

LEXISNEXIS RISK SOLUTIONS

Easy Setup of Fast HPCC System on AWS

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6/17/2015

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Easy Setup of Fast HPCC System on AWS

1. Introduction

Configuring and deploying an HPCC System on AWS from your Windows computer is a two-step process when using the HPCC CloudFormation template and accompanying scripts.

1. Copy the 14 accompanying scripts and your ssh pem file to an S3 bucket.
2. Using CloudFormation on the AWS console to do the rest.

When you get to section 3, “Using CloudFormation ...”, you need a placement group in the region where you deploy your HPCC System. Appendix B gives detailed instructions for making one. Also, for section 3, you need an ssh key pair on your Windows machine. Appendix C gives detailed instructions on how to make the key pair on the AWS console and download it to your Windows machine.

This document provides details for accomplishing the above two-step process.

1.1 Document Conventions

Throughout this document we have commands that you must enter at the DOS prompt of a DOS window. These commands are shown in this document like the following command.

```
dir
```

Also, throughout this document are screenshots that show current topic web pages. I don’t always show the whole page. Often the right side of the web page has been chopped off. In addition, often I’ll have a green arrow that points to something of interest. These green arrows look like:



2. Make an S3 Bucket and Copy Scripts and Ssh Pem File

Here is a summary of this process:

1. Make an S3 bucket to copy scripts and ssh pem file.
2. Copy scripts and ssh pem file into created S3 bucket.

You need s3cmd installed on your Windows machine. Installation instructions are given in Appendix A.

The following link shows the s3cmd usage commands: <http://s3tools.org/usage>

2.1 Make an S3 Bucket

First, you need an s3 bucket to copy the scripts and ssh pem file to. The following commands make an s3 bucket called BuildHPCCScripts.

```
python c:\s3cmd\s3cmd mb s3://BuildHPCCScripts
```

Next, in a DOS window, cd into the folder containing all 14 perl/bash scripts and your ssh pem file for the region you will deploy your HPCC System on AWS.

2.2 Copy Scripts and Ssh Pem File to S3 Bucket

The following command copies everything in the current folder into the s3 bucket, BuildHPCCScripts.

```
python c:\s3cmd\s3cmd --recursive put . s3://BuildHPCCScripts
```

You can check to see if the scripts and ssh pem file are in the s3 bucket using the following command.

```
python c:\s3cmd\s3cmd ls s3://BuildHPCCScripts/*
```

3. Using CloudFormation on AWS Console to Configure and Deploy an HPCC System

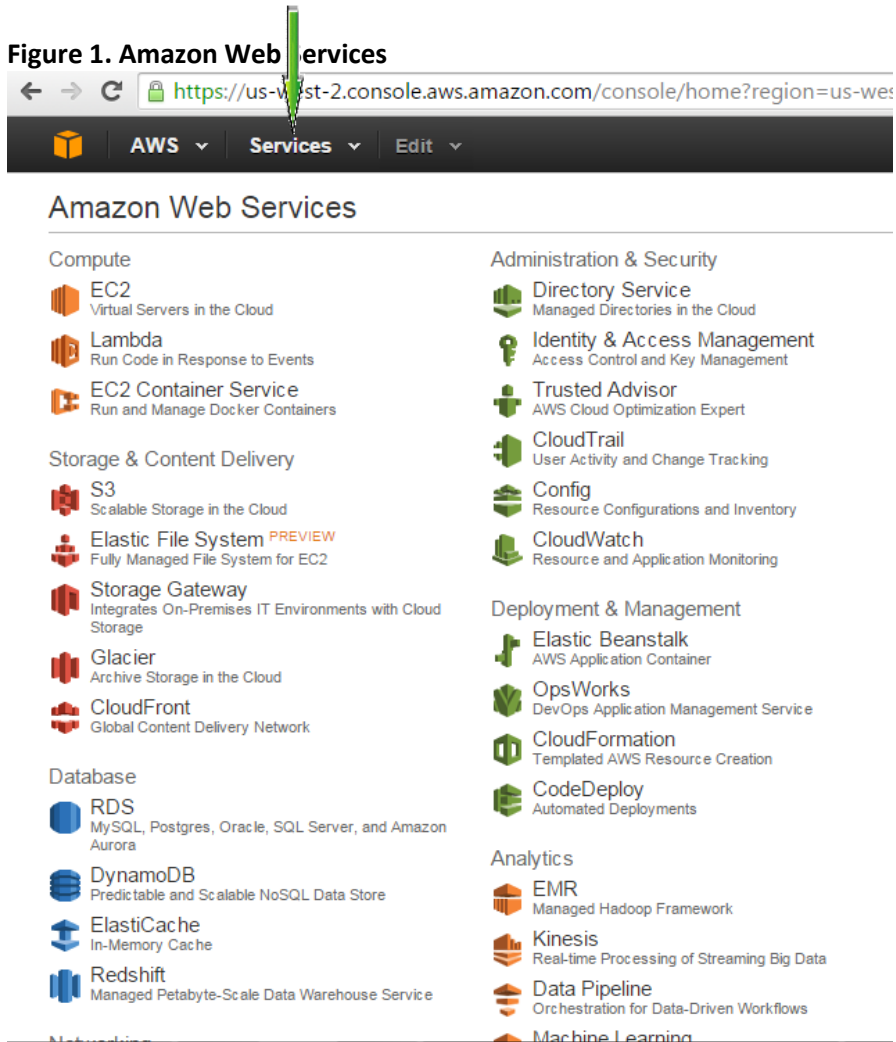
Here is a summary of this process:

1. Navigate to the CloudFormation web page.
2. Enter a Unique Name for the stack being created and give a path to the HPCC CF template.
3. Fill in the HPCC CF template parameters, e.g. name of pem file, placement group, etc.
4. Click the “Create” button to start the process of creating the HPCC System on AWS.

3.1 Navigate to CloudFormation Web Page

After logging into the AWS console (from your browser), you should see a web page that looks like Figure 1, below. Click on “Services”, (pointed to by the green arrow in Figure 1).

Figure 1. Amazon Web Services



On the next web page, which is a list of all AWS services, click on CloudFormation (pointed to by the green arrow of Figure 2).

Figure 2. All AWS Services

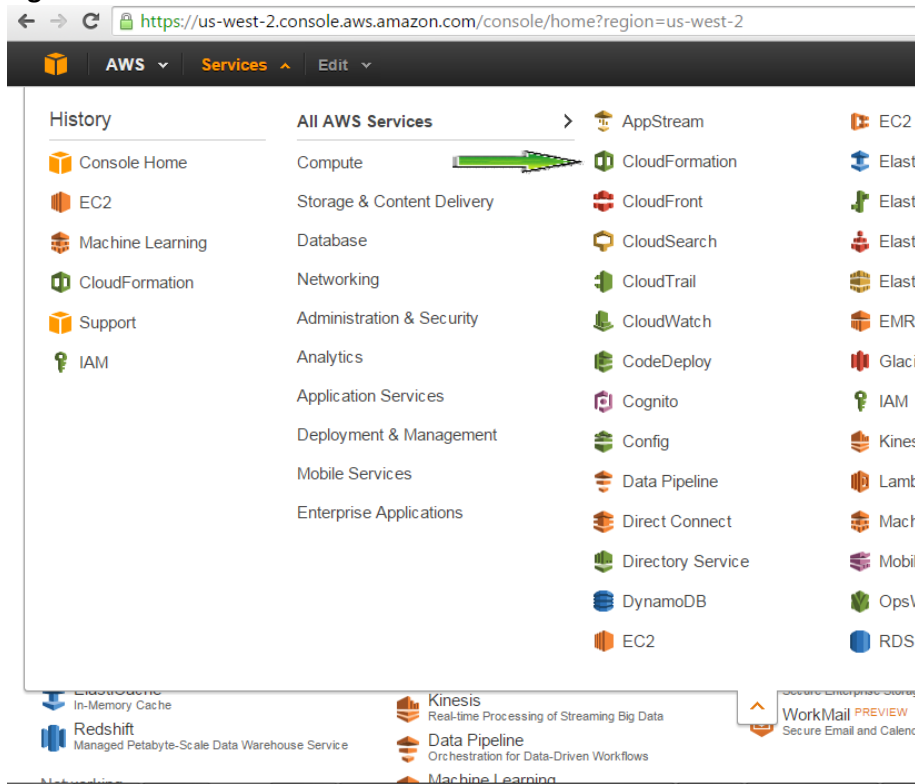
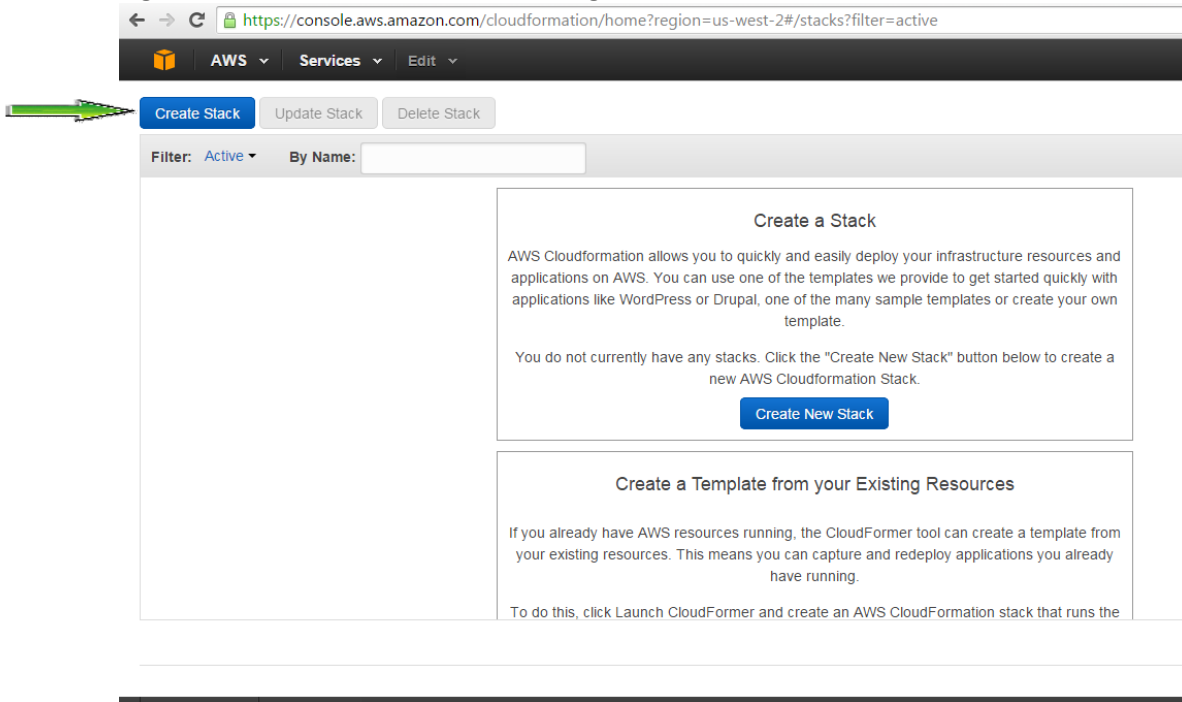


