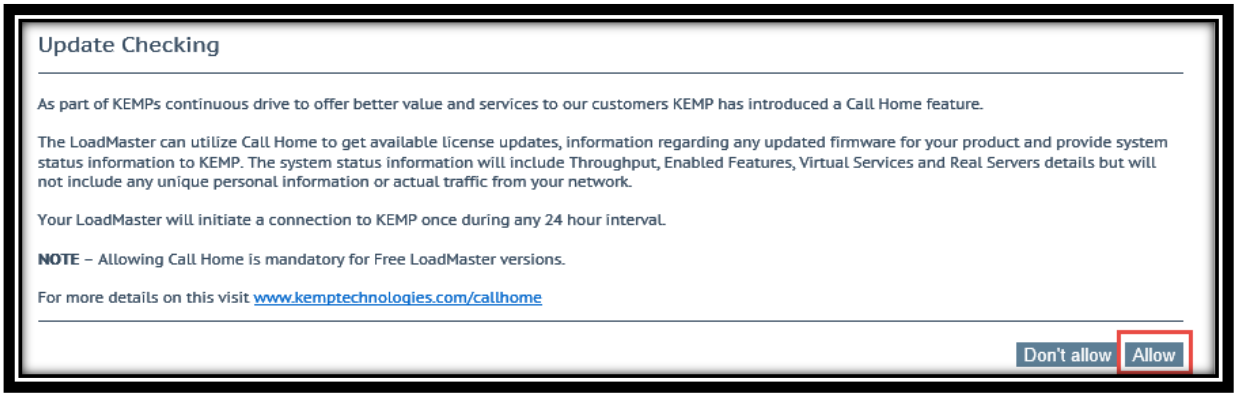
Enter default credentials for the KEMP Appliance

5. Agree to the KEMP Technologies Licensing Agreement



Agreeing to the KEMP Technologies EULA

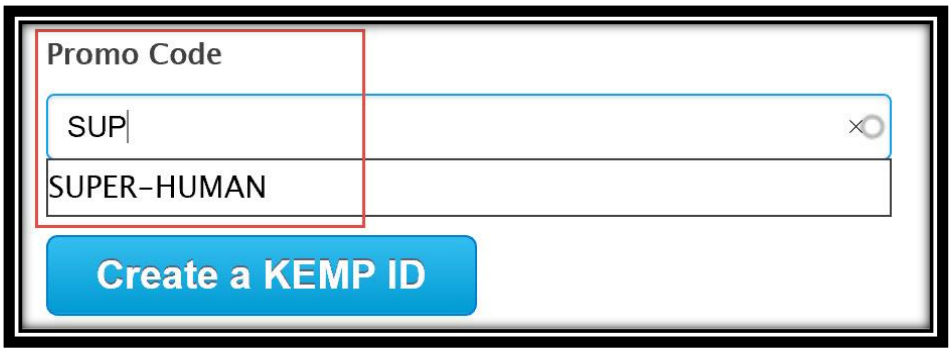
6. Allow **Update Checking**



Allowing Update Checking

7. If you do not have a **KEMP ID**, click the link to register. Registering will require email confirmation. **IMPORTANT:** When registering, please enter **SUPER-HUMAN** in the **Promo Code** field to indicate you are registering an ID for this Azure Marketplace lab.

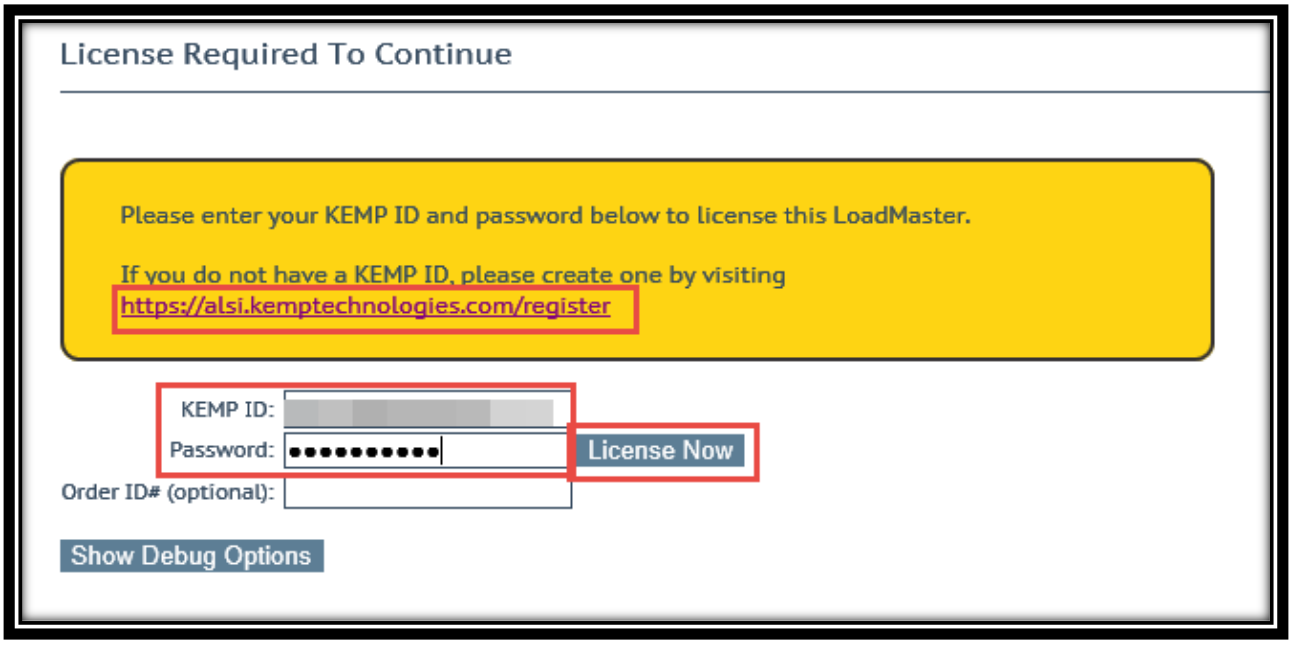
   NOTE: The field will auto-populate for you when you start typing Super-Human.



Entering SUPER-HUMAN as the Promo Code

NOTE: You will receive confirmation emails to complete the registration.

8. Enter your **KEMP ID** and **Password** then click **License Now**

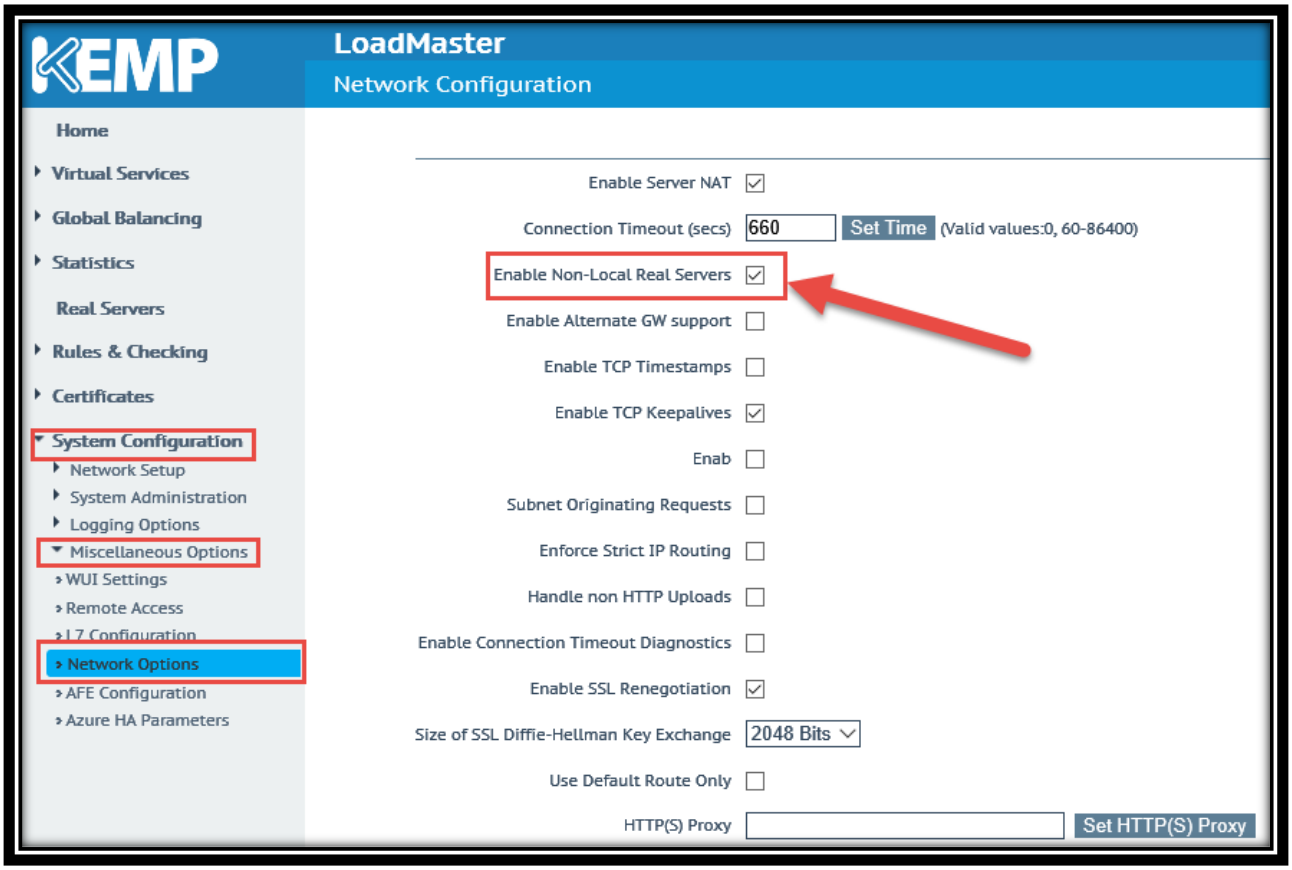


KEMP ID creation URL, Entering and Licensing of the KEMP Appliance

9. Click **Continue** at the **Machine Successfully Licensed** prompt
10. Click **Continue** at the **Provisioning Finished** prompt

Task 4: Enable use of Non-Local Real Servers

1. In the left pane, select **System Configuration** > **Miscellaneous Options** > **Network Options**
2. Check the checkbox for: **Enable Non-Local Real Server**



Enabling Non-Local Real Servers

Task 5: Create Two Content Matching Rules

1. In the left pane, select **Rules & Checking** > **Content Rules**
2. Click on the **Create New...** button and create the rule for the Web App Rule

