

Deployment of Chef on Microsoft Azure

Lab Guide

March 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

This document will provide detailed step-by-step instructions that will guide you through the installation of Chef Server on Microsoft Azure assuming an Azure subscription has already been created. The scenarios that will cover the setup Chef Server 12, BYOL (Bring Your Own License), install cookbooks and bootstrapping a Windows VM (virtual machine) node with an IIS Web Server installation Cookbook.

Requirements

Microsoft Azure Subscription

Local workstation can be any OS you choose (Linux, Mac OS, or Windows) or a virtual machine configured with:

- Text Editor – Most popular ones are [Atom](#), [Sublime Text](#), and [Notepad++](#) for writing Chef code amongst others.
- Free Telnet/SSH Client for Windows – Most popular ones are [Microsoft Telnet Client](#), [PuTTY](#), and [AnyConnect](#) amongst others.

Note: This lab guide is written with detailed instructions how using Windows as the client. Some actions will be different from other OS options.

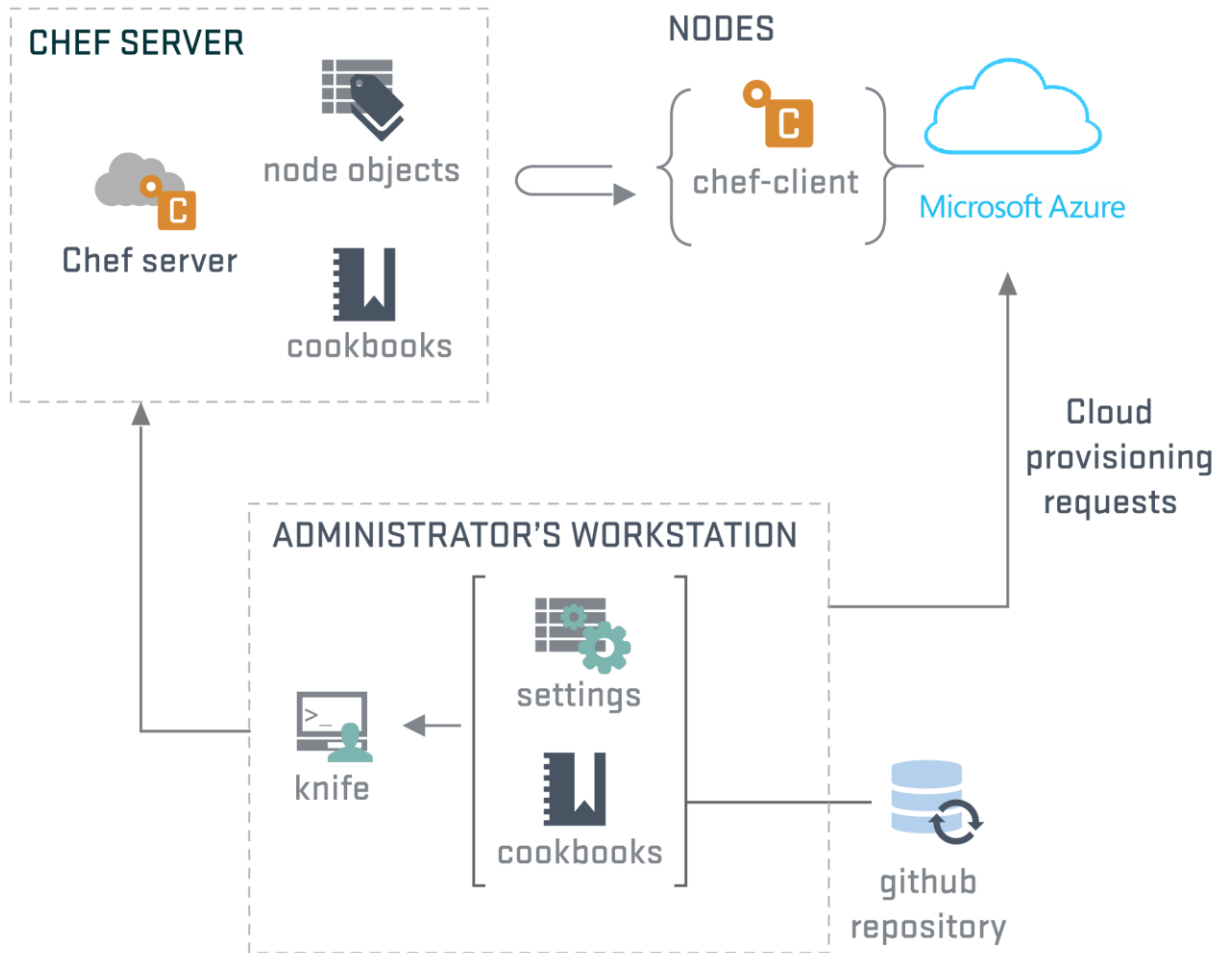
As an option you can use your Microsoft Azure subscription to create a new virtual machine using the Windows Server 2012 R2 Datacenter image as a workstation for this lab.

Technical Support

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

Chef Basic Concepts

This is a highlevel architectural diagram of components in Chef Server.

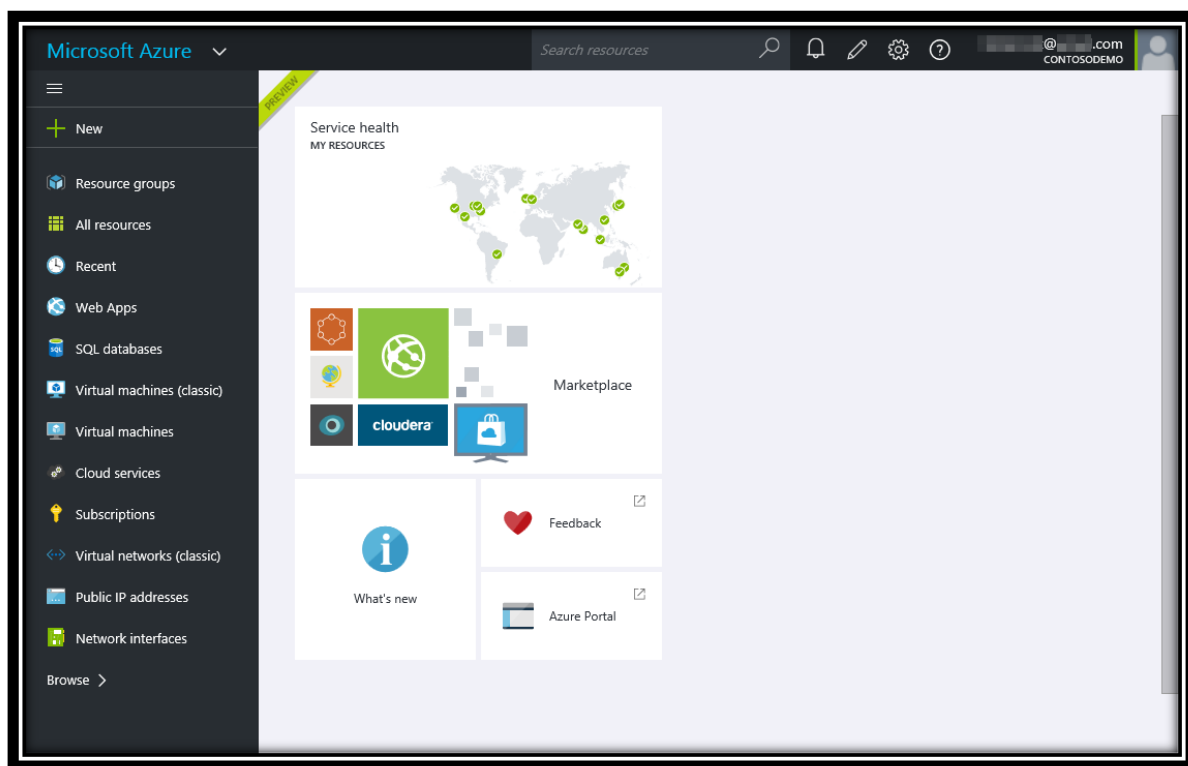


Exercise 1: Environment Setup

In this exercise you will setup your Chef Server environment for use throughout the rest of the exercises. This will involve downloading some tools and sample code to your local workstation that will be need to complete all the steps.

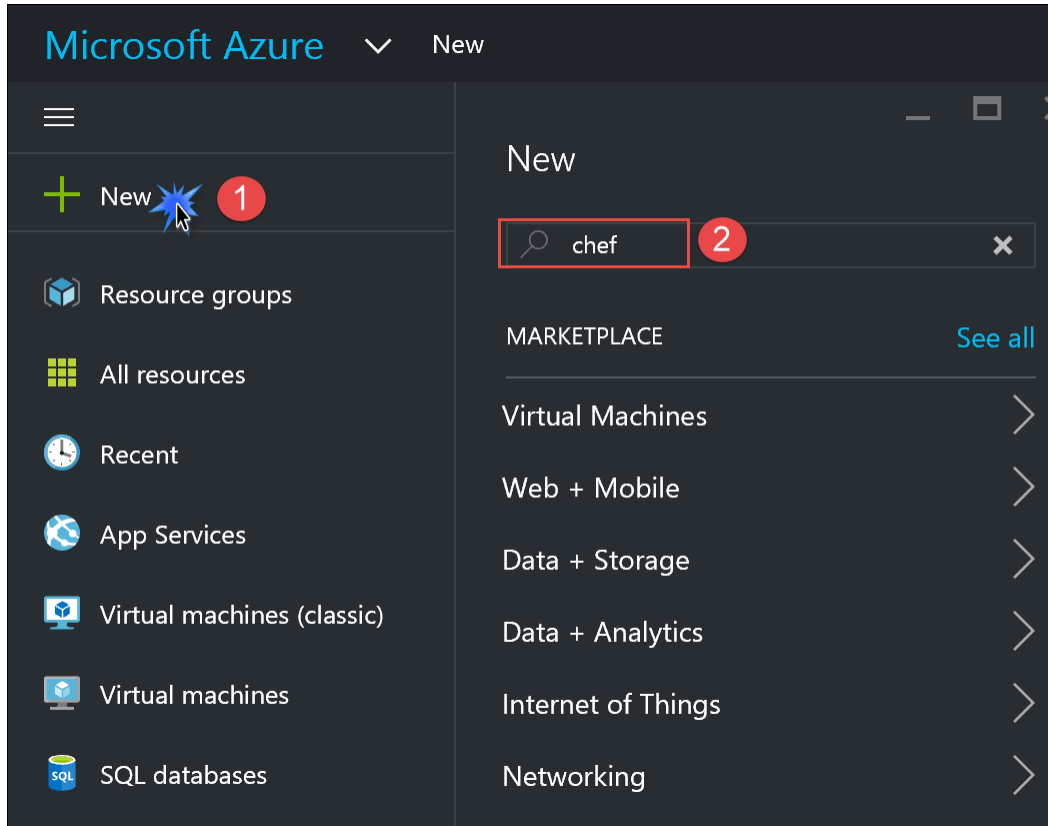
Task 1: Creating the Chef Server 12, BYOL

1. Verify that you have installed the text editor and the SSH client as per the prerequisites.
2. Go to the Azure Preview portal (<http://portal.azure.com/>), after entering your credentials the following screen will be displayed.