Figure 3 shows the first page of the CloudFormation section. Click on “Create Stack” to begin the process of configuring and deploying an HPCC System to AWS. (“Create Stack” is pointed to by the green arrow of Figure 3).

Figure 3. First CloudFormation Web Page



3.2 Enter a Unique Stack Name and Path to HPCC CF Template

Figure 4 shows the next web page you will see. On this page, enter a unique stack name in the textbox labeled “Name” (pointed to by the top green arrow of Figure 4). Then click on the “Choose File” button (pointed to by the bottom green arrow of Figure 4).


	<p>The stack name MUST be unique – different than any previous stack names.</p>
---	--

Figure 4. Select Template Web Page

← → ↻ <https://console.aws.amazon.com/cloudformation/home?region=us-west-2#/stacks/new>

AWS Services Edit

Select Template

Specify Parameters

Options

Review

Select Template

Specify a stack name and then select the template that describes the stack that you want to create.

Stack

An AWS CloudFormation stack is a collection of related resources that you provision and update as a single unit.

Name

Template

A template is a JSON-formatted text file that describes your stack's resources and their properties. AWS CloudFormation stores templates in an Amazon S3 bucket. [Learn more.](#)

Source

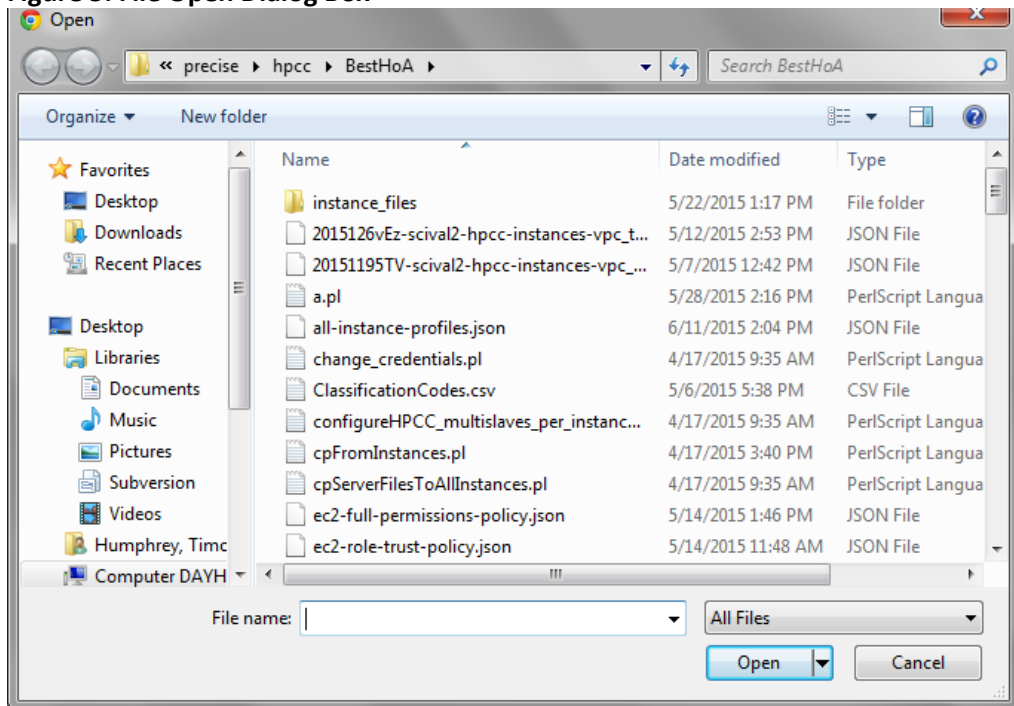
☒ Select a sample template

☐ Upload a template to Amazon S3

☐ Specify an Amazon S3 template URL

Choose File No file chosen

When you click on “Choose File”, you get an open-file dialog box, like that of Figure 5, below.

Figure 5. File Open Dialog Box

Use the open-file dialog box to find the HPCC CF template on your Windows computer and then click on open. The name of the HPCC CF template is: MyHPCCCloudFormationTemplate.json.

After entering a unique name for the stack and choosing the HPCC CF template, the web page should look like Figure 6, below (note. The following screenshot is after I scrolled down enough to see the “Next” button). Now, click on the “Next” button (pointed to by the green arrow in Figure 6, below).

Figure 6. Filled-in Select Template Web Page

The screenshot shows the AWS CloudFormation console's 'Select Template' page. The browser address bar displays <https://console.aws.amazon.com/cloudformation/home?region=us-west-2#/stacks/new>. The page is divided into two main sections: 'Stack' and 'Template'. In the 'Stack' section, the 'Name' field is filled with 'FastHPCC-150615-1'. In the 'Template' section, the 'Source' is set to 'Upload a template to Amazon S3', and the 'Choose File' button has selected the file 'MyHPCCCloud...plate.json'. At the bottom right, there are 'Cancel' and 'Next' buttons. A green arrow points to the 'Next' button.

3.3 Enter HPCC CF Template Parameters

After clicking on the “Next” button, the next web page you see should look like Figure 7, below.

Figure 7. HPCC Stack Parameters Web Page

Parameters

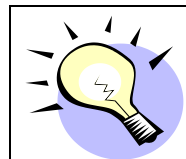
HPCCPlacementGroup	<input type="text"/>	Placement Group using by HPCC System
KeyPair	<input type="text" value="tlh_keys_us_west_2"/>	The EC2 Key Pair to allow SSH access to the instances.
MasterInstanceType	<input type="text" value="d2.4xlarge"/>	HPCC Thor Master EC2 instance type
NumberOfRoxieNodes	<input type="text" value="0"/>	Number of Roxie nodes in deployed HPCC System
NumberOfSlaveInstances	<input type="text" value="7"/>	Number of Slave instances to be launched
NumberOfSlavesPerNode	<input type="text" value="12"/>	Number of THOR slave nodes per slave instance
RoxieInstanceType	<input type="text" value="c3.2xlarge"/>	HPCC Roxie EC2 instance type
ScriptsS3BucketFolder	<input type="text" value="s3://BuildHPCCScripts"/>	S3 bucket folder that contains the scripts that are executed in the UserData section.
SlaveInstanceType	<input type="text" value="d2.8xlarge"/>	HPCC Thor Slave EC2 instance type

[Cancel](#) [Previous](#) [Next](#)

First, notice that the ScriptsS3BucketFolder has been set to the name of the bucket where we placed the scripts and ssh pem, i.e., s3://BuildHPCCScripts (see Section 2.2, above). And, KeyPair has been set to the name of the ssh pem file that was put into the above mentioned s3 bucket; that is tlh_keys_us_west_2 (notice that '.pem' is omitted).

The other non-empty text boxes have been set to the recommended settings for an HPCC System that runs fast on AWS, except for NumberOfRoxieNodes, which has been set to "0".

HPCCPlacementGroup is the only text box that doesn't have anything in it. Enter the name of the placement group you want to use for the current region (Appendix B shows you how to setup a placement group using the AWS console).



The current aws region is found in the top right-hand corner of the aws console display. It is a dropdown menu. So, you can select a different aws region. My current aws region was "Oregon", us-west-2.


