

Deployment of KEMP LoadMaster on Microsoft Azure

Lab Guide

February 2016

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Some examples are for illustration only and are fictitious. No real association is intended or inferred.

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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

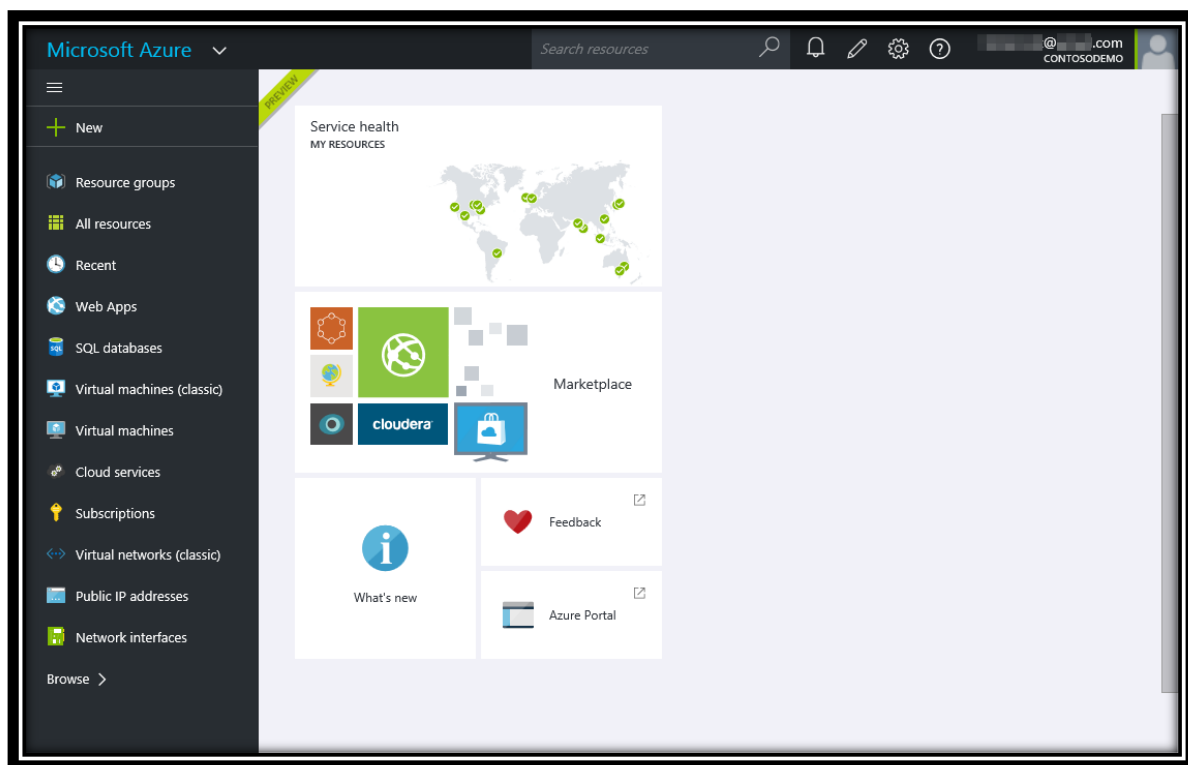
Having trouble with this lab or have a question? Please contact SuperHuman_Help@microsoft.com for technical assistance.

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.

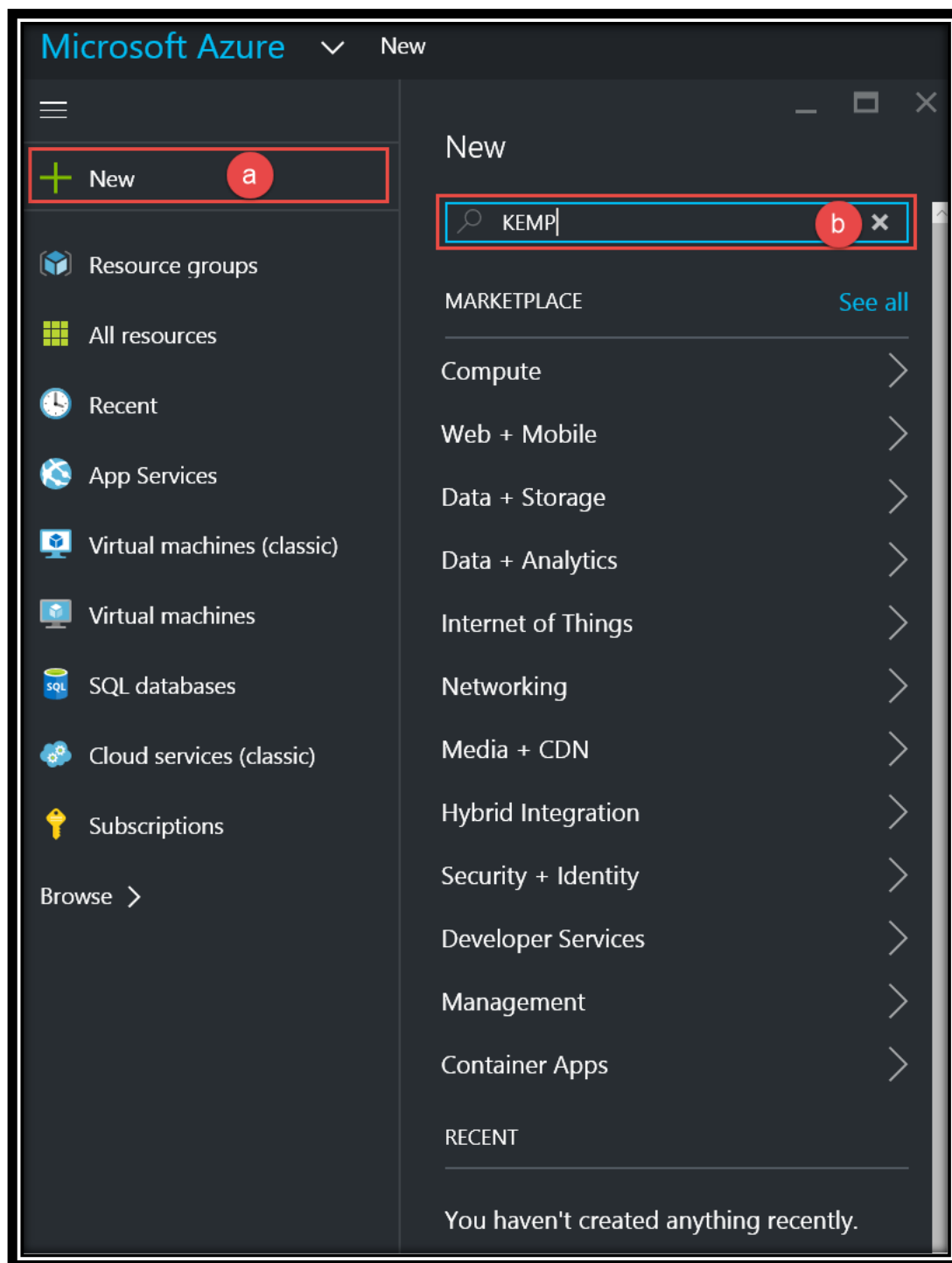
Task 1: Create the KEMP Load Master

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



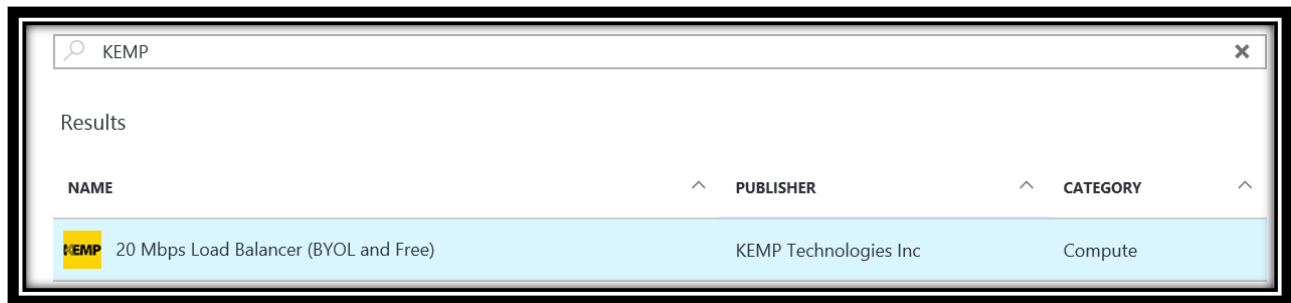
Azure Portal

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.



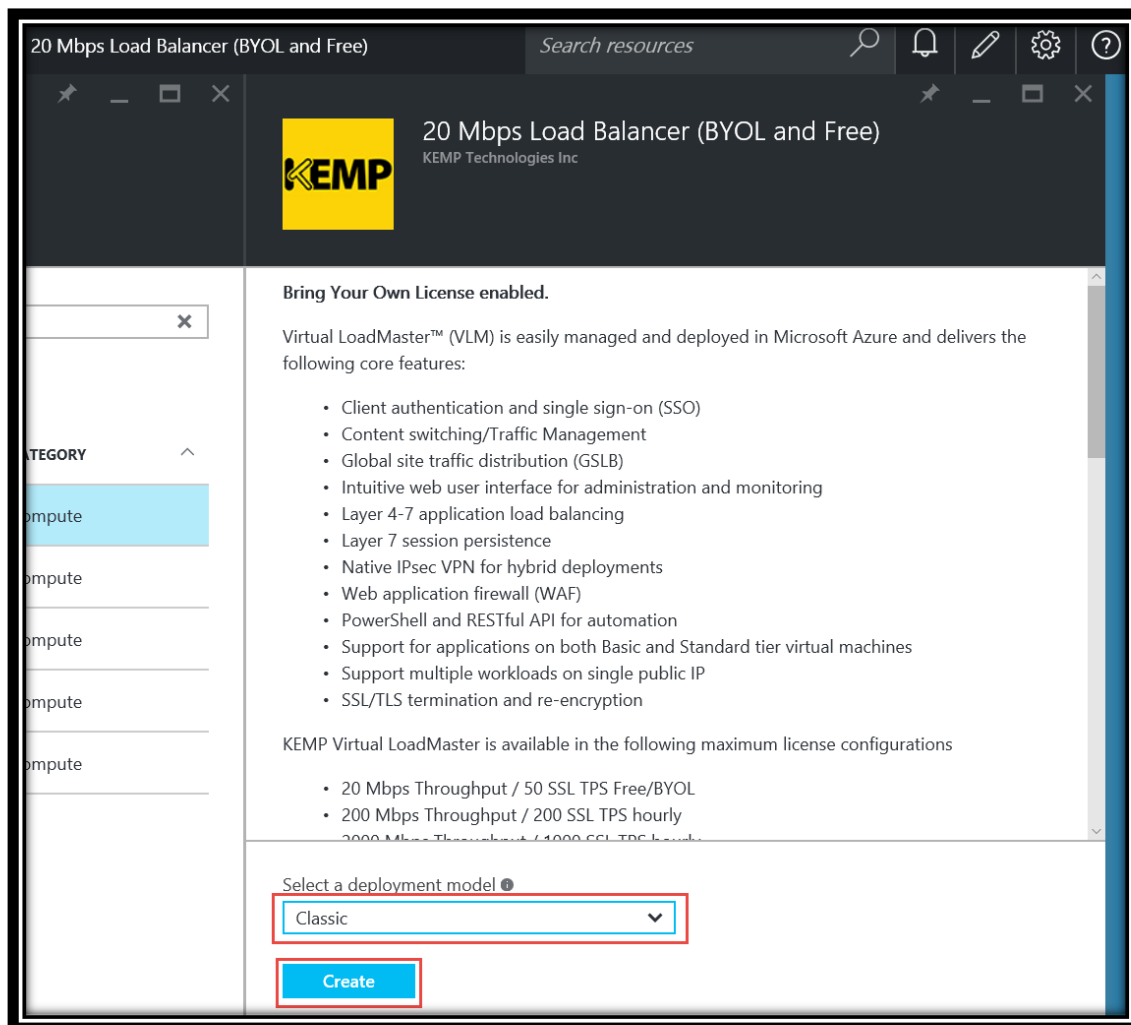
Negotiating Azure Portal

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**.