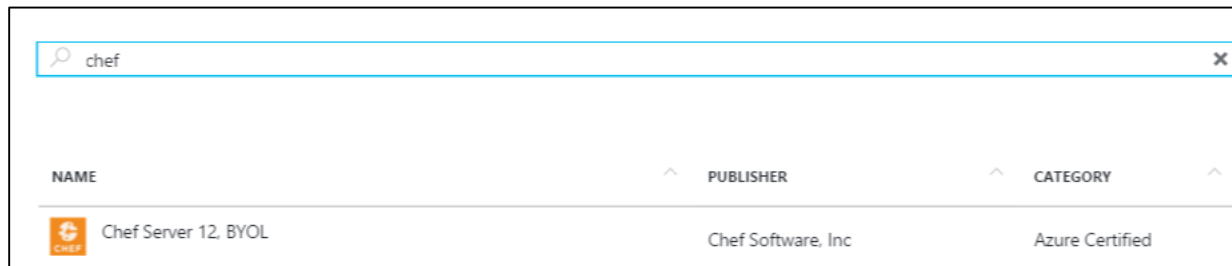
Azure Preview portal

3. To create the Chef Server, you need to get the application from the Marketplace. First click on **+New**, then type "chef" into the search box and hit enter.



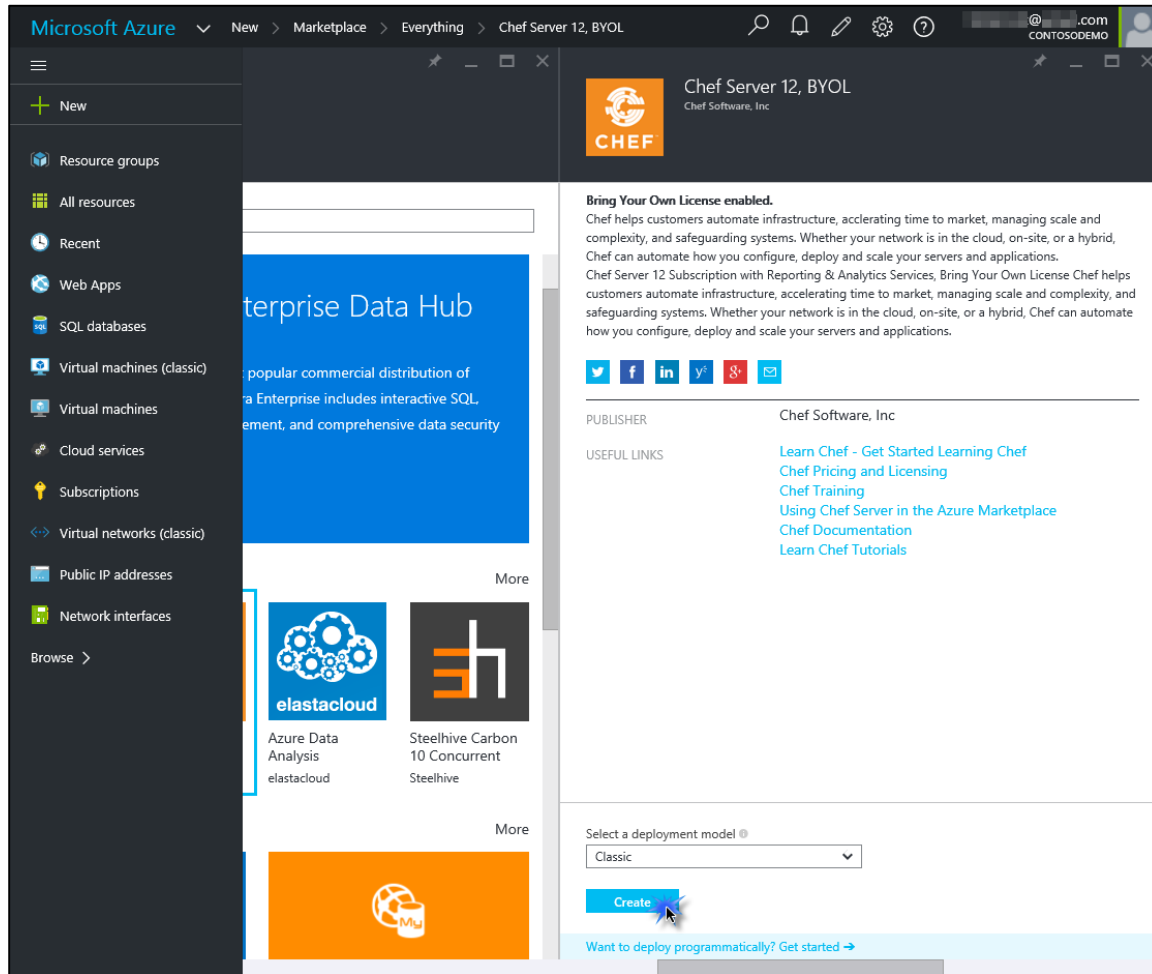
Navigating to the Marketplace

4. Click **Chef Server 12, BYOL**.



Locating Chef Server 12 in the Marketplace

5. After clicking on **Chef Server 12, BYOL**, change the deployment model to **Classic** and click on **Create**.

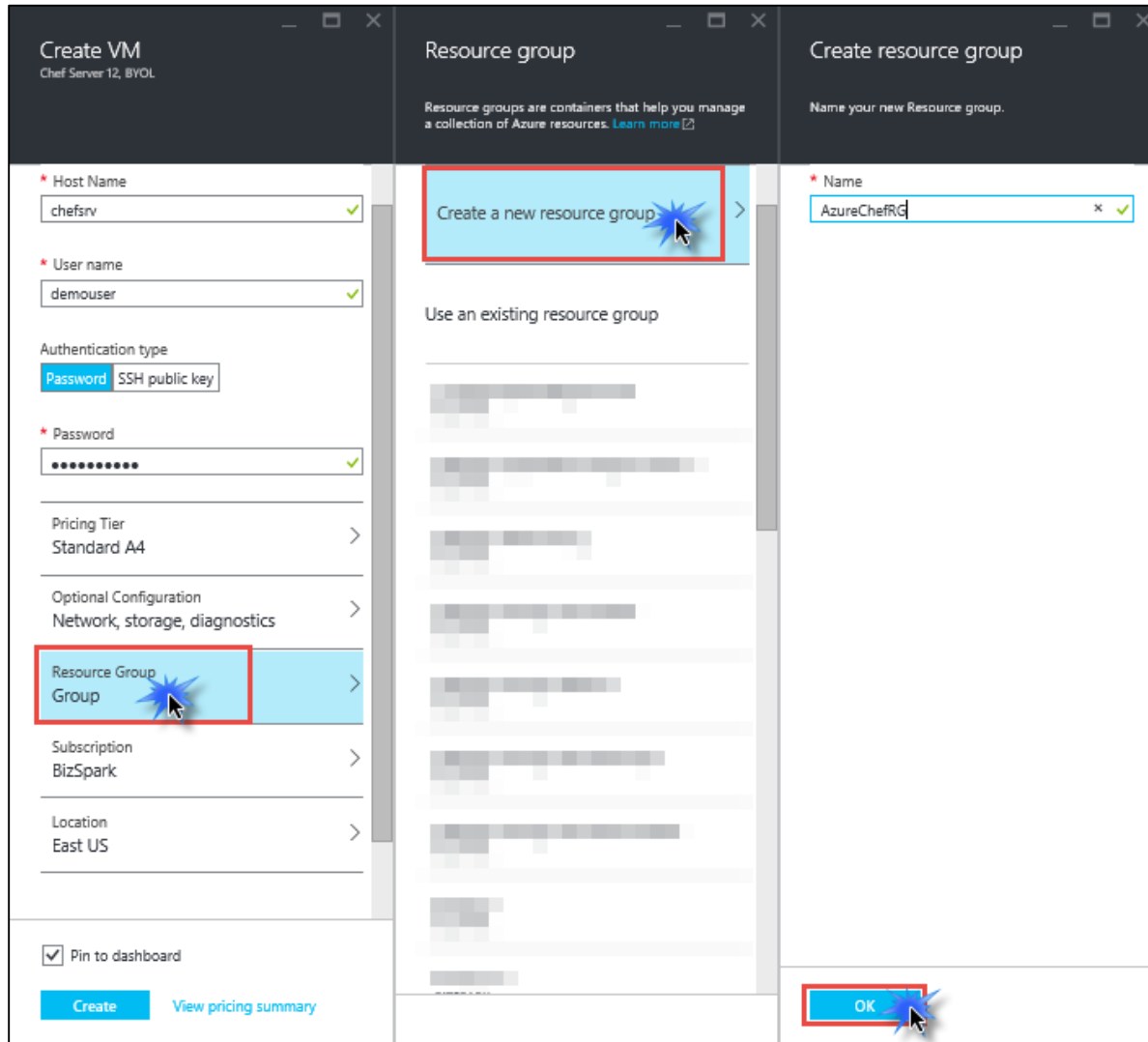


Chef Server VM Creation

6. In the creation process of the Chef Server VM, enter **Host Name**, **User name**, and **Password**. For the purpose of this exercise, we used:

- i. Host Name = *chefsrv*
- ii. User name = *demouser*
- iii. Password = *demo@pass1*

- 7. Click **Resource Group** on the Create VM blade
- 8. Click **Create a new resource group** on the Resource group blade
- 9. Use the name "**AzureChefRG**" on the Create resource group blade
- 10. Click on **OK** button which takes you back to Create VM blade

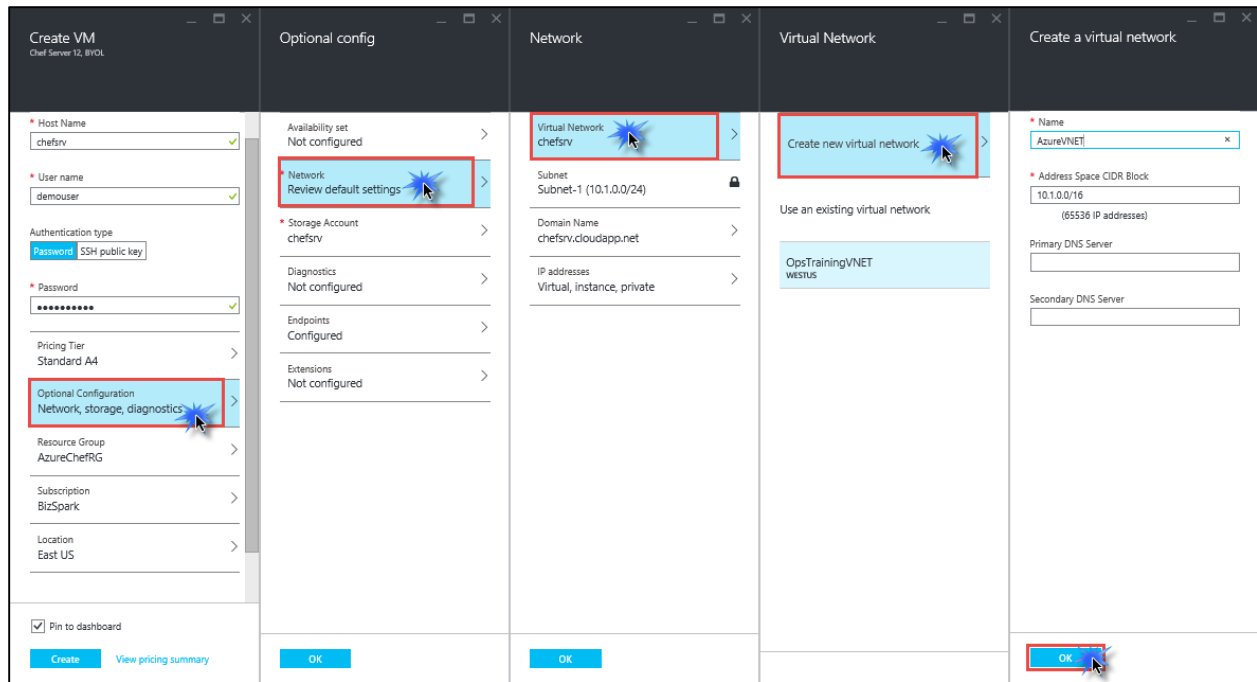


Creating Resource Group

***NOTE:** We left the default A4 Standard Pricing Tier just for the purpose of this exercise. This Pricing Tier is for *Azure Infrastructure Costs*, not the cost of *Chef Server 12, BYOL* application. But if you plan to deploy Chef Server in a development or production environment, then you should follow [Chef's System Requirements](#) as if it were On-premises requirements.