For the purpose of demonstrating the use of the HPCC CF template, I will change some of the recommended values so the HPCC System that is configured and deployed doesn't cost me much money. The following screenshot is what Figure 7 looks like after making my changes.

Figure 8. Filled-in HPCC Stack Parameters Web Page

Parameters

HPCCPlacementGroup	<input type="text" value="pg-tlh-best"/>	Placement Group using by HPCC System
KeyPair	<input type="text" value="tlh_keys_us_west_2"/>	The EC2 Key Pair to allow SSH access to the instances.
MasterInstanceType	<input type="text" value="c3.2xlarge"/>	HPCC Thor Master EC2 instance type
NumberOfRoxieNodes	<input type="text" value="0"/>	Number of Roxie nodes in deployed HPCC System
NumberOfSlaveInstances	<input type="text" value="1"/>	Number of Slave instances to be launched
NumberOfSlavesPerNode	<input type="text" value="2"/>	Number of THOR slave nodes per slave instance
RoxieInstanceType	<input type="text" value="c3.2xlarge"/>	HPCC Roxie EC2 instance type
ScriptsS3BucketFolder	<input type="text" value="s3://BuildHPCCScripts"/>	S3 bucket folder that contains the scripts that are executed in the UserData section.
SlaveInstanceType	<input type="text" value="c3.2xlarge"/>	HPCC Thor Slave EC2 instance type

[Cancel](#) [Previous](#) [Next](#)



Notice I changed NumberOfSlavesPerNode from 12 to 2, the NumberOfSlaveInstances from 7 to 1 and the instance types for the Master and Slaves, I changed to c3.2xlarge. Also, notice in Figure 8, above, that I've set HPCCPlacementGroup to "pg-tlh-best", which is the name of the placement group I created for the us-west-2 region, which is where this stack will be created.

3.4 Start Creation Process

Once you have the parameters the way you want them, you click on "Next" (where green arrow points in Figure 8, above). The next web page looks like Figure 9, below.

Figure 9. Stack Options Web Page

Select Template
Specify Parameters
Options
Review

Options

Tags

You can specify tags (key-value pairs) for resources in your stack. You can add up to 10 unique key-value pairs for each stack. [Learn more.](#)

	Key (127 characters maximum)	Value (255 characters maximum)	
1	<input type="text"/>	<input type="text"/>	<input type="button" value="+"/>

► Advanced

You can set additional options for your stack, like notification options and a stack policy. [Learn more.](#)

There is nothing to do on this web page. So, just click the “Next” button to continue to the next web page which looks like Figure 10, below.

Figure 10. Review Parameters Web Page

Select Template
Specify Parameters
Options
Review

Review

Template

Name	FastHPCC-150615-1
Template URL	https://s3-us-west-2.amazonaws.com/cf-templates-19ljwti8ng5rf-us-west-2/2015
Description	Need: Add descriptions of the various resources.
Estimate cost	Cost

Parameters

HPCCPlacementGroup	pg-tlh-best
KeyPair	tlh_keys_us_west_2
MasterInstanceType	c3.2xlarge
NumberOfRoxieNodes	0
NumberOfSlaveInstances	1
NumberOfSlavesPerNode	2
RoxieInstanceType	c3.2xlarge
ScriptsS3BucketFolder	s3://BuildHPCCScripts
SlaveInstanceType	c3.2xlarge
Create IAM resources	False

This page shows all your settings, so you can verify they are what you want before starting the stack building process.

The next screenshot shows the same web page as above, except I've scrolled down so you can see the "Create" button. You click on the "Create" button to start the stack building process.

But, before you doing, you must click on the acknowledge checkbox (pointed to by the green arrow of Figure 11, below) to indicate that you know that the template comes from a trusted source. Why? Because the template creates AWS resources that you have to pay for and also the template gives permission to the instances created to access AWS resources such as S3 buckets.

Figure 11. Bottom of Review Parameters Web Page

Options

Tags

No tags provided

Advanced

Notification


Timeout none

Rollback on failure Yes

Capabilities

i The following resource(s) require capabilities: [AWS::IAM::InstanceProfile, AWS::IAM::Role]

This template might include Identity and Access Management (IAM) resources, which can include groups, IAM users, and IAM roles with certain permissions. Ensure that the template you are using is from a trusted source. [Learn more.](#)

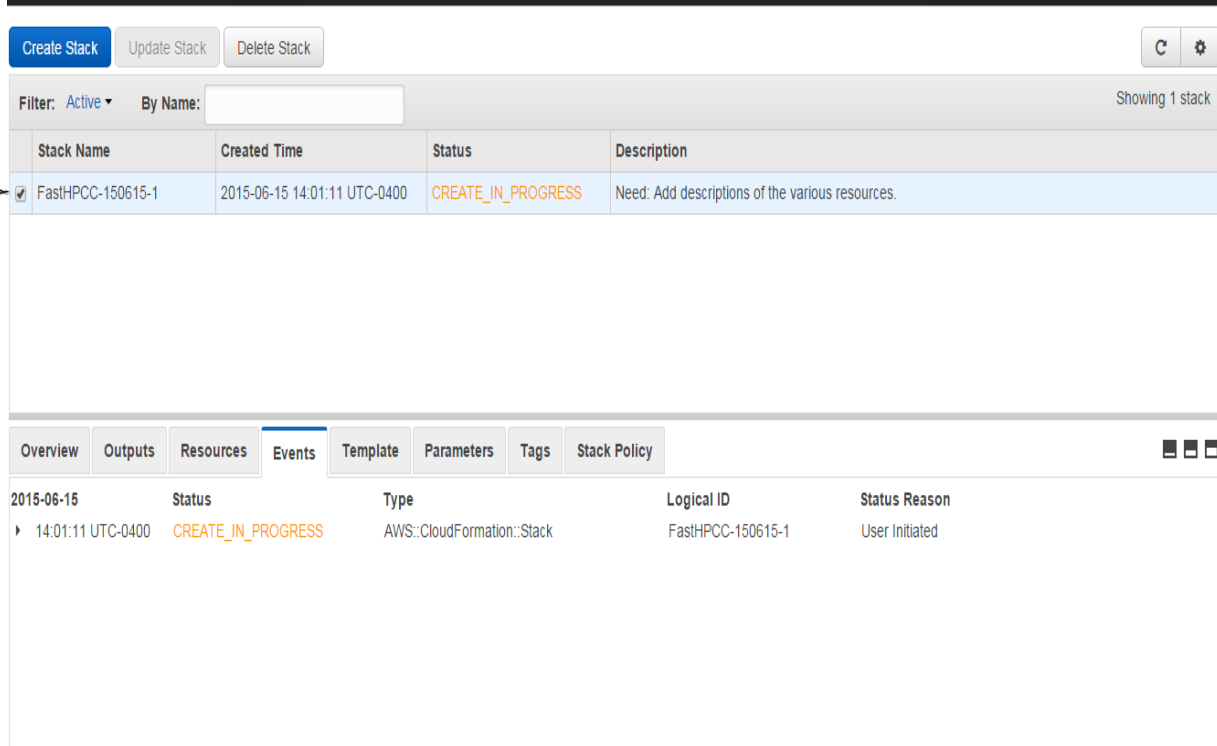
 ☐ I acknowledge that this template might cause AWS CloudFormation to create IAM resources.

Cancel Previous Create

The next web page you see should look like Figure 12, below.

It is divided into 2 parts. The top part shows the stacks (in this case only one). And the bottom part shows the progress of the stack build process for the stack with the checkbox "checked" (where the green arrow points in Figure 12).

