雲端運算基礎入門
Introduction to Cloud Computing

AWS Content Delivery Network: Lab 5
Using CloudFront as a CDN for a Website

Time: 2022/5/6 (Friday) 18:30-20:30
Place: 電資406室, 國立臺北大學 (NTPU)

戴敏育 副教授

Min-Yuh Day, Ph.D, Associate Professor

國立臺北大學 資訊管理研究所

Institute of Information Management, National Taipei University

https://web.ntpu.edu.tw/~myday

2022-05-06

NTPU
國立臺北大學
National Taipei University

戴敏育 博士
(Min-Yuh Day, Ph.D.)

aws academy
Accredited Educator

aws certified
Solutions Architect
Associate

aws certified
Cloud Practitioner

aws educate | Cloud Ambassador
2020 Cohort

國立臺北大學 資訊管理研究所 副教授
中央研究院 資訊科學研究所 訪問學人
國立臺灣大學 資訊管理 博士

Publications Co-Chairs, IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2013-)

Program Co-Chair, IEEE International Workshop on Empirical Methods for Recognizing Inference in TExt (IEEE EM-RITE 2012-)

Publications Chair, The IEEE International Conference on Information Reuse and Integration for Data Science (IEEE IRI)

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中央研究院 ACADEMIA SINICA 1928

國立臺灣大學

Outline

- AWS Content Delivery Network: Lab 5 Using CloudFront as a CDN for a Website
  - AWS Academy Introduction to Cloud: Semester 1
  - Module 5 Content Delivery
  - Lab 5 - Amazon CloudFront

Available AWS Certifications

3

Professional

Two years of comprehensive experience designing, operating, and troubleshooting solutions using the AWS Cloud

SAP

2

Associate

One year of experience solving problems and implementing solutions using the AWS Cloud

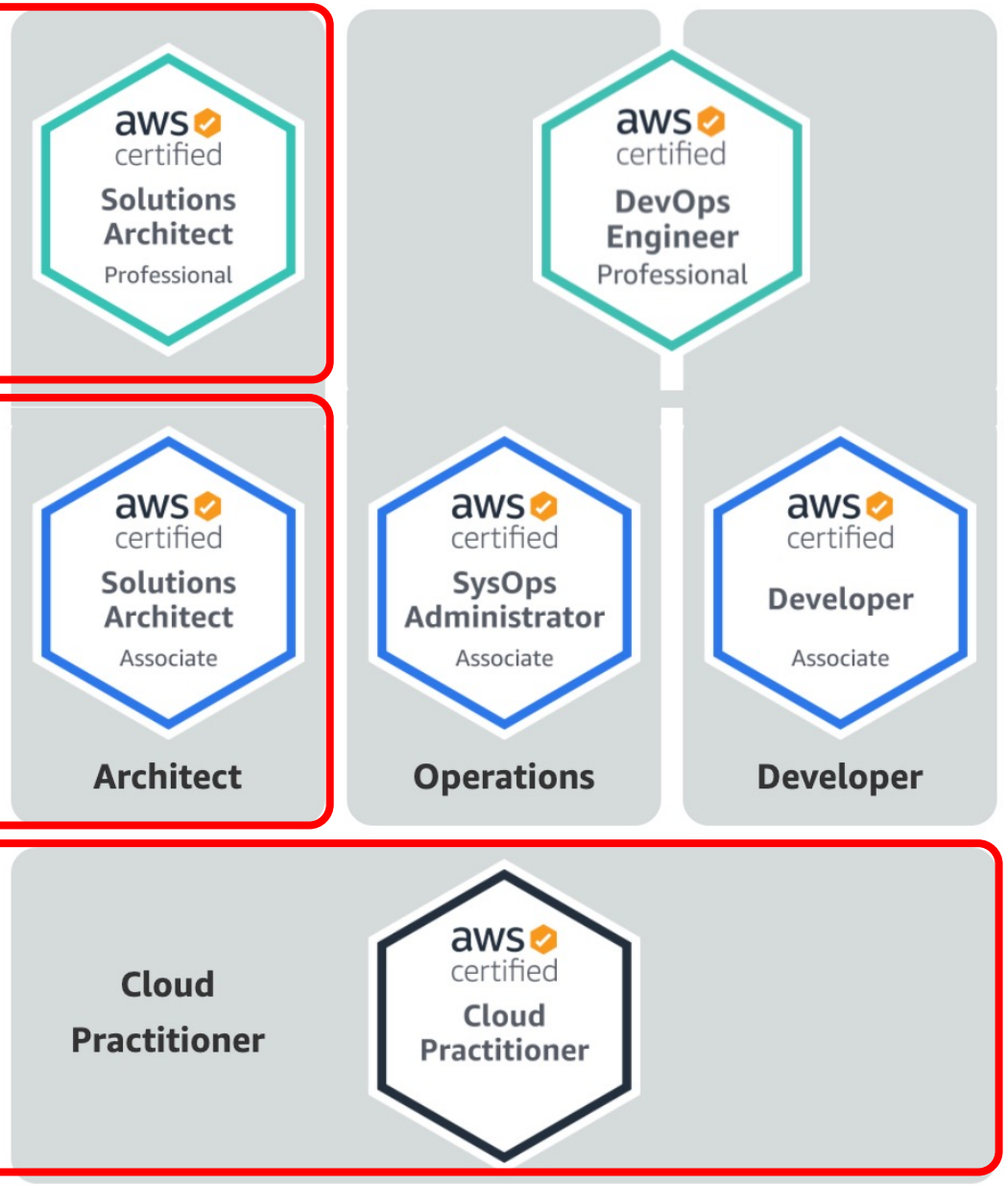
SAA

1

Foundational

Six months of fundamental AWS Cloud and industry knowledge

CLF



Specialty

Technical AWS Cloud experience in the Specialty domain as specified in the **exam guide**

https://aws.amazon.com/certification/

Available AWS Certifications

3

專業級

兩年使用 AWS 雲端設計、操作及疑難排解解決方案的廣泛經驗

SAP

2

助理級

一年使用 AWS 雲端解決問題和實作解決方案的經驗

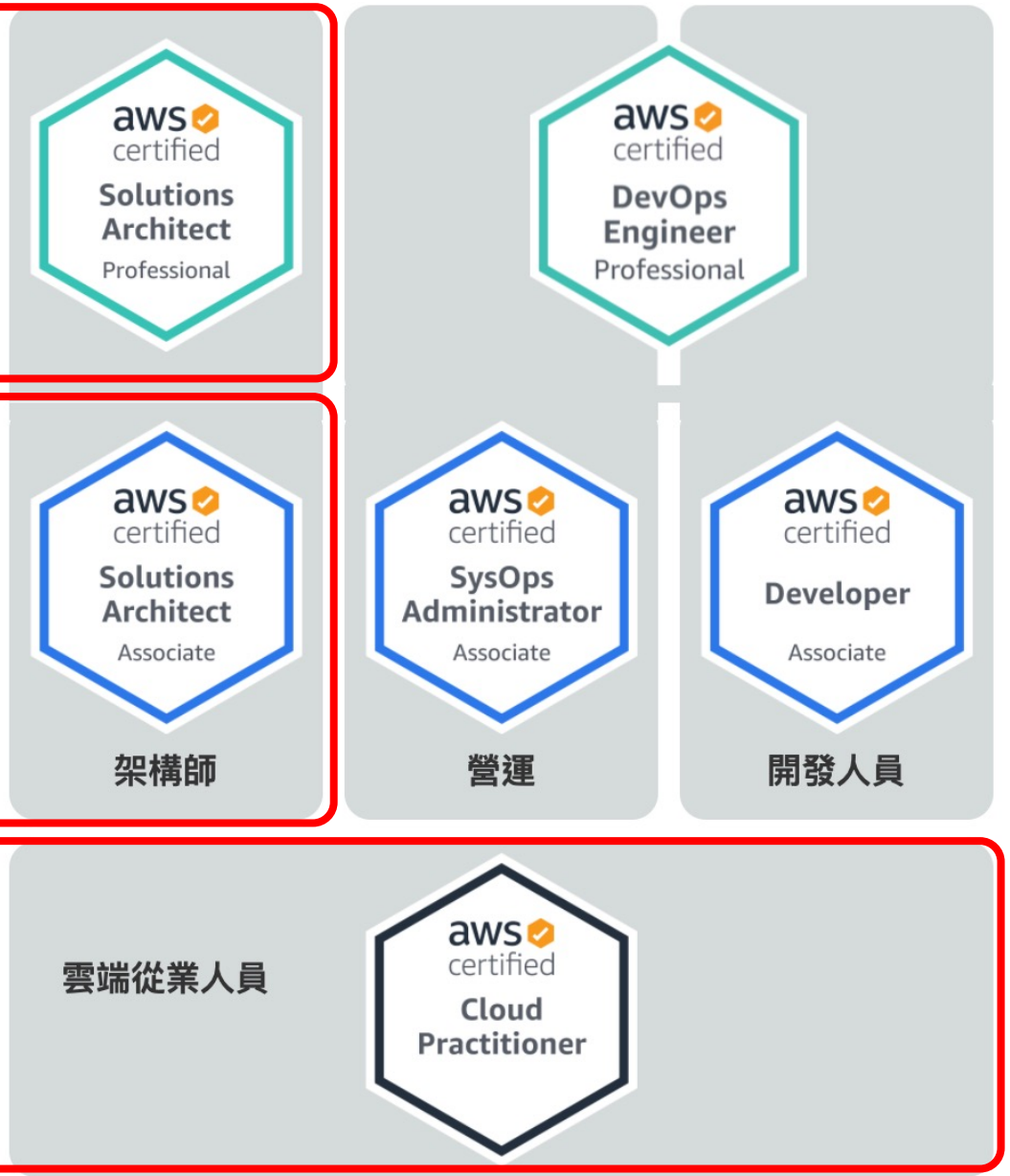
SAA

1

基礎

六個月的基礎 AWS 雲端和產業知識

CLF



專家級

考試指南中指定的專業領域中的 AWS 雲端技術經驗

https://aws.amazon.com/certification/

企業雲端運算入門
(Foundation of Business Cloud Computing)
雲端概念概述
(Cloud Concepts Overview)