11. At the Create VM blade click on **Optional Configuration**.
12. Click on **Network**.
13. Click **Virtual Network**, on the Virtual Network blade click on **Create new virtual network**.

14. On the Create a virtual network blade type **AzureVNET** for Name and click **OK** button, click **OK** on Network blade, click **OK** on Optional config blade.



Creating Virtual Network

15. Click **Legal terms**, notice that the cost to use *Chef Server 12, BYOL* is **\$0.00 USD**, click on the **Purchase** button.

Purchase

Offer details

Chef Server 12 by Chef Software, Inc Terms of use and privacy policy Standard A4 by Microsoft Terms of use and privacy policy	0.0000 USD/hr * 0.4800 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.

Terms of use

By clicking "Purchase", I (a) agree to the legal terms and privacy statement(s) associated with each

Purchase

Purchase blade for Chef Server, BYOL VM

- On the Create VM blade, click the **Create** button. This will take you back to the portal where you will see the Chef VM being created.

Create VM

Chef Server 12, BYOL

* Host Name

chefsrv

* User name

demouser

Authentication type

PasswordSSH public key

* Password

••••••••

Pricing Tier

Standard A4

Optional Configuration

Network, storage, diagnostics

Resource Group

AzureChefRG

Subscription

Visual Studio Ultimate with MSDN

Location

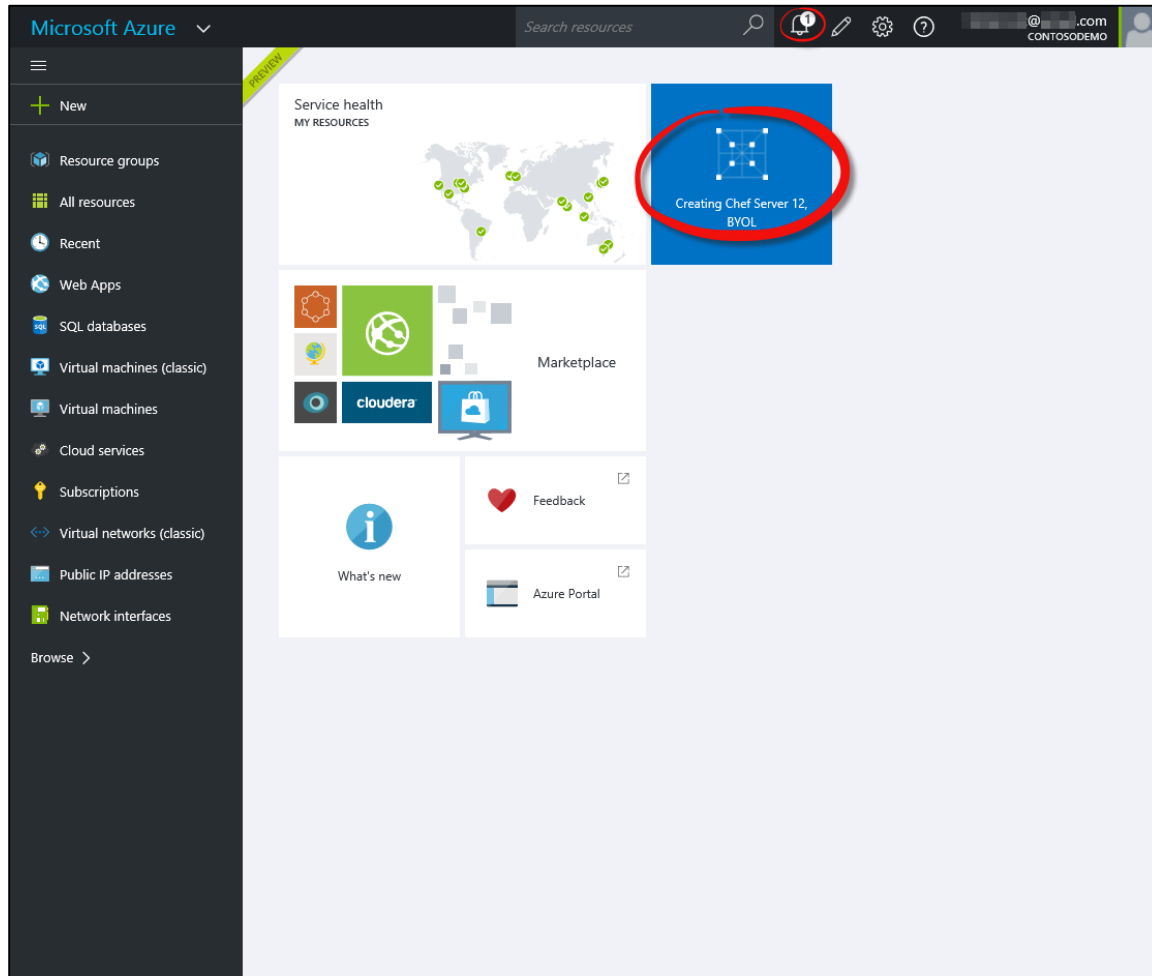
East US

* Legal terms

Legal terms accepted

☒ Pin to dashboard

Create



Azure Preview portal creating Chef Server, BYOL VM

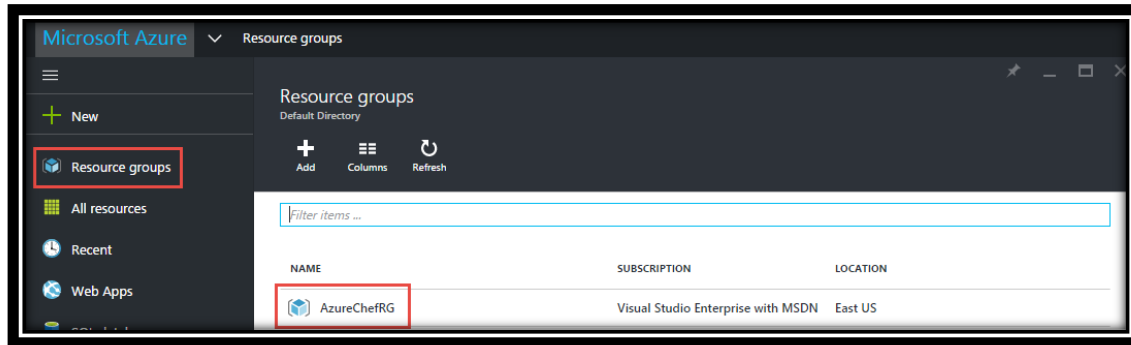
17. Once completed, it will display all the VM Settings and it should be up running automatically.

The screenshot displays the Microsoft Azure portal interface. The top navigation bar shows the path: Microsoft Azure > Resource groups > AzureChefRG > chefsrv > Settings. The left sidebar contains a navigation menu with options like New, Resource groups, All resources, Recent, App Services, Virtual machines (classic), Virtual machines, SQL databases, Cloud services (classic), and Subscriptions. The main content area shows the 'chefsrv' virtual machine settings. The 'Essentials' section lists key properties: Resource group (AzureChefRG), Status (Running), Location (East US), Subscription name (Visual Studio Ultimate with MSDN), and Subscription ID. The 'Monitoring' section shows a graph for CPU percentage today, which is at 100%.

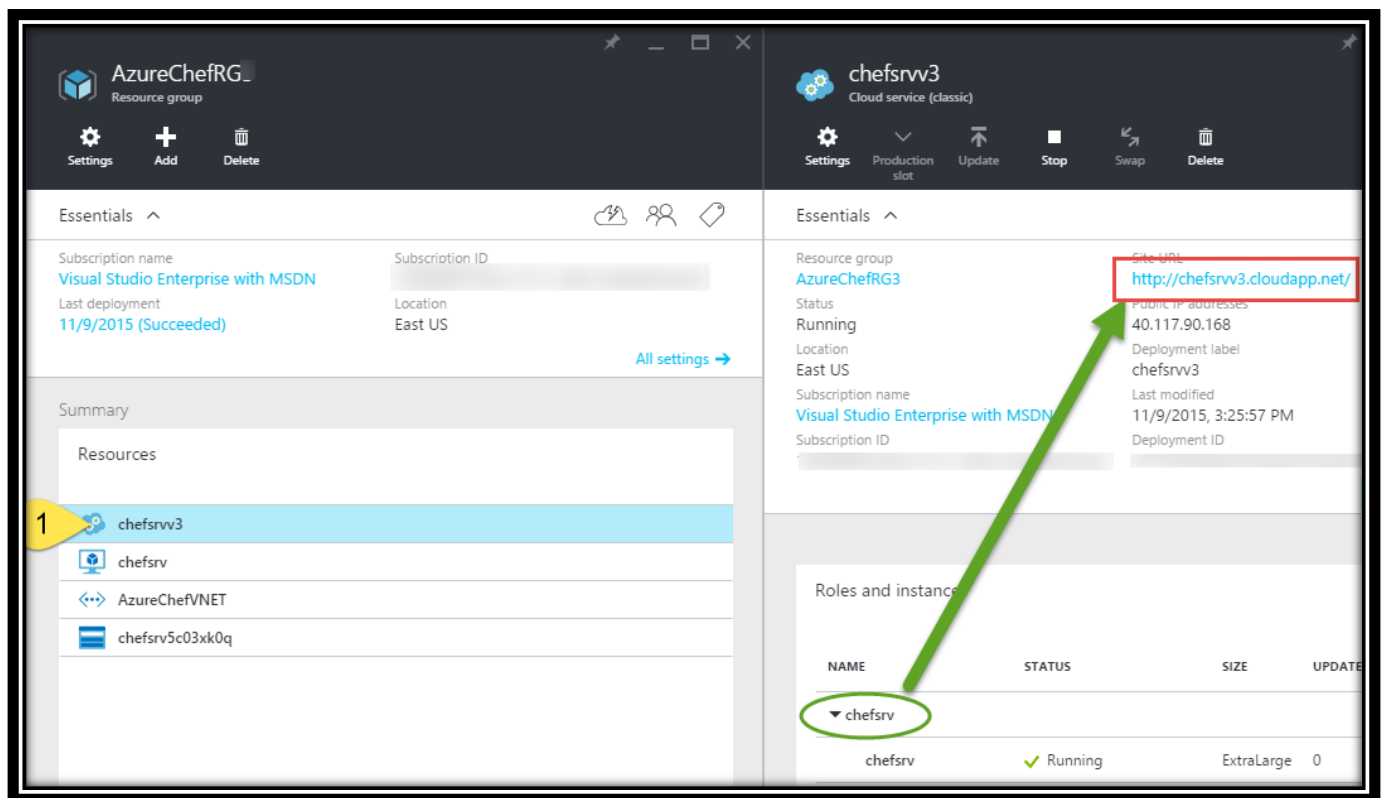
Screen details when Chef Server, BYOL VM completes