Figure 12. Show Stacks Web Page



Buttons: Create Stack, Update Stack, Delete Stack

Filter: Active By Name: Showing 1 stack

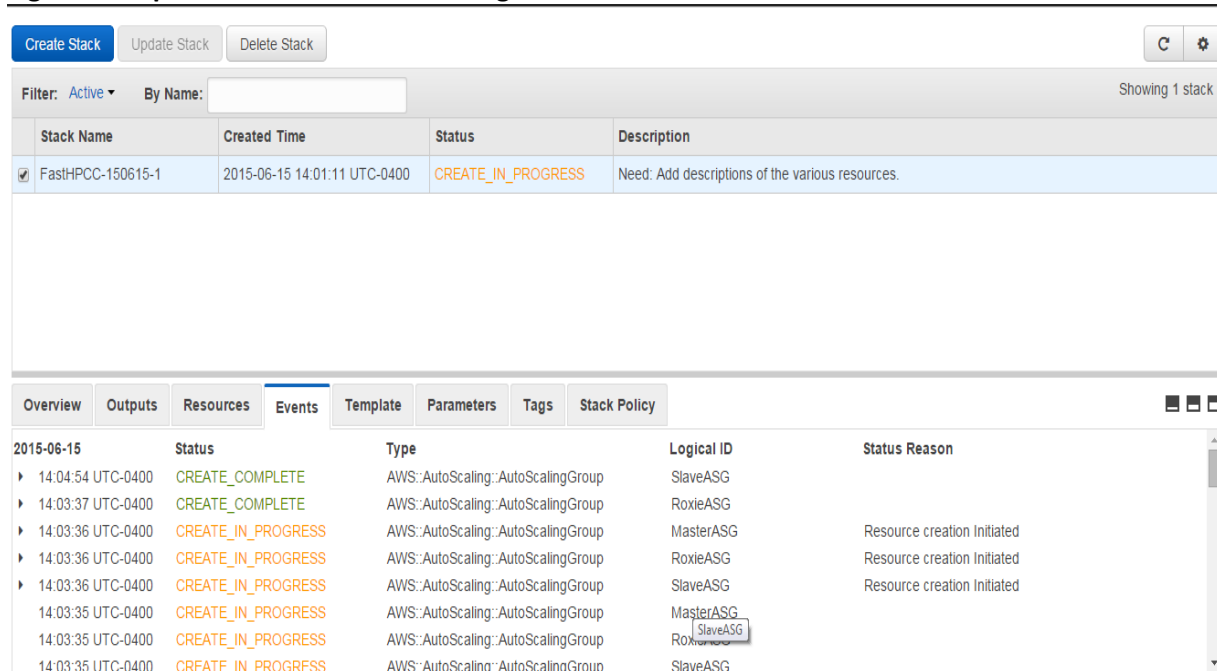
Stack Name	Created Time	Status	Description
<input checked="" type="checkbox"/> FastHPCC-150615-1	2015-06-15 14:01:11 UTC-0400	CREATE_IN_PROGRESS	Need: Add descriptions of the various resources.

Overview Outputs Resources **Events** Template Parameters Tags Stack Policy

2015-06-15	Status	Type	Logical ID	Status Reason
14:01:11 UTC-0400	CREATE_IN_PROGRESS	AWS::CloudFormation::Stack	FastHPCC-150615-1	User Initiated

If you refresh the web page, you will see an update of the progress of the stack build process (like Figure 13, below).

Figure 13. Updated Show Stacks Web Page



Buttons: Create Stack, Update Stack, Delete Stack

Filter: Active By Name: Showing 1 stack

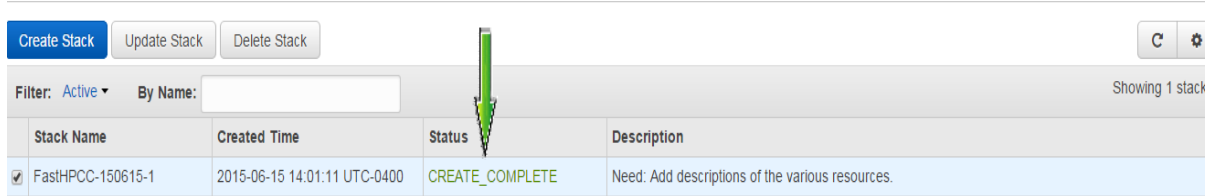
Stack Name	Created Time	Status	Description
<input checked="" type="checkbox"/> FastHPCC-150615-1	2015-06-15 14:01:11 UTC-0400	CREATE_IN_PROGRESS	Need: Add descriptions of the various resources.

Overview Outputs Resources **Events** Template Parameters Tags Stack Policy

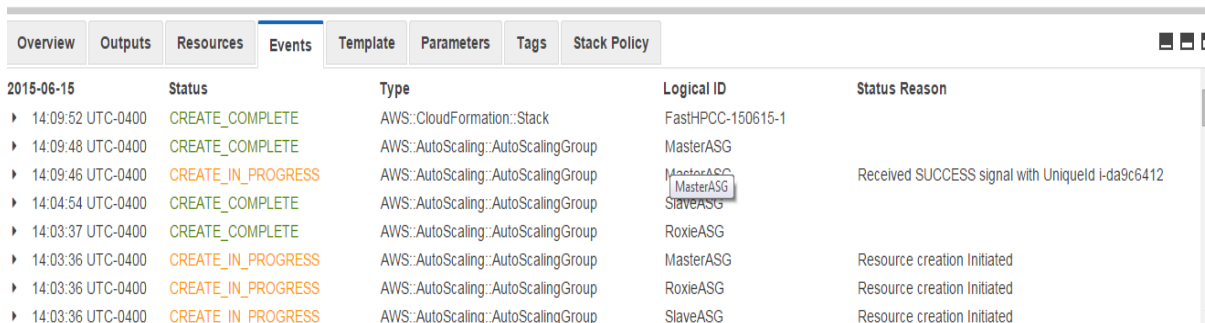
2015-06-15	Status	Type	Logical ID	Status Reason
14:04:54 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	SlaveASG	
14:03:37 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	RoxieASG	
14:03:36 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	MasterASG	Resource creation Initiated
14:03:36 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	RoxieASG	Resource creation Initiated
14:03:36 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	SlaveASG	Resource creation Initiated
14:03:35 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	MasterASG	
14:03:35 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	RoxieASG	
14:03:35 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	SlaveASG	

The stack build process is done (meaning the HPCC System is setup) when “CREATE_COMPLETE” is the Status of the stack building process (where the green arrow points in Figure 14, below).

Figure 14. Finished Stack Creation




Create Stack	Update Stack	Delete Stack		
Filter: Active	By Name:			Showing 1 stack
Stack Name	Created Time	Status	Description	
FastHPCC-150615-1	2015-06-15 14:01:11 UTC-0400	CREATE_COMPLETE	Need: Add descriptions of the various resources.	



Overview	Outputs	Resources	Events	Template	Parameters	Tags	Stack Policy
2015-06-15		Status	Type	Logical ID	Status Reason		
14:09:52 UTC-0400		CREATE_COMPLETE	AWS::CloudFormation::Stack	FastHPCC-150615-1			
14:09:48 UTC-0400		CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	MasterASG			
14:09:46 UTC-0400		CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	MasterASG	Received SUCCESS signal with Uniqueld i-da9c6412		
14:04:54 UTC-0400		CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	SlaveASG			
14:03:37 UTC-0400		CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	RoxieASG			
14:03:36 UTC-0400		CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	MasterASG	Resource creation Initiated		
14:03:36 UTC-0400		CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	RoxieASG	Resource creation Initiated		
14:03:36 UTC-0400		CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	SlaveASG	Resource creation Initiated		

When the stack creation process has completed go to the “Instances” page on the AWS console to get the IP address of the Master, which is needed to access ECL Watch and to setup the ECL IDE.



Once you have finished with the deployed HPCC System, delete the stack so all resources are terminated and AWS charges won't continue.

Getting Public IP of Master

From the EC2 Dashboard, click on “Instances” (pointed to by the green arrow of Figure 15, below).

Figure 15. EC2 Dashboard with Instances Marked

EC2 Dashboard

Events
Tags
Reports
Limits

INSTANCES

Instances
Spot Requests
Reserved Instances

IMAGES

AMIs
Bundle Tasks

ELASTIC BLOCK STORE

Volumes
Snapshots

NETWORK & SECURITY

Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs

Resources

You are using the following Amazon EC2 resources in the US West (Oregon) region:

0 Running Instances	0 Elastic IPs
13 Volumes	10 Snapshots
9 Key Pairs	0 Load Balancers
2 Placement Groups	32 Security Groups

Automate application deployments to EC2 with [CodeDeploy](#).

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the US West (Oregon) region

Service Health

Service Status:

US West (Oregon):
This service is operating normally

Availability Zone Status:

us-west-2a:

Scheduled Events

US West (Oregon):
No events

Next, you will see the Instance page which should look like Figure 16, below. The Master instance has been selected by clicking on the button just to the left of the instance's name (pointed to by the top-left green arrow in Figure 16). And because this instance is selected, its Public IP address is shown where the bottom-right green arrow points. You can swipe across this Public IP address and save it. Then, paste it into your browser's address bar and append ":8010" to access ECL Watch.

Figure 16. Instances Page with Master Marked

The screenshot shows the AWS Management Console 'Instances' page. The left-hand navigation menu has 'Instances' selected, indicated by a green arrow. The main content area displays a table of instances:

<input type="checkbox"/>	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status
<input checked="" type="checkbox"/>	FastHPCC-150615-1--Master	i-41cf3589	c3.2xlarge	us-west-2c	● running	⌚
<input type="checkbox"/>	FastHPCC-150615-1--Slave	i-e2cf352a	c3.2xlarge	us-west-2c	● running	⌚

Below the table, the details for the selected instance 'i-41cf3589 (FastHPCC-150615-1--Master)' are shown. The 'Public IP' is 52.26.215.137, which is highlighted with a green arrow. The 'Description' tab is active, showing the instance ID and state.