企業雲端運算入門 (Foundation of Business Cloud Computing) (BA4, NTPU) (Spring 2022)
(AWS Academy Cloud Foundations; ACF) (AWS Certified Cloud Practitioner)
(BA4, NTPU) (3 Credits, Elective) (U4010) (自主學習課程)(商業智慧與大數據分析學士學分學程)
(1102) (國立台北大學企管系4A, 4B) (選修3學分) (授課教師：謝榮桂，戴敏育) (2022.02 - 2022.06)
(週三 Wed, 6, 7, 8, 14:10-17:00) (台北大學三峽校區 商3F10)

謝榮桂 (Jung-Kuei Hsieh), 戴敏育 (Min-Yuh Day)

National Taipei University

國立臺北大學

2022-02-23

NTPU

國立臺北大學

National Taipei University

+ aws academy

教學目標

- 本課程主要介紹亞馬遜公司的雲端運算服務 **Amazon Web Services (AWS)**，
  對於想要全面瞭解企業雲端運算概念的同學，
  本課程將詳細介紹
  雲概念、
  AWS 核心服務、
  安全性、
  架構、
  定價和相關支援等服務，
  並以通過認證 **AWS Certified Cloud Practitioner**為目標。

Course Objectives

- This course introduces Amazon Web Services (AWS), the cloud computing service of Amazon.
- For students who want to fully understand the concept of enterprise cloud computing, this course will introduce the AWS Academy Cloud Foundations.
- Topics include Cloud Concepts Overview, Cloud Economics and Billing, AWS Global Infrastructure Overview, AWS Cloud Security, Networking and Content Delivery, Cloud Compute, Cloud Storage, Cloud Databases, Cloud Architecture, Cloud Automatic Scaling and Monitoring.
- The course objective is training students to pass the certification of AWS Certified Cloud Practitioner.

內容綱要

- 說明如何使用 AWS 帳戶的最佳實務
- 說明AWS架構完善的框架和設計原則
- 說明AWS高可用性和可靠性
- 描述AWS設計決策的業務影響
- 描述AWS如何設置組織結構以簡化帳單和提高帳戶可見性
- 說明AWS替代支援選項和功能

Course Outline

1. Cloud Concepts Overview
2. Cloud Economics and Billing
3. AWS Global Infrastructure Overview
4. AWS Cloud Security
5. Networking and Content Delivery
6. Cloud Compute
7. Cloud Storage
8. Cloud Databases
9. Cloud Architecture
10. Cloud Automatic Scaling and Monitoring

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
1	2022/02/23	雲端概念概述 (Cloud Concepts Overview)
2	2022/03/02	雲端經濟與計費 (Cloud Economics and Billing)
3	2022/03/09	AWS全球基礎設施概述 (AWS Global Infrastructure Overview)
4	2022/03/16	AWS雲端安全 (AWS Cloud Security)
5	2022/03/23	網路和內容交付 (Networking and Content Delivery)
6	2022/03/30	雲端計算 (Cloud Compute)

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
7	2022/04/06	放假一天 (Make-up Holiday, No Classes)
8	2022/04/13	雲端儲存 (Cloud Storage)
9	2022/04/20	雲端數據庫 (Cloud Databases)
10	2022/04/27	雲端架構 (Cloud Architecture)
11	2022/05/04	雲端自動擴展和監控 (Cloud Automatic Scaling and Monitoring)
12	2022/05/11	學生自主學習 (Self-learning)

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
13	2022/05/18	學生自主學習 (Self-learning)
14	2022/05/25	雲端專案成果報告與討論 (Cloud Project Presentation and Discussion)
15	2022/06/01	學生自主學習 (Self-learning)
16	2022/06/08	期末專案成果報告 (Final Project Presentation)
17	2022/06/15	學生自主學習 (Self-learning)
18	2022/06/22	學生自主學習 (Self-learning)

AWS Products and Services

Analytics

Application Integration

AR & VR

AWS Cost Management

Blockchain

Business Applications

Compute

Customer Engagement

Database

Developer Tools

End User Computing

Game Tech

Internet of Things

Machine Learning

Management & Governance

Media Services

Migration & Transfer

Mobile

Networking & Content Delivery

Quantum Technologies

Robotics

Satellite

Security, Identity & Compliance

Storage

Source: https://aws.amazon.com/

AWS Compute

Compute

Amazon EC2
Virtual servers in the cloud

Amazon EC2 Auto Scaling
Scale compute capacity to meet demand

Amazon Elastic Container Registry
Store and retrieve docker images

Amazon Elastic Container Service
Run and manage docker containers

Amazon Elastic Kubernetes Service
Run managed Kubernetes on AWS

Amazon Lightsail
Launch and manage virtual private servers

AWS Batch
Run batch jobs at any scale

AWS Elastic Beanstalk
Run and manage web apps

AWS Fargate
Run containers without managing servers or clusters

AWS Lambda
Run code without thinking about servers

AWS Outposts
Run AWS infrastructure on-premises

AWS Serverless Application Repository
Discover, deploy, and publish serverless applications

AWS Wavelength
Deliver ultra-low latency applications for 5G devices

VMware Cloud on AWS
Build a hybrid cloud without custom hardware

Source: https://aws.amazon.com/

AWS Database

Amazon Aurora
High Performance Managed Relational Database

Amazon DynamoDB
Managed NoSQL Database

Amazon DocumentDB (with MongoDB compatibility)
Fully managed document database

Amazon ElastiCache
In-memory Caching System

Amazon Managed Apache Cassandra Service
Managed Cassandra-compatible database

Amazon Neptune
Fully Managed Graph Database Service

Amazon Quantum Ledger Database (QLDB)
Fully managed ledger database

Amazon RDS
Managed Relational Database Service for MySQL, PostgreSQL, Oracle, SQL Server, and MariaDB