Offer details

Virtual LoadMaster™ (VLM) for Azure
by KEMP Technologies Inc
[Terms of use](#) and [privacy policy](#)
Basic A1
by Microsoft
[Terms of use](#) and [privacy policy](#)

0.0000 USD/hr *

0.0440 USD/hr +
[Pricing for other VM sizes](#)

*** Marketplace Offering:** May not be purchased using Microsoft subscription credits or monetary commitment funds and does not participate in discounts. These purchases are billed separately.

+ Azure Resource: May be purchased using Microsoft subscription credits or monetary commitment funds and participates in discounts. Prices presented are retail prices and may not reflect discounts associated with your subscription.

If you have previously purchased a free trial offering, your free trial period will run 30 days from the date of your original purchase; all use thereafter will be billed at the standard rates listed above.

Terms of use


By clicking "Purchase", I (a) agree to the legal terms and privacy statement(s) associated with each Marketplace offering above, (b) authorize Microsoft to charge or bill my current payment method for the fees associated with my use of 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 Microsoft may share my contact information and transaction details with the seller(s) of the offering (s). Microsoft does not provide rights for third-party products or services. See the [Azure Marketplace Terms](#) for additional terms.

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.



20 Mbps Load Balancer (BYOL and Free)
KEMP Technologies Inc

Create VM
20 Mbps Load Balancer (BYOL and Free)

Bring Your Own License enabled.

Virtual LoadMaster™ (VLM) is easily managed and deployed in Microsoft Azure and delivers the following core features:

- Client authentication and single sign-on (SSO)
- Content switching/Traffic Management
- Global site traffic distribution (GSLB)
- Intuitive web user interface for administration and monitoring
- Layer 4-7 application load balancing
- Layer 7 session persistence
- Native IPsec VPN for hybrid deployments
- Web application firewall (WAF)
- PowerShell and RESTful API for automation
- Support for applications on both Basic and Standard tier virtual machines
- Support multiple workloads on single public IP
- SSL/TLS termination and re-encryption

KEMP Virtual LoadMaster is available in the following maximum license configurations

- 20 Mbps Throughput / 50 SSL TPS Free/BYOL
- 200 Mbps Throughput / 200 SSL TPS hourly
- 2000 Mbps Throughput / 1000 SSL TPS hourly
- 5000 Mbps Throughput / 10,000 TPS hourly
- 10 Gbps Throughput / 12,000 SSL TPS hourly

A paid license can be applied to the Free/BYOL version to move to a higher throughput tier.

Select a deployment model ⓘ

Classic ▼

Create

* Host Name

KEMPsite ✓

* User name

LMAdmin ✓

Authentication type

Password SSH public key

* Password

••••••••

✓

Pricing Tier

Basic A1 >

Optional Configuration

Network, storage, diagnostics >

Resource Group

KEMPRG >

Subscription

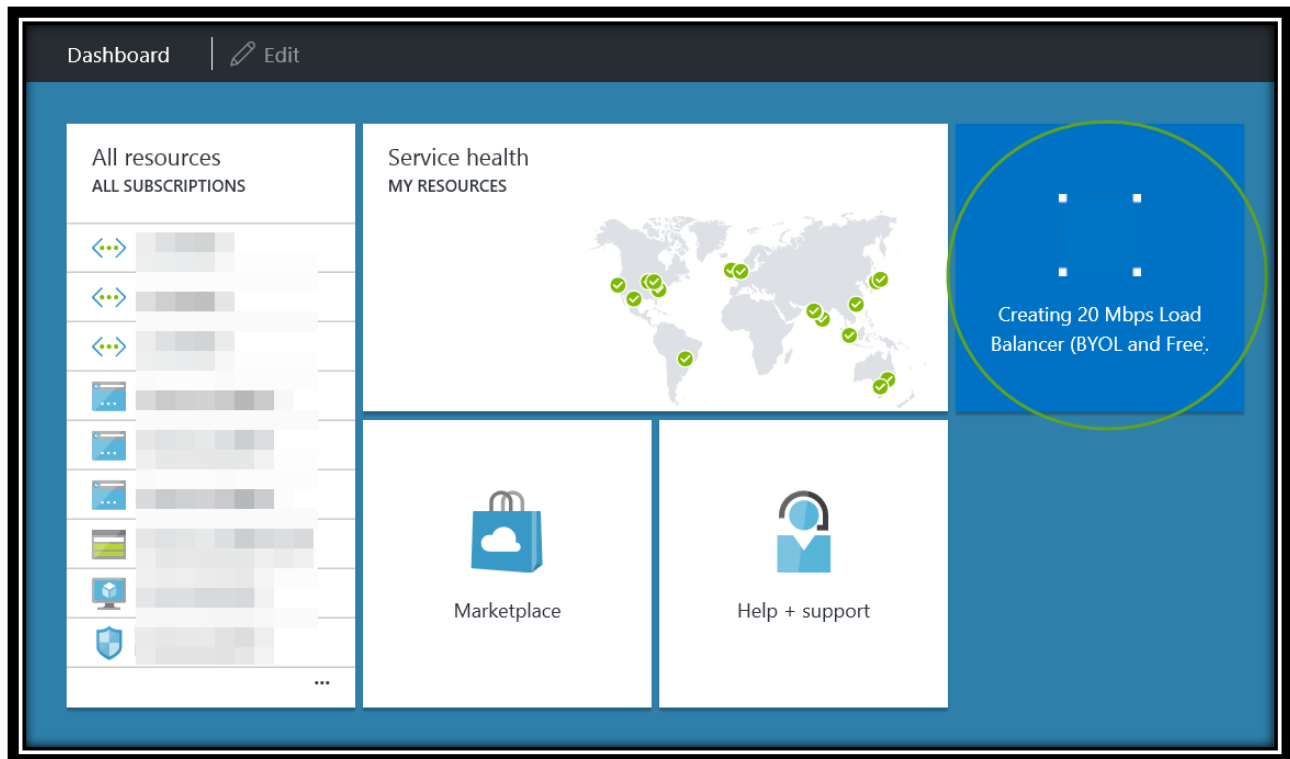
Visual Studio Enterprise with MS... >

☒ Pin to dashboard

Create

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.

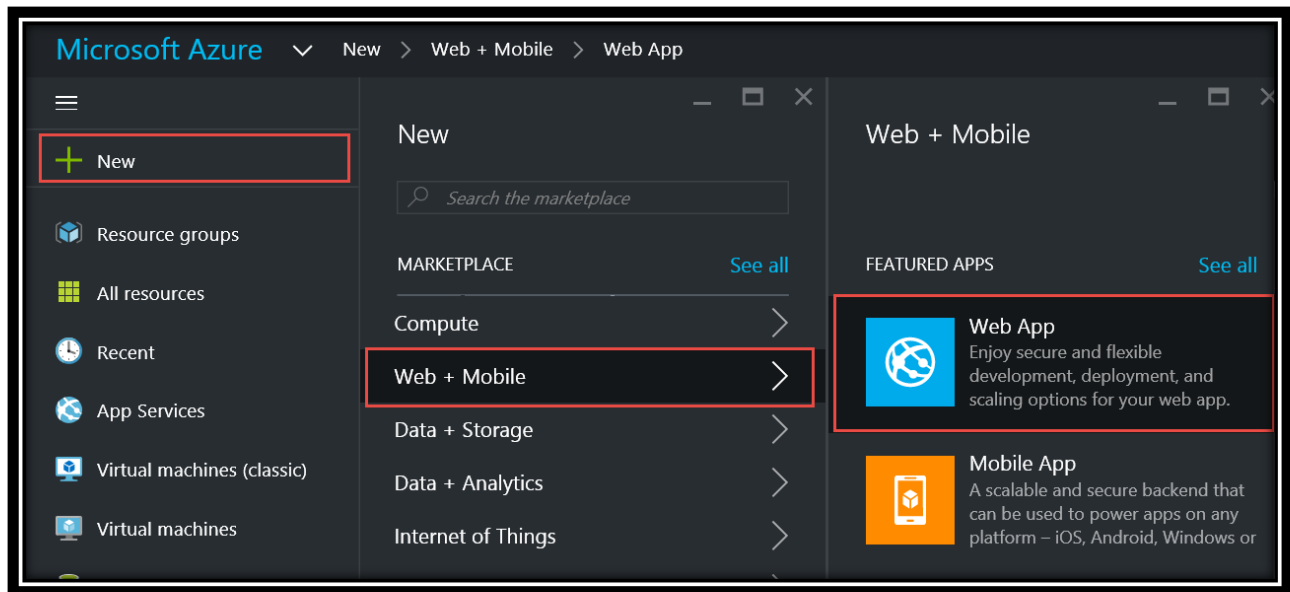


Azure Preview portal creating KEMP LoadMaster Appliance BYOL VM

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

* App Service Name
KEMPweb ✓
.azurewebsites.net

* Subscription
Visual Studio Enterprise with MSDN ▼



* Resource Group
KEMPRG >


New

Web App Properties

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

App Service plan

 An App Service plan is the container for your app. The App Service plan settings will determine the location, features, cost and compute resources associated with your app. 

 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

App Service plan

Choose your pricing tier
Browse the available plans and their features

App Service Environments are available in some regions, and more. [Learn more](#)