Create New Content Rules

3. In the Create Rule dialog options enter the following:

    a. Rule Name: **WebMatch**

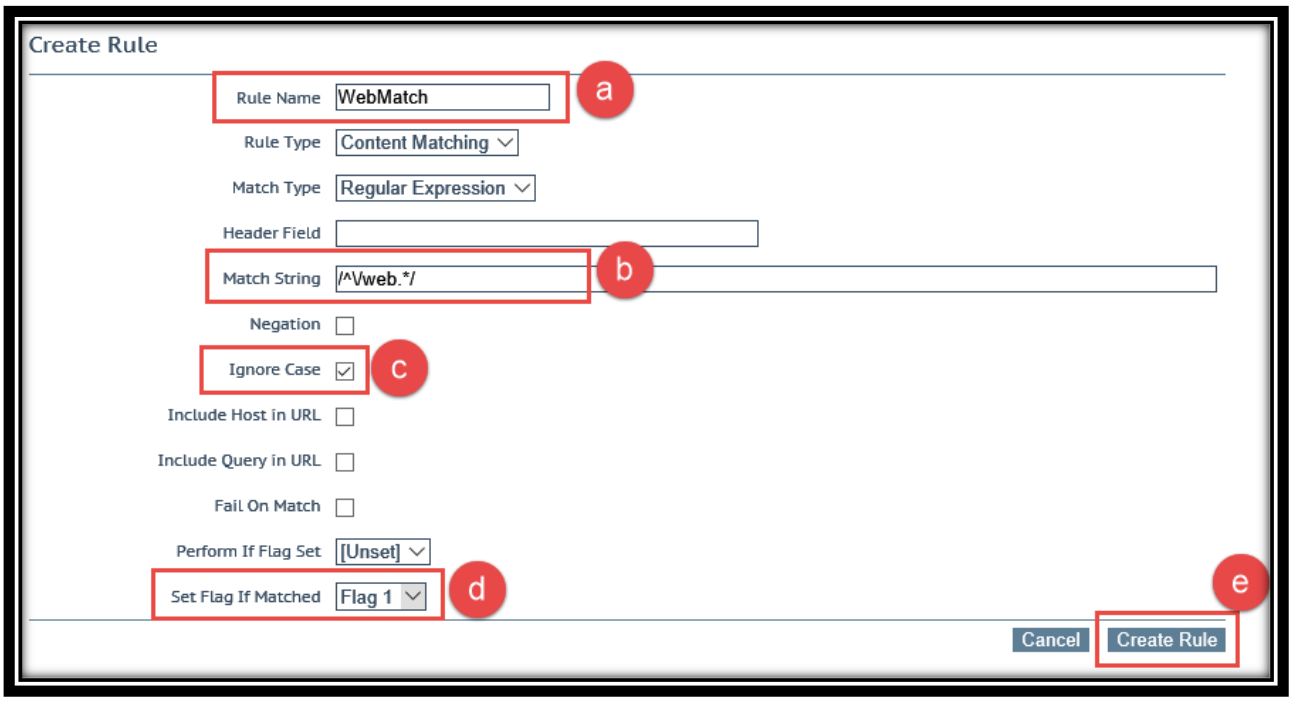
    b. Match String: **/^\/web.*/**

(NOTE: Make sure there is no "trailing space" if copying the text)

    c. Check the **Ignore Case** checkbox

    d. Use the drop down list to select **Flag 1** in the **Set Flag if Matched** option

    e. Click **Create Rule** button

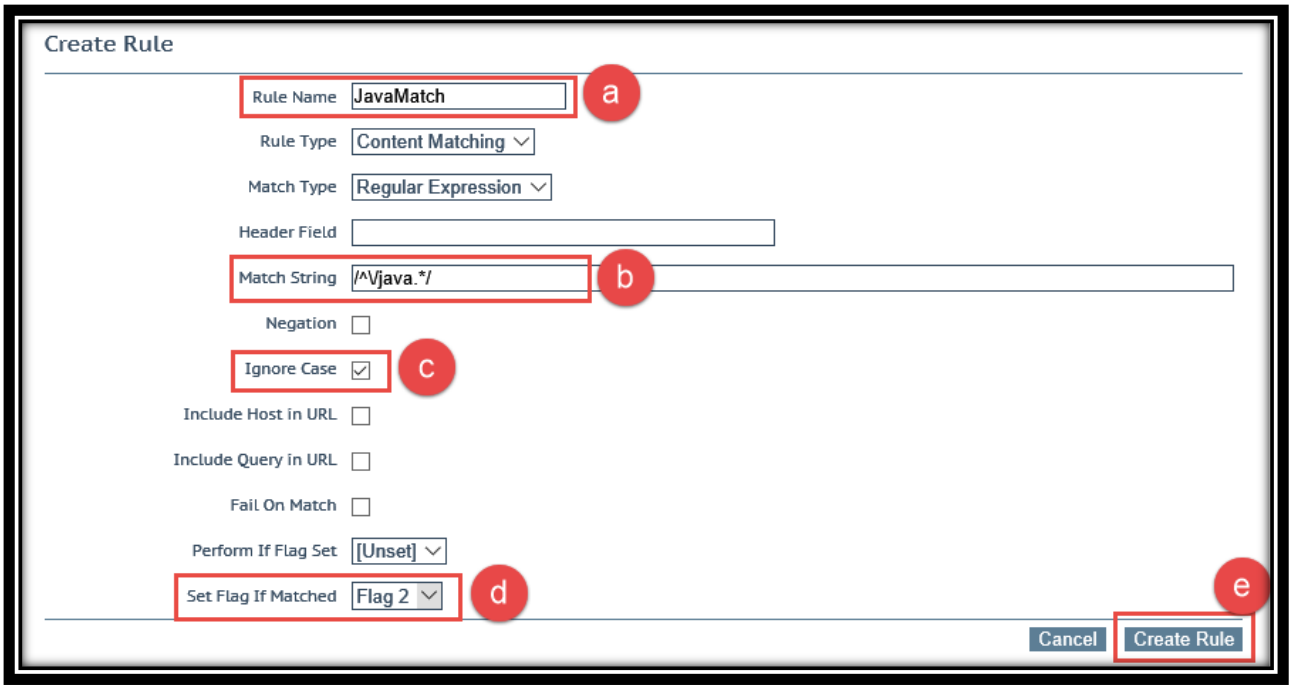


Creation of the WebMatch Content Matching Rule

4. Click **Create New…** for the Java App Rule
5. Repeat the steps 3a. through 3e. in Task 5 for the rule for the Java App modifying the following as needed:
    a. Rule Name: **JavaMatch**
    b. Match String: **/^\/java.*/**

(NOTE: Make sure there is no "trailing space" if copying the text)

    c. Check the **Ignore Case** checkbox
    d. Use the drop down list to select **Flag 2** in the **Set Flag if Matched** option
    e. Click **Create Rule** button



Creation of JavaMatch Content Matching Rule

Task 6: Create Two Remove Header Modification Rules

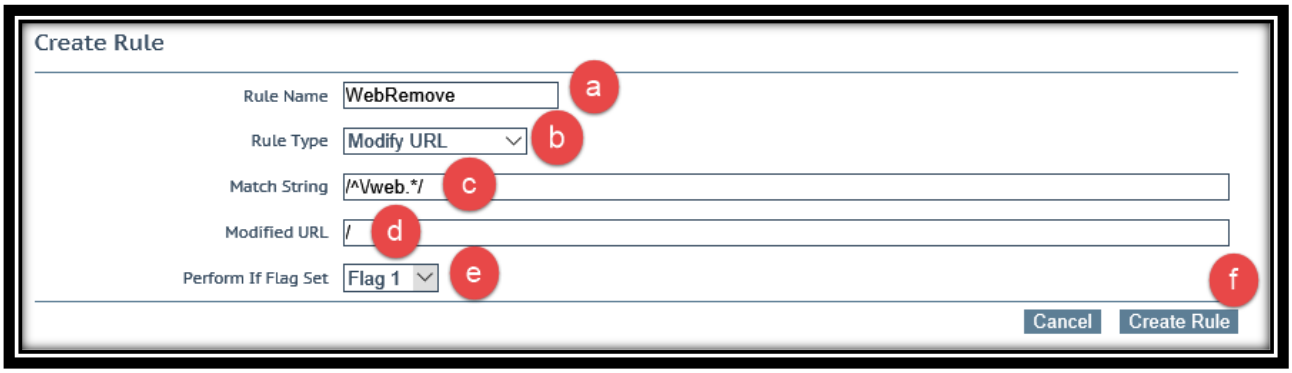
1. Click on the **Create New…** button
2. In the Create Rule dialog options enter the following:
    a. Rule Name: **WebRemove**
    b. Rule Type: **Modify URL**
    c. Match String: **/^\/web.*/**

(NOTE: Make sure there is no "trailing space" if copying the text)

d. Modified URL: **/**

e. Perform If Flag Set: **Flag 1**

f. Click the **Create Rule** button



Creation of Modify URL Rule for the Web App

3. Repeat steps 2a. through 2f. in Task 6 for the Java App with the following modifications:

a. Rule Name: **JavaRemove**

b. Rule Type: **Modify URL**

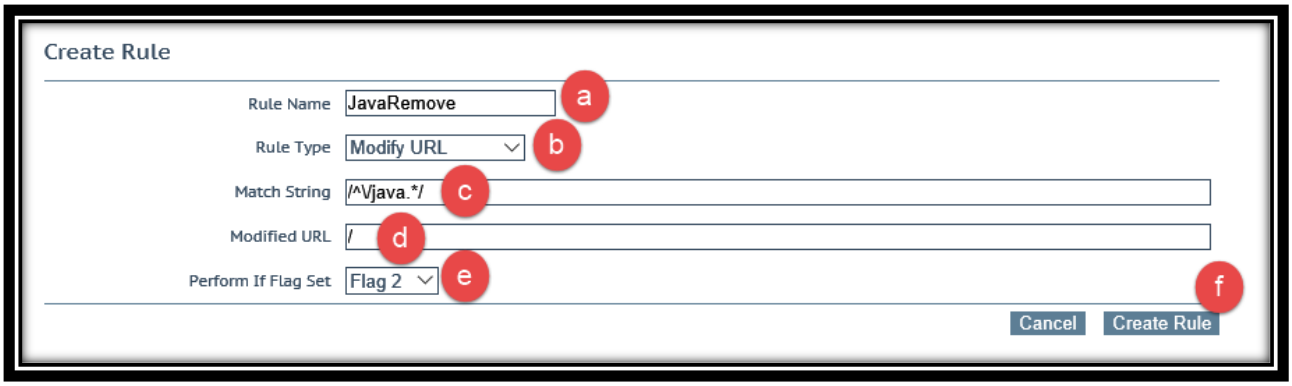
c. Match String: **/^\/java.*/**

(NOTE: Make sure there is no "trailing space" if copying the text)