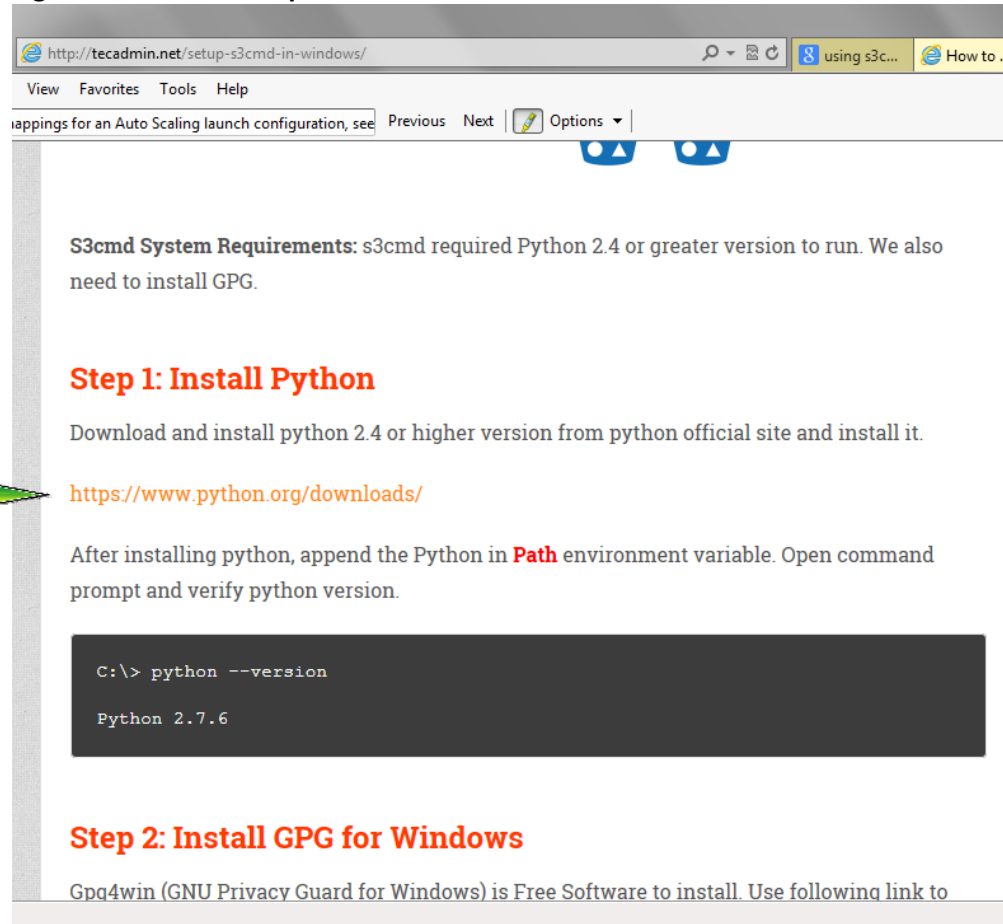
Appendix A. Install S3cmd on Your Windows Machine

The following link gives detailed instructions for installing s3cmd:

<http://tecadmin.net/setup-s3cmd-in-windows/>

S3cmd needs both python and gpg for windows. This web site shows how to install both as well as how to install and configure s3cmd.

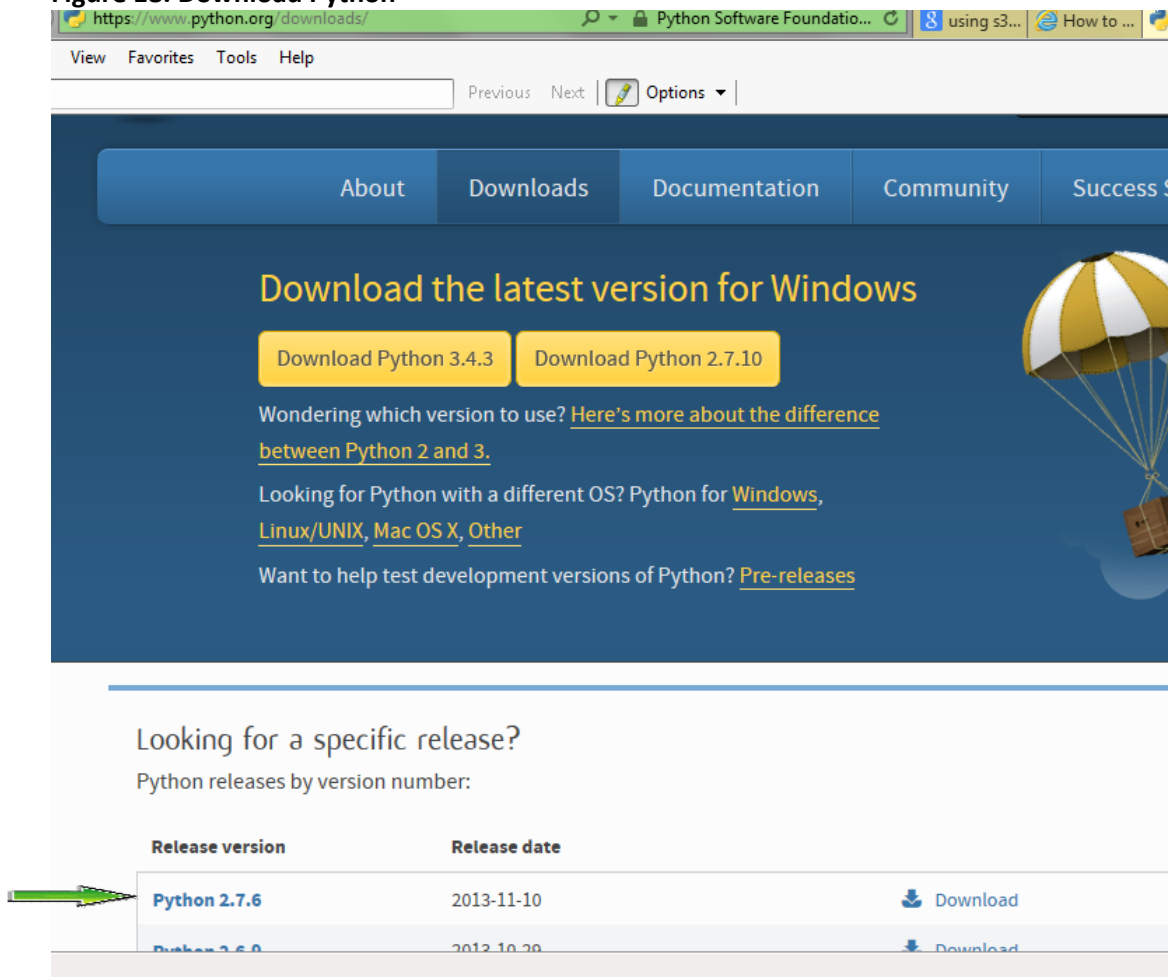
Figure 17. How to Setup S3cmd on Windows



To install python, click on the link pointed to by the green arrow in Figure 15, above. The next page you see looks like Figure 18, below – for downloading python.


You don't want the latest Python. You want Python 2.7.6 which is in the list of other versions shown at the bottom of the page (you may have to scroll down to see the list and then scroll the list to find version 2.7.6).

Figure 18. Download Python



Installing pgp4win

No additional instructions are needed for the installation of pgp4win. Just following the instructions on the “How to Install S3cmd on Windows” web page.

	Remember the path where pgp4win is installed. Later, it is needed for the configuration of s3cmd.
---	---

Installing s3cmd

No additional instructions are needed for the installation of s3cmd. Just following the instructions on the “How to Install S3cmd on Windows” web page.

Configuring s3cmd

Once, s3cmd is install, do the following command to configure it. This command creates a the file, .s3cfg, in your home directory.

```
Python c:\s3cmd\s3cmd --configure
```

The above command will prompt you for information. You will use the defaults supplied accept for those prompts given in the following table.

Table 1. S3cmd Configuration Parameters

Prompt	Your Response
Access key	Enter your AWS access key
Secret key	Enter your AWS secret key
Encryption password	Just hit enter, i.e. don't provide a password
Path to GPG program	Enter the path where gpg was installed (my is C:\Program Files (x86)\GNU\GnuPG\pub\gpg.exe)
Test access with supplied credentials	Enter yes (this assures you didn't make any mistakes when entering the above parameters)
Save settings	Enter yes

Appendix B. Making a Placement Group

The EC2 instances of the deployed HPCC System are in the same placement group. This assures the instances are close together and therefore communication is faster.

The following gives detailed instructions for making a placement group in the region your HPCC System is deployed.

Figure 19 is the top right corner of the home page of the AWS console. It and other AWS console pages have the region where instances will be launched in the top right-hand corner of the page (where the green arrow is pointing). If you click on the region, you get a dropdown menu containing all the regions. And, you can pick from the dropdown list another region.