Amazon RDS on VMware
Automate on-premises database management

Amazon Redshift
Fast, Simple, Cost-effective Data Warehousing

Amazon Timestream
Fully managed time series database

AWS Database Migration Service
Migrate Databases with Minimal Downtime

Source: https://aws.amazon.com/

AWS Storage

Amazon Simple Storage Service (S3)
Scalable Storage in the Cloud

Amazon Elastic Block Store (EBS)
EC2 block storage volumes

Amazon Elastic File System (EFS)
Fully managed file system for EC2

Amazon FSx for Lustre
High-performance file system integrated with S3

Amazon FSx for Windows File Server
Fully managed Windows native file system

Amazon S3 Glacier
Low-cost Archive Storage in the Cloud

AWS Backup
Centralized backup across AWS services

AWS Snow Family
Physical devices to migrate data into and out of AWS

AWS Storage Gateway
Hybrid Storage Integration

CloudEndure Disaster Recovery
Highly automated disaster recovery

Source: https://aws.amazon.com/

AWS Networking & Content Dilivery

Amazon VPC
Isolated Cloud Resources

Amazon API Gateway
Build, Deploy, and Manage APIs

Amazon CloudFront
Global Content Delivery Network

Amazon Route 53
Scalable Domain Name System

AWS PrivateLink
Securely Access Services Hosted on AWS

AWS App Mesh
Monitor and control microservices

AWS Cloud Map
Application resource registry for microservices

AWS Direct Connect
Dedicated Network Connection to AWS

AWS Global Accelerator
Improve application availability and performance

AWS Transit Gateway
Easily scale VPC and account connections

Elastic Load Balancing
Distribute incoming traffic across multiple targets

Source: https://aws.amazon.com/

AWS Security, Identity & Compliance

AWS Identity & Access Management
Manage User Access and Encryption Keys

Amazon Cognito
Identity Management for your Apps

Amazon Detective
Investigate potential security issues

Amazon GuardDuty
Managed Threat Detection Service

Amazon Inspector
Analyze Application Security

Amazon Macie
Discover, Classify, and Protect your Data

AWS Artifact
On-demand access to AWS compliance reports

AWS Certificate Manager
Provision, Manage, and Deploy SSL/TLS Certificates

AWS CloudHSM
Hardware-based Key Storage for Regulatory Compliance

AWS Directory Service
Host and Manage Active Directory

AWS Firewall Manager
Central Management of Firewall Rules

AWS Key Management Service
Managed Creation and Control of Encryption Keys

AWS Resource Access Manager