d. Modified URL: **/**

e. Perform If Flag Set: **Flag 2**

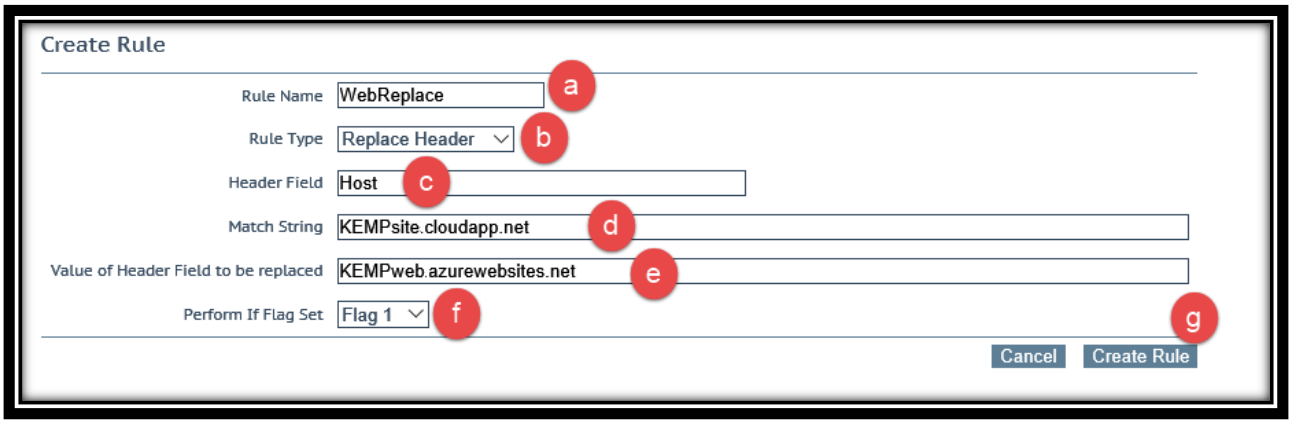
f. Click the **Create Rule** button



Creation of Modify URL Rule for the Java App

Task 7: Create Two Replace Header Modification Rules

1. Click on the **Create New…** button
    a. Rule Name: **WebReplace**
    b. Rule Type: **Replace Header**
    c. Header Field: **Host**
    d. Match String: Enter URL of LoadMaster from table above (e.g. **KEMPsite.cloudapp.net**)
    e. Value of Header Field to be replaced: Enter URL of Web App from table above (e.g. **KEMPweb.azurewebsites.net**)
    f. Perform If Flag Set: Select **Flag 1** in the drop down
    g. Click the **Create Rule** button



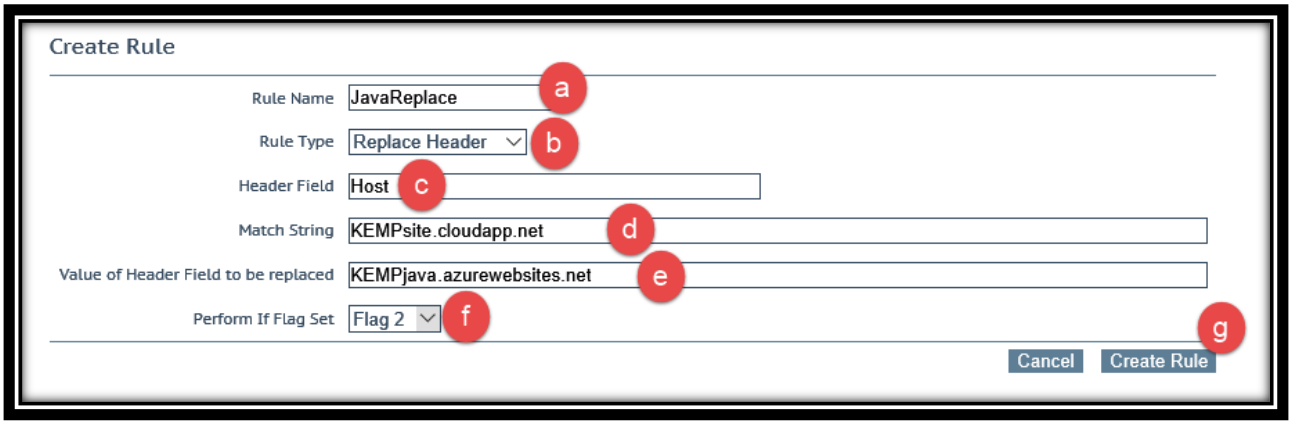
Creation of Replace Header Rule for Web App

2. Repeat steps 1a. through 1g. in Task 7 for the Java App with the following modifications:
    a. Rule Name: **JavaReplace**
    b. Rule Type: **Replace Header**
    c. Header Field: **Host**
    d. Match String: Enter URL of LoadMaster from table above (e.g. **KEMPsite.cloudapp.net**)

e. Value of Header Field to be replaced: Enter URL of Java App from table above (e.g. **KEMPjava.azurewebsites.net**)

f. Perform If Flag Set: Select **Flag 2** in the drop down

g. Click the **Create Rule** button



Creation of Web Replace Rule for Java App

Task 8: Create Virtual Service

1. Create the Virtual Service

   a. In the left pane, select **Virtual Services**

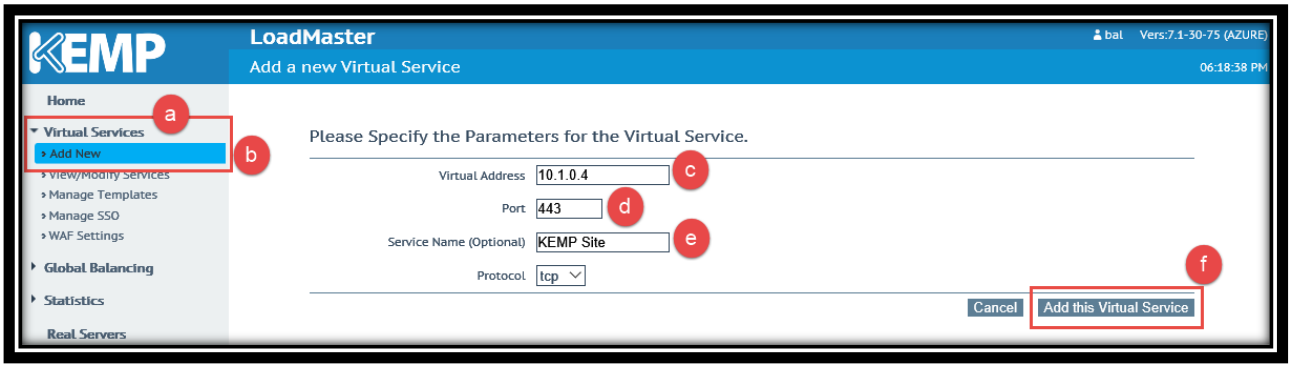
   b. Click **> Add New**

   c. The **IP address** is automatically entered

   d. Port: change from 80 to **443**

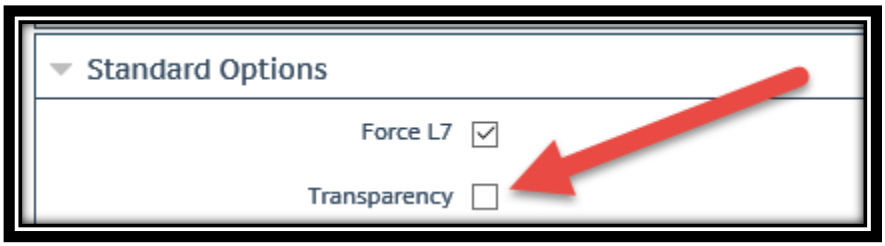
   e. Service Name (Optional): enter a name e.g. **KEMP Site**