Figure 19. Selecting Region

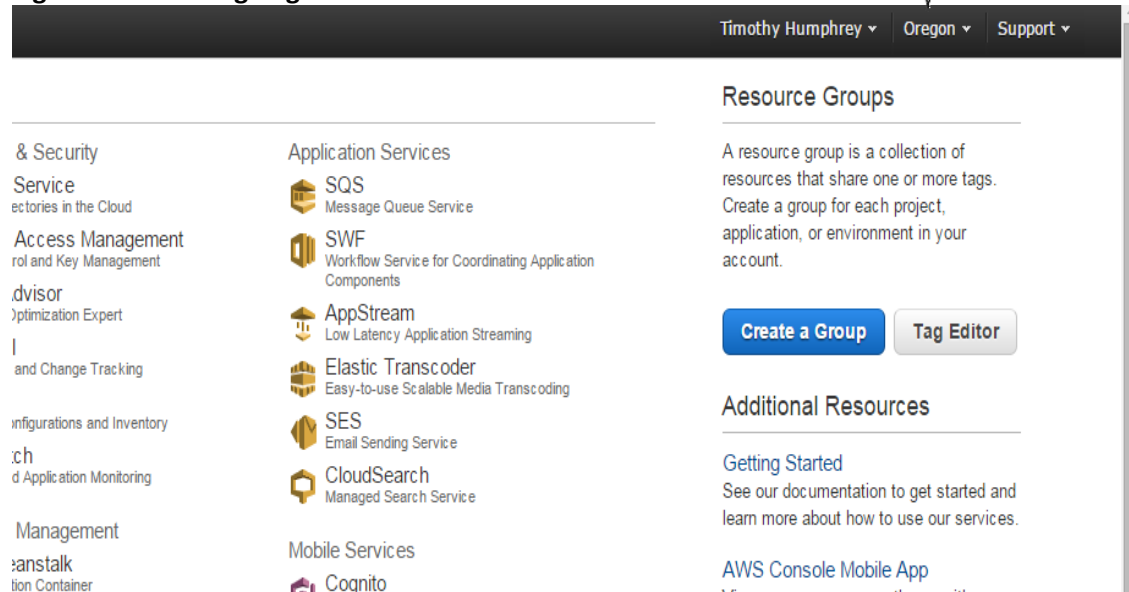
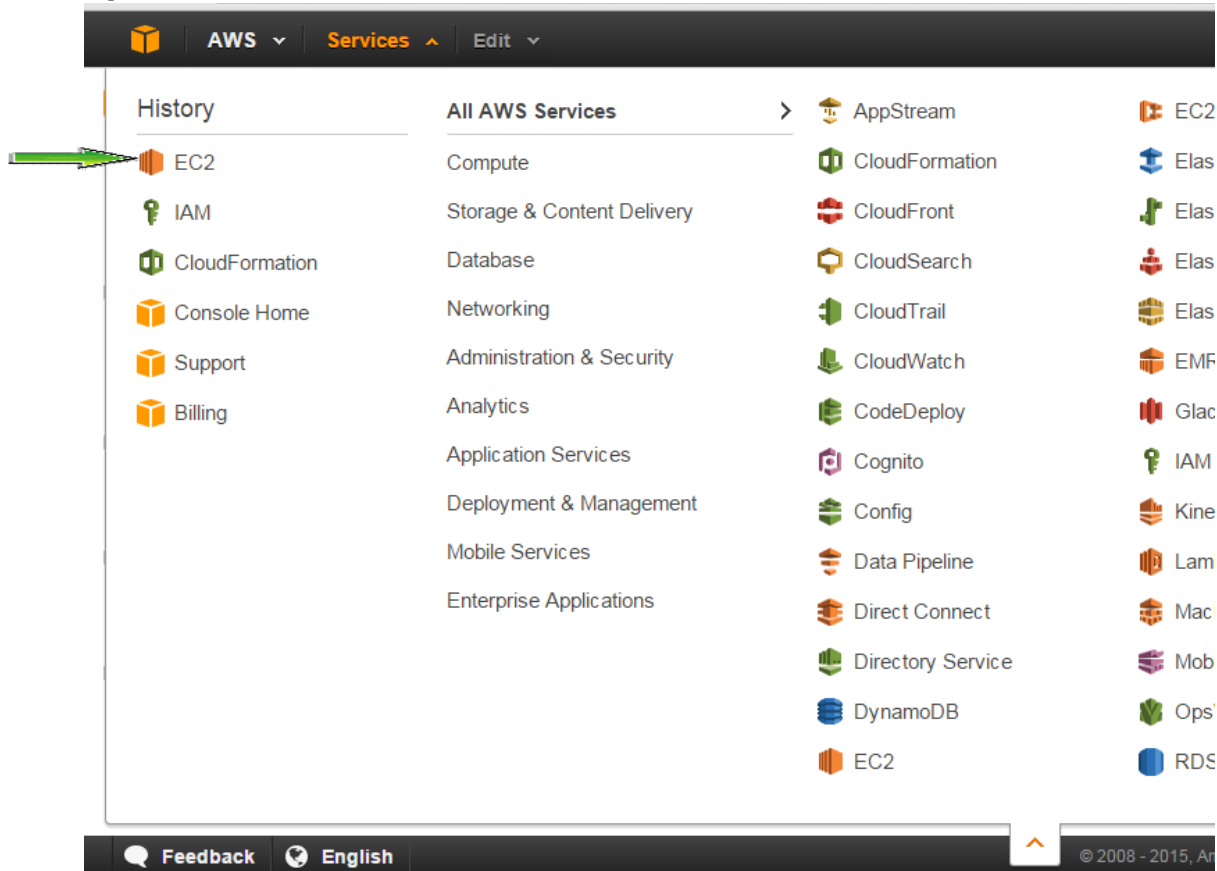


Figure 20, below, shows the AWS Services page which you get when you click on “Services” in the top left-hand corner of the AWS console home page. Click on EC2 pointed at by the green arrow of Figure 18.

Figure 20. AWS Services



Next you will see the EC2 Dashboard page, Figure 21, below. Click on “Placement Groups”, pointed to by the green arrow of Figure 21.

Figure 21. EC2 Dashboard

The screenshot shows the AWS Management Console EC2 Dashboard. The top navigation bar includes the AWS logo, 'AWS' dropdown, 'Services' dropdown, and 'Edit' dropdown. The left sidebar contains the following menu items: EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (Instances, Spot Requests, Reserved Instances), IMAGES (AMIs, Bundle Tasks), ELASTIC BLOCK STORE (Volumes, Snapshots), and NETWORK & SECURITY (Security Groups, Elastic IPs, Placement Groups, Load Balancers, Key Pairs). A green arrow points to 'Placement Groups' in the NETWORK & SECURITY section.

Resources

You are using the following Amazon EC2 resources in the US West (Oregon) region:

0 Running Instances	0 Elastic IPs
13 Volumes	10 Snapshots
9 Key Pairs	0 Load Balancers
2 Placement Groups	32 Security Groups

[Automate application deployments to EC2 with CodeDeploy.](#) [Hi](#)

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the US West (Oregon) region

Service Health

Service Status:

US West (Oregon):
This service is operating normally

Availability Zone Status:

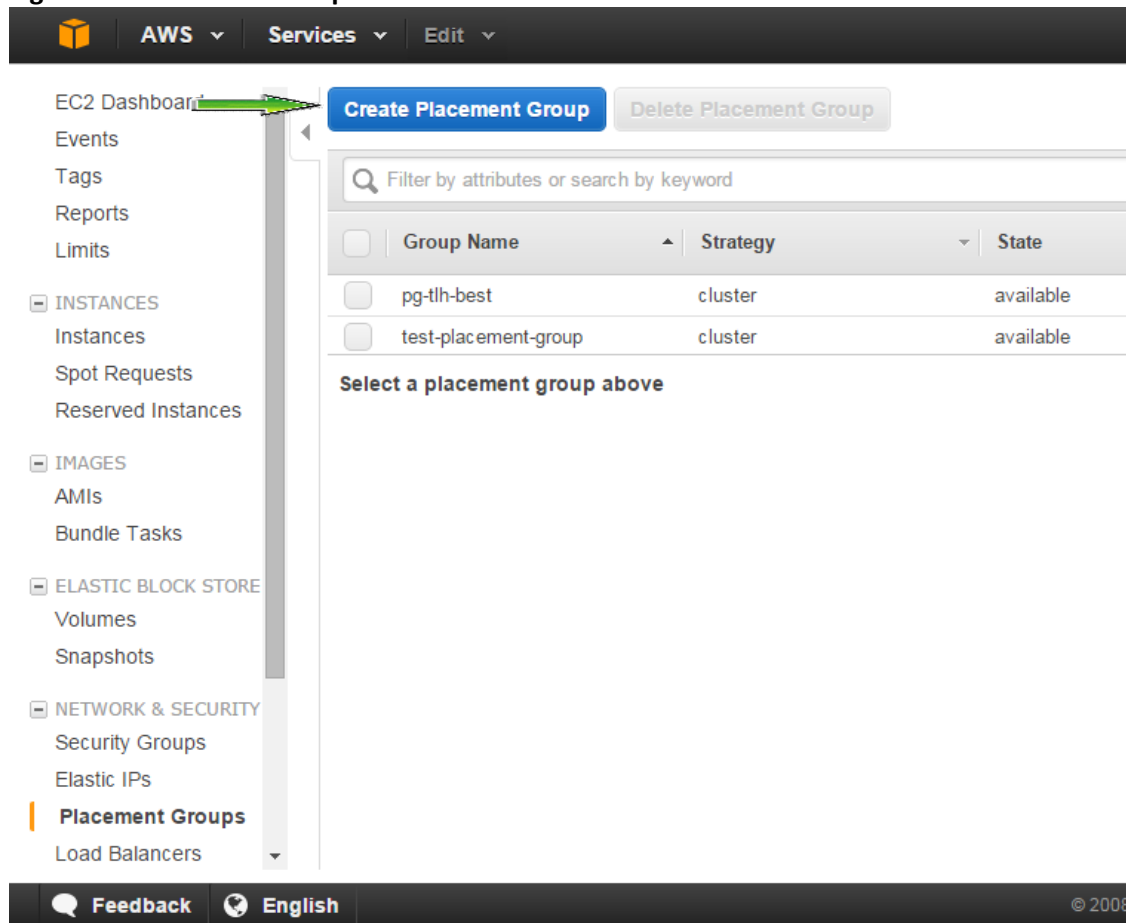
us-west-2a:

