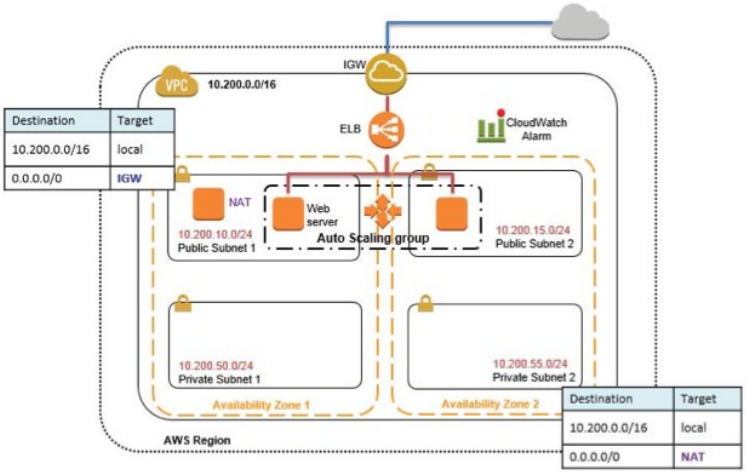
PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Lab 5: Exploring AWS CloudFormation

Lab Overview

Introduction

In this lab, you will use AWS CloudFormation to automate the creation of all AWS resources that you manually created in the previous labs, such as a VPC, subnets, a NAT server, and an Auto Scaling group. Using an AWS CloudFormation template, you can manage and configure your AWS cloud more quickly.



Allotted time

The allotted time for this lab is listed as follows:

Component	Time
Overview	1 minute
Lab	30 minutes
Total:	**31 minutes**

Continued on next page

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Lab Overview, Continued

Prerequisites

This lab requires:

- Access to a notebook computer with Wi-Fi on a Microsoft Windows, Mac OS X, or Linux (Ubuntu, SuSE, or Red Hat) system.

  (The qwikLABS lab environment is not accessible on an iPad or tablet device, but you may use these devices to access the student guide PDF.)
- For Microsoft Windows users: Administrator access to the computer
- An Internet browser such as Chrome, Firefox, or IE9 (previous versions of Internet Explorer are not supported)

Objectives

After completing this lab, you will be able to:

- Navigate through the AWS CloudFormation Dashboard and inspect the AWS resources that were created.
- Select a region and create an AWS CloudFormation stack.
- Examine the execution of the AWS CloudFormation template.

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Exploring the AWS CloudFormation Dashboard

Introduction

AWS CloudFormation gives developers and systems administrators an easy way to create and manage a collection of related AWS resources, provisioning and updating them in an orderly and predictable fashion.

Task 5.1: Inspect the existing stack

Your lab environment contains a pre-defined Amazon VPC. It contains four subnets, and is nearly identical to the VPC that you created in the previous lab. To check the properties of those subnets:

Step	Action
5.1.1	In the AWS Management Console, on the **Services** menu, click **CloudFormation**. You should see a stack with *CREATE_IN_PROGRESS* status. Wait until the status changes to *CREATE_COMPLETE*.
5.1.2	Select the check box for the existing stack (the stack name starts with *qlstack2-labinstance-*). Information about this stack is displayed on the **Overview** tab in the lower pane. Notice that the **Description** field provides a brief explanation about this stack.
5.1.3	Click the **Resources** tab. Review each of the resources created for you by the template. Notice that the resource Type and its ID, such as **AWS::EC2::VPC,** has a Physical ID that starts with *vpc-*, which you observed in previous labs.
5.1.4	Click the **Events** tab. The Events tab provides point-in-time event information, starting at template initialization and ending with the completed template. This information can help you debug your AWS CloudFormation template.
5.1.5	Click the **Parameters** tab. The Parameters tab displays parameter values that were set by the AWS CloudFormation template.

Continued on next page

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Exploring the AWS CloudFormation Dashboard, Continued

Task 5.2: Review the existing launch configuration

To review the existing launch configuration:

Step	Action
5.2.1	On the **Services** menu, click **EC2**.
5.2.2	In the navigation pane, click **Instances**. Notice that there are three instances: two **WebApplicationServer** instances and one **NAT** instance.
5.2.3	In the navigation pane, click **Launch Configurations**.
5.2.4	Select the existing launch configuration. The **Details** tab displays the settings for the launch configuration, such as **AMI ID** and **Instance Type**.
5.2.5	Click the **View User data** link to see the bootstrapping script. **Note:** In the previous lab, you configured these properties manually from the AWS Management Console.
5.2.6	Click **Close**.
5.2.7	In the navigation pane, click **Auto Scaling Groups**.
5.2.8	If it is not already selected, select the check box for the existing Auto Scaling group. In the lower pane, the **Details** tab displays the configuration for this Auto Scaling group.
5.2.9	Click the **Scaling History** tab to see that two instances were launched by this Auto Scaling group because the policy is set to run at least two instances (min.).

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Creating a Stack

Introduction

In this part of the lab, you will deploy a template and its associated collection of resources (called a *stack*) by using the AWS CloudFormation Dashboard.