   f. Click on the **Add this Virtual Service** button



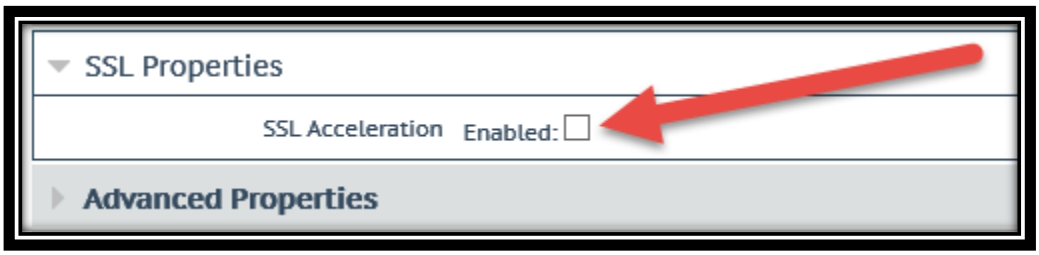
Add New Virtual Service

2. In the resulting Properties page, expand the **Standard Options** tab and uncheck the checkbox for **Transparency**



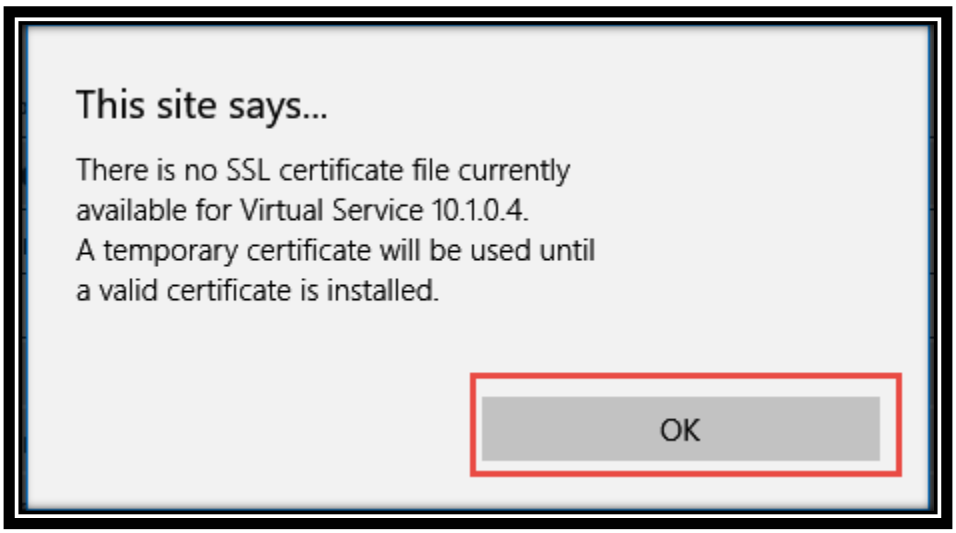
Disable Transparency

3. Expand the **SSL Properties** tab and check the checkbox for **Enabled** for **SSL Acceleration**



Enabling SSL Acceleration

4. Click **OK** at the prompt from the Site indicating a temporary certificate will be used

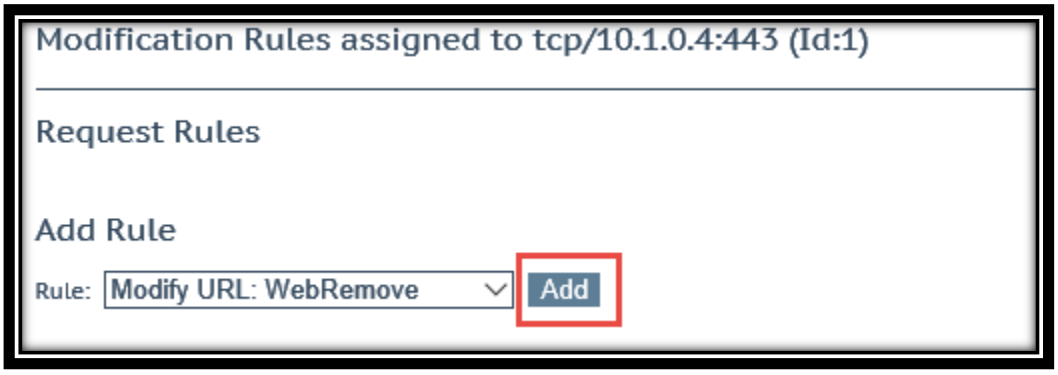


Temporary Certificate prompt

5. Expand the **Advanced Properties** tab and in the **HTTP Header Modifications** line select the **Show Header Rules** button

Show Header Rules

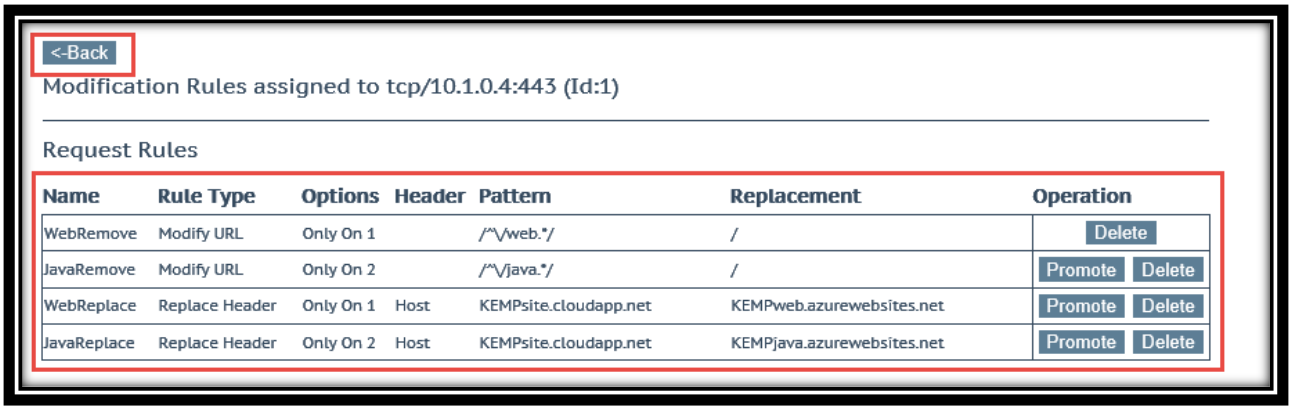
6. In the **Rule Management** resulting page, make sure to click the **Add** button under the **Request Rules** section



Adding Request Rules to Virtual Service

7. Click **Add** four times, to add all of the following:
    a. WebRemove
    b. JavaRemove
    c. WebReplace
    d. JavaReplace
8. Click the **Back** button to return to the **Virtual Service Properties** page

NOTE: You must use the back button on the Configuration Tool web page. Do not use the back button in your browser.



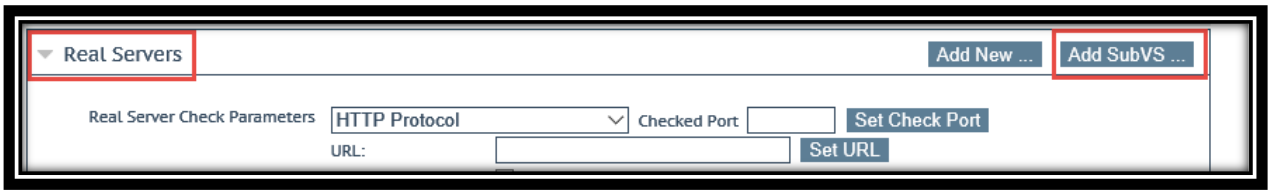
All Four Header Rules added

NOTE: The *Show Header Rules* button should now have the additional information that shows *(4 Requests)*

Showing all 4 Rules added to HTTP Header Modifications

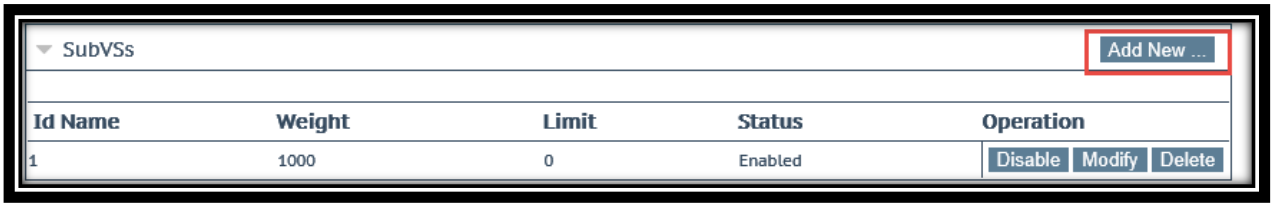
Task 9: Add SubVS Entries

1. Expand the **Real Servers** tab and click the **Add SubVS...** button



Adding SubVS

2. Once **Id Name** #1 is created, click the **Add New** button

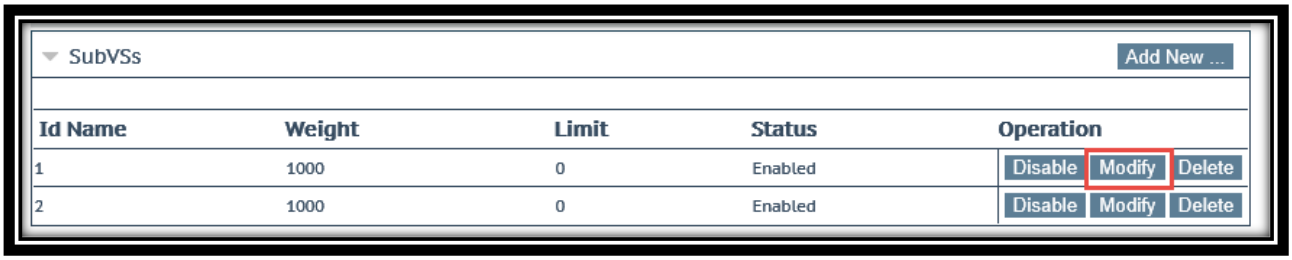


Adding New (Second) SubVS

3. This will create **ID Name** #2

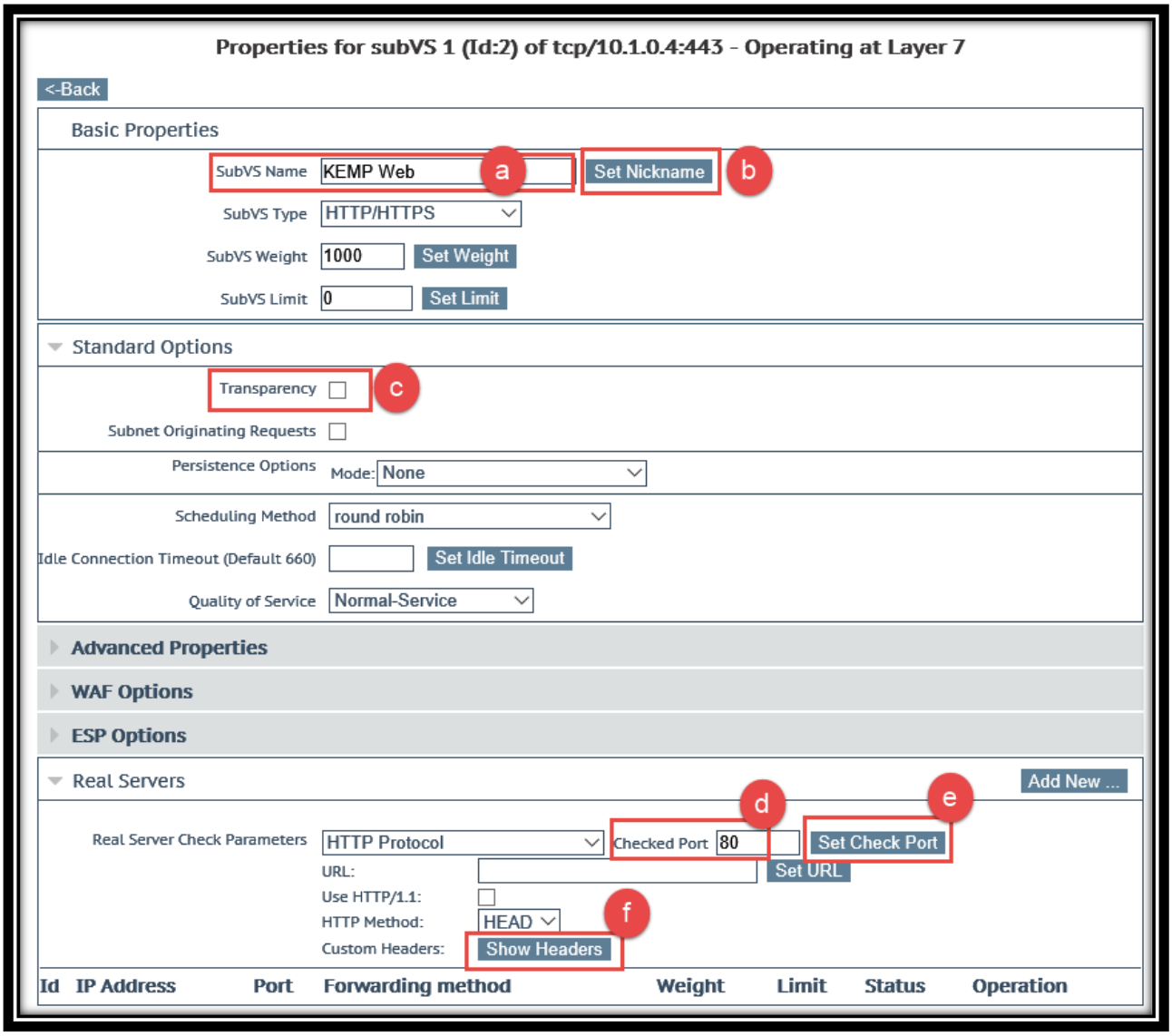
Task 10: Set Properties for SubVS for the Web App