* App Service plan

EastUS

✓

* Location

East US

▼

* Pricing tier

S1 Standard

>

10 GB Storage

Custom domains

Up to 3 instances
Manual scale

32.74
USD/MONTH (ESTIMATED)

F1 Free

- Shared infrastructure

1 GB Storage

0.00
USD/MONTH (ESTIMATED)

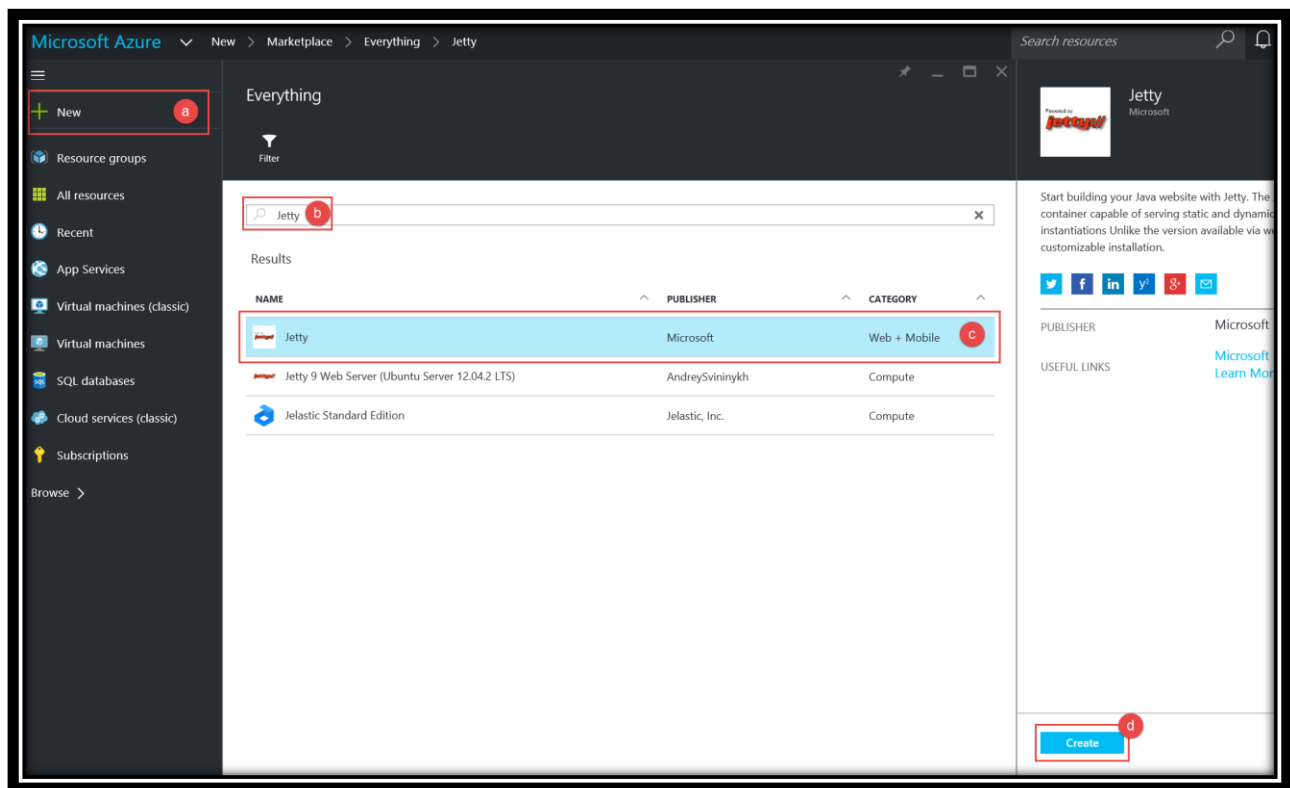
OK

Select

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

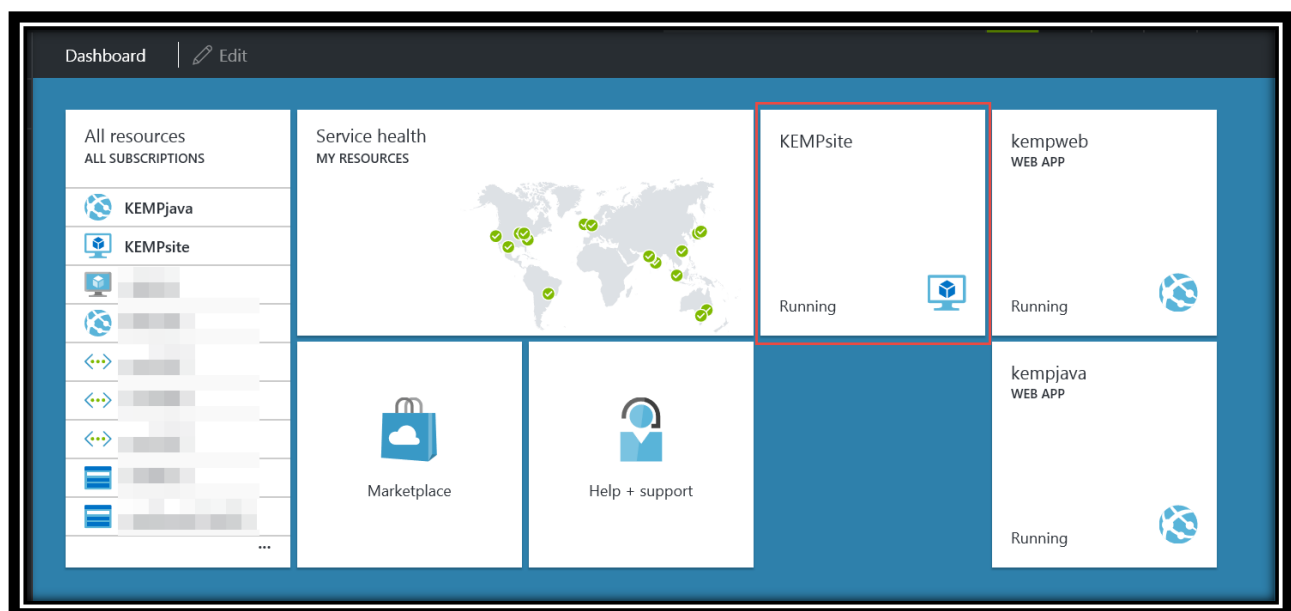
NOTE: Allow Time for Web Apps and Load Master to be created (approx. 10-15 minutes)

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.

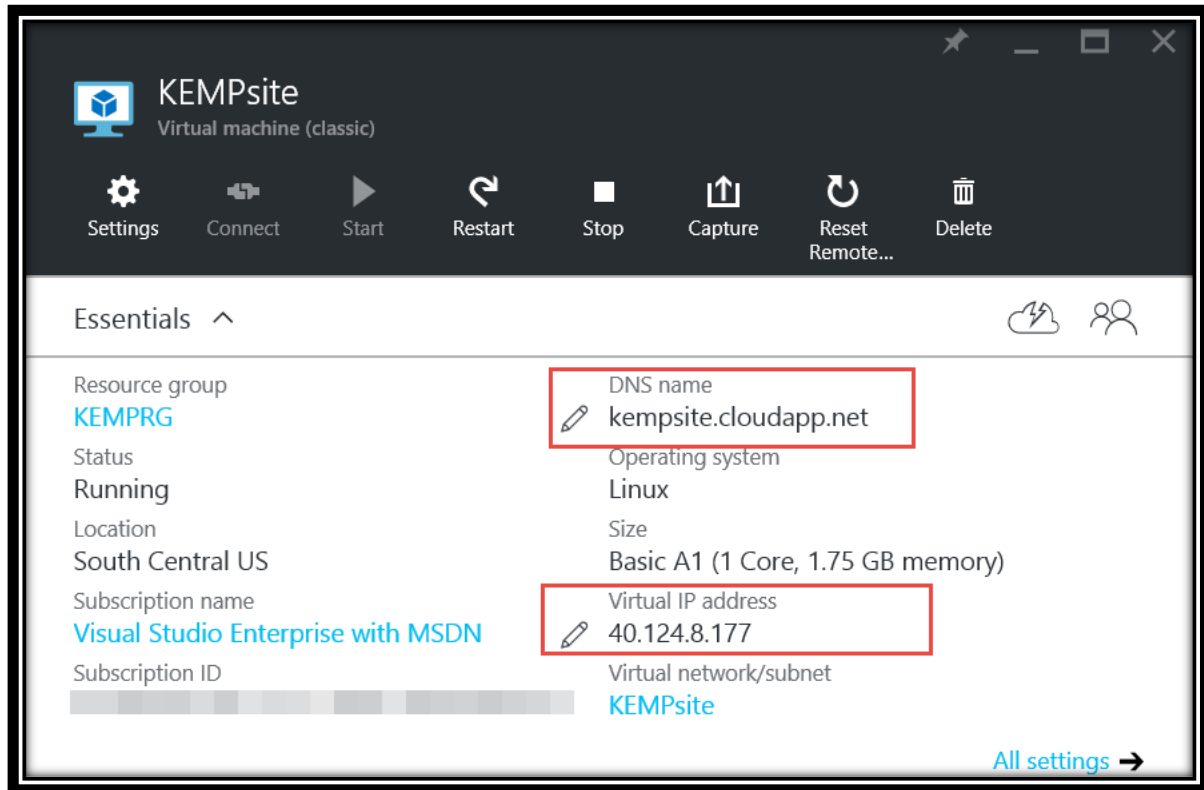
Task 1: Build a Table with Information needed for LoadMaster Configuration

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

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



DNS Name and Virtual IP address location for the KEMP Appliance

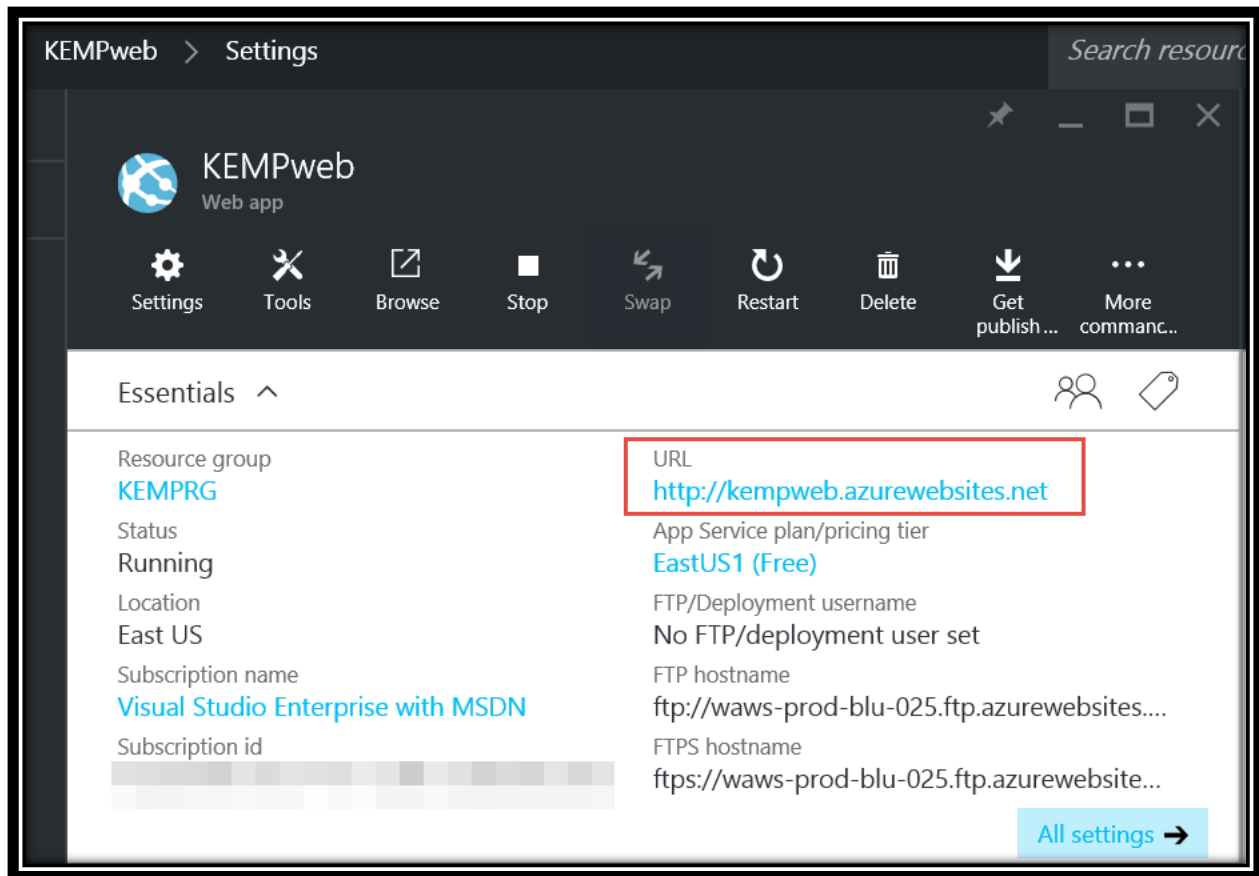
- Write down **DNS name** and **IP address** of Load Master in the following table:

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.

- Return to the Azure Portal Dashboard and click on the **KEMPweb** Web App to display the properties
- 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

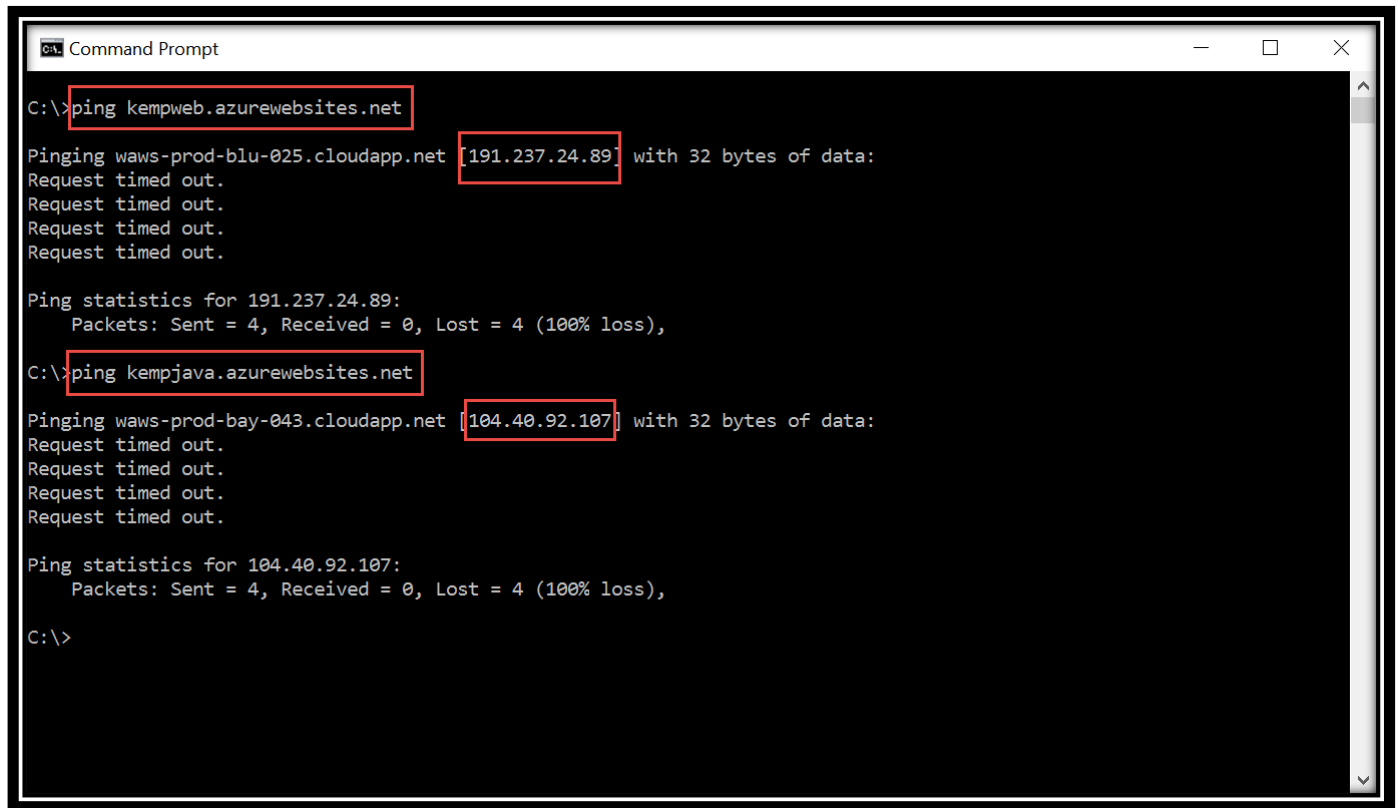
Table for recording Web Application URLs and IP Addresses