Simple, secure service to share AWS resources

AWS Secrets Manager
Rotate, Manage, and Retrieve Secrets

AWS Security Hub
Unified security and compliance center

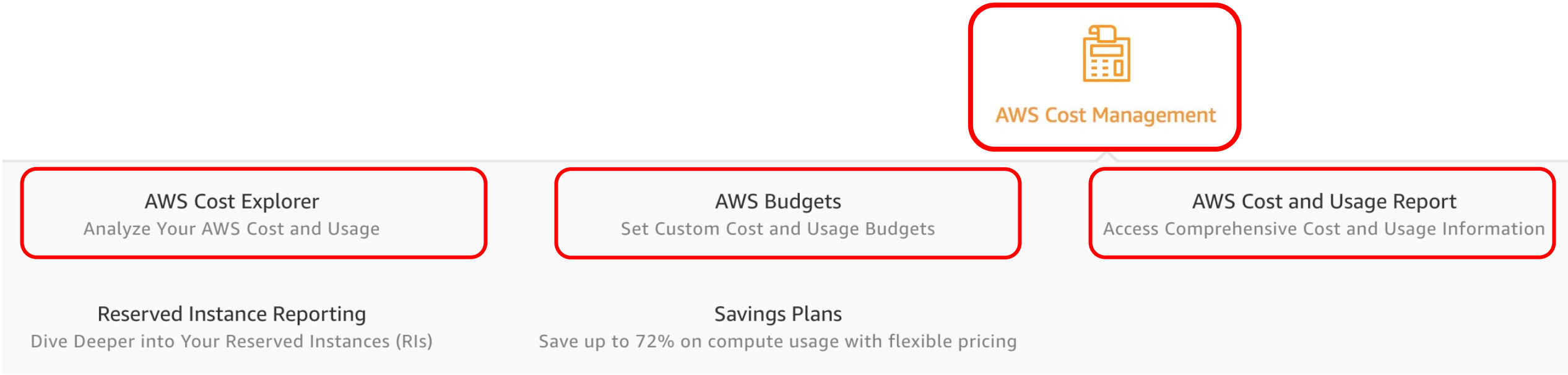
AWS Shield
DDoS Protection

AWS Single Sign-On
Cloud Single Sign-On (SSO) Service

AWS WAF
Filter Malicious Web Traffic

Source: https://aws.amazon.com/

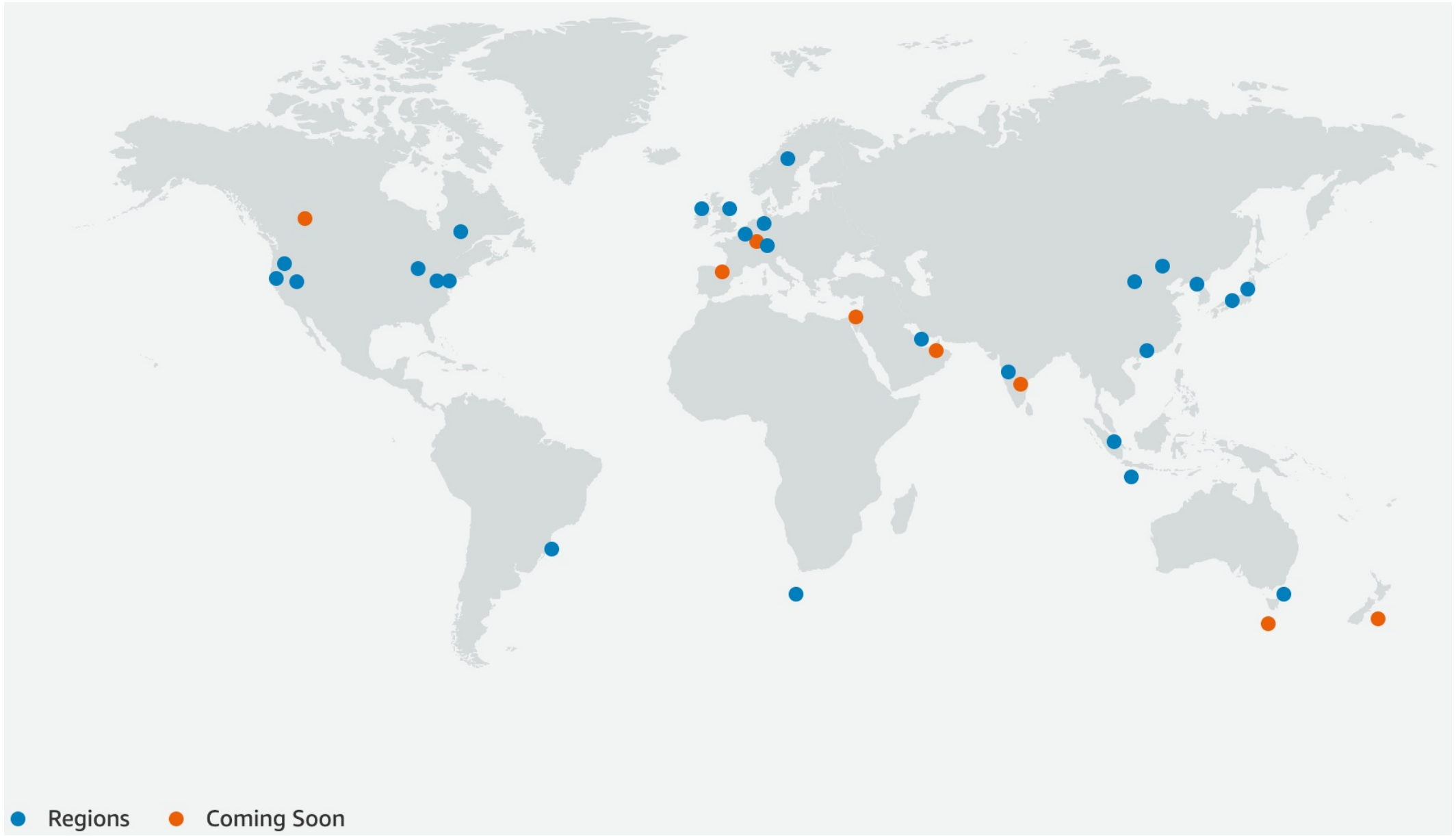
AWS Cost Management



Source: https://aws.amazon.com/

AWS Content Delivery Network: Lab 5 Using CloudFront as a CDN for a Website

AWS Global Cloud Infrastructure



Source: https://aws.amazon.com/about-aws/global-infrastructure/

AWS Global Cloud Infrastructure

Regions and Availability Zones

US West (Oregon) Region

Availability Zones: 4

Launched 2011

Local Zones: 7

Launched 2019

US East (Northern Virginia) Region

Availability Zones: 6

Launched 2006

Local Zones: 10

Launched 2020

Source: https://aws.amazon.com/about-aws/global-infrastructure/

AWS Global Cloud Infrastructure

Regions and Availability Zones

Regions

Edge locations

Asia Pacific (Tokyo) Region

Availability Zones: 4

Launched 2011

Asia Pacific (Singapore) Region

Availability Zones: 3

Launched 2010

Asia Pacific (Sydney) Region

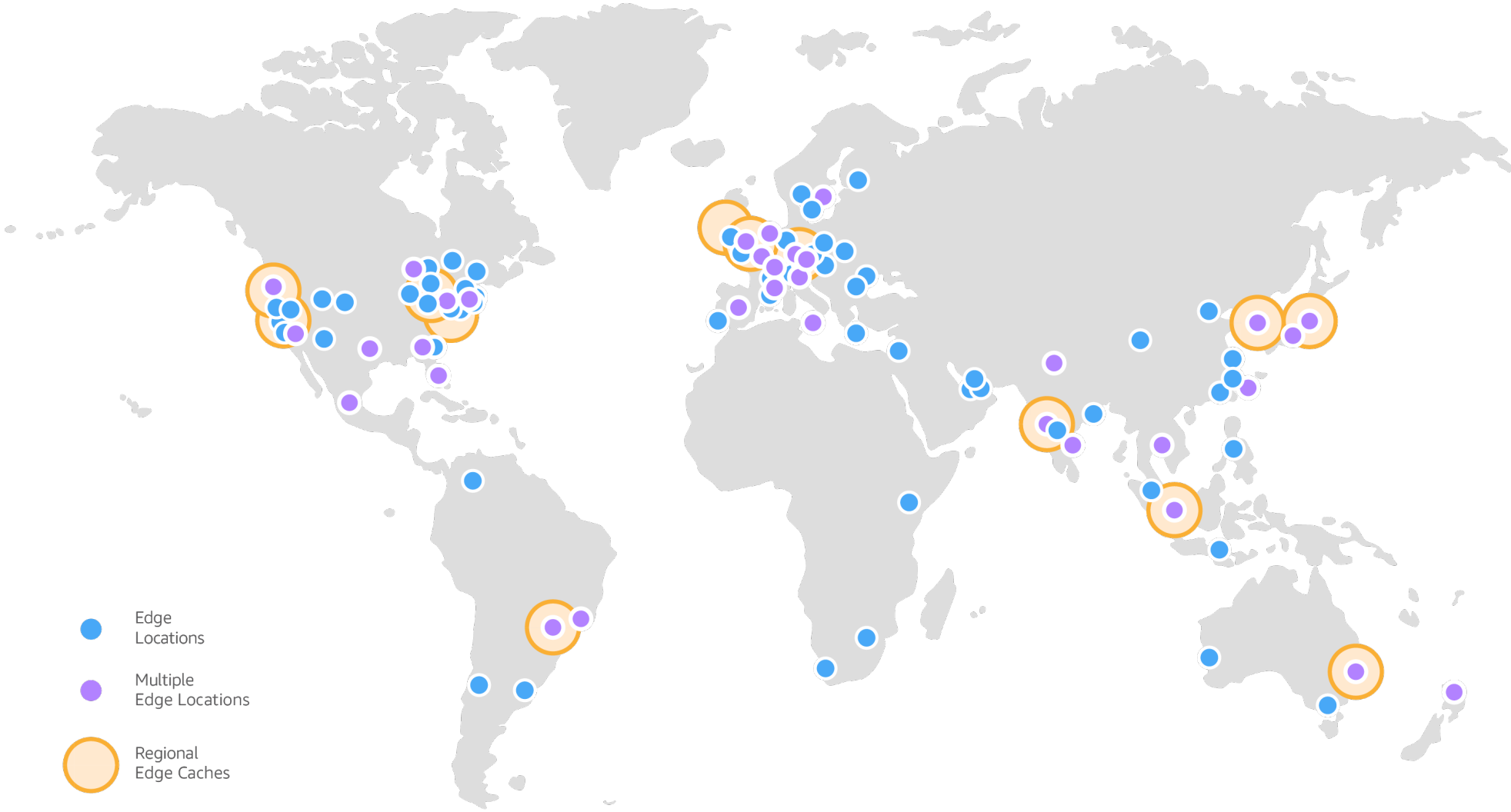
Availability Zones: 3

Launched 2012

Source: https://aws.amazon.com/about-aws/global-infrastructure/

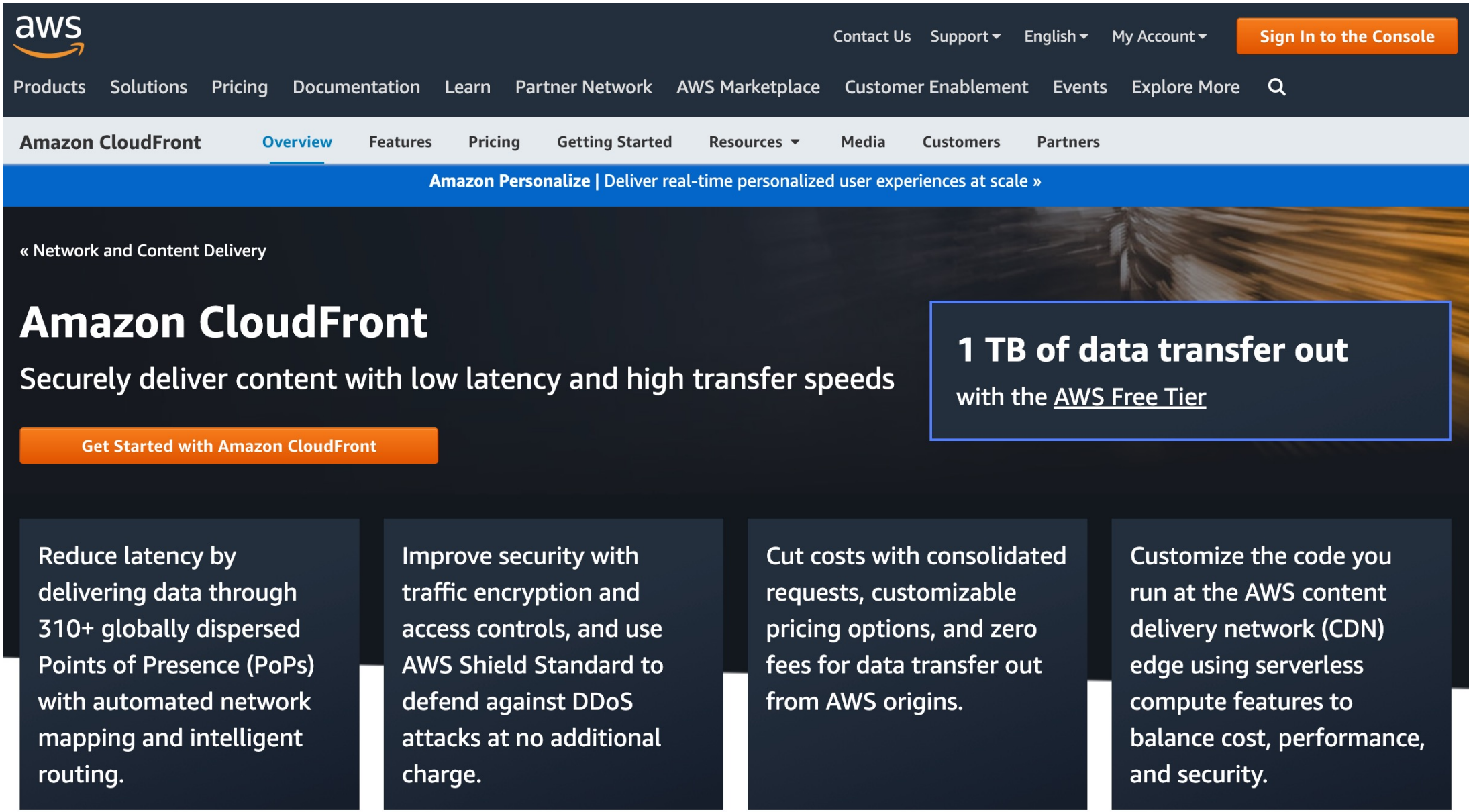
Amazon CloudFront

Global Edge Network: Edge locations, Regional Edge caches



Source: https://aws.amazon.com/cloudfront/features/

Amazon CloudFront



https://aws.amazon.com/cloudfront/

AWS Academy Introduction to Cloud: Semester 1 [18745]
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

Module 5 Lab: Using CloudFront as a CDN for a Website

Lab overview

In this lab, you will use Amazon CloudFront as a content delivery network (CDN) for a website that is stored in the Amazon Simple Storage Service (Amazon S3).

Duration

This lab requires approximately **40 minutes** to complete.

aws academy

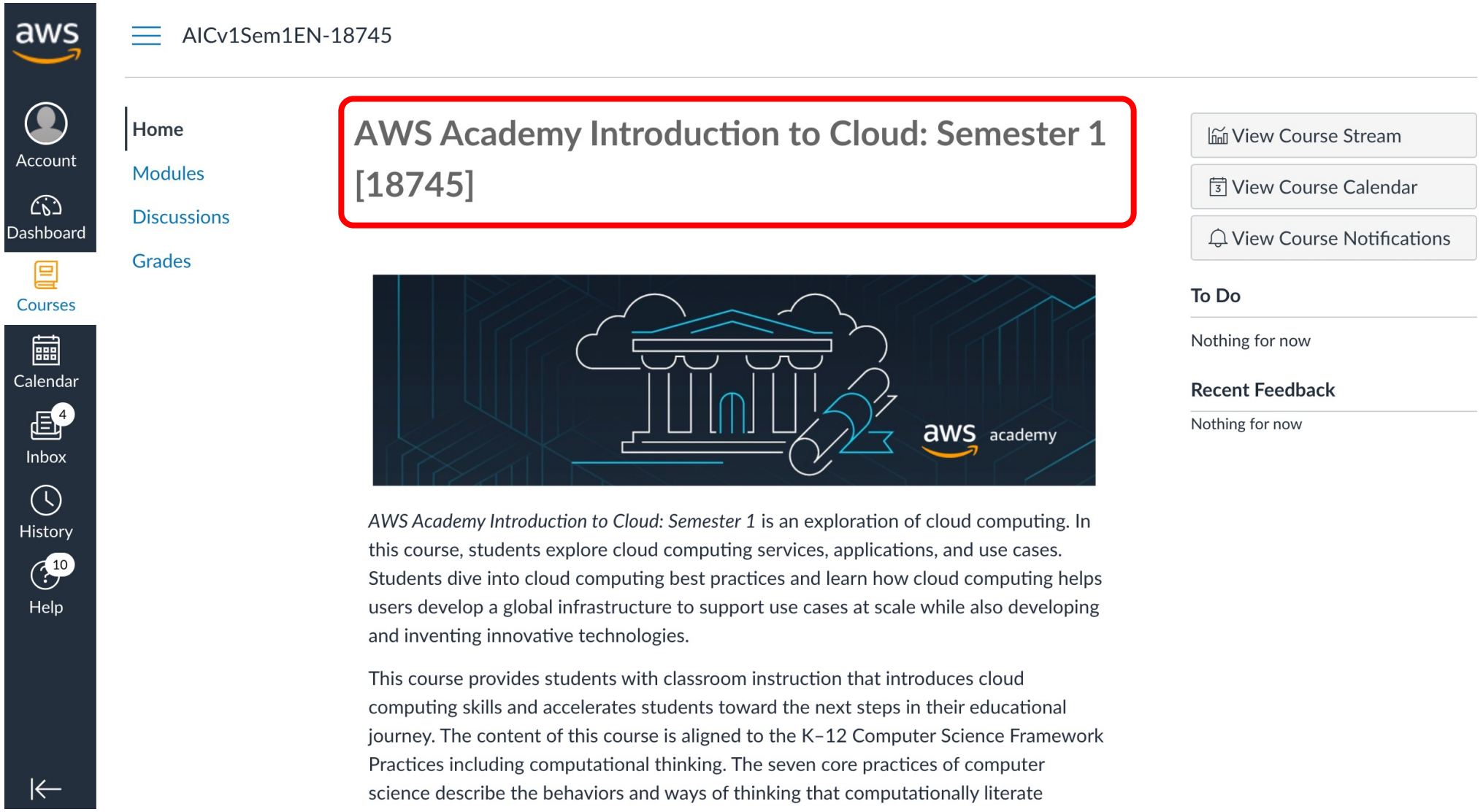
Module 5 Lab:
Using CloudFront as a CDN for a Website

- Access the AWS Management Console
- Task 1. Create an S3 bucket using the AWS CLI
- Task 2. Add a bucket policy
- Task 3. Upload an HTML document
- Task 4. Test your website
- Task 5. Create a CloudFront distribution to serve your website
- Lab complete

AWS Academy Introduction to Cloud: Semester 1 [18745]