1. In the ID listing, select the **Modify** button for Id Name #1



Modifying Properties for SubVS #1

2. In the **Properties of SubVS 1** enter the following:
    a. SubVS Name: **KEMP Web**
    b. Click the **Set Nickname** button
    c. Expand **Standard Options** and uncheck **Transparency** checkbox
    d. Expand **Real Servers** and enter **80** in the **Checked Port** box
    e. Click the **Set Check Port** button
    f. For the line **Custom Headers:** click the **Show Headers** button



Entering SubVS Properties for SubVS #1

3. In the resulting dialog boxes:

    a. Enter **Host** in the first box and the **URL** of the Web App that will be returned (e.g. **KEMPweb.azurewebsites.net**)

    b. Click the **Set Header** button

Entering Custom Header for Host

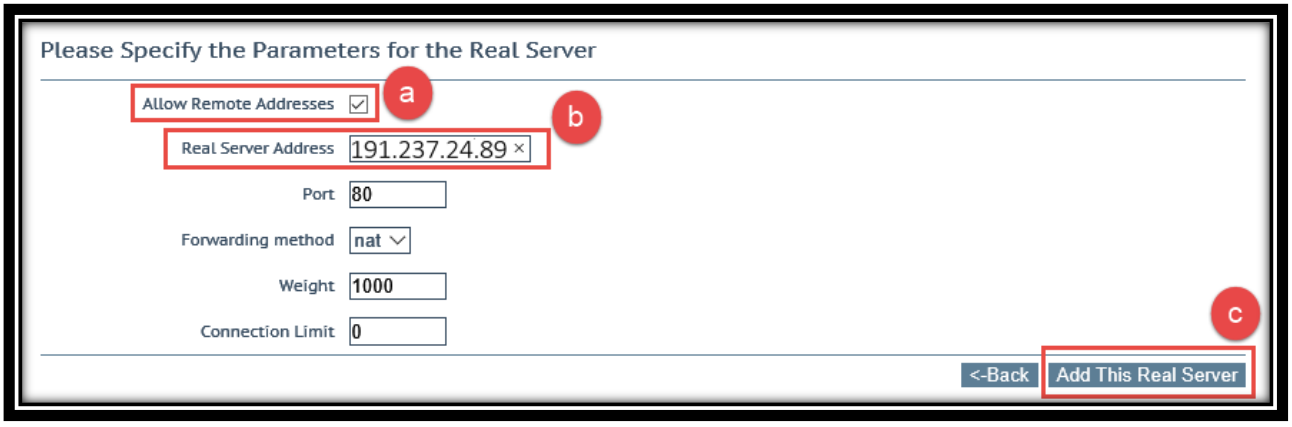
4. Click on the **Add New** button to add the IP address of the Web App to the Virtual Service

Add New button location

a. In the resulting **Parameters** page, check the checkbox for **Allow Remote Addresses**

b. Enter the IP for the Web App recorded in the table above into the **Real Server Address** box (e.g. **191.237.24.89**)

c. Click on **Add This Real Server** button



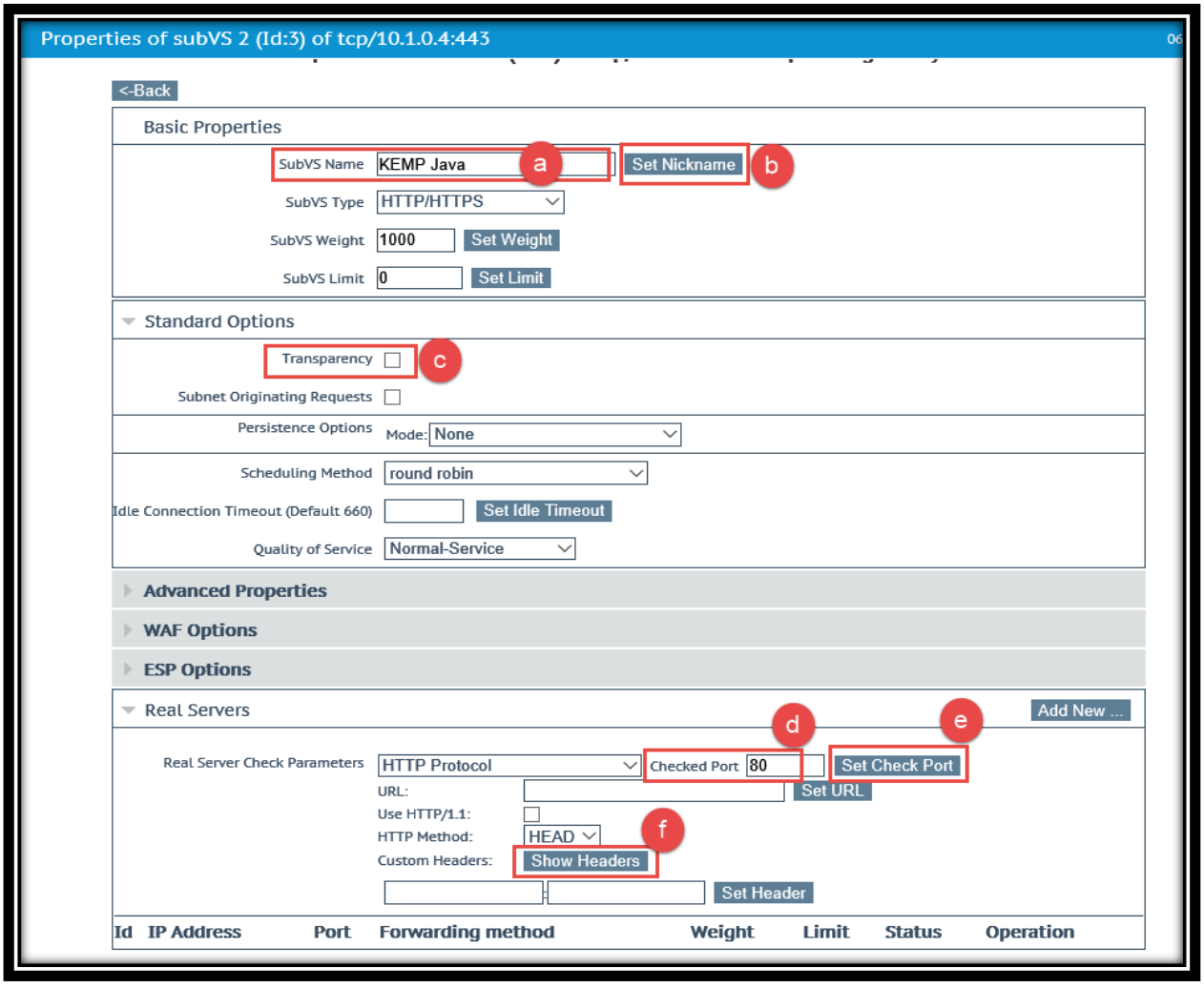
Adding IP address to Real Server

5. Click the **Back** button twice *(in the Configuration Tool, **NOT** the browser back button)* to return to the Properties page for the Virtual Service

NOTE: *Id Name 1* should now include the name entered above (e.g. *KEMP Web*)

Task 11: Set Properties for SubVS for the Java App

1. In the ID listing, select the **Modify** button for Id Name #2
2. In the **Properties of SubVS 2** enter the following:
    a. SubVS Name: **KEMP Java**
    b. Click the **Set Nickname** button
    c. Expand **Standard Options** and uncheck **Transparency** checkbox
    d. Expand **Real Servers** and enter **80** in the **Checked Port** box
    e. Click the **Set Check Port** button
    f. For the line **Custom Headers:** click the **Show Headers** button



Entering SubVS properties for SubVS #2

3. In the resulting dialog boxes

    a. Enter **Host** in the first box and the **URL** of the Java App that will be returned (e.g. **KEMPjava.azurewebsites.net**)

    b. Click the **Set Header** button

Entering Custom Header for Host

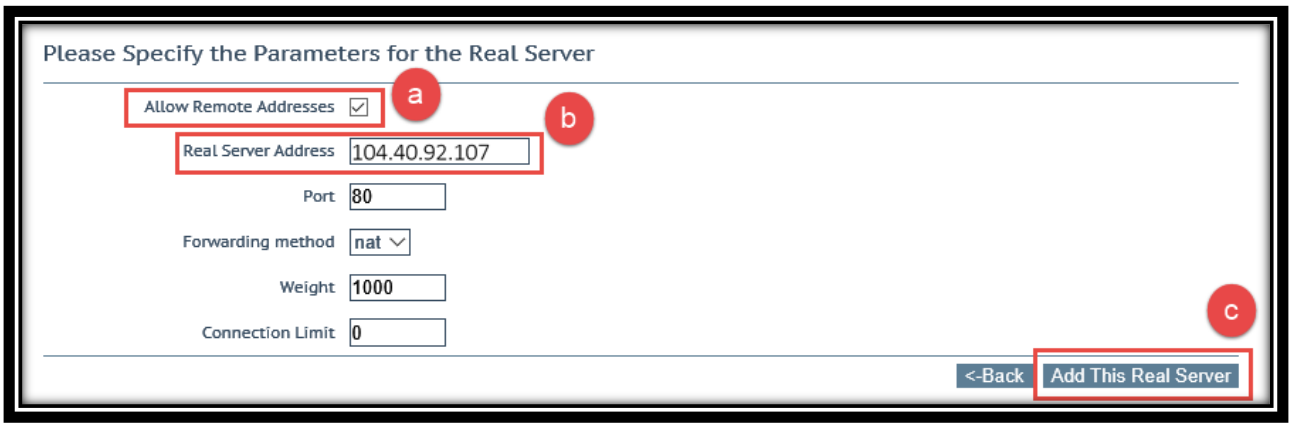
4. Click on the **Add New** button to add the IP address of the Java App to the Virtual Service