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



```
Command Prompt
C:\>ping kempweb.azurewebsites.net
Pinging waws-prod-blu-025.cloudapp.net [191.237.24.89] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 191.237.24.89:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping kempjava.azurewebsites.net
Pinging waws-prod-bay-043.cloudapp.net [104.40.92.107] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

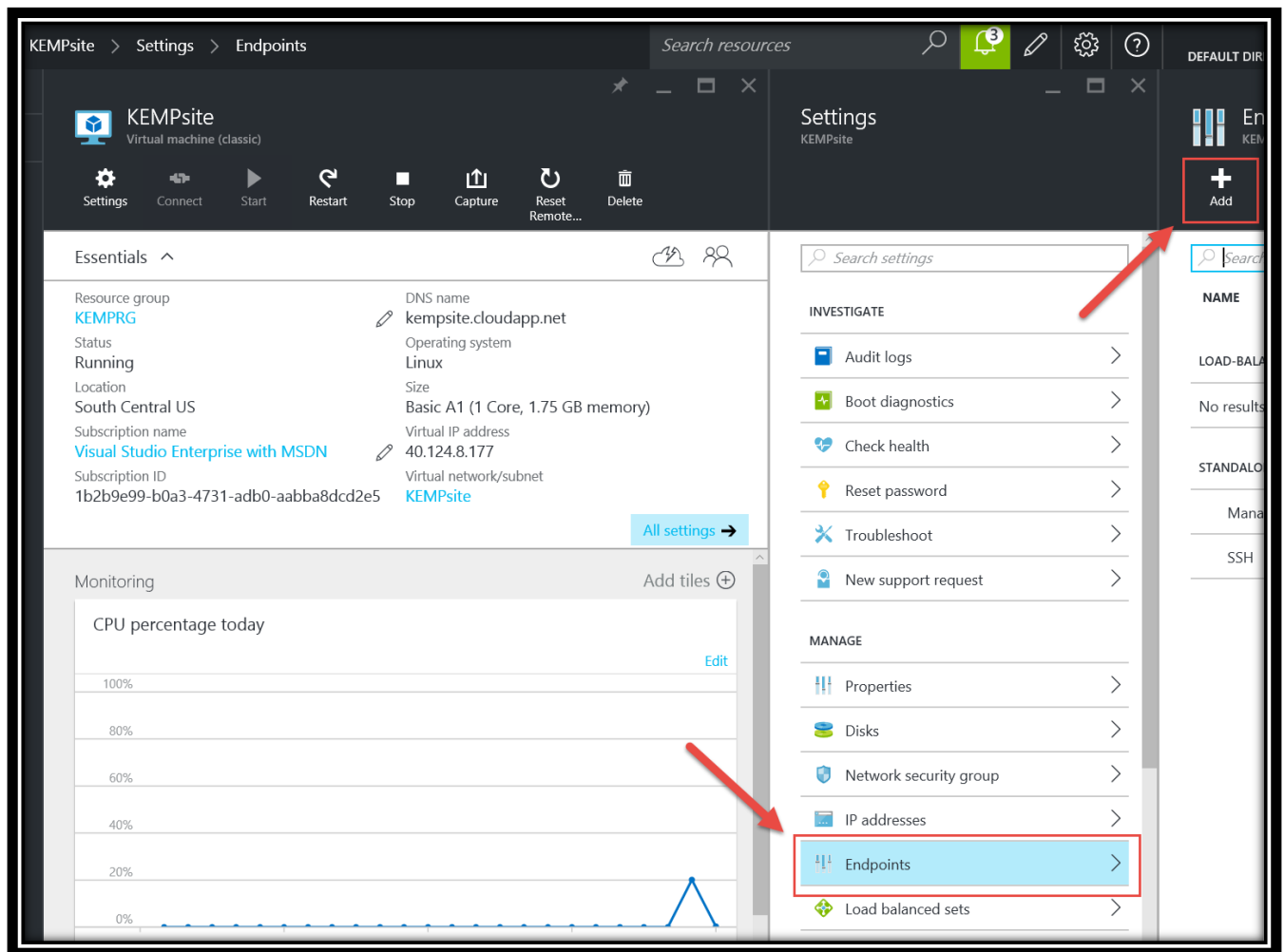
Ping statistics for 104.40.92.107:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

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**

Add endpoint
KEMPsite6565

* Name: ✓

Protocol: ☒ TCP ☐ UDP

* Public port: ✓

* Private port: ✕

Floating IP address ⓘ: ☒ Disabled ☐ Enabled

Access control list

ORDER	NAME	ACTION	REMOTE SUBNET
<input type="text"/>	<input type="text"/>	deny ▼	0.0.0.0/0 ...

Properties for New Endpoint Creation

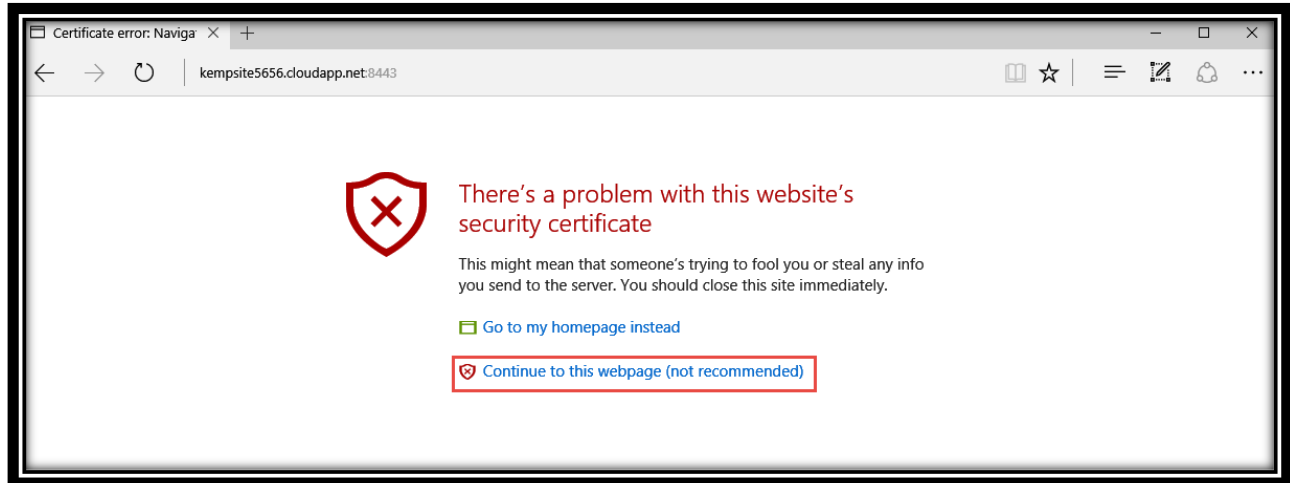
Allow time for this Endpoint to build within the device configuration

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>

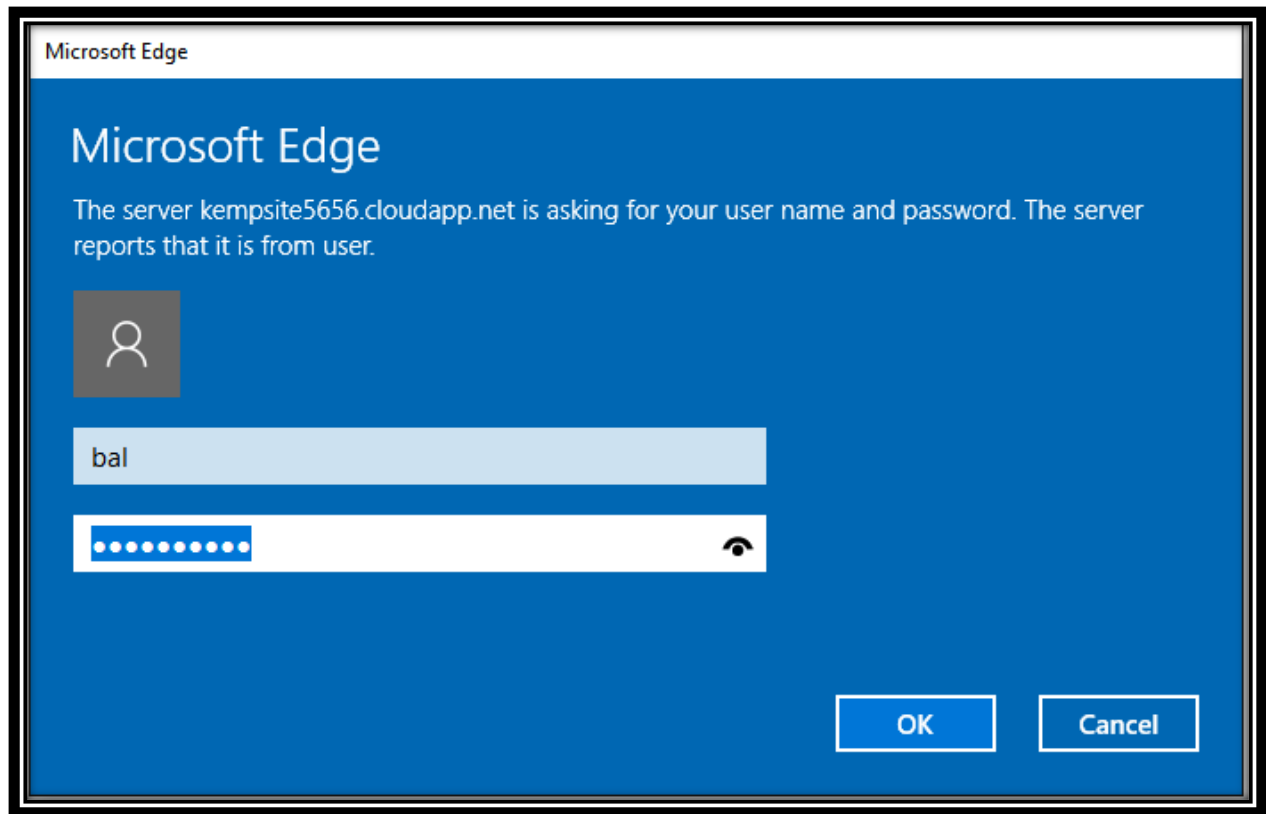
NOTE: This will be the DNS Name recorded in the table earlier in the lab. This is just the example for this document.

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

Licensing (EULA)

matter of this Agreement. This Agreement may be amended, modified or supplemented only by a writing that is signed by the authorized representatives of both parties.

13.5 RESERVATION OF RIGHTS: All rights not expressly granted in this Agreement are reserved by KEMP.

14. INJUNCTION. Because KEMP would be irreparably damaged if the terms of this License Agreement were not specifically enforced, you agree that KEMP shall be entitled, without bond, other security or proof of damages, to appropriate equitable remedies with respect to breaches of this Agreement, in addition to such other remedies as KEMP may otherwise have under applicable laws.

15. INDEMNITY. At KEMP's request, you agree to defend, indemnify and hold harmless KEMP, its subsidiaries, affiliates, contractors, officers, directors, employees, agents, licensors, licensees, distributors, developers, content providers, and other users of the Product, from all damages, losses, liabilities, claims and expenses, including attorneys' fees, arising directly or indirectly from your acts and omissions to act in using the Product pursuant to the terms of this License Agreement or any breach of this License Agreement by you. KEMP reserves the right, at its own expense, to assume the exclusive defense and control of any matter otherwise subject to indemnification by you hereunder, and in such event, you shall have no further obligation to provide indemnification for such matter.

16. TERMINATION. Without prejudice to any other rights of KEMP, this License Agreement and your right to use the Product may automatically terminate without notice from KEMP if you fail to comply with any provision of this Agreement or any terms and conditions associated with the Product. In such event, you must destroy all copies of this Product and all of its component parts.