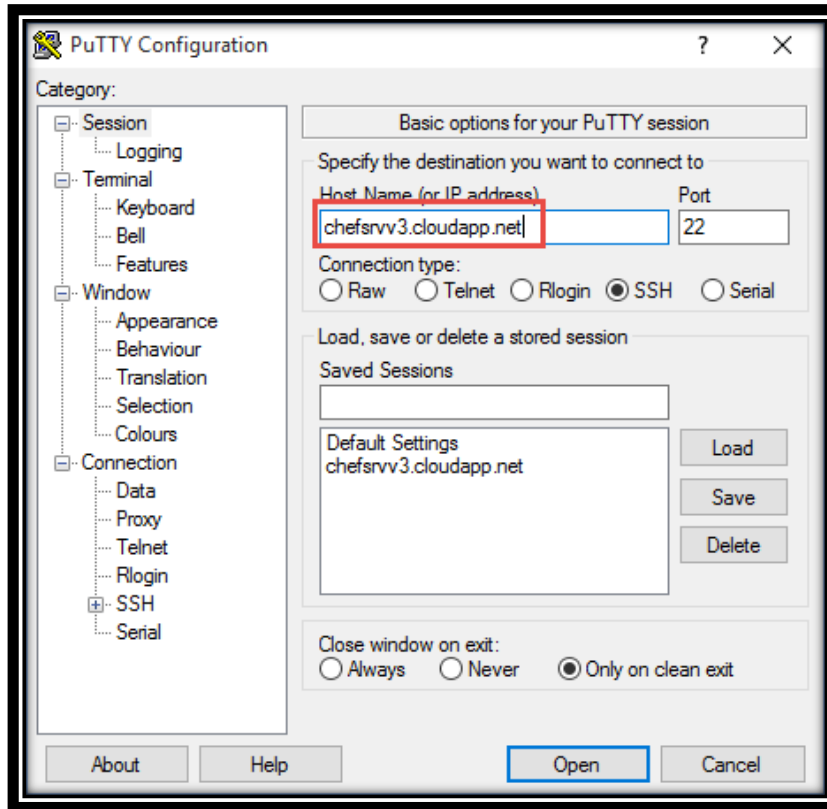
Task 2: Completing Chef Server Installation

1. When confirming that the Chef Server VM was successfully created and running, you will need to use a [SSH and telnet client](#) tool of your preference to establish a connection to the Chef Server. **You will need to connect use the external DNS name for the Chef Server.**
2. For this lab demo we'll use **PuTTY**, copy and paste the Host Name details and create a friendly name to save it under Saved Sessions.
3. To find the external URL of the Cloud Service where your Chef Server resides use the following steps: Browse to <http://portal.azure.com>
4. Click **Resource Groups** and then **AzureChefRG**



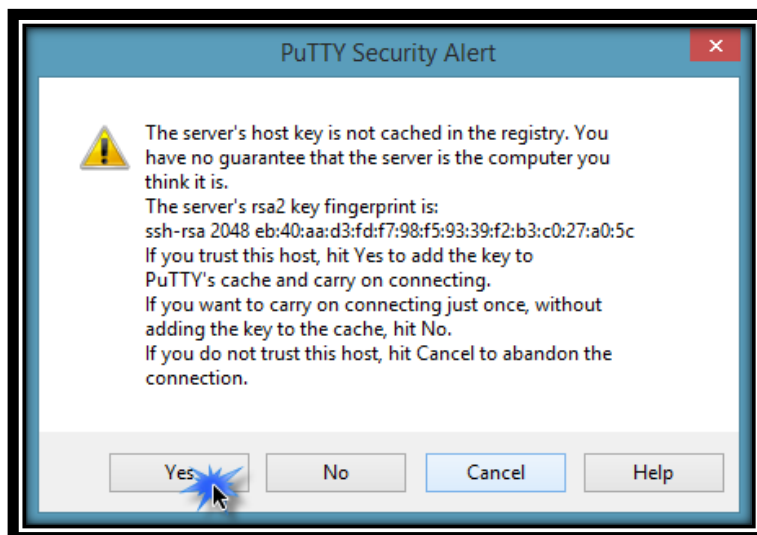
- Once the Resource Group Loads click the Cloud Service icon and verify you see the Chef Server VM. Then locate the Site URL that you will use to connect to the Chef Server from the internet for the rest of this lab. In our example here the **Site URL** is **chefsrvv3.cloudapp.net**.





PuTTY Configuration

6. Click the **Yes** button to get past the *PuTTY Security Alert* dialog box.



PuTTY Security Alert dialog box


```
Please enter your first name:
[redacted]
Please enter your last name:
[redacted]
Please enter your email:
[redacted]
Please enter the name of your Organization (e.g. Chef):
azurechef
```

NOTE: You must use **azurechef** or the rest of this lab will not work properly.

10. Type **Yes** to accept the Chef License Agreement

```
By continuing you agree to be held to the terms of the
Chef Software, Inc. License Agreement, as detailed here:
https://www.chef.io/online-master-agreement/
Type 'yes' if you agree
Yes
```

Once Chef Server has finished installing, you get the following message.

```
You're all set!

Next you'll want to log into the Chef management console and download the Starter Kit:
https://.cloudapp.net/organizations/azure_chef/getting_started

Use your username 'demouser' instead of your email address to login

In order to use Transport Layer Security (TLS) we had to generate a self-signed certificate which
might cause a warning in your browser, you can safely ignore it.

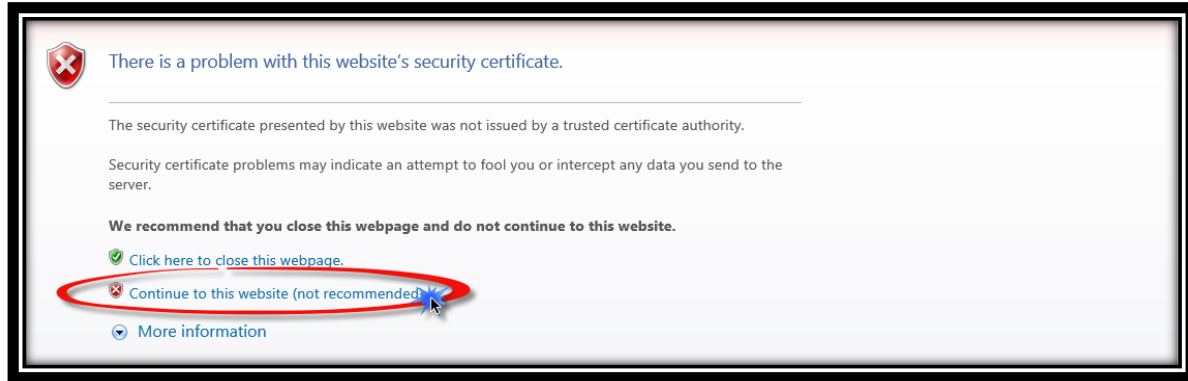
Gain insight into your infrastructure in the Chef Analytics UI:
https://.cloudapp.net:8443
```

Chef Server completion and important details

Exercise 2: Chef Server Configuration

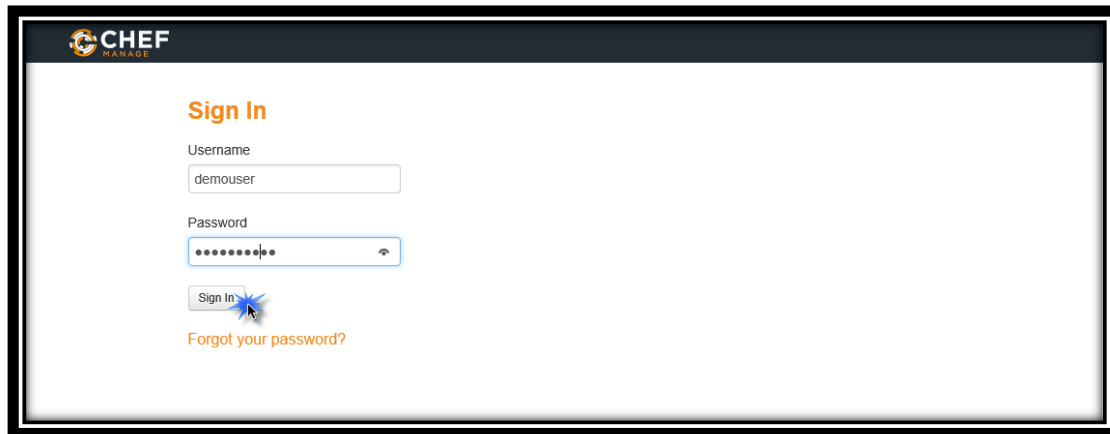
Task 1: Setting up Organization details

1. Open a browser on your local workstation and go to the Chef Manage console using the SITE URL name of your Chef Server VM. Click on **Continue to this website (not recommended)** link.



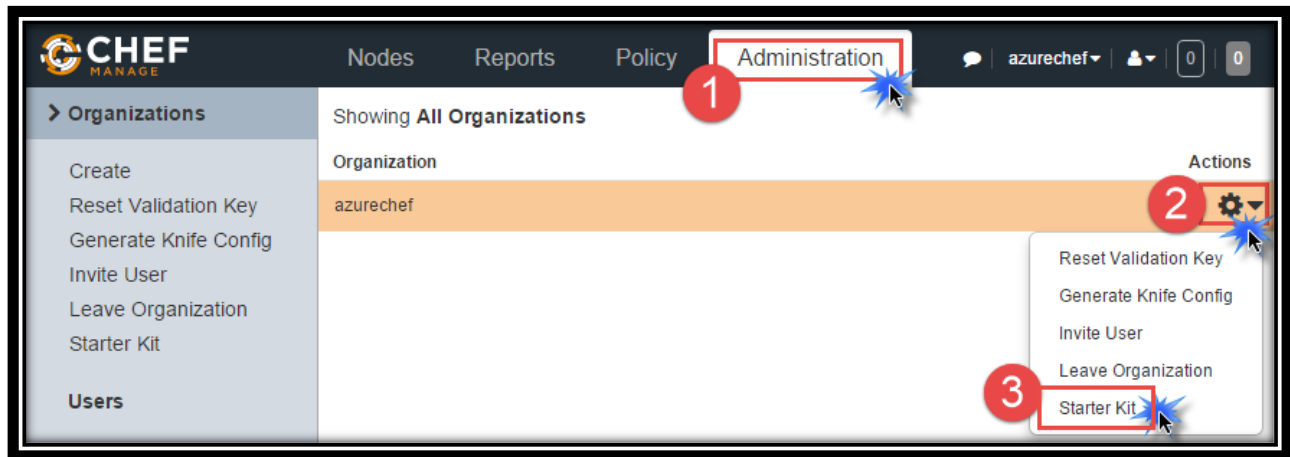
Chef Manage console certificate warning screen

2. Enter credentials and click on the **Sign In** button.



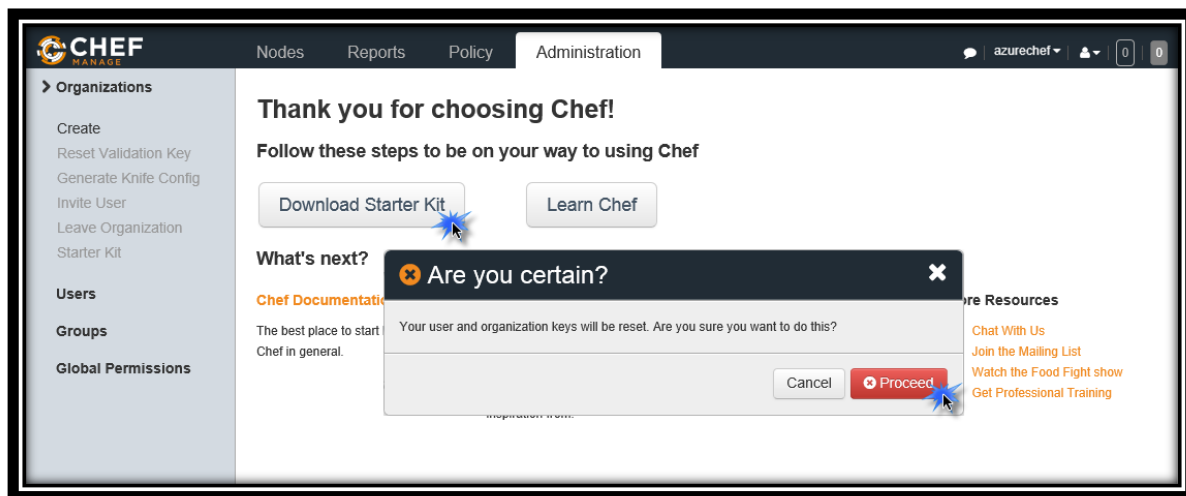
Chef Server Sign In screen

- Once logged into the Chef Management Portal click **Administration** and then click gear icon under **Actions**. When the menu opens click **Starter Kit**.