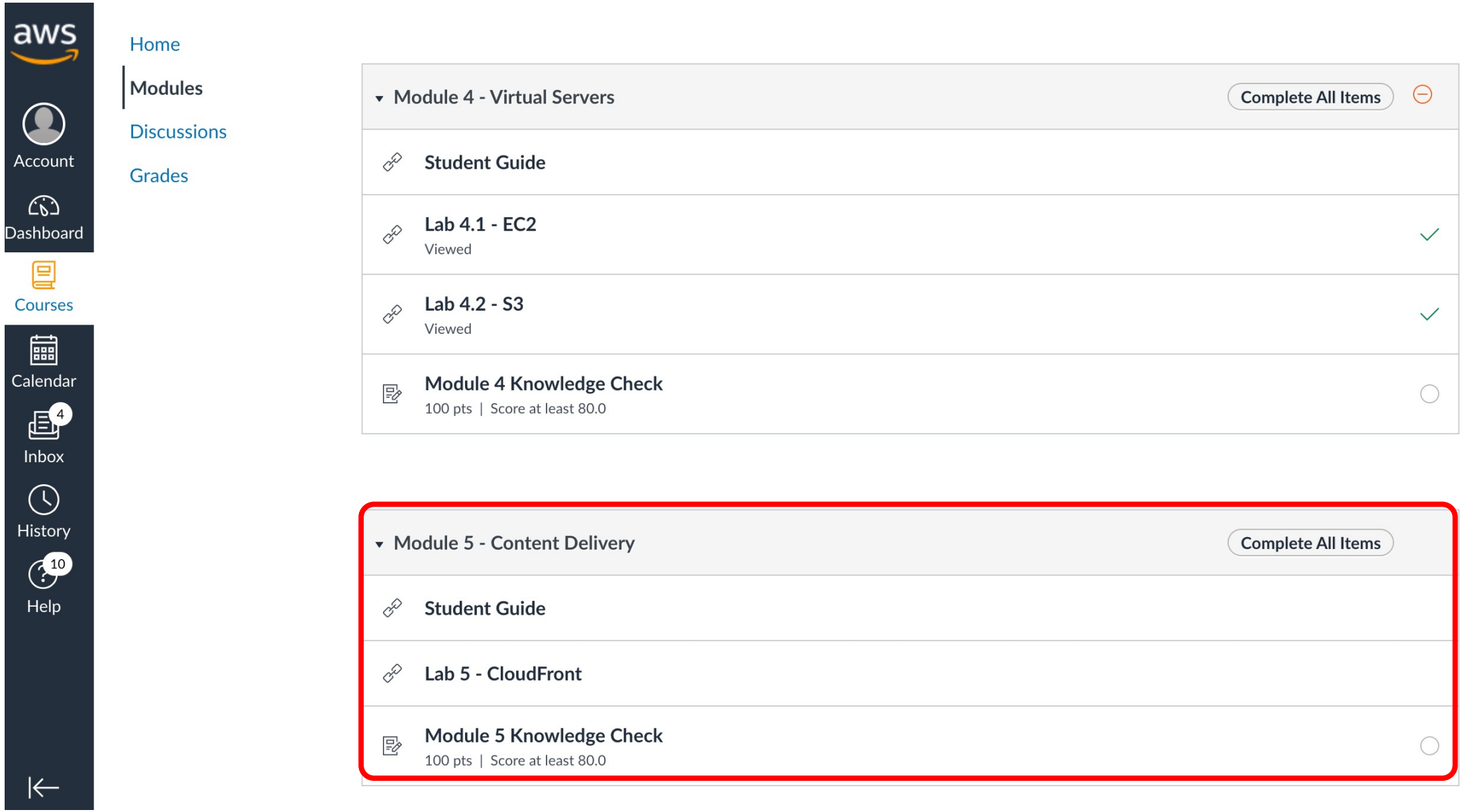
AWS AICv1Sem1EN

https://awsacademy.instructure.com/courses/18745



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1 [18745]
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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AWS Academy Introduction to Cloud: Semester 1 [18745]
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

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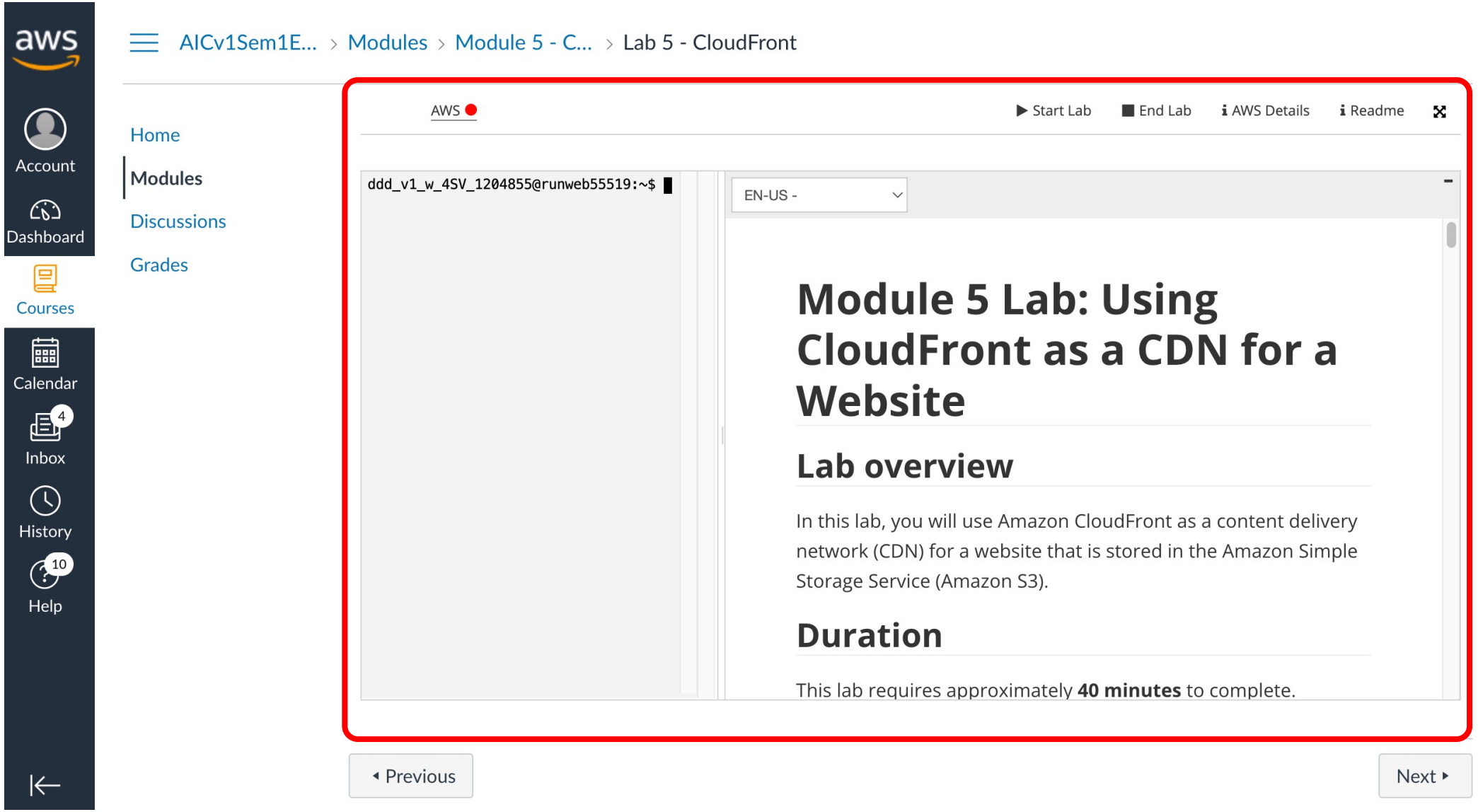

AWS Academy Introduction to Cloud: Semester 1 [18745]
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

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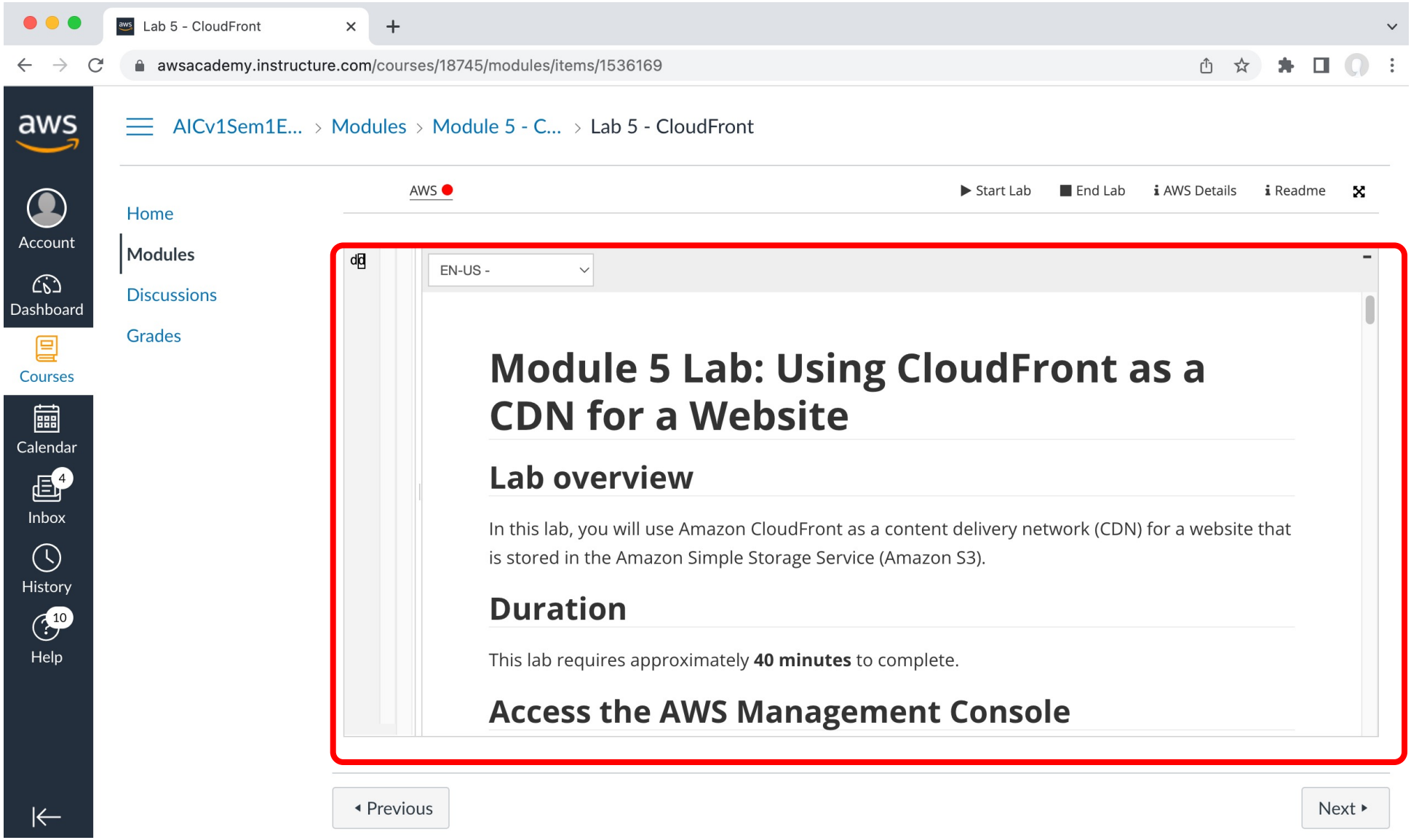