17. GENERAL PROVISIONS. You may not use, copy, modify, sublicense, rent, sell, assign or transfer the rights or obligations granted to you in this Agreement, except as expressly provided in this Agreement. Any assignment in violation of this Agreement is void, except that you may transfer your Product to another person provided that person accepts the terms of this License Agreement. If any provision of this Agreement is held to be unenforceable for any reason, such provision shall be reformed only to the extent necessary to make it enforceable, and such decision shall not affect the enforceability of: (i) such provision under other circumstances, or (ii) the remaining provisions hereof under all circumstances. KEMP's failure to enforce at any time any of the provisions of this Agreement shall in no way be construed to be a present or future waiver of such provisions, nor in any way affect the right of any party to enforce each and every such provision thereafter. The express waiver by KEMP of any provision, condition or requirement of this Agreement shall not constitute a waiver of any future obligation to comply with such provision, condition or requirement. Notwithstanding anything else in this Agreement, no default, delay or failure to perform on the part of KEMP shall be considered a breach of this Agreement if such default, delay or failure to perform is shown to be due to causes beyond the reasonable control of KEMP. This Agreement represents the complete agreement concerning this License Agreement between you and KEMP.

By clicking 'Agree' you agree to abide by the terms put forth above. If you do not agree with terms put forth above contact your KEMP Representative for further information and help.

Copyright © 2002-2013 KEMP Technologies, Inc.

Cancel

Agree

Copyright © 2002-2015 KEMP Technologies, Inc.

Agreeing to the KEMP Technologies EULA

6. Allow Update Checking

Update Checking

As part of KEMP's continuous drive to offer better value and services to our customers KEMP has introduced a Call Home feature.

The LoadMaster can utilize Call Home to get available license updates, information regarding any updated firmware for your product and provide system status information to KEMP. The system status information will include Throughput, Enabled Features, Virtual Services and Real Servers details but will not include any unique personal information or actual traffic from your network.

Your LoadMaster will initiate a connection to KEMP once during any 24 hour interval.

NOTE – Allowing Call Home is mandatory for Free LoadMaster versions.

For more details on this visit www.kemptechnologies.com/calhome

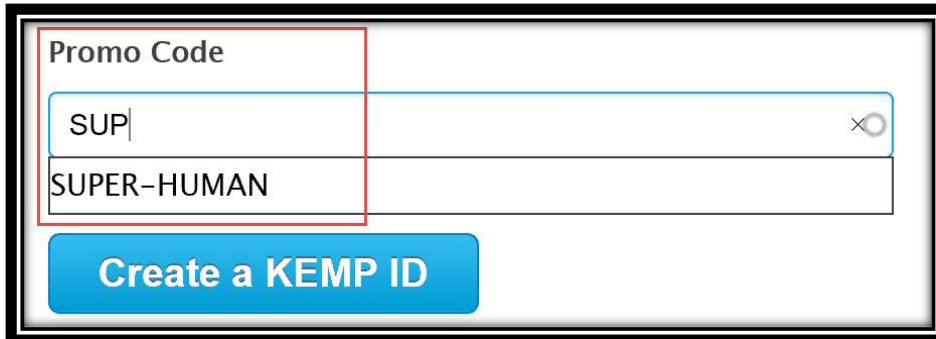
Don't allow

Allow

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.

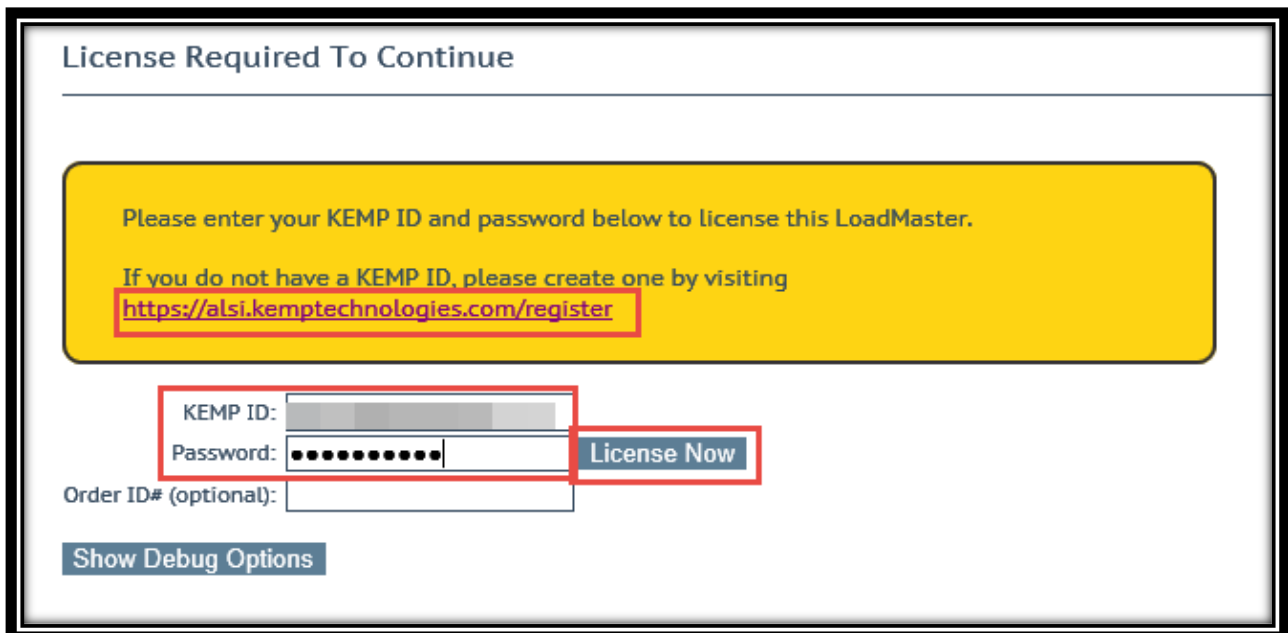
NOTE: The field will auto-populate for you when you start typing Super-Human.

A screenshot of a registration form. At the top, there is a label "Promo Code" above a text input field. The input field contains the text "SUP" and has a clear button (an 'x' in a circle) to its right. Below the input field, the text "SUPER-HUMAN" is displayed. Below the input field and the displayed text is a blue button with the text "Create a KEMP ID".

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**

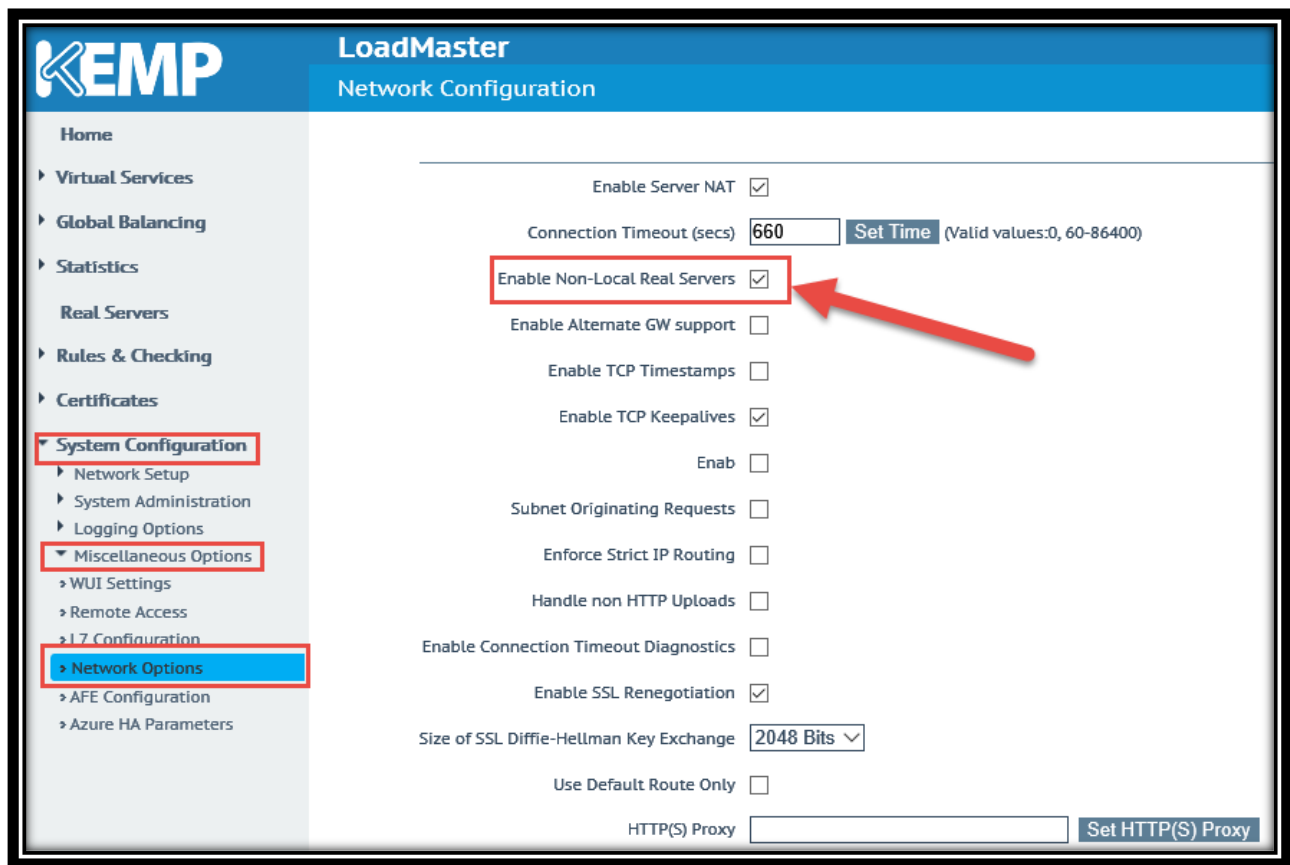