Starter Kit dialog boxes

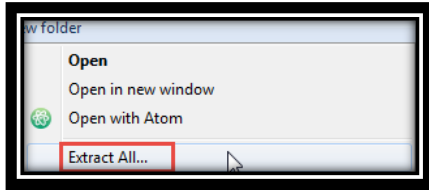
- Now click on **Download Starter Kit** button and click on **Proceed** button.



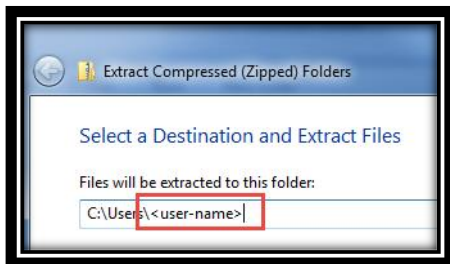
Starter Kit dialog boxes

Note: This will download the Starter Kit to the Downloads folder on the local machine.

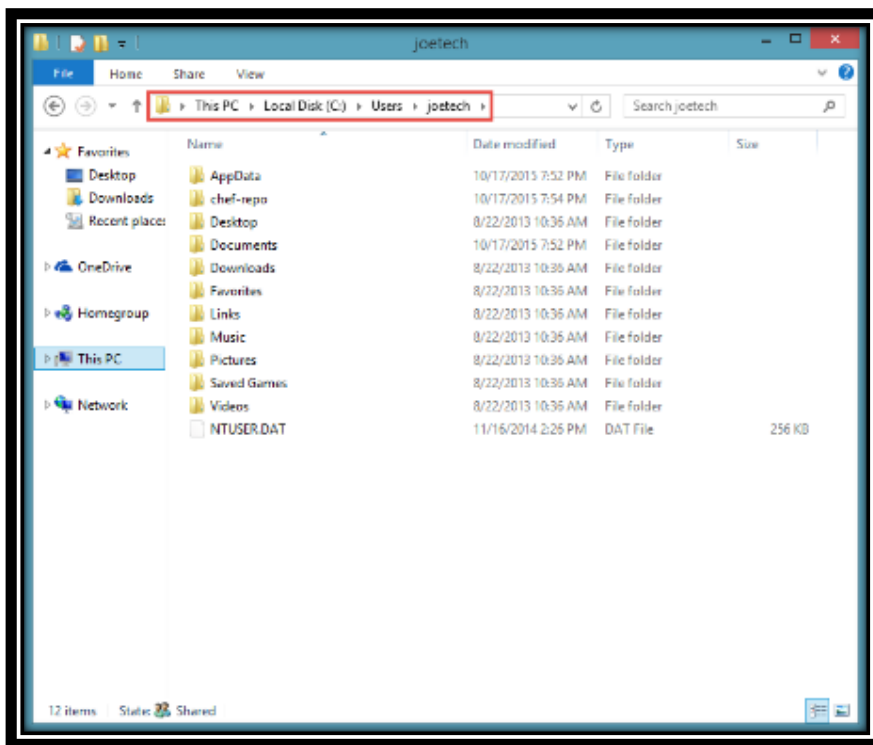
- Browse to the "Downloads" folder on the machine being used for the lab. Right click on the file **chef-starter.zip** and click on **Extract All**



6. In the Select Destination and Extract Files box point the zip file to the Root of the **C:\users\<user-name>** directory replacing the **<user-name>** with your user profile name that you are using for this lab.



Note: This zip file will create a folder called **chef-repo** folder that will be extracted to your local workstation signed on Users folder



Users folder on workstation where chef-repo folder resides

- Next you will install the Chef Development Kit on the local machine. Open a new browser window and go to <https://downloads.chef.io/chef-dk/>. Choose the correct client based on the OS you are using.

Note: The following install steps are provided for Windows.

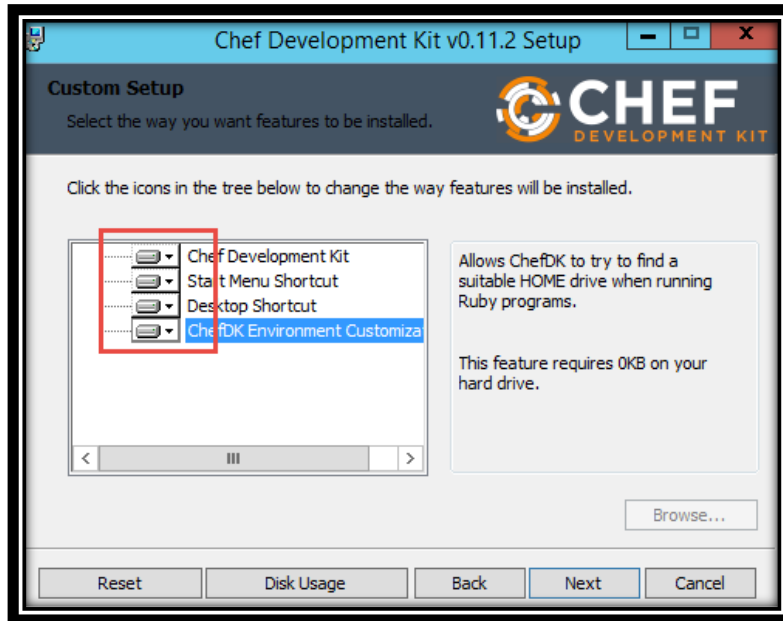
- Click Windows and then **Downloads** to get the Chef Developer Kit bits.



- Double click on the **chef-dk** MSI package file that was saved to your **Downloads** folder.
- Click **Next** on the Chef Developer Kit Setup Wizard and accept the terms and click **Next** on the following screen.



- Choose all of the available packages to install to your hard drive on the Custom Setup Screen of the Chef Development Kit Setup Wizard.



12. Once the installation has completed, open Explorer in Windows and find the folder **c:\users\<user-name>\chef-repo\.chef** then review the files that were created which should include:

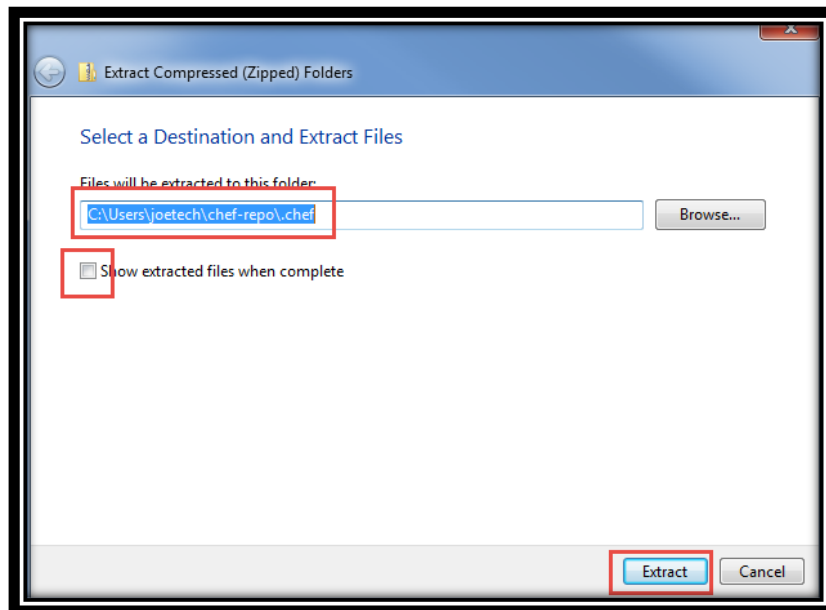
- **<cheforganizationname>-validator.pem**
- **<chefuser>.pem**
- **knife.rb**

13. Open the **knife.rb** file and update the the **chef_server_url** to the SITEURL of the CHEF server. Also add a new line with the following:
ssl_verify_mode :verify_none

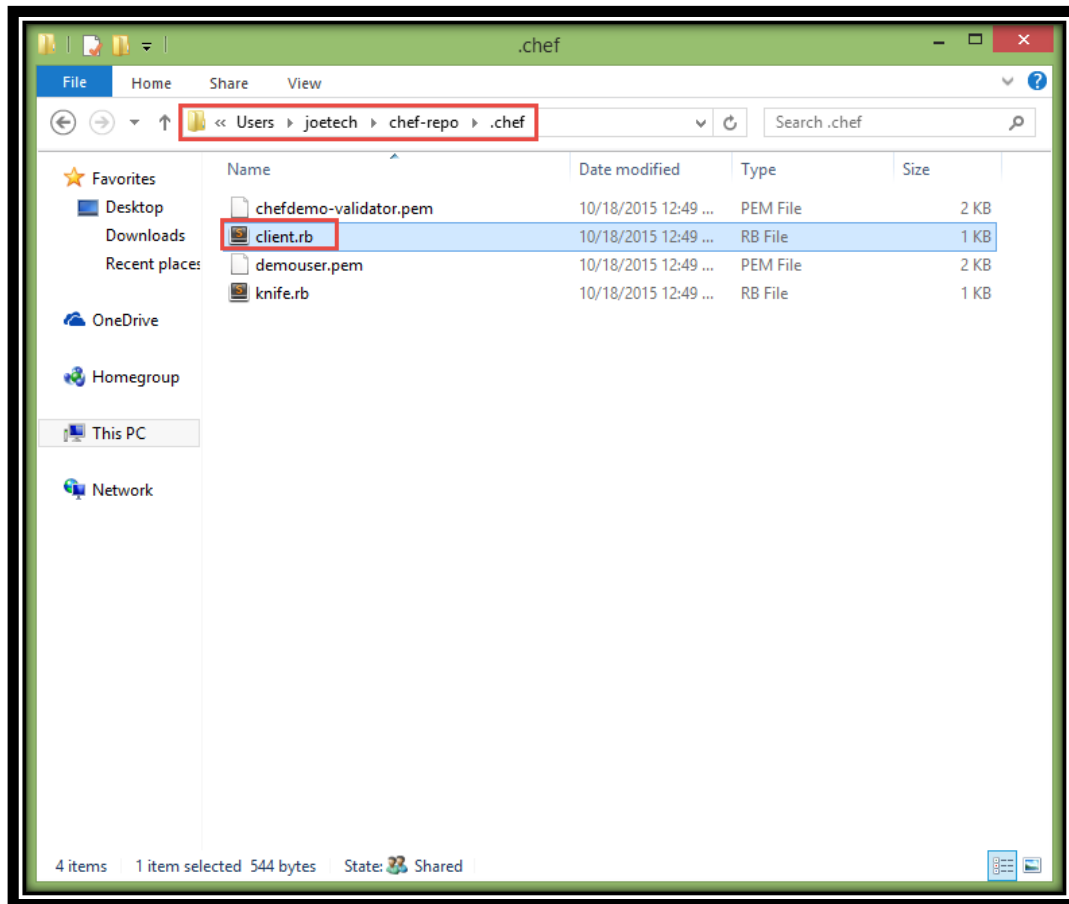
The knife.rb file should look the following:

```
current_dir = File.dirname(__FILE__)
log_level      :info
log_location   STDOUT
node_name      "demouser"
client_key      "#{current_dir}/demouser.pem"
validation_client_name "azurechef-validator"
validation_key  "#{current_dir}/azurechef-validator.pem"
chef_server_url "https://chefsrvv3.cloudapp.net/organizations/azurechef"
cookbook_path  ["#{current_dir}/../cookbooks"]
ssl_verify_mode :verify_none
```