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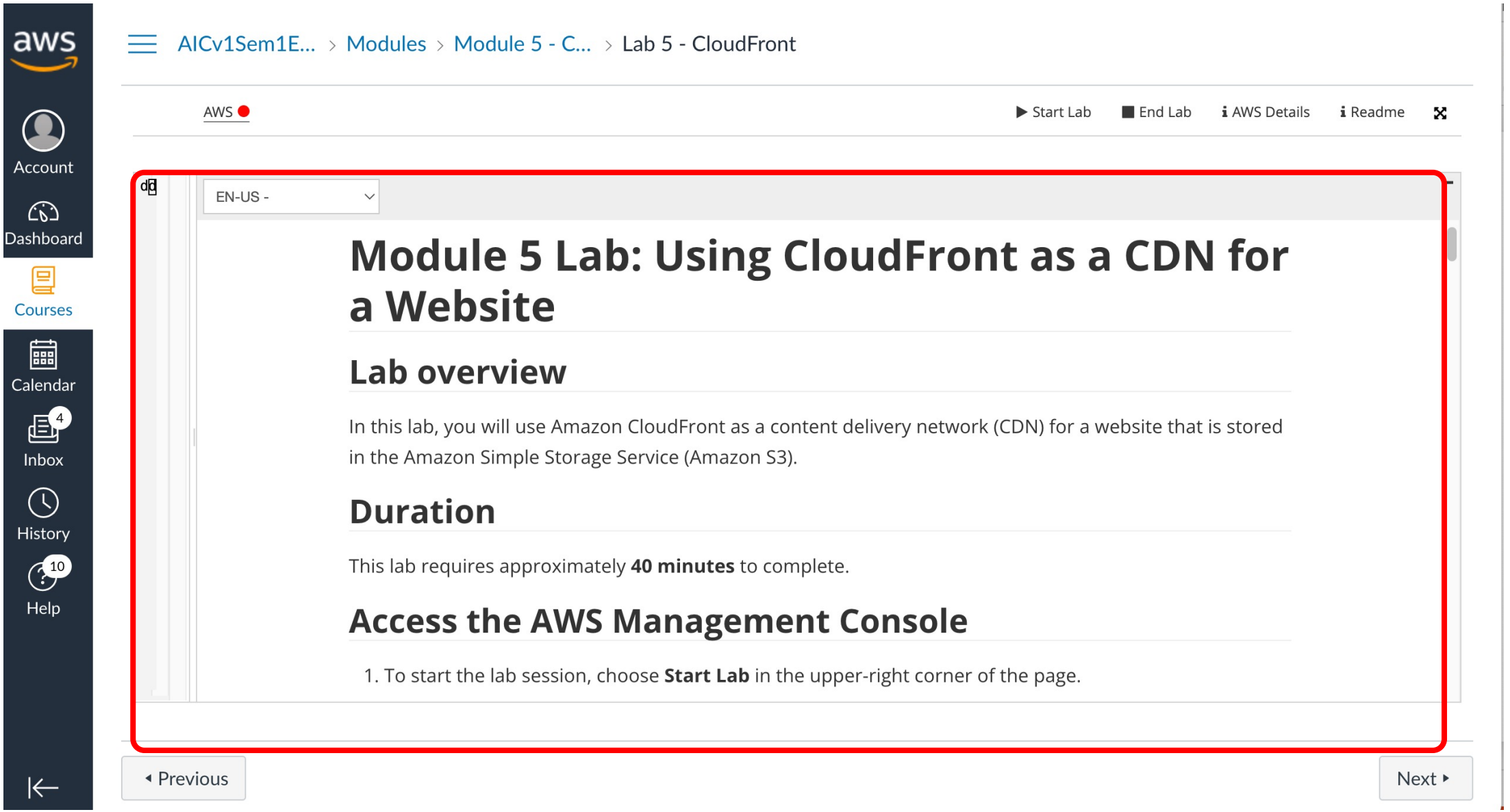
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

Access the AWS Management Console

1.To start the lab session, choose **Start Lab** in the upper-right corner of the page.

The lab session starts.

A timer displays in the upper-right corner of the page and shows the time remaining in the session.

Tip: To refresh the session length at any time, choose **Start Lab** again before the timer reaches 0:00.

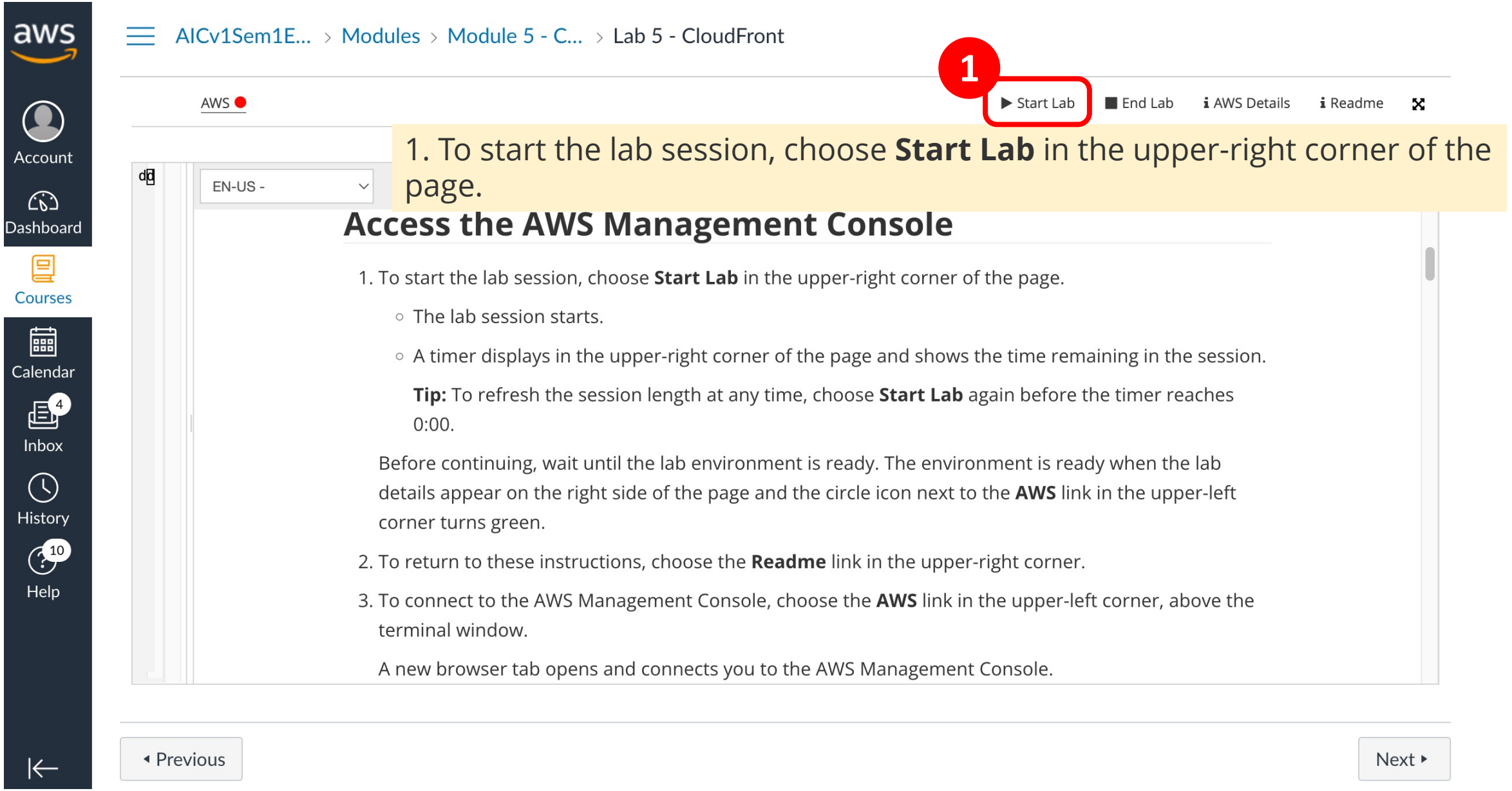
Before continuing, wait until the lab environment is ready. The environment is ready when the lab details appear on the right side of the page and the circle icon next to the **AWS** link in the upper-left corner turns green.

2.To return to these instructions, choose the **Readme** link in the upper-right corner.

3.To connect to the AWS Management Console, choose the **AWS** link in the upper-left corner, above the terminal window.