A screenshot of a web page titled "License Required To Continue". Below the title is a yellow box containing the text: "Please enter your KEMP ID and password below to license this LoadMaster." followed by "If you do not have a KEMP ID, please create one by visiting" and a red-bordered box containing the URL "https://alsi.kemptechnologies.com/register". Below the yellow box are three input fields: "KEMP ID:" (with a red border), "Password:" (with a red border and masked with dots), and "Order ID# (optional):". To the right of the Password field is a blue button labeled "License Now". Below the input fields is a blue button labeled "Show Debug Options".

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

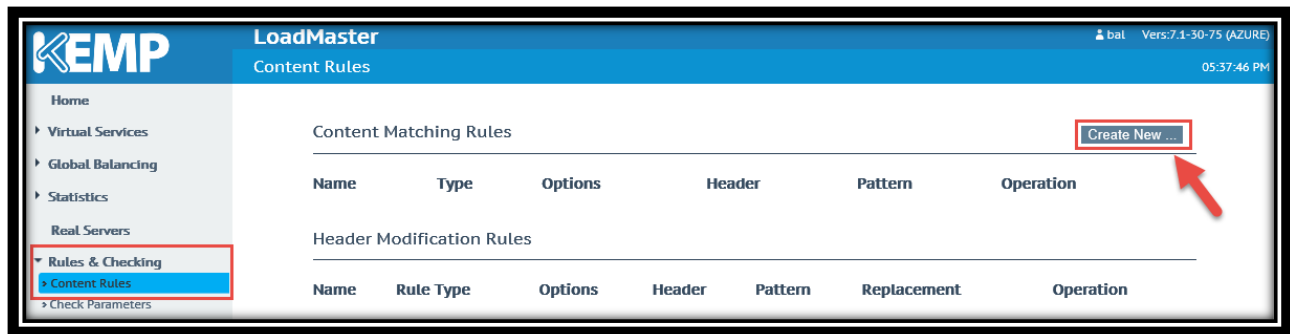
1. In the left pane, select **System Configuration > Miscellaneous Options > Network Options**
2. Check the checkbox for: **Enable Non-Local Real Server**



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: **/^Vjava.***

(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

The screenshot shows the 'Create Rule' dialog box with the following configuration and annotations:

- Rule Name:** JavaMatch (Annotation a)
- Rule Type:** Content Matching
- Match Type:** Regular Expression
- Header Field:** (Empty)
- Match String:** /^Vjava.* (Annotation b)
- Negation:** ☐
- Ignore Case:** ☒ (Annotation c)
- Include Host in URL:** ☐
- Include Query in URL:** ☐
- Fail On Match:** ☐
- Perform If Flag Set:** [Unset]
- Set Flag If Matched:** Flag 2 (Annotation d)
- Buttons:** Cancel and Create Rule (Annotation e)

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: **/^Vweb.***

(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

Create Rule

Rule Name: **a**

Rule Type: **b**

Match String: **c**

Modified URL: **d**

Perform If Flag Set: **e**

f

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

Create Rule

Rule Name: **a**

Rule Type: **b**

Match String: **c**

Modified URL: **d**

Perform If Flag Set: **e**

f

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

The screenshot shows the 'Create Rule' dialog box with the following fields and values:

- Rule Name: WebReplace (a)
- Rule Type: Replace Header (b)
- Header Field: Host (c)
- Match String: KEMPsite.cloudapp.net (d)
- Value of Header Field to be replaced: KEMPweb.azurewebsites.net (e)
- Perform If Flag Set: Flag 1 (f)
- Buttons: Cancel and Create Rule (g)

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

Create Rule

Rule Name: **a**

Rule Type: **b**

Header Field: **c**

Match String: **d**

Value of Header Field to be replaced: **e**

Perform If Flag Set: **f**

g

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

KEMP LoadMaster bal Vers:7.1-30-75 (AZURE) 06:18:38 PM

Add a new Virtual Service

Please Specify the Parameters for the Virtual Service.

Virtual Address: **c**

Port: **d**

Service Name (Optional): **e**

Protocol:

f

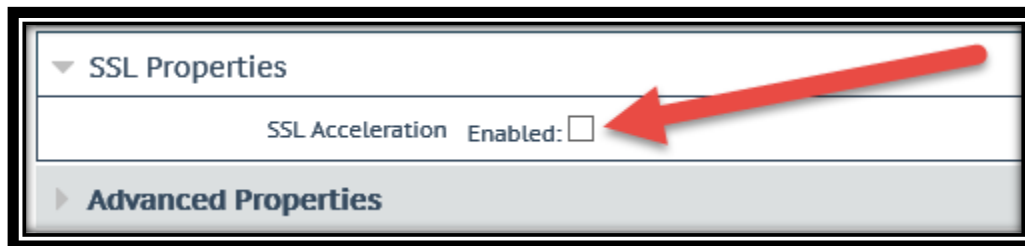
Add New Virtual Service

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



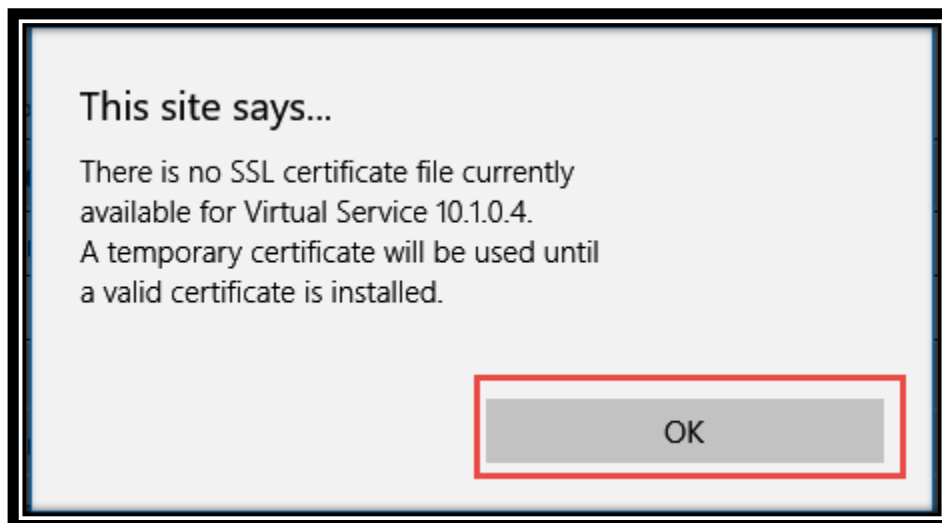
Disable Transparency

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



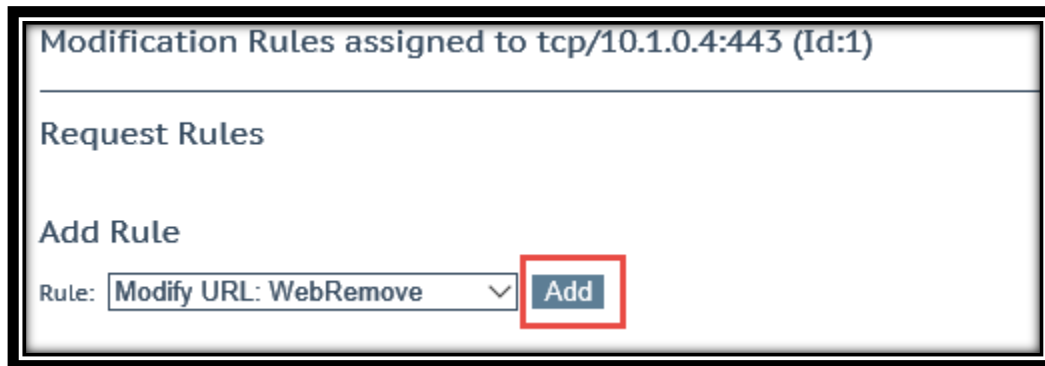
Temporary Certificate prompt

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



Show Header Rules

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



Adding Request Rules to Virtual Service

- Click **Add** four times, to add all of the following:
 - WebRemove
 - JavaRemove
 - WebReplace
 - JavaReplace

- 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.

[<-Back](#)

Modification Rules assigned to tcp/10.1.0.4:443 (Id:1)

Request Rules