Add New button location

    a. In the resulting **Parameters** page, check the checkbox for **Allow Remote Addresses**

    b. Enter the IP for the Java App recorded in the table above into the **Real Server Address** box (e.g. **104.40.92.107**)

    c. Click on **Add This Real Server** button



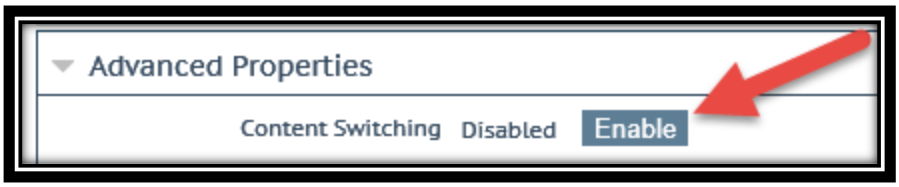
Adding IP Address to Real Server

5. Click the **Back** button twice *(in the Configuration Tool, **NOT** the browser back button)* to return to the Properties page for the Virtual Service

> **NOTE: *Id Name 2* should now include the name entered above (e.g. *KEMP Java*)**

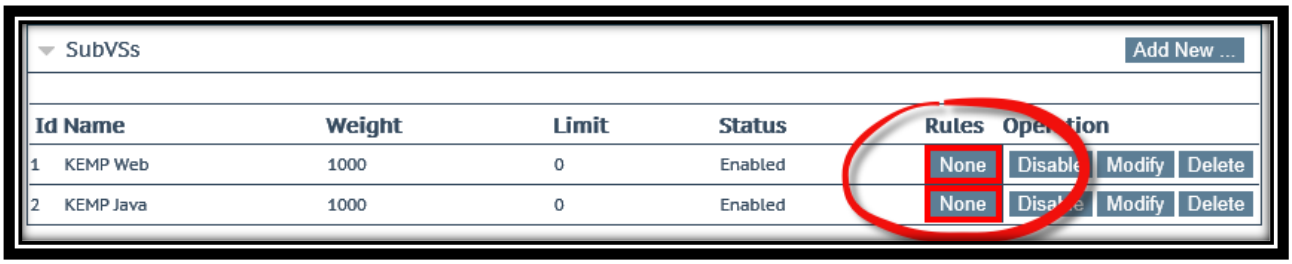
Task 12: Assign Content Matching Rules to Real Servers

1. Click on **Advanced Properties** tab to expand it
2. In the **Content Switching** line, click the **Enable** button



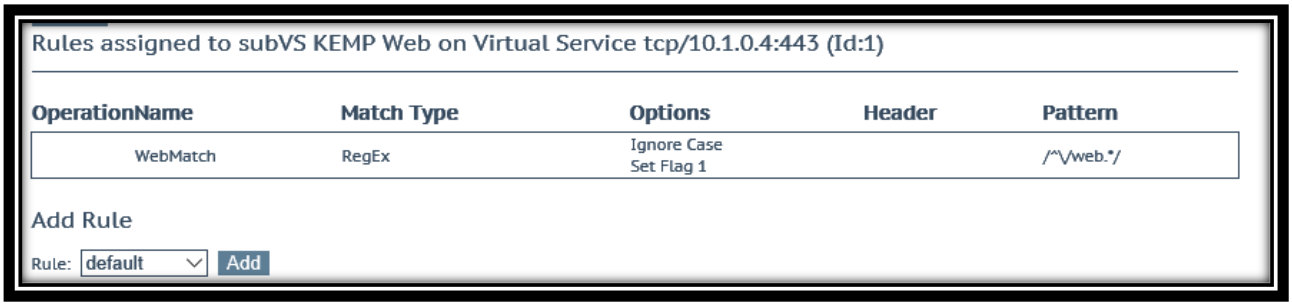
Enabling Content Switching

> **NOTE: Once Content Switching is enabled, the *Rules* column in the SubVSs tab will have the background of the *None* button turn RED indicating that they need to be configured**



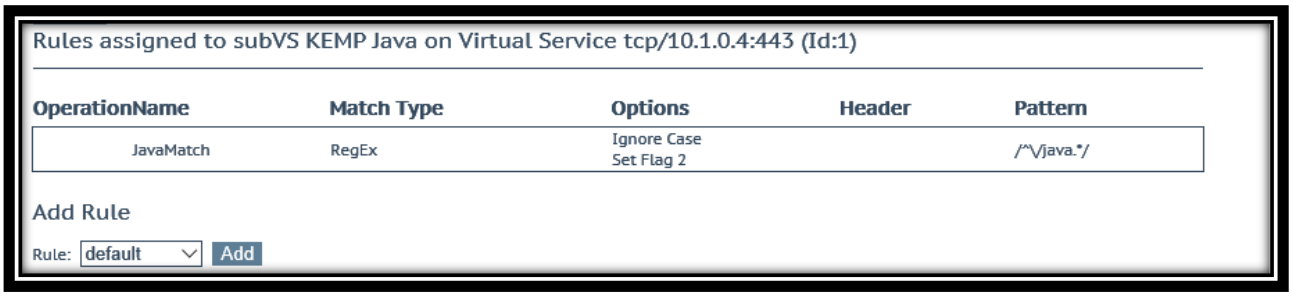
Note the Red Background indicating Content Switching Enabled but not configured

3. Click on the **None** button for the **KEMP Web**
4. In the **Add Rule** drop down, select **WebMatch** and click the **Add** button



Adding WebMatch Rule

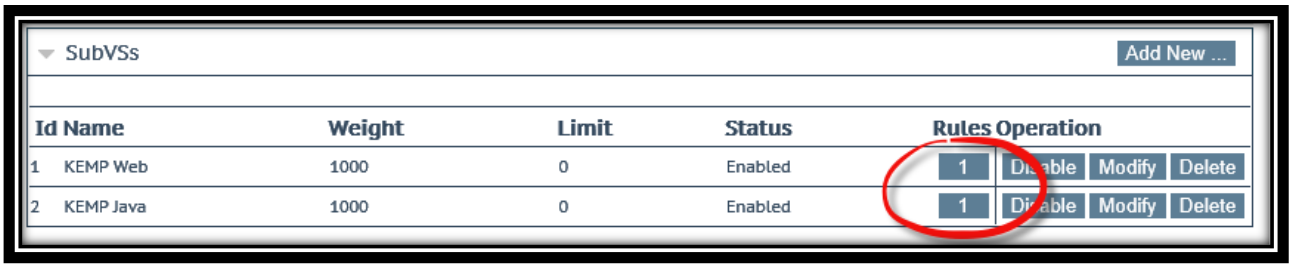
5. Hit the **Back** button.
6. Click on the **None** button for the **KEMP Java**
7. In the **Add Rule** drop down, select **JavaMatch** and click the **Add** button



Adding the JavaMatch Rule

8. Hit the **Back** button

NOTE: The *Rules* column will lose the red color and each will now show a number *1* in the button indication a single rule enabled



Note rules background no longer red and the number 1 indicating configuration success

Exercise 3: Validate the Creation of the LoadMaster Appliance and Web Apps

In this exercise, you will validate the completion of the lab by viewing the newly created KEMP Appliance Service, viewing the successful creation pages of the Web Apps, and view the real time stats showing successful connectivity and content switching.

Task 1: View Service just created

1. In the left pane, click **View/Modify Services**

NOTE: Allow time for server health to be validated and show a Status of Up

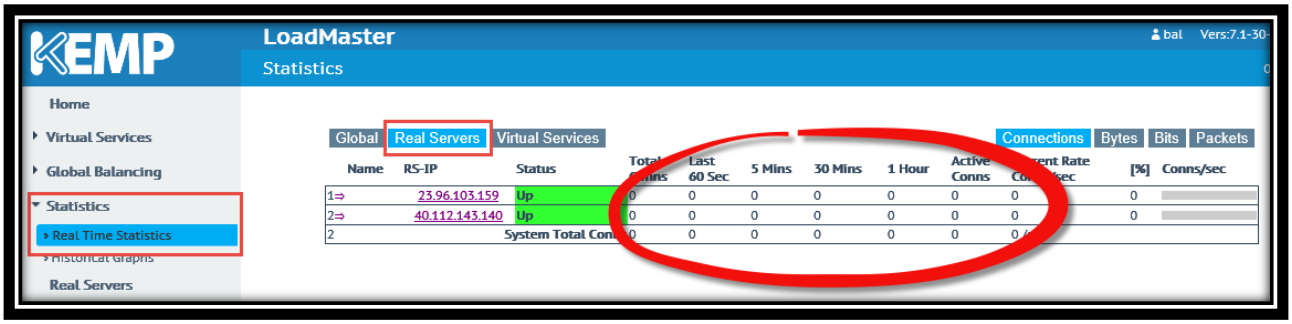
2. Click on the IP address of the Service and make sure the two Virtual Services are in the Up state as well