A new browser tab opens and connects you to the AWS Management Console.

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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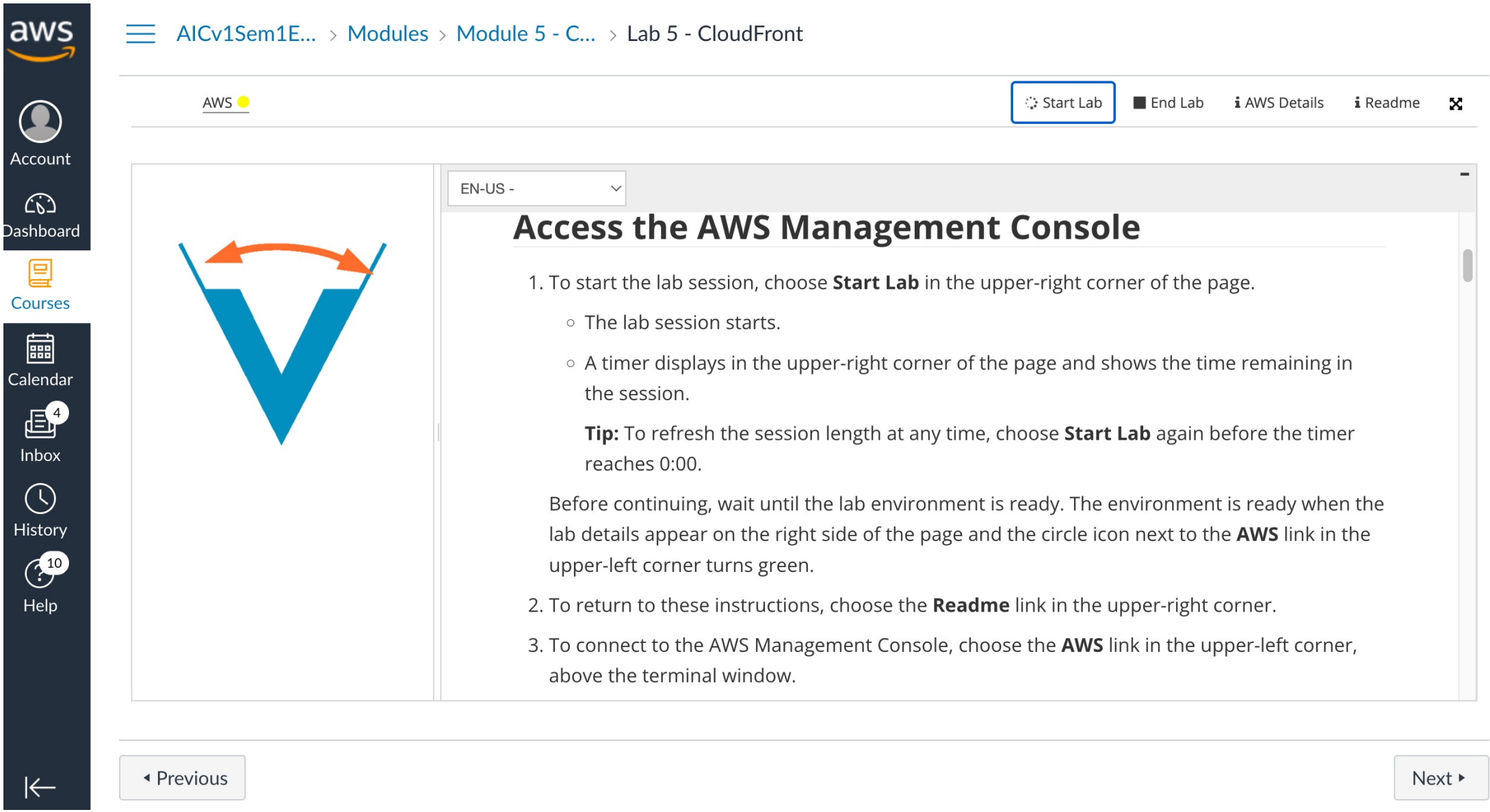
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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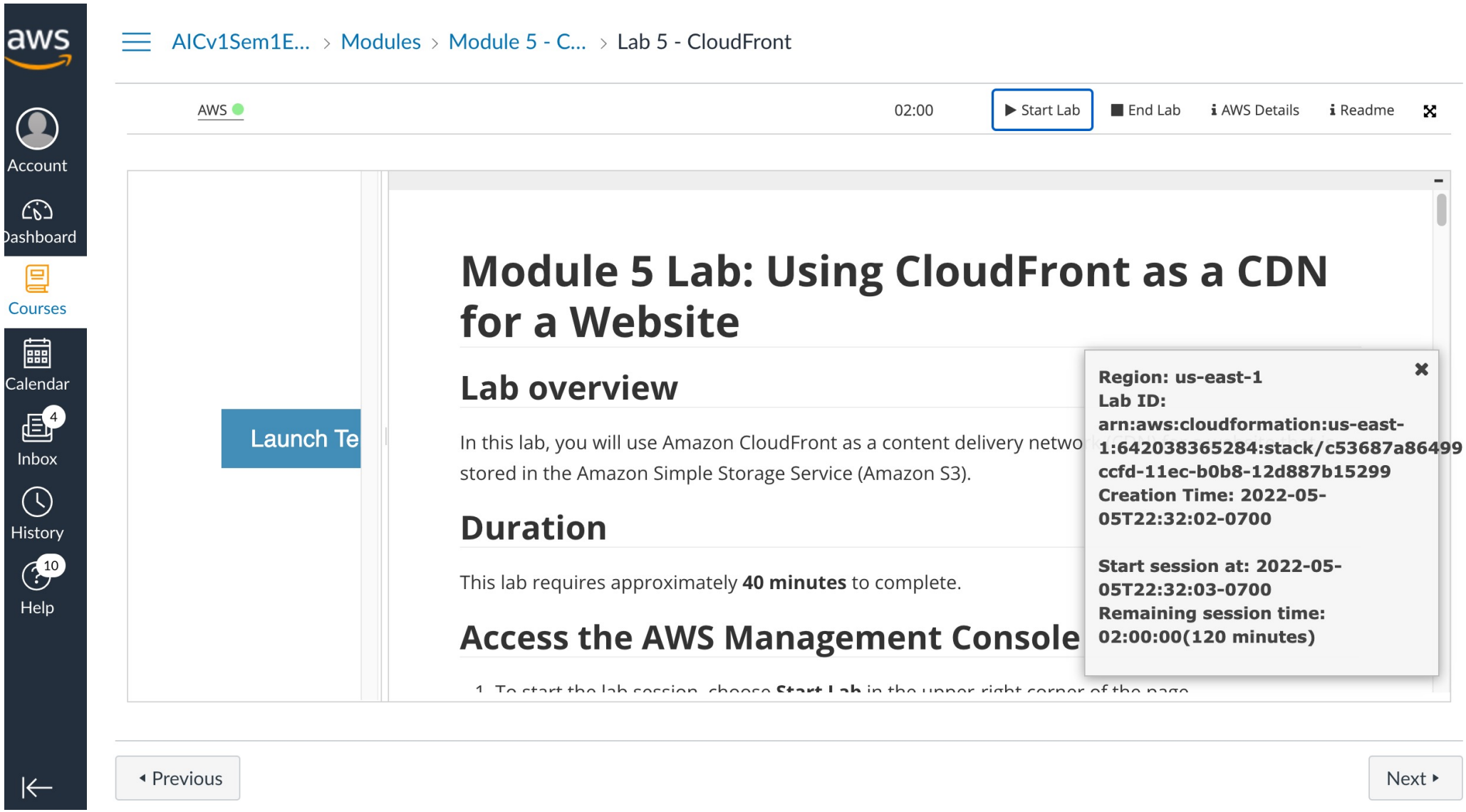
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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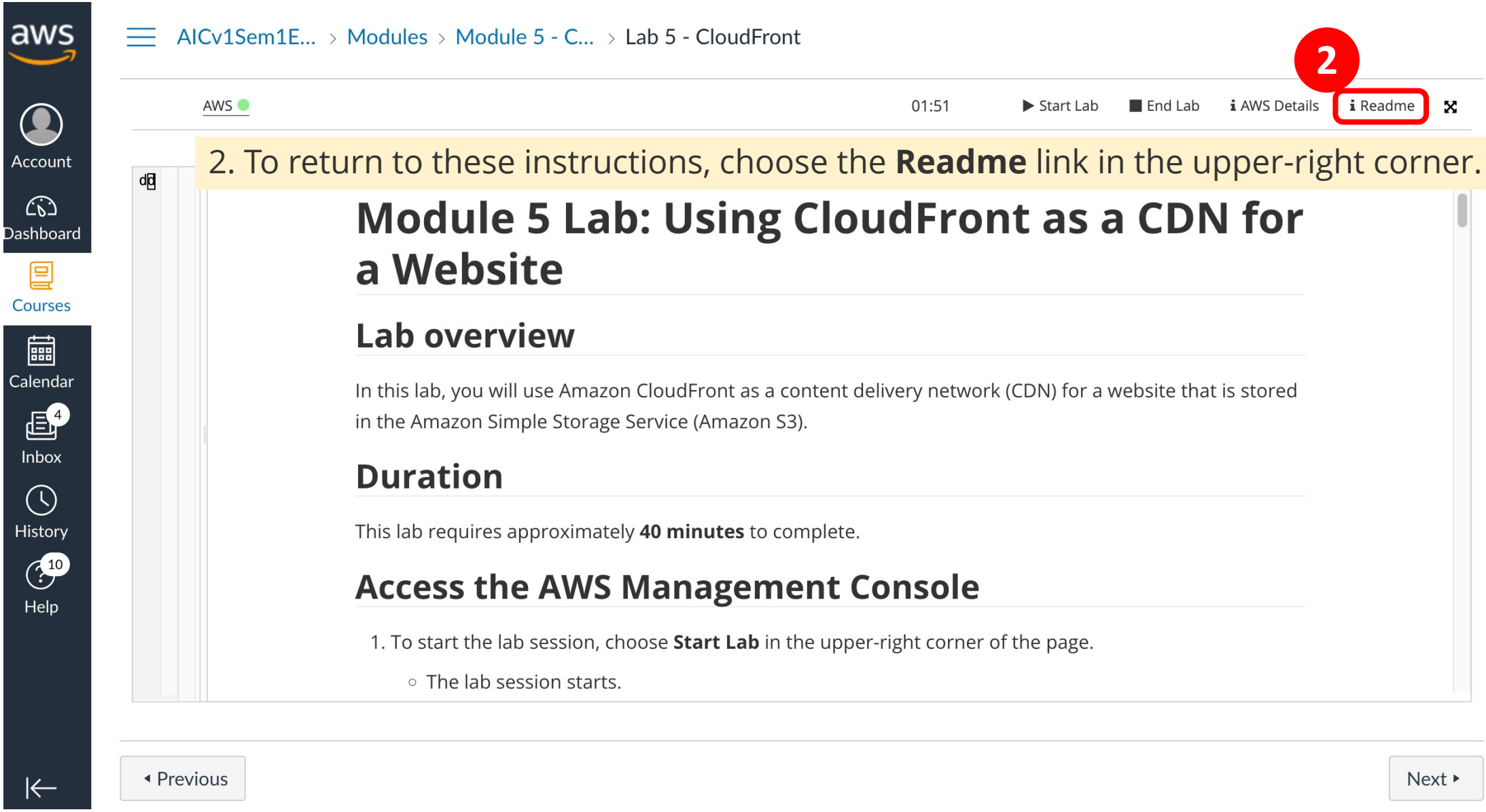