Name	Rule Type	Options	Header	Pattern	Replacement	Operation
WebRemove	Modify URL	Only On 1		/^\/web.*/	/	Delete
JavaRemove	Modify URL	Only On 2		/^\/java.*/	/	Promote Delete
WebReplace	Replace Header	Only On 1	Host	KEMPsite.cloudapp.net	KEMPweb.azurewebsites.net	Promote Delete
JavaReplace	Replace Header	Only On 2	Host	KEMPsite.cloudapp.net	KEMPjava.azurewebsites.net	Promote Delete

All Four Header Rules added


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

▼ Advanced Properties

Content Switching Disabled

HTTP Selection Rules [Show Selection Rules](#)

HTTP Header Modifications [Show Header Rules \(4 Requests\)](#)



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

▼ Real Servers [Add New ...](#) [Add SubVS ...](#)

Real Server Check Parameters Checked Port [Set Check Port](#)

URL: [Set URL](#)

Adding SubVS

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

▼ SubVSs [Add New ...](#)

Id Name	Weight	Limit	Status	Operation
1	1000	0	Enabled	Disable Modify Delete

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

▼ SubVSs

Add New ...

Id	Name	Weight	Limit	Status	Operation		
1		1000	0	Enabled	Disable	Modify	Delete
2		1000	0	Enabled	Disable	Modify	Delete

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

Properties for subVS 1 (Id:2) of tcp/10.1.0.4:443 - Operating at Layer 7

[<-Back](#)

Basic Properties

SubVS Name **a** [Set Nickname](#) **b**

SubVS Type

SubVS Weight [Set Weight](#)

SubVS Limit [Set Limit](#)

Standard Options

Transparency ☐ **c**

Subnet Originating Requests ☐

Persistence Options Mode:

Scheduling Method

Idle Connection Timeout (Default 660) [Set Idle Timeout](#)

Quality of Service

Advanced Properties

WAF Options

ESP Options

Real Servers

[Add New ...](#)

Real Server Check Parameters **d** [Set Check Port](#) **e**

URL: [Set URL](#)

Use HTTP/1.1: ☐

HTTP Method: **f**

Custom Headers: [Show Headers](#)

Id	IP Address	Port	Forwarding method	Weight	Limit	Status	Operation
----	------------	------	-------------------	--------	-------	--------	-----------

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

HTTP Method:

Custom Headers:

Host	KEMPweb.azurewebsites.net	<input type="button" value="Set Header"/>
<input type="text"/>	<input type="text"/>	<input type="button" value="Set Header"/>

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

▼ Real Servers

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

Please Specify the Parameters for the Real Server

☒ Allow Remote Addresses

Port

Forwarding method

Weight

Connection Limit

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

Properties of subVS 2 (Id:3) of tcp/10.1.0.4:443

<-Back

Basic Properties

SubVS Name: **KEMP Java** **a** **Set Nickname** **b**

SubVS Type: HTTP/HTTPS

SubVS Weight: 1000 **Set Weight**

SubVS Limit: 0 **Set Limit**

Standard Options

Transparency ☐ **c**

Subnet Originating Requests ☐

Persistence Options Mode: None

Scheduling Method: round robin

Idle Connection Timeout (Default: 660) **Set Idle Timeout**

Quality of Service: Normal-Service

Advanced Properties

WAF Options

ESP Options

Real Servers **d** **e** **Add New ...**

Real Server Check Parameters: HTTP Protocol **Checked Port** **80** **Set Check Port**

URL: **Set URL**

Use HTTP/1.1: ☐

HTTP Method: HEAD **f**

Custom Headers: **Show Headers** **Set Header**

Id	IP Address	Port	Forwarding method	Weight	Limit	Status	Operation