14. Browse to the following link: <http://bit.ly/1H3ppBD> to download the **client.zip** file. Right click the file and extract the client.rb file into the **c:\users\<user-name>\chef-repo\.chef** folder.



The folder will look like this once you have unzipped the file to the correct directory.



Files in .chef folder

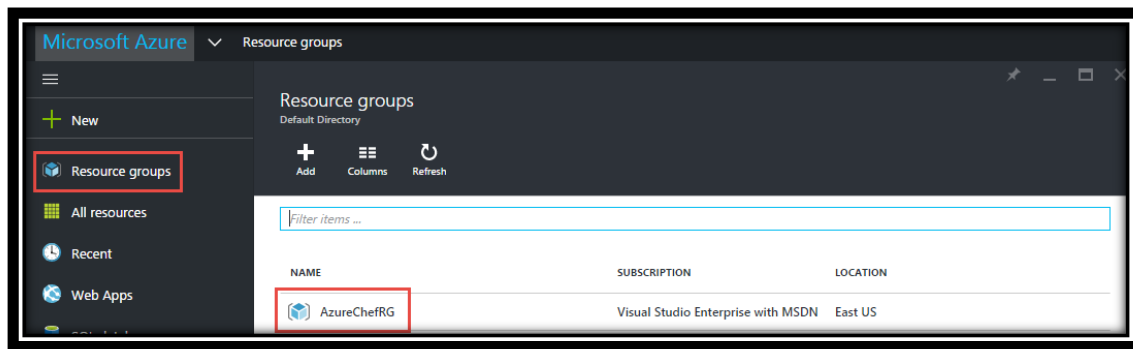
- Next, open the **client.rb** file with a text editor and change the URL for the Chef Server to the **Site URL** where the Chef Server Resides. Ensure you update the [SITEURL] place holder.

```
log_level      :info
log_location   STDOUT
chef_server_url https://chefsrvv3.cloudapp.net/organizations/azurechef"
validation_client_name "azurechef-validator"
validation_key "{current_dir}/azurechef-validator.pem"
client_key     "{current_dir}/demouser.pem"
ssl_verify_mode :verify_none
```

Note: If you are unable to download the client.zip file that contains the client.rb file you can create it using the text found in the box above making sure to change the name of the chef_server_url to the SITEURL of your Chef Server. This should be placed into the `c:\user\userid\chef-repo\.chef` folder.

To find the external **SITE URL** of the Cloud Service where your Chef Server resides use the following steps:

16. Browse to <http://portal.azure.com>
17. Click **Resource Groups** and then **AzureChefRG**



18. Once the Resource Group Loads click each Cloud Service until you find the Cloud Service that shows your Chef Server VM. Then locate the **Site URL** that you will use to update the client.rb file.

The screenshot displays the Azure portal interface for the 'chefsrv' cloud service. On the left, the 'Resources' list shows 'chefsrv' selected. The right pane provides details for 'chefsrv', including its status (Running), location (East US 2), and subscription information. A green box highlights the 'Site URL' field, which contains the value 'http://chefsrv.cloudapp.net/'. A callout bubble points to this field with the text 'Update the client.rb file with your URL'. Below, the 'Roles and instances' table shows 'chefsrv' as a running instance of size 'ExtraLarge'.

19. Next confirm connectivity is working from local workstation SSL connections to the Chef Server using the **knife** tool. Open a PowerShell console window using **Run as Administrator**. Execute the following steps commands:

```
CD C:\users\[your user id]\chef-repo
knife ssl fetch
```

The screenshot shows a Windows PowerShell console window titled 'Administrator: Windows PowerShell'. The user has navigated to the 'C:\users\joetech\chef-repo' directory and executed the command 'knife ssl fetch'. The output displays a warning: 'WARNING: Certificates from chefsrv.cloudapp.net will be fetched and placed in your trusted_cert directory (C:/users/joetech/chef-repo/.chef/trusted_certs)'. It then states: 'Knife has no means to verify these are the correct certificates. You should verify the authenticity of these certificates after downloading.' Finally, it confirms: 'Adding certificate for chefsrv.cloudapp.net in C:/users/joetech/chef-repo/.chef/trusted_certs/chefsrv_cloudapp_net.crt'.

Confirming SSL validity from PowerShell CLI

Troubleshooting the knife command

All knife commands needs to run from the chef-repo folder of the user's home folder on the local workstation (**C:\users\\chef-repo**), so make sure you are running from that directory.

Also verify that the **client.rb** file and **knife.rb** file point to the external name of the cloud service that contains your Chef Server.

If you experience issues with the knife tool such as the following error then you need to ensure that you have started the PowerShell window by using the Run as Administrator or you may have to restart your machine to allow the environment variables to be set.

```
knife : The term 'knife' is not recognized as the name of a cmdlet, function, script file, or operable program. Check
the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ knife
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (knife:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException
```

Exercise 3: Download and Install Cookbooks

Chef cookbooks can be manually downloaded from [Chef Supermarket](https://supermarket.chef.io/) found at <https://supermarket.chef.io/>. This is repository of cookbooks is created and maintained by Chef's Community.

In this exercise you will download and extract Cookbooks using the Chef Development Kit Tools.

Task 1: Manual Download and Extraction of Cookbooks

1. Open a PowerShell console window using **Run as Administrator**. The following steps must be executed in this window from the directory:
C:\users
2. Download, Extract and then delete the **IIS cookbook for Windows** into the
C:\users\ using the following commands.

```
knife cookbook site download learn_chef_iis
tar -zxvf learn_chef_iis-0.2.1.tar.gz -C cookbooks
```

```
rm learn_chef_iis*.tar.gz
```

```

Administrator: Windows PowerShell
PS C:\Users\...\chef-repo> knife cookbook site download learn_chef_iis
Downloading learn_chef_iis from Supermarket at version 0.2.1 to C:/Users/dan/chef-repo/learn_chef_iis-0.2.1.tar.gz
Cookbook saved: C:/Users/dan/chef-repo/learn_chef_iis-0.2.1.tar.gz
PS C:\Users\...\chef-repo> tar -zxvf learn_chef_iis-0.2.1.tar.gz -C cookbooks
x learn_chef_iis/
x learn_chef_iis/.kitchen.yml
x learn_chef_iis/Berksfile
x learn_chef_iis/cheffignore
x learn_chef_iis/metadata.json
x learn_chef_iis/metadata.rb
x learn_chef_iis/README.md
x learn_chef_iis/recipes/
x learn_chef_iis/templates/
x learn_chef_iis/templates/default/
x learn_chef_iis/templates/default/Default.htm.erb
x learn_chef_iis/templates/default/index.html.erb
x learn_chef_iis/recipes/default.rb
PS C:\Users\...\chef-repo> rm learn_chef_iis*.tar.gz
PS C:\Users\...\chef-repo>
  
```

Downloading cookbooks in Administrator PowerShell from Chef Supermarket

Task 2: Upload the Cookbook to Chef Server

1. From an Administrator PowerShell window, you will upload the **IIS cookbook for Windows** to the Chef Server using the following steps:

Note: Confirm you are in the chef-repo folder before beginning.

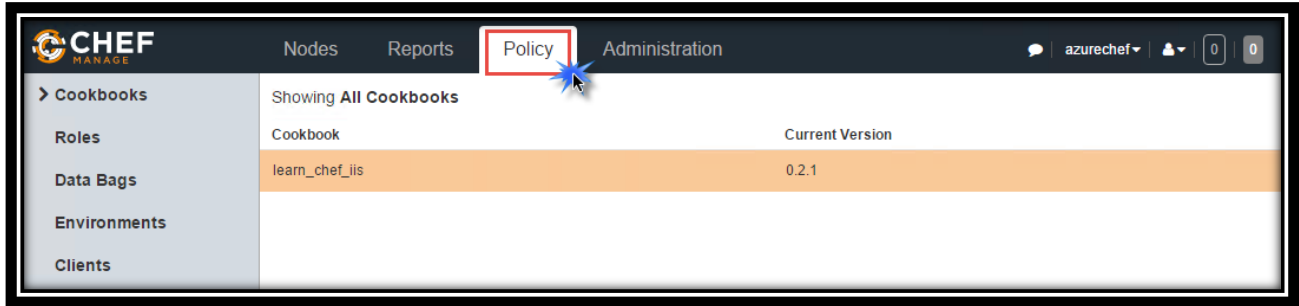
```
knife cookbook upload learn_chef_iis
```

```

PS C:\Users\...\chef-repo> knife cookbook upload learn_chef_iis
Uploading learn_chef_iis [0.2.1]
Uploaded 1 cookbook.
  
```

Uploading cookbooks to Chef Server

2. Open a browser to your Chef Server at [http://\[SITE URL\].cloudapp.net](http://[SITE URL].cloudapp.net) which will connect you to the Chef Manage console. Once logged in click the **Policy** button to and confirm the cookbook has been uploaded successfully.