Scheduled Events

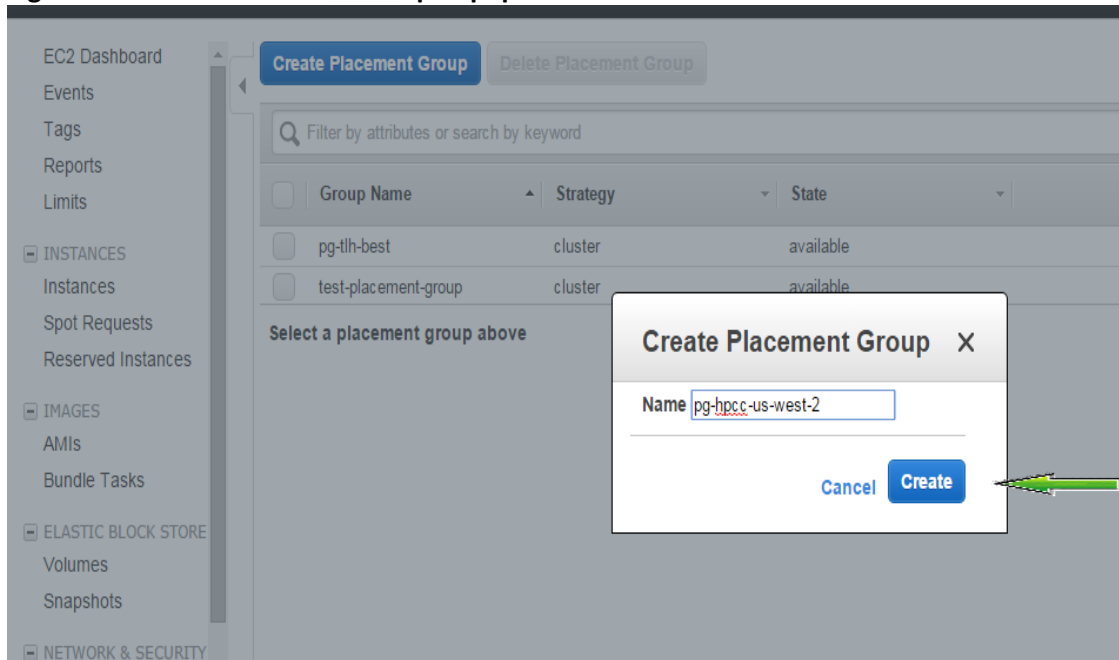
US West (Oregon):
No events

Next, you will see Figure 22, Placement Groups. Click on “Create Placement Group”, pointed to by the green arrow of Figure 22.

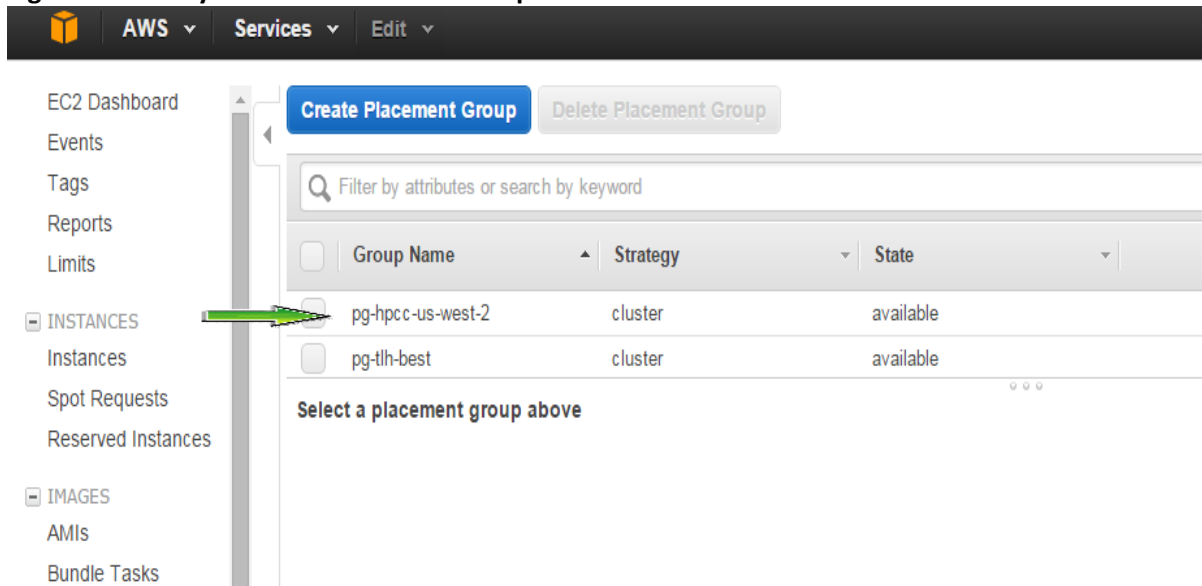
Figure 22. Placement Groups



This causes a popup as shown in Figure 23, below. Enter the name you want the placement group to have in the textbox named “Name” (In Figure 23, I have entered the name “pg-hpcc-us-west-2”. After entering the name, click on “Create” pointed to by the green arrow of Figure 23. This causes the placement group to be created.

Figure 23. Create Placement Group Popup

Next, as shown in Figure 24, you will see the newly created placement group in the list of placement groups (see where green arrow is pointing in Figure 24).

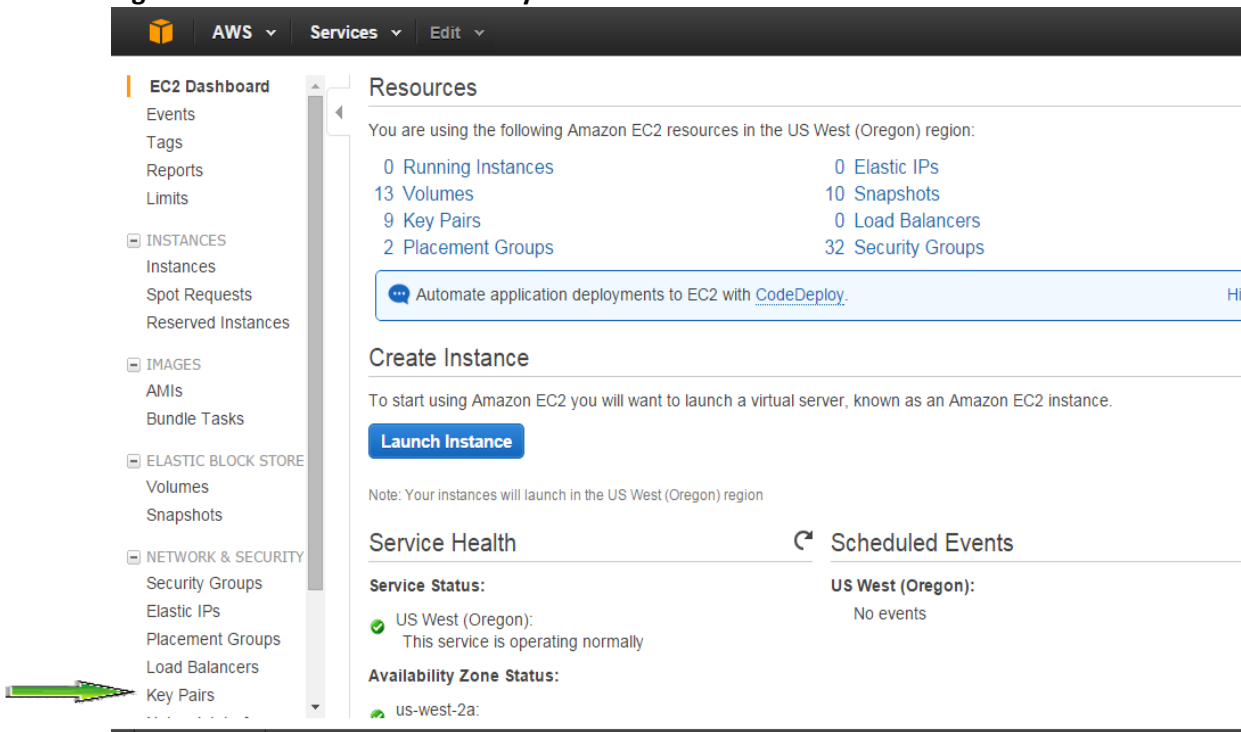
Figure 24. Newly Created Placement Group

Appendix C. Make a Ssh Pem File

An ssh key pair is used by the nodes of your deployed HPCC System to access other nodes of the system. The following gives details on how to create an ssh key pair and have it pem file downloaded to your Windows computer.