Validation of Status on KEMP Appliance and Web Apps

Task 2: View Stats of Service just created

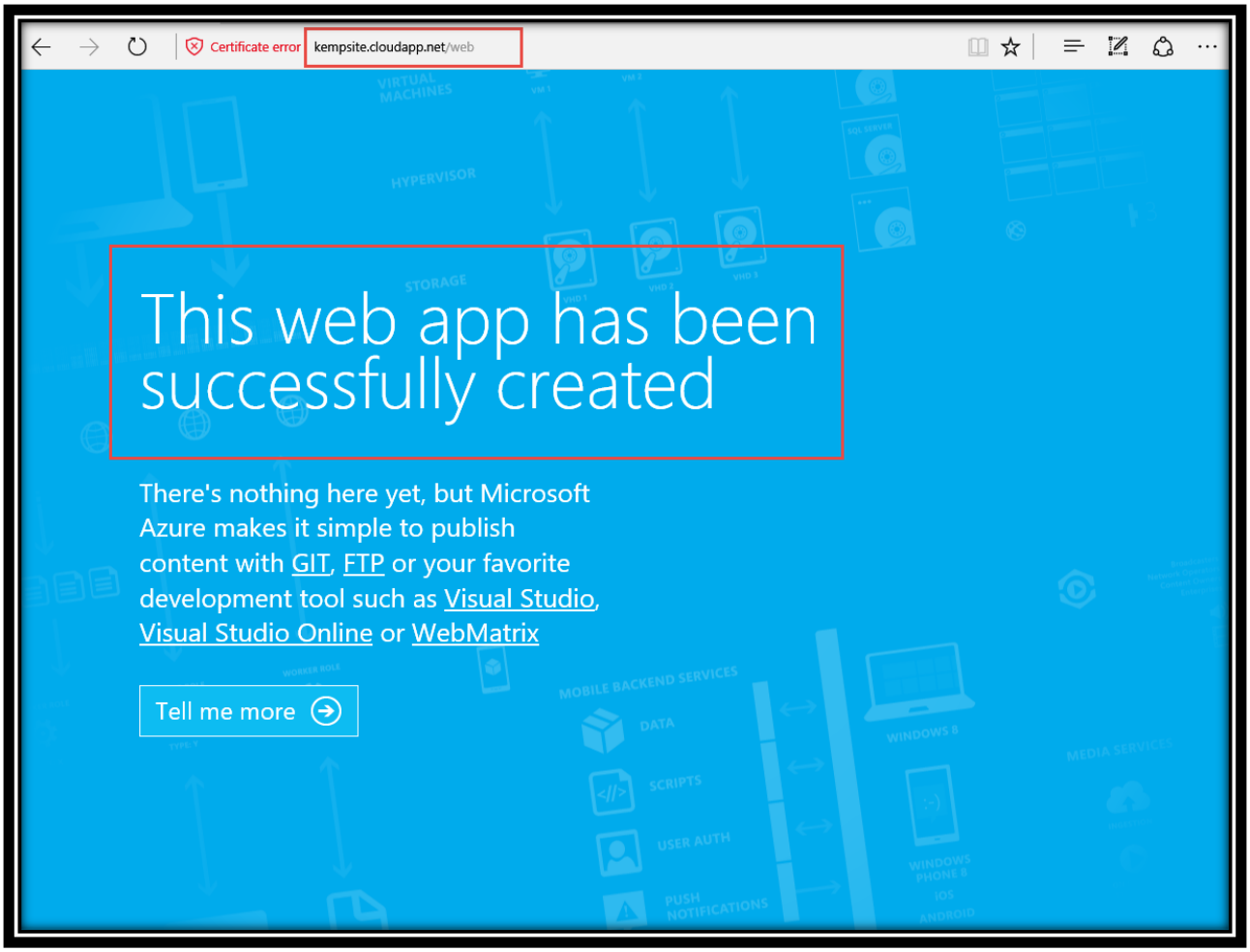
1. In the left pane, select **Statistics**
2. Under **Statistics**, select **Real Time Statistics**
3. Click the **Real Servers** button

NOTE: All Stats are 0 (zeros)



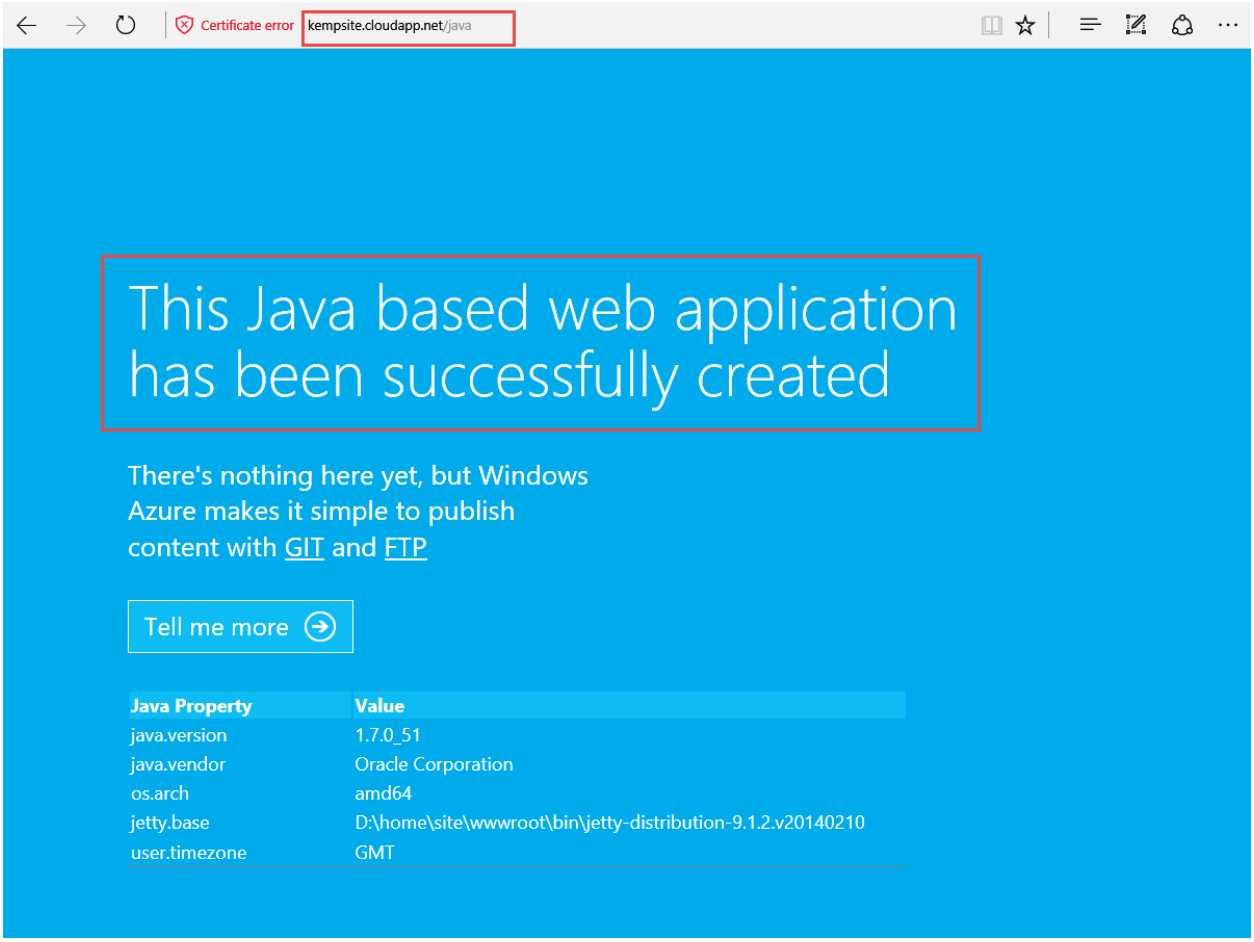
Real Time Stats in KEMP Appliance Configuration

4. Open a browser and in the Address Bar type the following to connect to the Web App: **https://KEMPsite.cloudapp.net/web**
5. Accept any certificate warning and choose to continue
6. The resulting page should show a successful splash screen that should include a statement similar to **This web app has been successfully created**



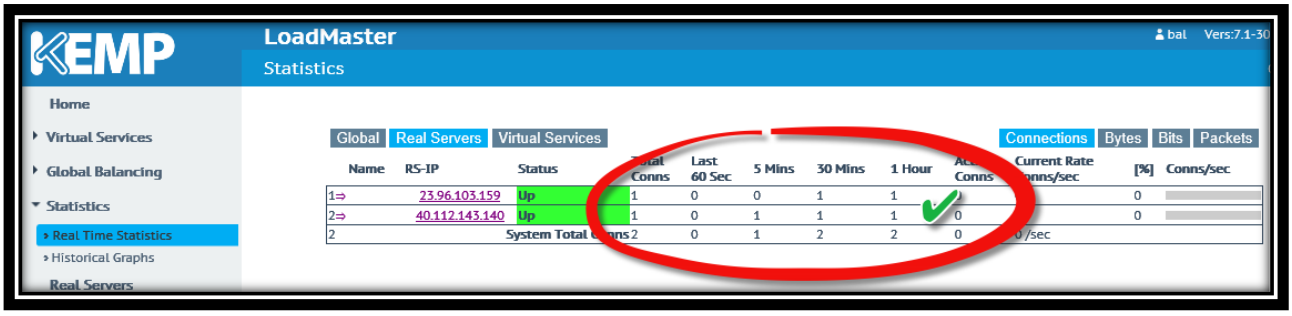
Success Splash Page for the Web App

7. Open a browser and in the Address Bar type the following to connect to the Web App: **https://KEMPsite.cloudapp.net/java**
8. Accept any certificate warning and choose to continue
9. The resulting page should show a successful splash screen that should include a statement similar to **This java based web app has been successfully created**



Success Splash Page for the Java Web App

10. Return to the Real Time Stats page and make note of the increased number showing the browsing worked for both the Java App and the Web App



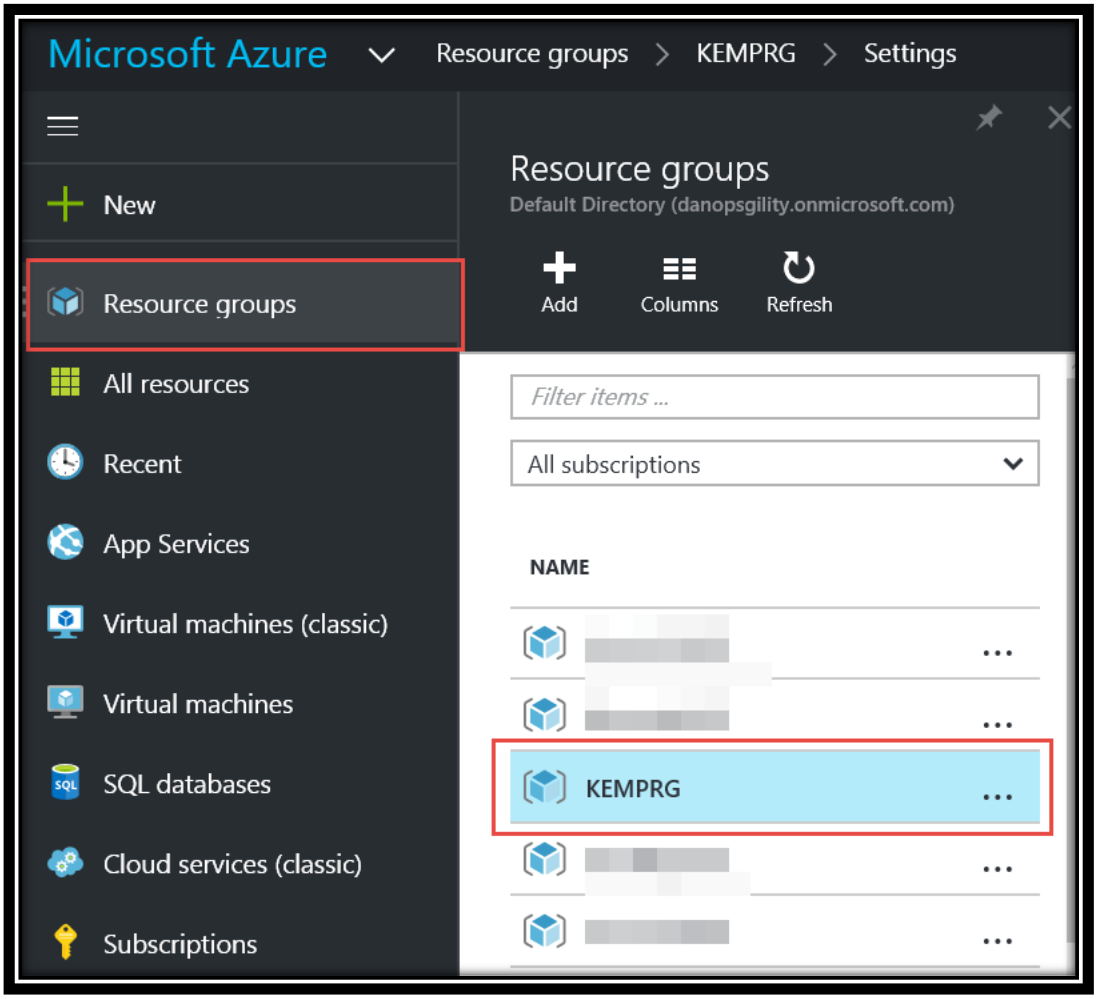
Statistics Page Showing Successful Browsing to Web and Java Apps