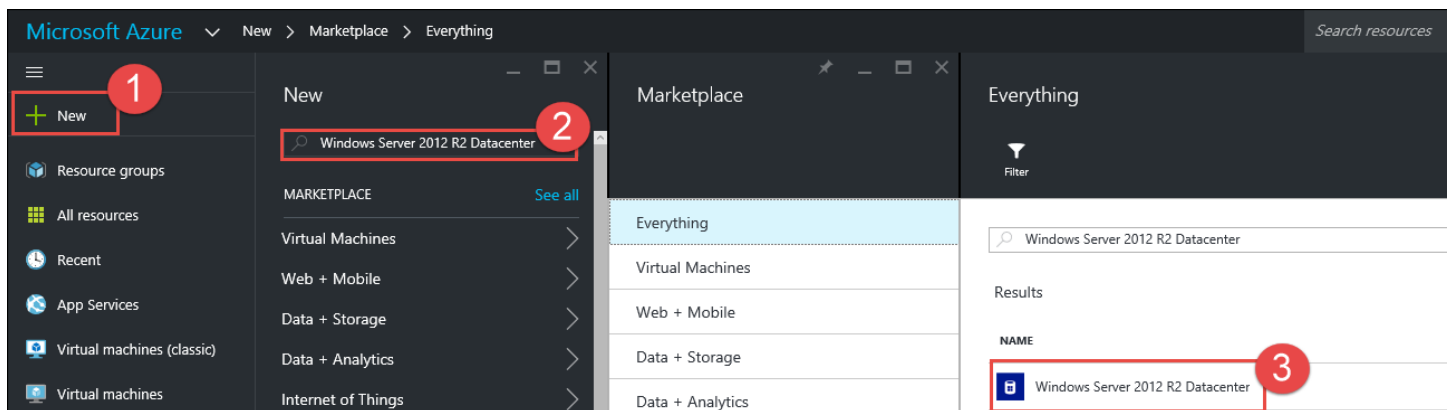
Chef Manage console to confirm cookbook uploaded

Exercise 4: Bootstrapping Chef Node in Azure

Now that Chef Server 12, BYOL is fully configured on Microsoft Azure, use the following steps to bootstrap a node using the Chef Client plugin extensions. The same steps are used to bootstrap either a Linux or Windows client node.

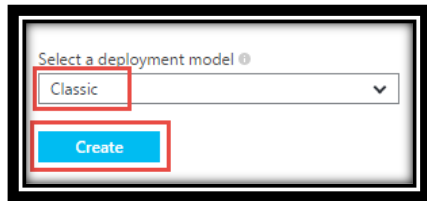
Task 1: Bootstrap Windows Client Node

1. From the Azure Preview portal click on **New**, then type **Windows Server 2012 R2 Datacenter** into the search box and hit enter and choose **Windows Server 2012 R2 Datacenter** from the search results.

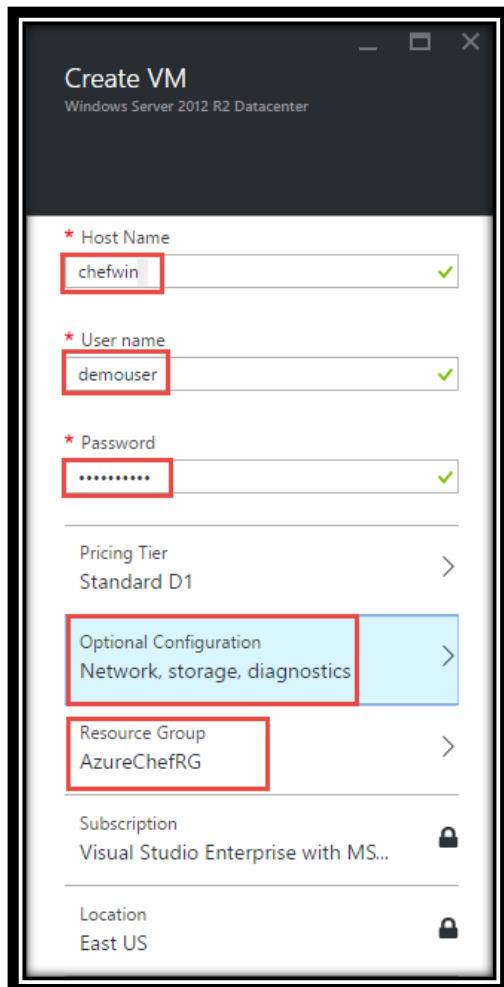


Bootstrap Windows Client node

2. On the Windows Server 2012 R2 Datacenter blade, change the default deployment model to Classic, click on **Create** button.



3. On the Create VM blade, type the **Host Name**, **User name**, and **Password**. In this example the Hostname was chefwin, demouser and demo@pass1 respectively.
4. Click on **Resource Group**, select **AzureChefRG**.



Bootstrap Windows Client node

5. Back on the Create VM blade, click on **Optional Configuration**

6. Click on **Endpoints**,
7. Add the following ports for **HTTP (80)** and **HTTPS (443)**
8. Click **OK**

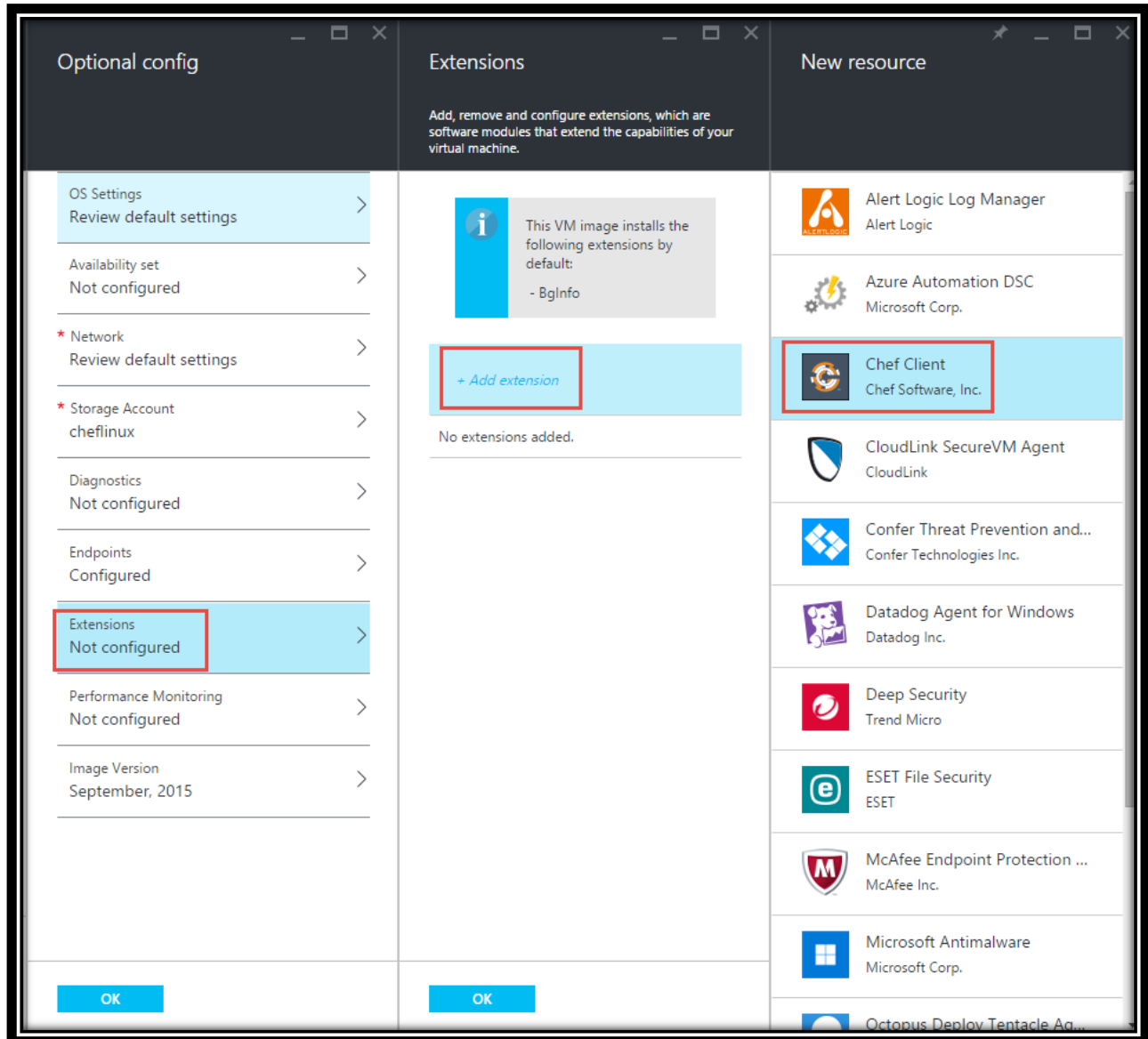
The screenshot shows the 'Create VM' wizard for Windows Server 2012 R2 Datacenter. The 'Optional config' blade is active, displaying various settings like OS Settings, Availability set, Network, Storage Account, Diagnostics, Endpoints (Configured), Extensions, Performance Monitoring, and Image Version. The 'Endpoints configuration' table is visible, showing the following ports:

NAME	PRIVATE PORT	PROTOCOL	PUBLIC PORT
Remote Desktop	3389	TCP	3389
WinRM	5986	TCP	5986
HTTP	80	TCP	80
HTTPS	443	TCP	443

The 'OK' button at the bottom right of the 'Endpoint configuration' blade is highlighted with a red box.

Opening Endpoint ports

9. On the **Optional Configuration** blade, select the following.
10. Click on **Extensions**
11. On the Extension blade, click on **+Add extension**,
12. On the New resource blade, click **Chef Client**.



Adding Windows Chef Extension

13. Click **Create** on the Chef Client blade.
14. Click on the empty box or blue folder icon under the **Validate Key (Required)** then select the **azurechef-validator.pem** from the **c:\users\<user-name>\chef-repo\chef** folder.
15. Click on the empty box or blue folder icon under the **Client RB (Required)** then select the **client.rb** from the **c:\users\<user-name>\chef-repo\chef** folder.

16. In the **Run List** box, type **learn_chef_iis** which is one of the cookbooks uploaded in earlier steps.

Add Extension

Validation Key (required)

azurechef-validator.pem

done

Client RB (required)

client.rb

done

Run List

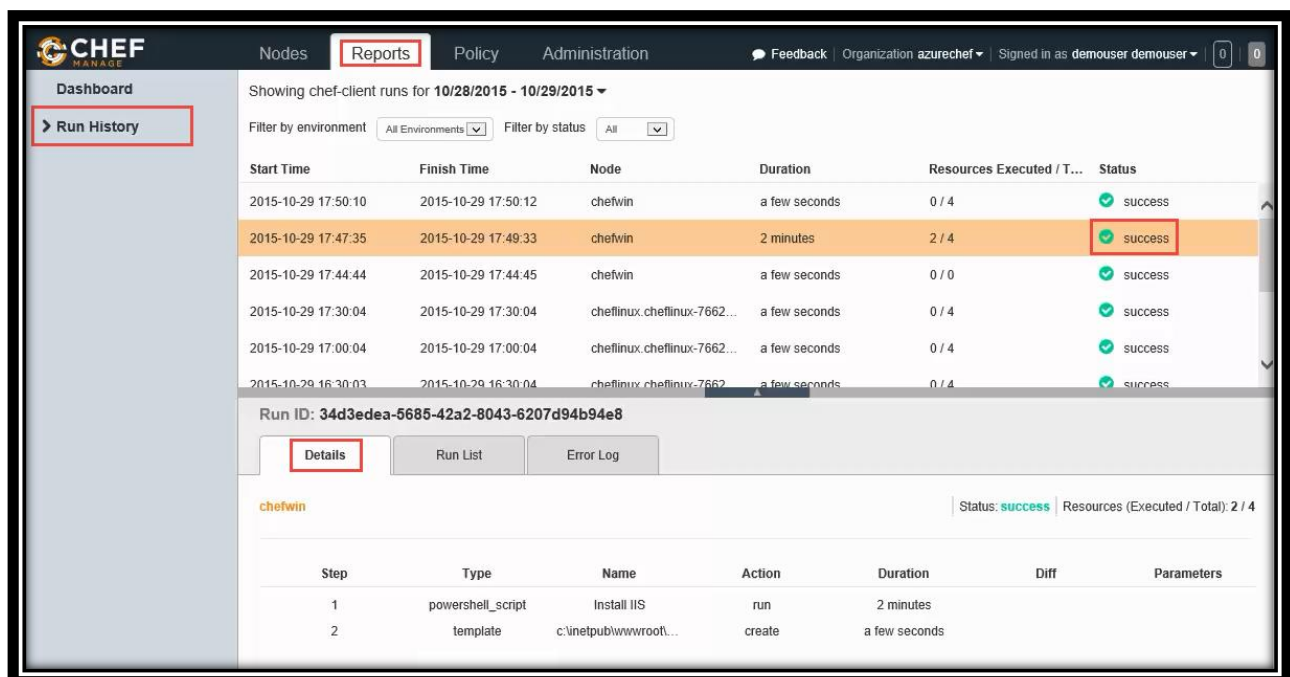
Complete adding Windows Chef Extension

17. Click **OK** button on the Add Extension pane,
18. Click **OK** button on the Extensions pane
19. Click **OK** button on the Optional Config pane.
20. Click **Create** button on the Create VM pane.