----	------------	------	-------------------	--------	-------	--------	-----------

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

HTTP Method: AD

Host	KEMPjava.azurewebsites.net	<input type="button" value="Set Header"/>
<input type="text"/>	<input type="text"/>	<input type="button" value="Set Header"/>

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

▼ Real Servers

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

Please Specify the Parameters for the Real Server

☒ Allow Remote Addresses

Real Server Address

Port

Forwarding method

Weight

Connection Limit

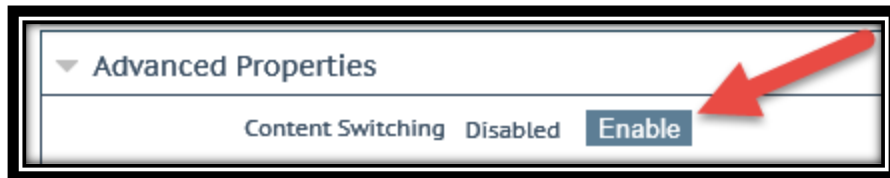
Adding IP Address to Real Server

- 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

- Click on **Advanced Properties** tab to expand it
- 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**

SubVSs					Add New ...			
Id	Name	Weight	Limit	Status	Rules	Operation		
1	KEMP Web	1000	0	Enabled	None	Disable	Modify	Delete
2	KEMP Java	1000	0	Enabled	None	Disable	Modify	Delete

Note the Red Background indicating Content Switching Enabled but not configured

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

Rules assigned to subVS KEMP Web on Virtual Service tcp/10.1.0.4:443 (Id:1)				
OperationName	Match Type	Options	Header	Pattern
WebMatch	RegEx	Ignore Case Set Flag 1		/^\web.*\$/

Add Rule

Rule: default Add

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

Rules assigned to subVS KEMP Java on Virtual Service tcp/10.1.0.4:443 (Id:1)

OperationName	Match Type	Options	Header	Pattern
JavaMatch	RegEx	Ignore Case Set Flag 2		/^\\java.*/

Add Rule

Rule:

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

SubVSs					Add New ...			
Id	Name	Weight	Limit	Status	Rules Operation			
1	KEMP Web	1000	0	Enabled	1	Disable	Modify	Delete
2	KEMP Java	1000	0	Enabled	1	Disable	Modify	Delete

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

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

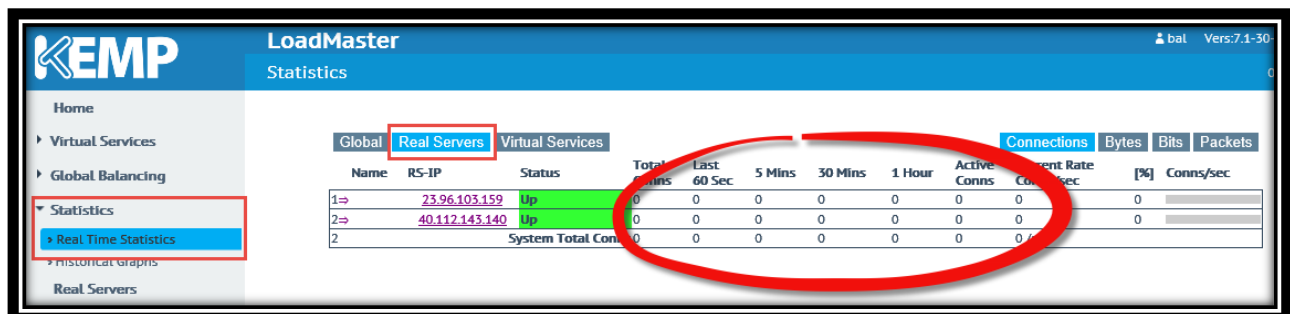


Validation of Status on KEMP Appliance and Web Apps

Task 2: View Stats of Service just created

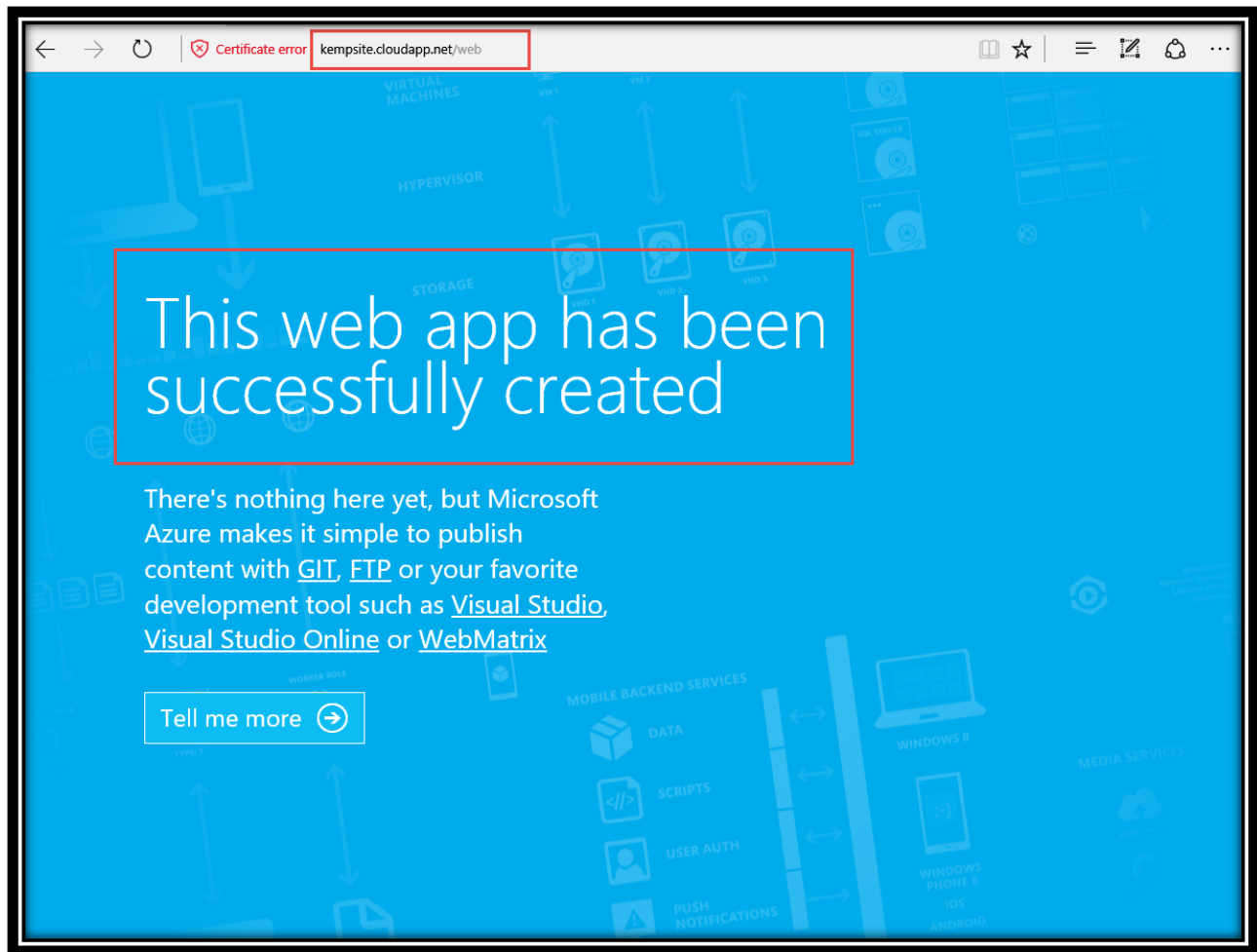
- In the left pane, select **Statistics**
- Under **Statistics**, select **Real Time Statistics**
- Click the **Real Servers** button

NOTE: All Stats are 0 (zeros)



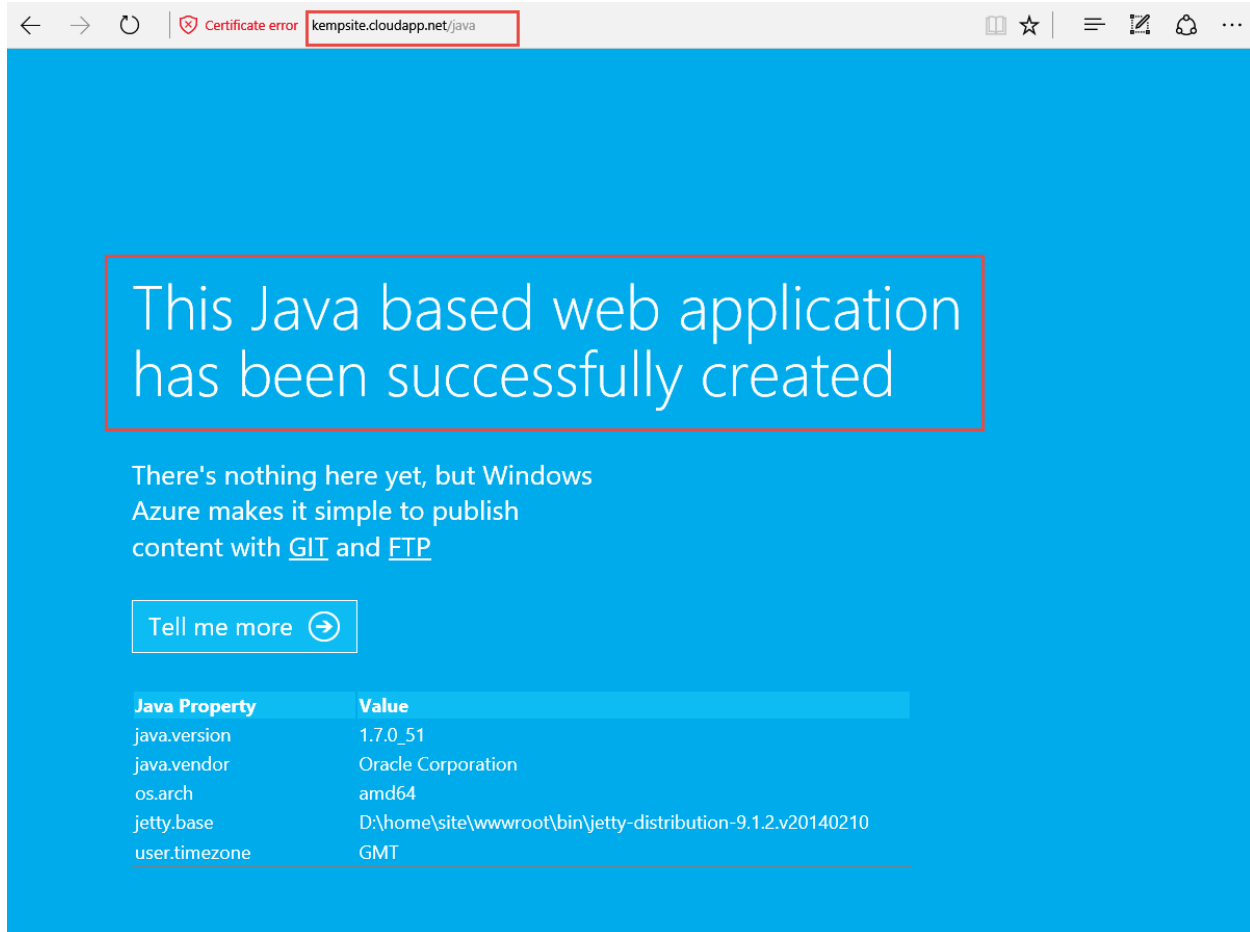
Real Time Stats in KEMP Appliance Configuration

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



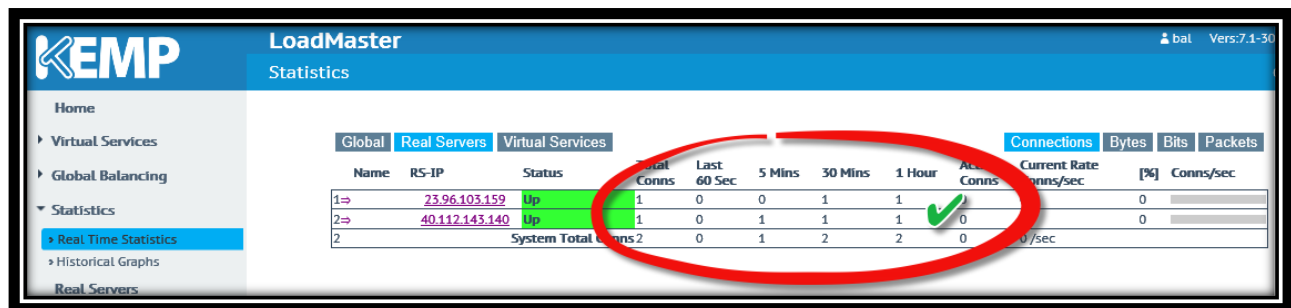
Success Splash Page for the Web App

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

- 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



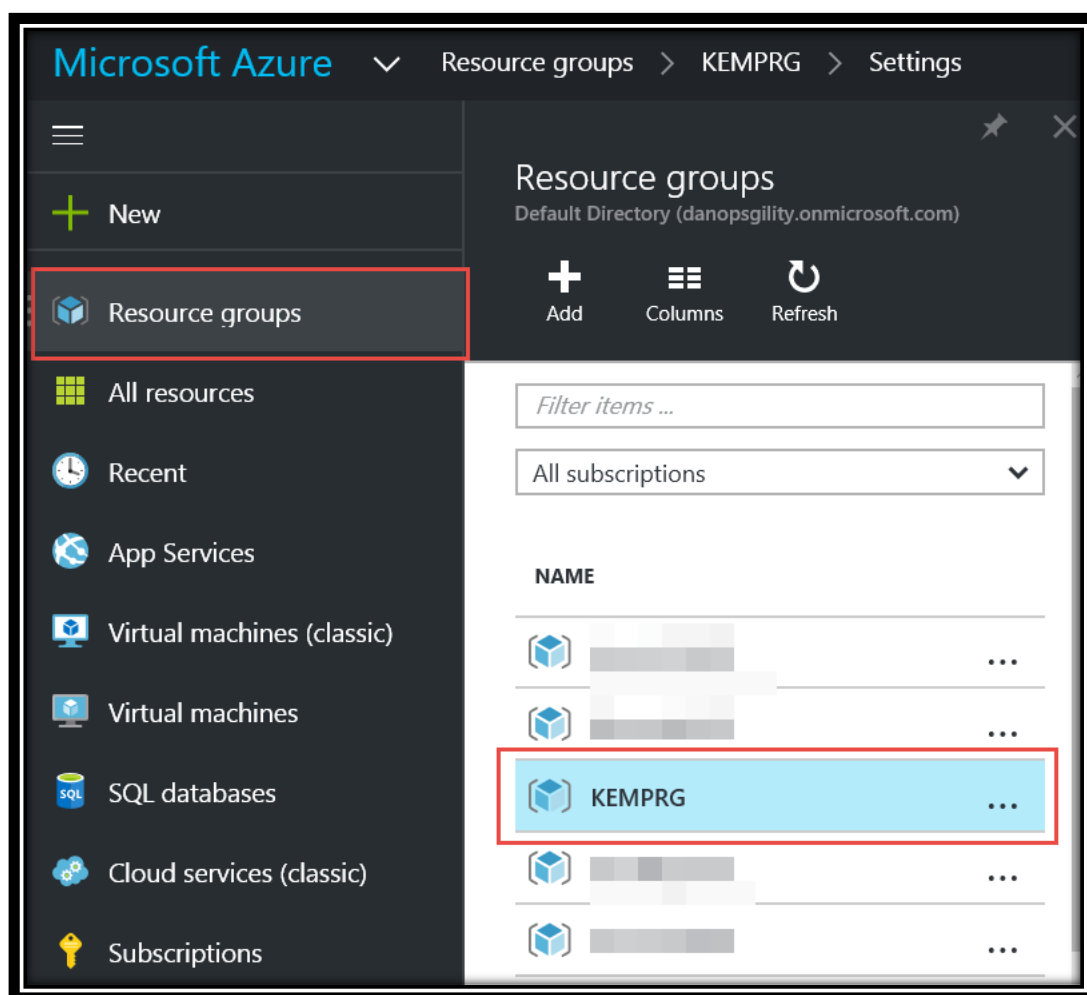
Statistics Page Showing Successful Browsing to Web and Java Apps

Exercise 4: Provide Proof of Lab Completion

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

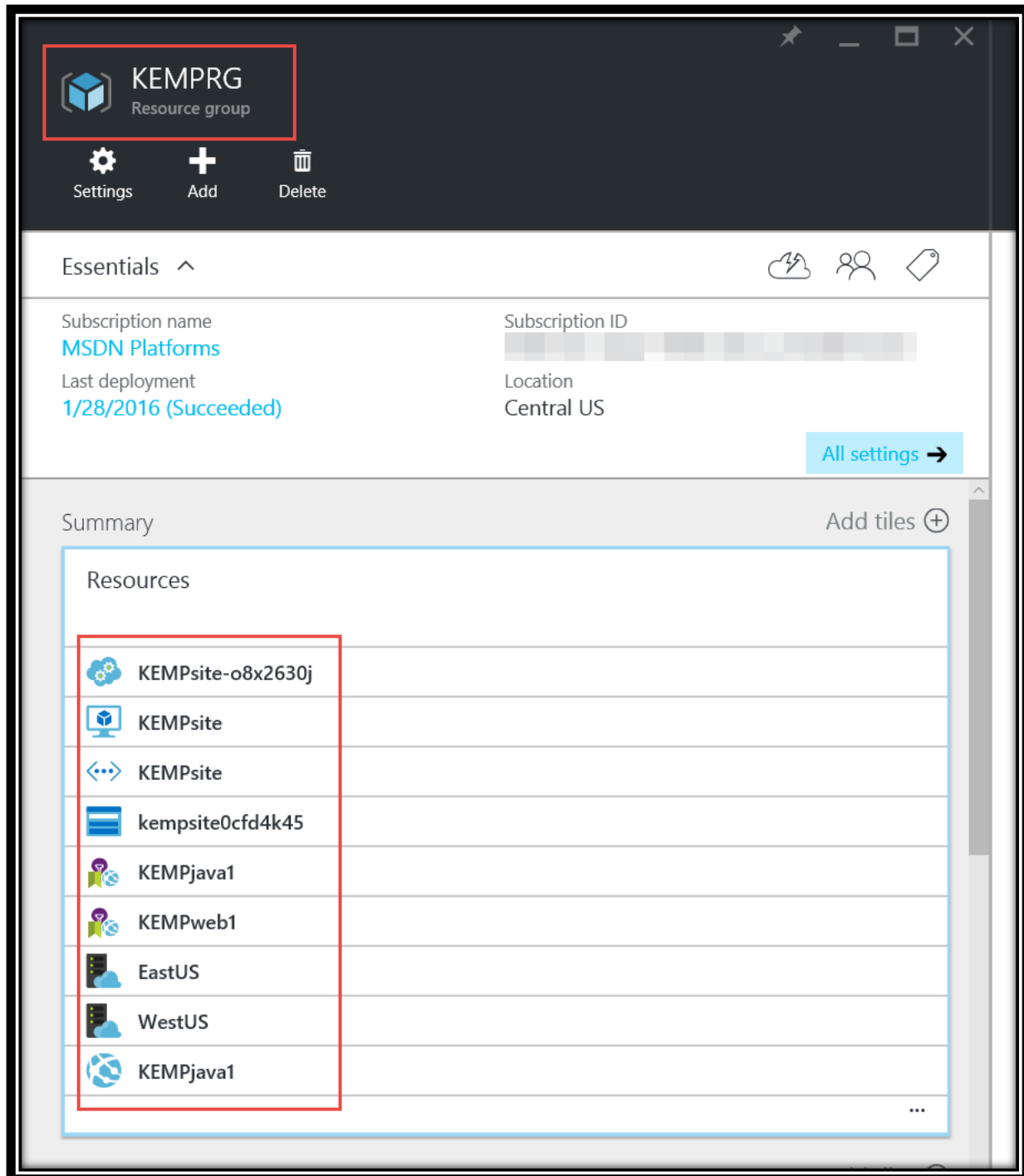
Please save your lab screenshots as either a .jpeg or .png. Upload your screenshots in one .zip file [here](#).

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



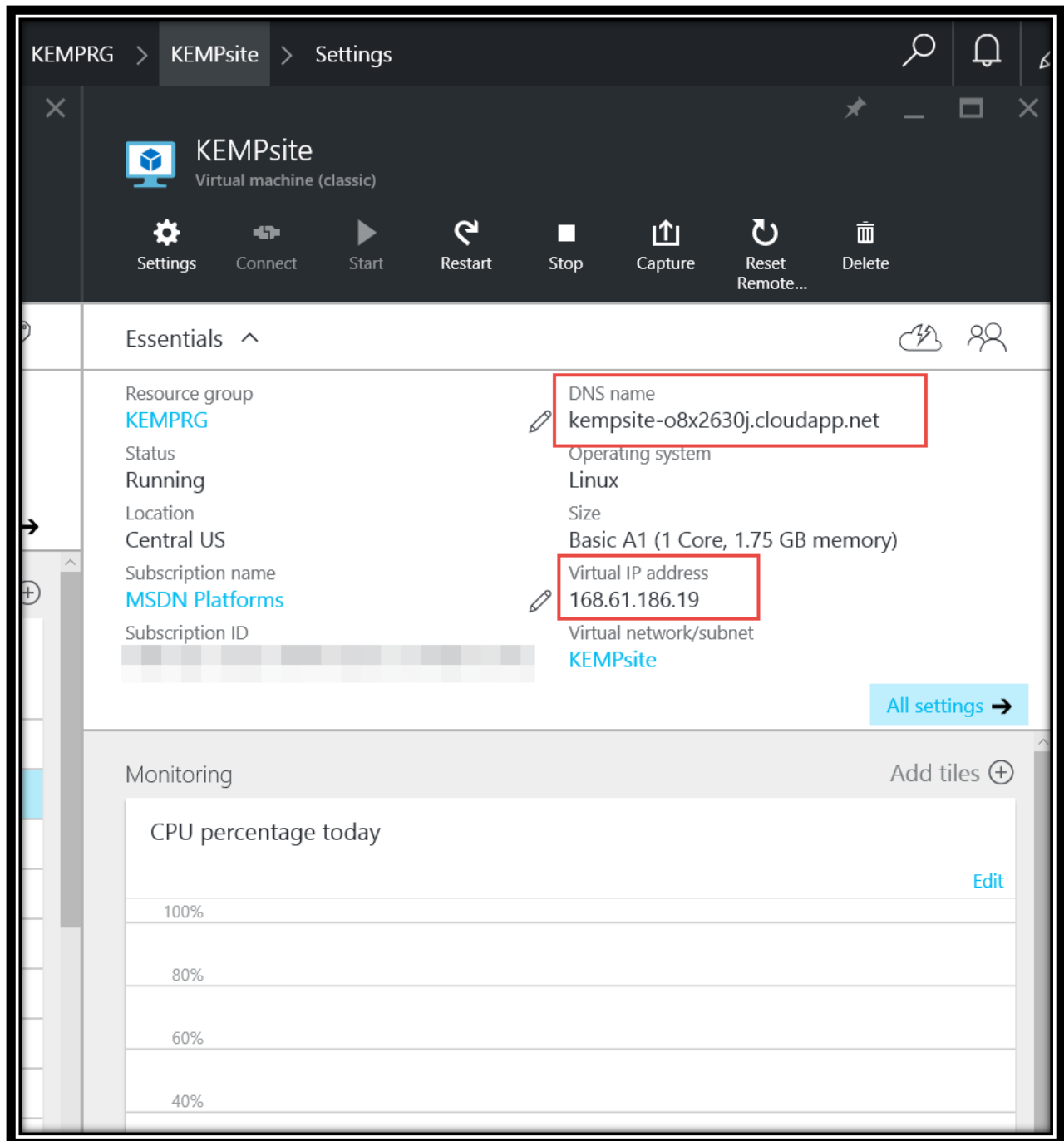
Screen shot example of the Resource Group

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



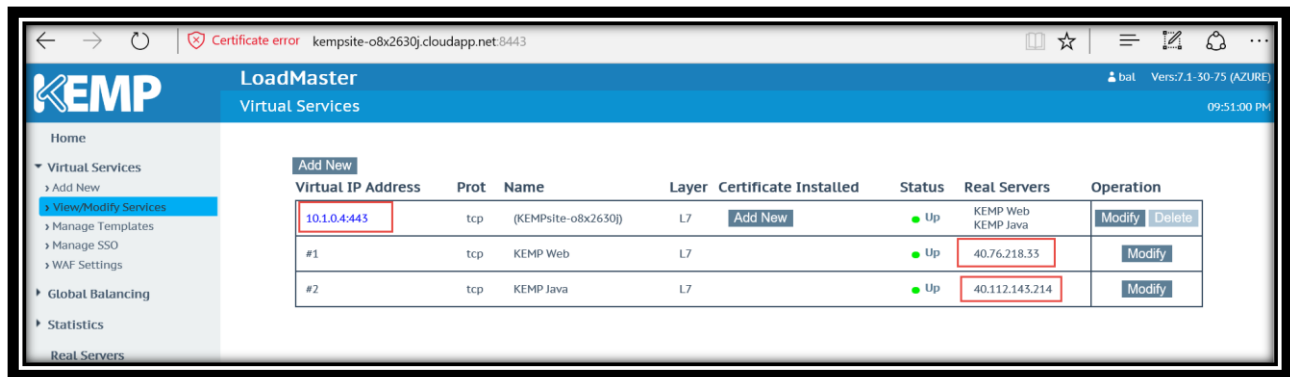
Resource Group populated with created and auto-generated resources

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

- 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