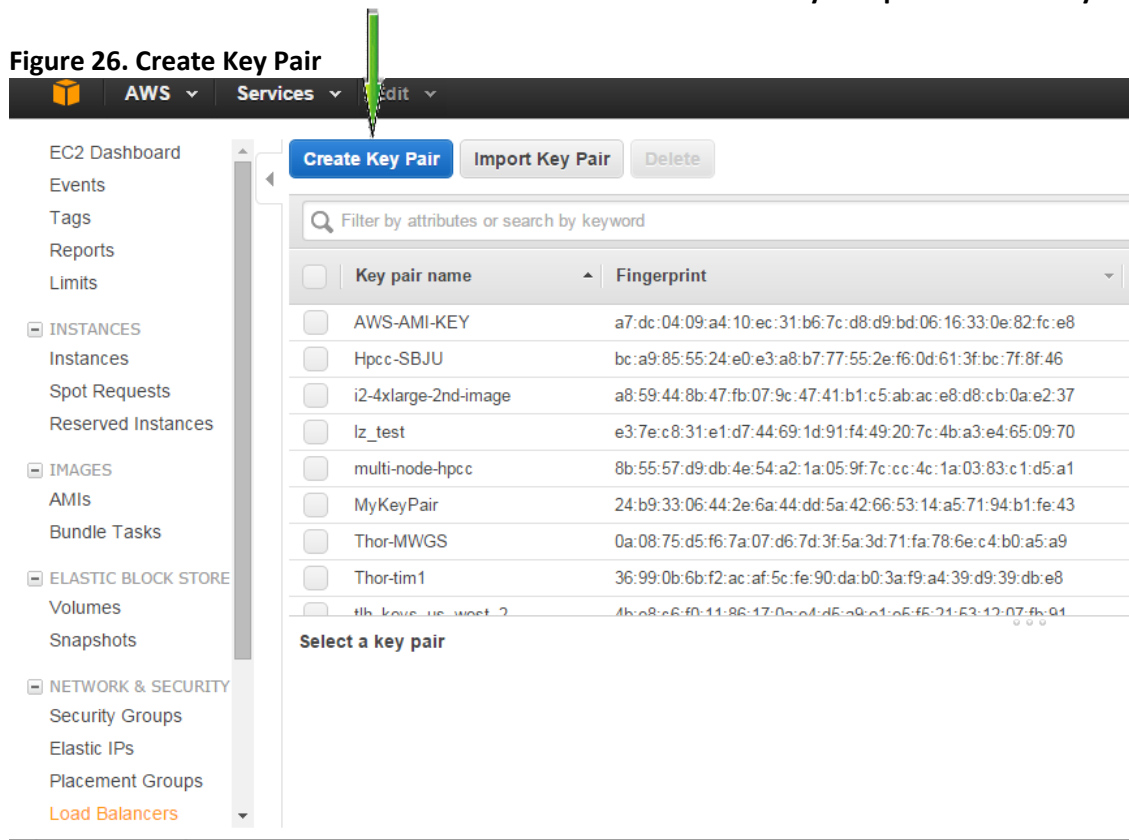
First from the EC2 Dashboard, click on Key Pair (pointed to by the green arrow of Figure 25).

Figure 25. EC2 Dashboard with KeyPair Marked

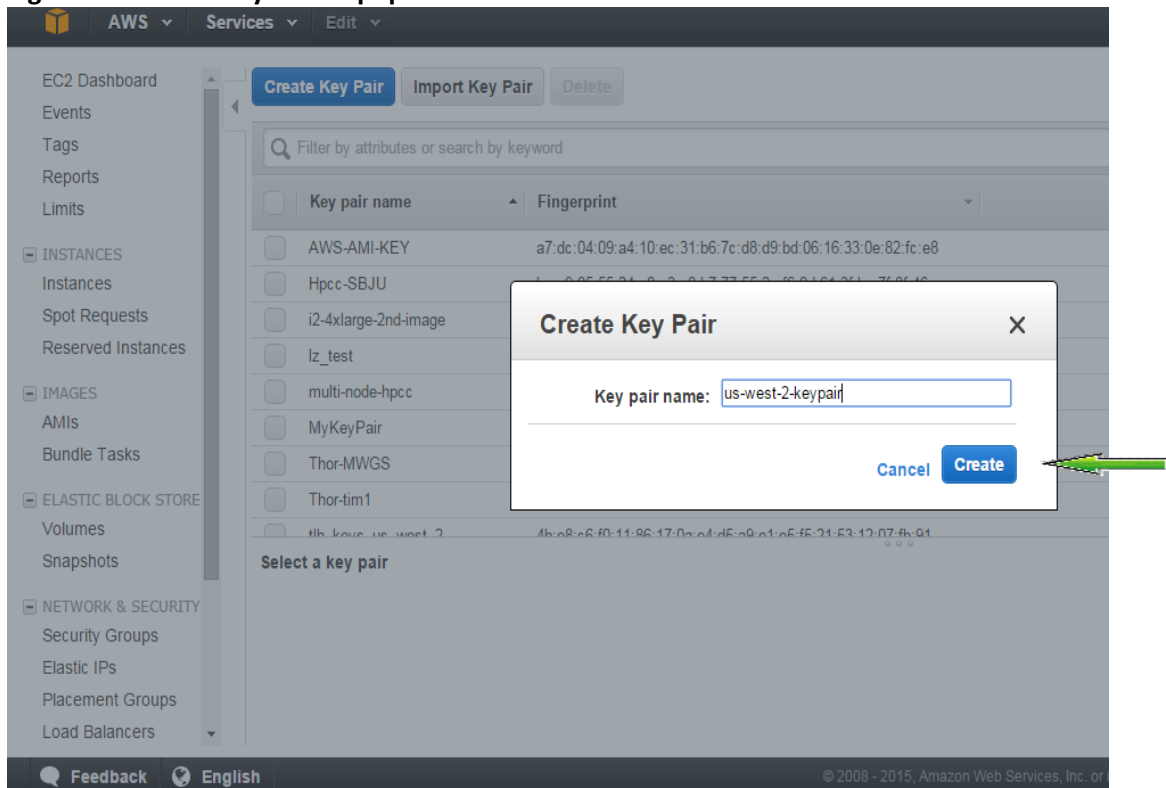


Next, you will see the page where you can create a new key pair. It should look like Figure 26, below. Click on “Create Key Pair” (pointed to by the green arrow of Figure 26).

Figure 26. Create Key Pair



Next, you will see a popup with the title “Create Key Pair”. It should look like Figure 27. Enter the name of your new key pair and then click on “Create” (pointed to by the green arrow of Figure 27). You will notice that in Figure 27, I entered the name “us-west-2-keypair”.

Figure 27. Create Key Pair Popup

After clicking on the “Create” button, the next thing you will see is a page that looks like Figure 28, below. And, you should get an indication that the pem file for the newly created key pair was downloaded to your Windows computer (pointed to by the green arrow of Figure 28, below).

Figure 28. Create Key Pair with Pem File Downloaded

The screenshot displays the AWS Management Console interface for creating a key pair. The top navigation bar includes the AWS logo, 'AWS', 'Services', and 'Edit' dropdowns. The left sidebar contains the navigation menu, with 'Network & Security' expanded. The main content area shows the 'Create Key Pair' page with buttons for 'Create Key Pair', 'Import Key Pair', and 'Delete'. Below these buttons is a search bar and a table of existing key pairs. A green arrow points to the 'us-west-2-key-pair.pem' file in the download bar at the bottom.

<input type="checkbox"/>	Key pair name	Fingerprint
<input type="checkbox"/>	AWS-AMI-KEY	a7:dc:04:09:a4:10:ec:31:b6:7c:d8:d9:bd:06:16:33:0e:82:fc:e8
<input type="checkbox"/>	Hpcc-SBJU	bc:a9:85:55:24:e0:e3:a8:b7:77:55:2e:f6:0d:61:3f:bc:7f:8f:46
<input type="checkbox"/>	i2-4xlarge-2nd-image	a8:59:44:8b:47:fb:07:9c:47:41:b1:c5:ab:ac:e8:d8:cb:0a:e2:37
<input type="checkbox"/>	Iz_test	e3:7e:c8:31:e1:d7:44:69:1d:91:f4:49:20:7c:4b:a3:e4:65:09:70
<input type="checkbox"/>	multi-node-hpcc	8b:55:57:d9:db:4e:54:a2:1a:05:9f:7c:cc:4c:1a:03:83:c1:d5:a1
<input type="checkbox"/>	MyKeyPair	24:b9:33:06:44:2e:6a:44:dd:5a:42:66:53:14:a5:71:94:b1:fe:43
<input type="checkbox"/>	Thor-MWGS	0a:08:75:d5:f6:7a:07:d6:7d:3f:5a:3d:71:fa:78:6e:c4:b0:a5:a9
<input type="checkbox"/>	Thor-tim1	36:99:0b:6b:f2:ac:af:5c:fe:90:da:b0:3a:f9:a4:39:d9:39:db:e8
<input type="checkbox"/>	th-key-us-west-2	4b:e8:e6:f0:11:86:17:0a:4d:5a:9a:e1:e6:f5:21:53:12:07:fb:91

Select a key pair

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us-west-2-key-pair.pem