Once the Windows Chef node has been successfully deployed, you will see it in Chef Manage console on the **Nodes** tab.



If you click on the **Reports** tab, then click on the **Run History** on the left column, you will notice that the cookbook **learn_chef_iis** from the Run List completed with a **success** status.

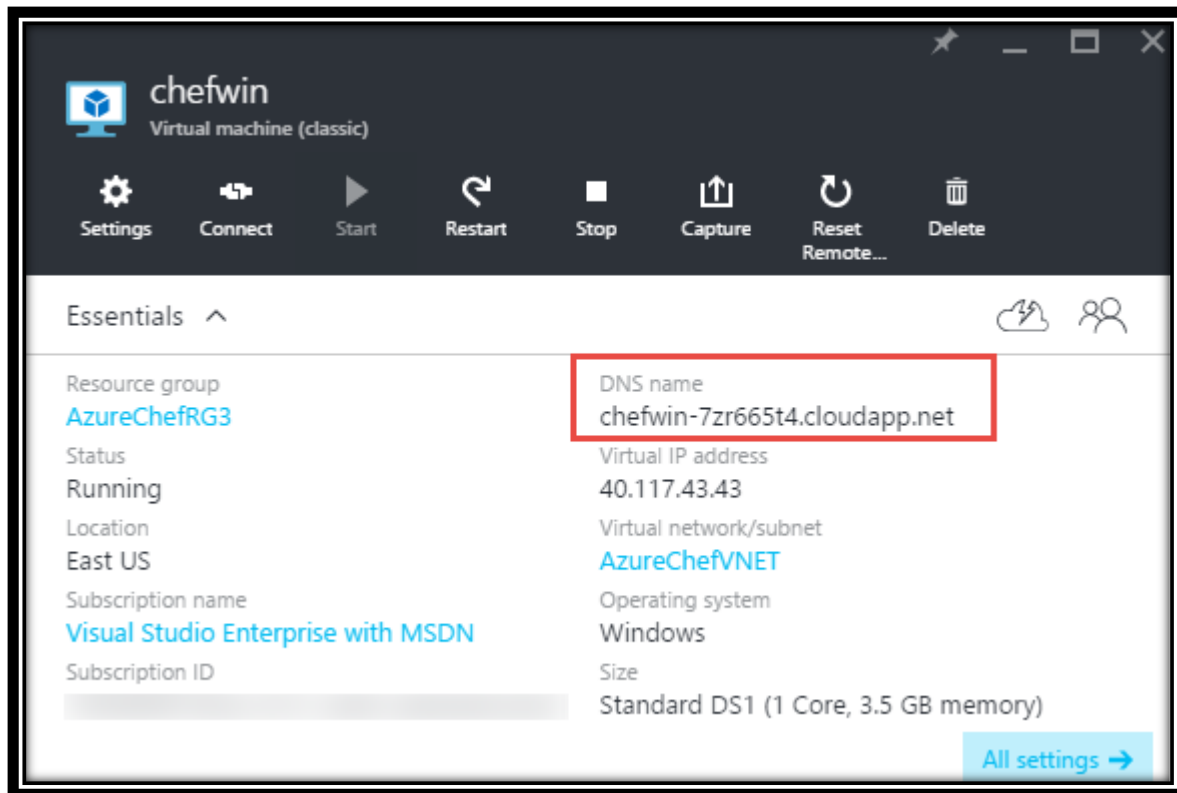


clear

You will also be able to verify the installation by navigating to the website using the

DNS name in a browser and see the default **hello world** webpage install by the **learn_chef_iis** cookbook:

21. Browse to <http://portal.azure.com>
22. Click **Resource Groups** and then **AzureChefRG**
23. Next click the name **chefwin** VM and locate the **DNS Name**



Browse to <http://<YourWindowsVMName>.cloudapp.net> to see the application running. In our case we browse to <http://chefwin-7zr665t4.cloudapp.net>

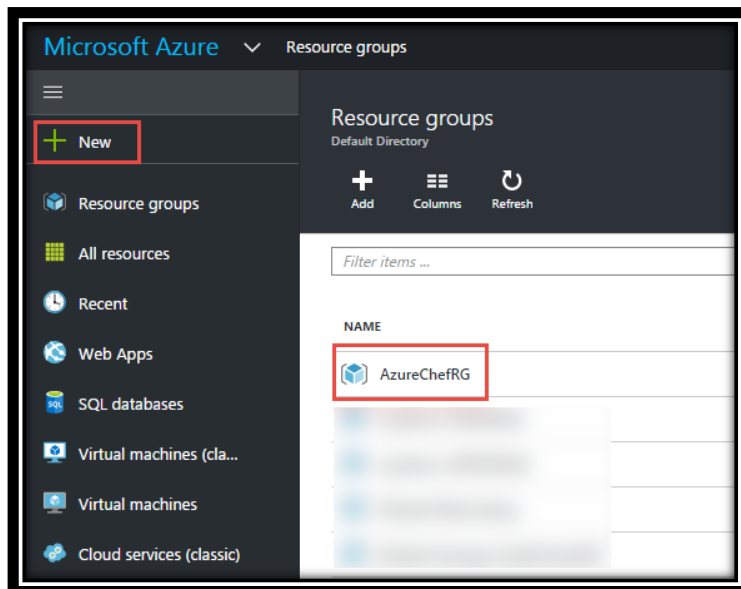


Exercise 5: Provide Proof of Lab Completion

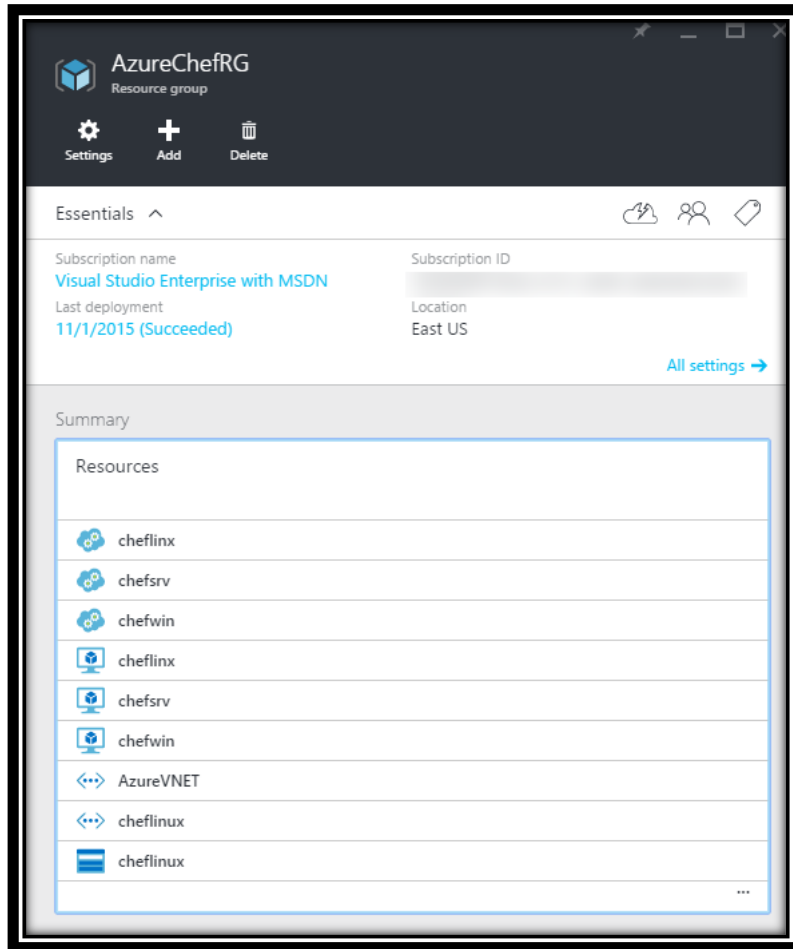
Task 1: Create Screen Shots of the environment created during this Lab

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

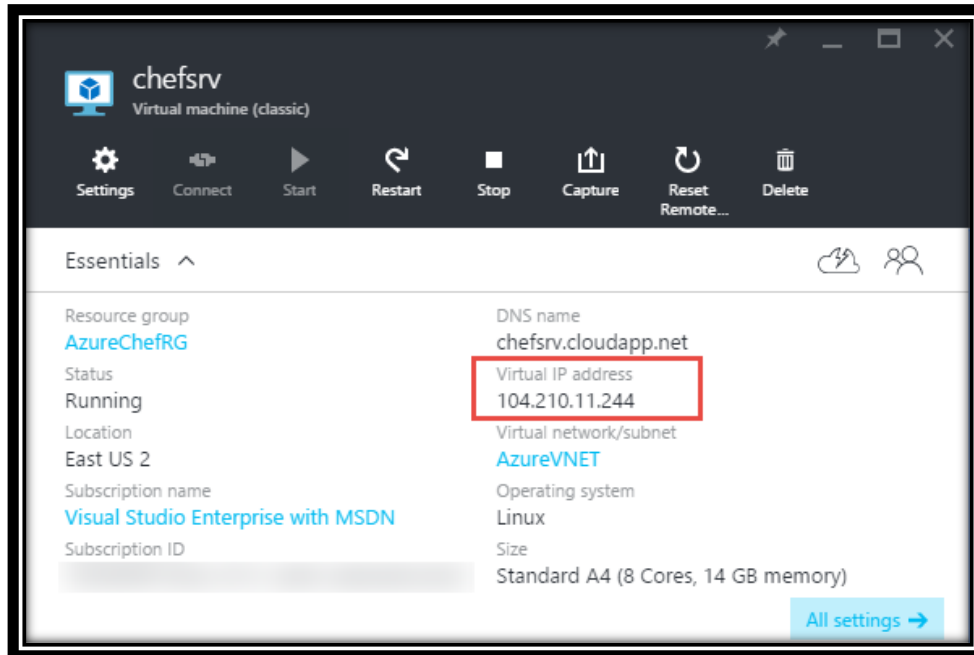
1. Browse to <http://portal.azure.com> using the subscription that was used for this lab.
2. Click on **Resource Groups** and then Click on **AzureChefRG**



3. Take a Screen shot of the Resources that you created



4. Click on the name of the Chef Server that you created in the example here the server is named **chefsrv**.
5. Take a screen shot of the details of **chefsrv** making note of the IP address



- Now browse to your Chef server and take a screen shot of the Management console showing the cheflinux and chefwin VMs.