Exercise 4: Provide Proof of Lab Completion

Task 1: Create Screen Shots of the environment created during this Lab

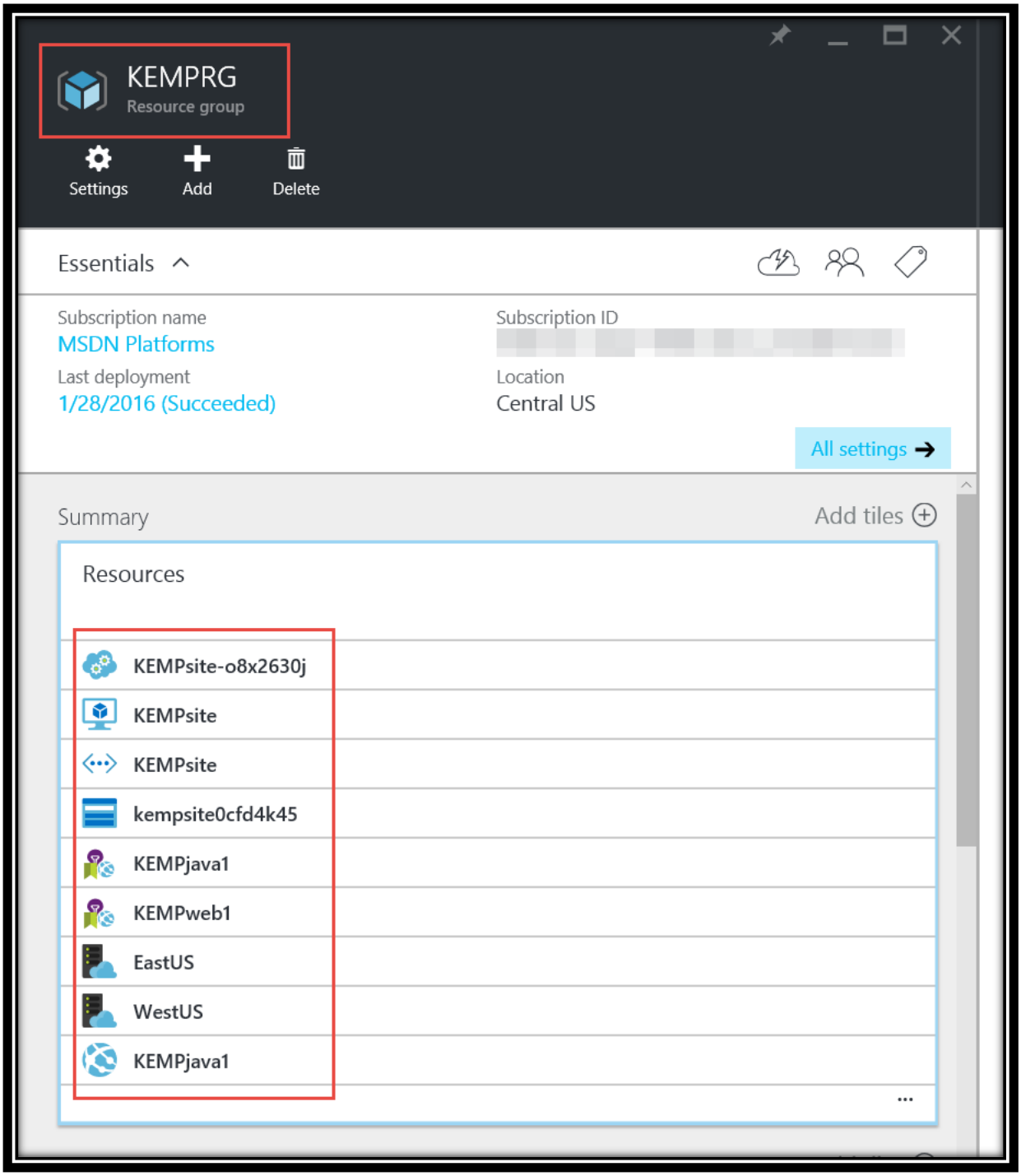
Please save your lab screenshots as either a .jpeg or .png. Upload your screenshots in one .zip file here.

1. Browse to http://portal.azure.com using the subscription used for this lab
2. Click on **Resource Groups** and then Click on the **KEMPRG** that was created during this lab



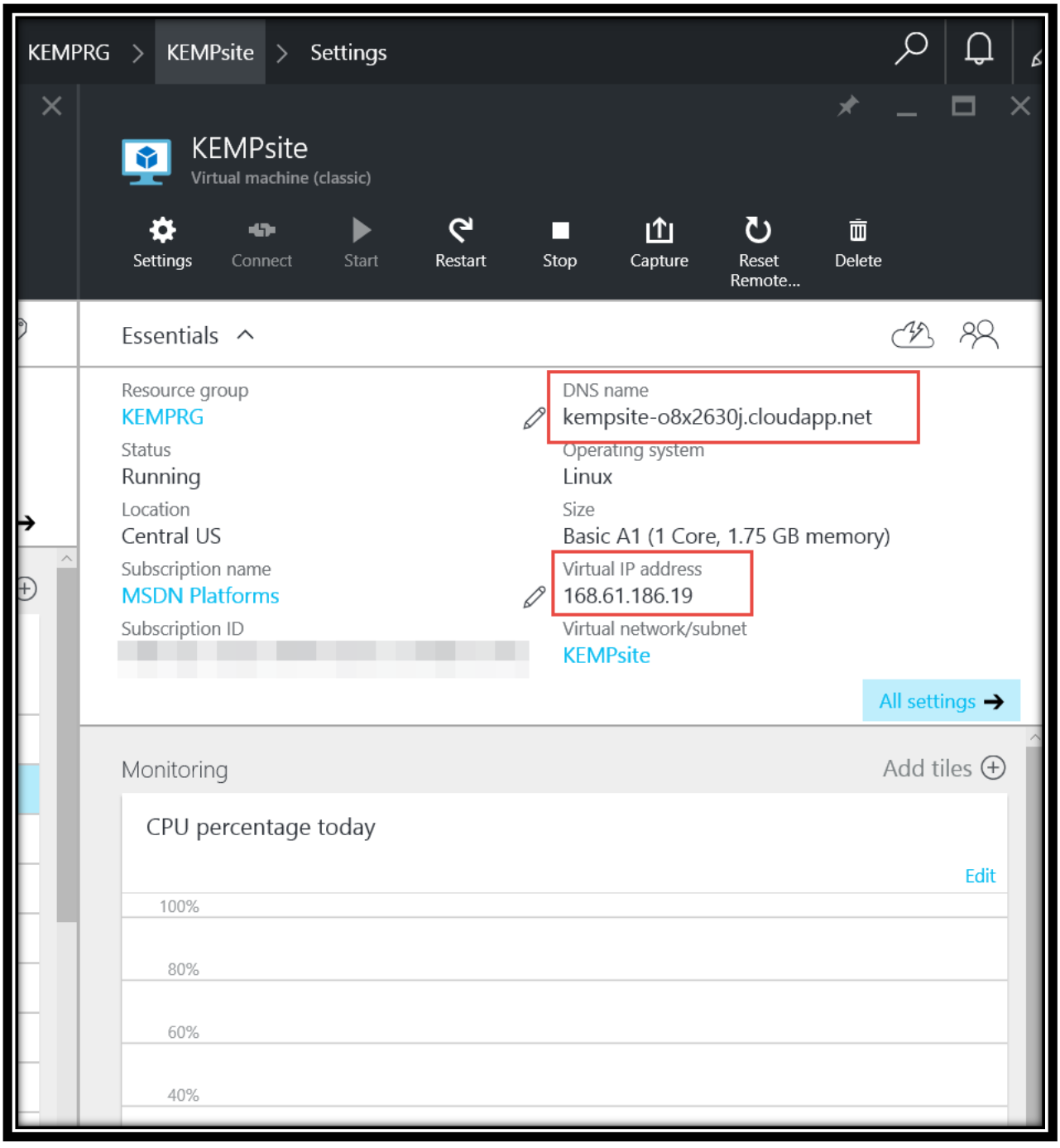
Screen shot example of the Resource Group

3. Take a Screen shot of the Resources you created and that were created automatically by the lab completion



Resource Group populated with created and auto-generated resources

4. Click on the name of the KEMP VM **KEMPsite** and take a Screen shot of the details noting the **DNS Name** and the **Virtual IP Address**



DNS Name and Virtual IP address

5. Provide a Screen Shot of the KEMP LoadMaster Virtual Services showing the **Virtual IP Address** and the **IP Addresses** of the **Real Servers**

IP Addresses of the Real Server in the KEMP Management Tool

6. Hit the **REFRESH** button a number of times in each of the Web App browser windows, the provide an updated Screen Shot of the **Real Time Statistics** showing multiple hits on each real server **IP Address**

Real Time Statistics in the KEMP Management Tool