Task 5.3: Create a stack

To create a stack in a different region:

Step	Action
5.3.1	On the **Services** menu, click **CloudFormation**.
5.3.2	In the navigation bar, select a different region from the drop-down list. 
5.3.3	Click **Create New Stack**.
5.3.4	In the **Name** box, type **MyLabTemplate**
5.3.5	In **Source**, select the option **Specify an Amazon S3 template URL**.
5.3.6	Type the following Amazon S3 URL: `https://us-west-2-aws-training.s3.amazonaws.com/awsu-ilt/architecting/v4.0/lab-5-exploring-cloudformation/static/lab-5-exploring-cloudformation-student.template` **Note:** If you prefer, you can copy and paste the URL from the **INSTRUCTION 1** tab of the qwikLABS web page.
5.3.7	Click **Next**.
5.3.8	Click **Next**. You don't need to change any of the parameter values.
5.3.9	In the **Tags** section, enter the following values: • In the **Key** box, type **Environment** • In the **Value** box, type **Lab**
5.3.10	Click **Next**.
5.3.11	On the **Review** page, click the **Template URL** link to open the provided AWS CloudFormation template in another tab. You can examine the template to see what it creates. Notice that **Mappings** specifies the AMI ID to be used for each region. Locate **WebApplicationLC** to see that user data is also defined within the block. You launched an Amazon EC2 instance and installed available updates and an Apache server manually in Lab 3. The same steps can be automated using an AWS CloudFormation template. Take your time to review the Cloud Formation template before proceeding.

Continued on next page

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Creating a Stack, Continued

Task 5.3: Create a stack, continued

Step	Action
5.3.12	Click **Create**. The status should be *CREATE_IN_PROGRESS*. Click the **Events** tab in the lower pane to track the progress. As the resources are created, you can see them in their respective sections of your AWS Management Console, such as in the EC2 Dashboard and VPC Dashboard. When all the resources are created, the status changes to *CREATE_COMPLETE*.

Ending your lab

When you are done, follow the instructions in Appendix B to end your lab.

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Conclusion

Achievements Having completed this lab, you are able to:

- Navigate through the AWS CloudFormation Dashboard and inspect the AWS resources that were created.
- Select a region and create an AWS CloudFormation stack.
- Examine the execution of the AWS CloudFormation template.

Your results are verified by your ability to complete the lab in the allotted time. When you have completed the lab, your instructor will facilitate a discussion of your results.

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Lab 6: Creating a Batch Processing Cluster

Lab Overview

Introduction

In this lab, you will use the AWS Management Console to build a basic batch processing cluster.

You will:

- Launch and configure an Amazon EC2 instance that will serve as the template for future worker nodes in your batch processing cluster.
- Create an Amazon Machine Image (AMI) from that instance.
- Use Amazon SQS to create task queues for passing messages to your instances.
- Launch an Auto Scaling group of instances based on your AMI.
- Schedule work via your task queue.
- Observe the output queue.

The worker nodes in your cluster have a simple job: to convert some number of individual images into a single montage image. A worker node will download images from a list that you provide and will then stitch them into a composite montage using the ImageMagick tool. While this is not the most CPU-intensive job, it does require some cycles; the larger the size and number of images you provide for each job, the more work each node will have.

For this lab, you will provide a newline-delimited list of image URLs. An Amazon EC2 worker node will download each image and produce output such as:



Continued on next page

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Lab Overview, Continued

Allotted time

The allotted time for this lab is listed as follows:

Component	Time
Overview	1 minute
Lab	40 minutes
Total:	**41 minutes**

Prerequisites

This lab requires:

- Access to a notebook computer with Wi-Fi on a Microsoft Windows, Mac OS X, or Linux (Ubuntu, SuSE, or Red Hat) system
  - The qwikLABS lab environment is not accessible on an iPad or tablet device, but you may use these devices to access the student guide (PDF)
- For Microsoft Windows users: Administrator access to the computer
- An Internet browser such as Chrome, Firefox, or IE9 (previous versions of Internet Explorer are not supported)
- An SSH client such as PuTTY

Objectives

After completing this lab, you will be able to:

- Bootstrap an EC2 instance using user data.
- Create an AMI from a running instance.
- Use the AWS Management Console to create an Amazon SQS queue.
- Create an Auto Scaling group with scaling policies based on an Amazon SQS queue.
- Use the AWS Management Console to pass messages to, and read messages from, an Amazon SQS queue.

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.

PRINTED BY: gleung@datapipe.com. Printing is for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

Creating an IAM Role

Introduction

Your batch processing nodes will communicate with Amazon SQS to receive processing instructions and will then store results in Amazon S3. Start by creating an IAM role that grants access to both Amazon SQS and Amazon S3. This role will be assigned to your Amazon EC2 instance.

Task 6.1: Create a role

To create an IAM role:

Step	Action
6.1.1	In the AWS Management Console, on the **Services** menu, click **IAM**.
6.1.2	In the navigation pane, click **Roles**.
6.1.3	Click **Create New Role**.
6.1.4	In the **Role Name** box, type **BatchProcessing**
6.1.5	Click **Next Step**.
6.1.6	On the Select Role Type page, ensure **AWS Service Roles** is selected.
6.1.7	In the AWS Service Roles menu, locate **Amazon EC2** and click **Select.**
6.1.8	On the **Set Permissions** page, ensure that **Select Policy Template** is selected.
6.1.9	In the **Select Policy Template** menu, locate the **Amazon SQS Full Access** policy and click **Select**. A policy document should be displayed for you to review.
6.1.10	Click **Next Step**.
6.1.11	Click **Create Role**.
6.1.12	Click the name of the newly created **BatchProcessing** role to display the details view.
6.1.13	To add an additional role policy, click **Attach Role Policy**.
6.1.14	Locate **Amazon S3 Full Access**, and click **Select**.
6.1.15	Click **Apply Policy**.

© 2015 Amazon Web Services, Inc. and its affiliates. All rights reserved.