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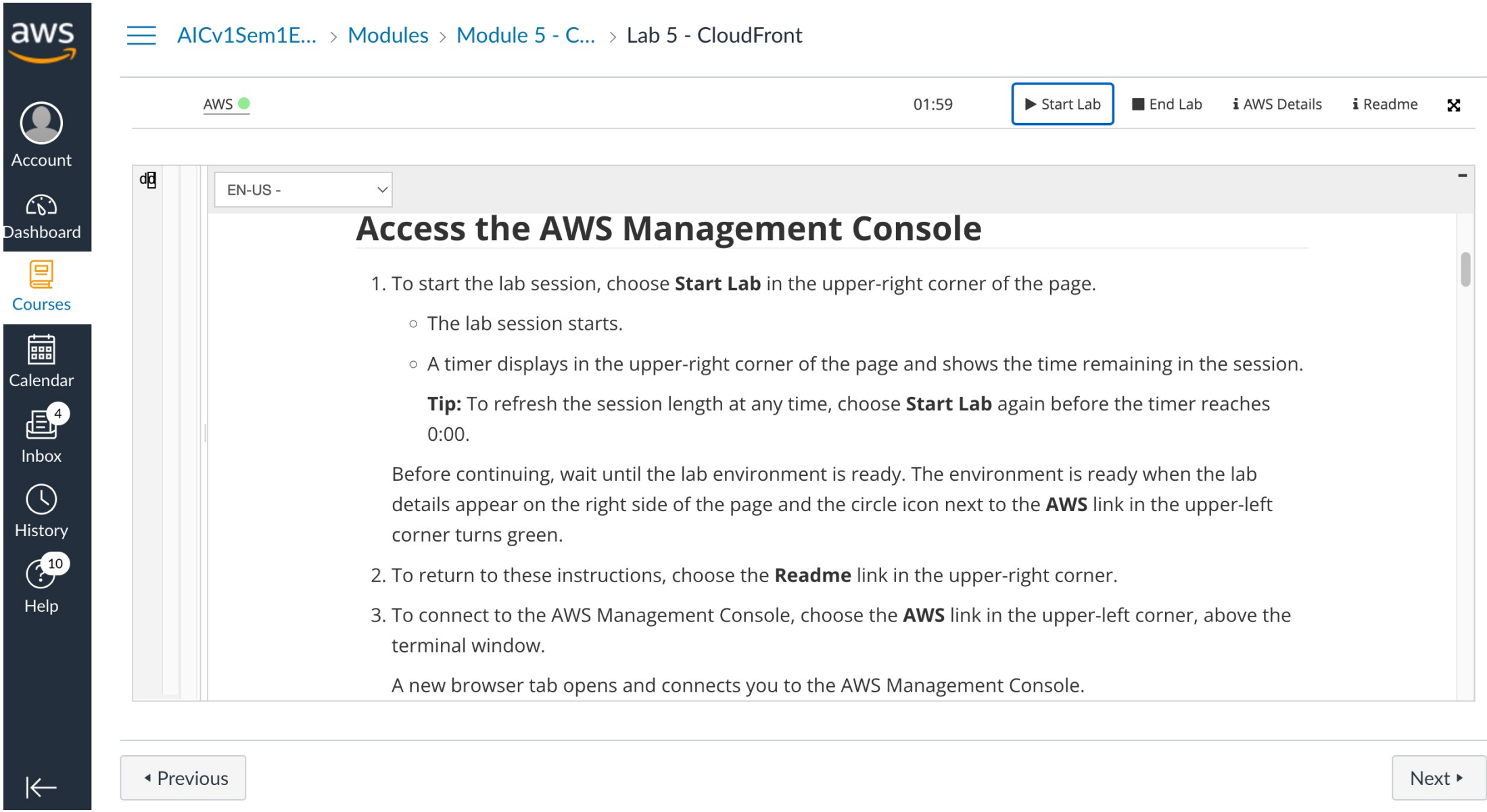

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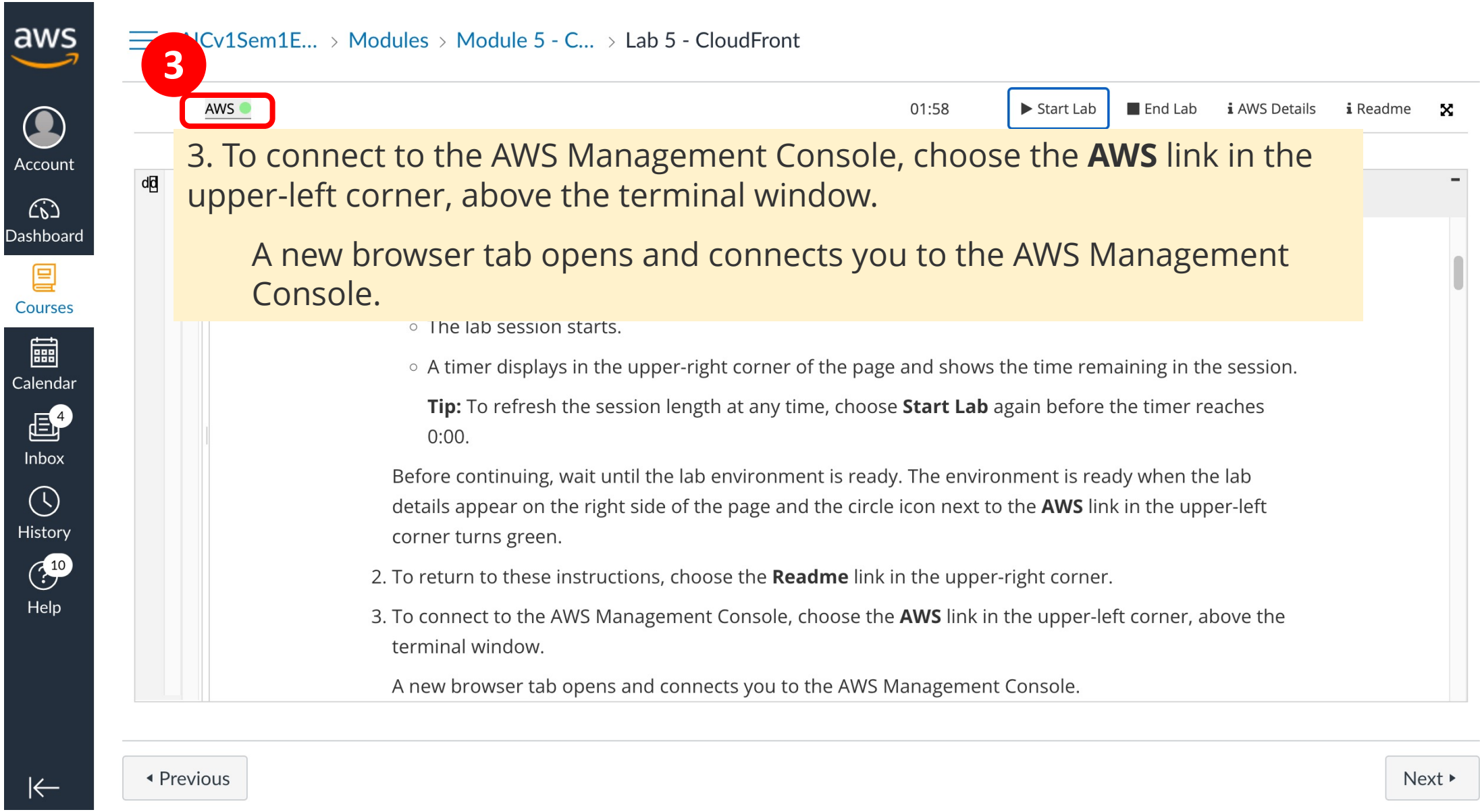

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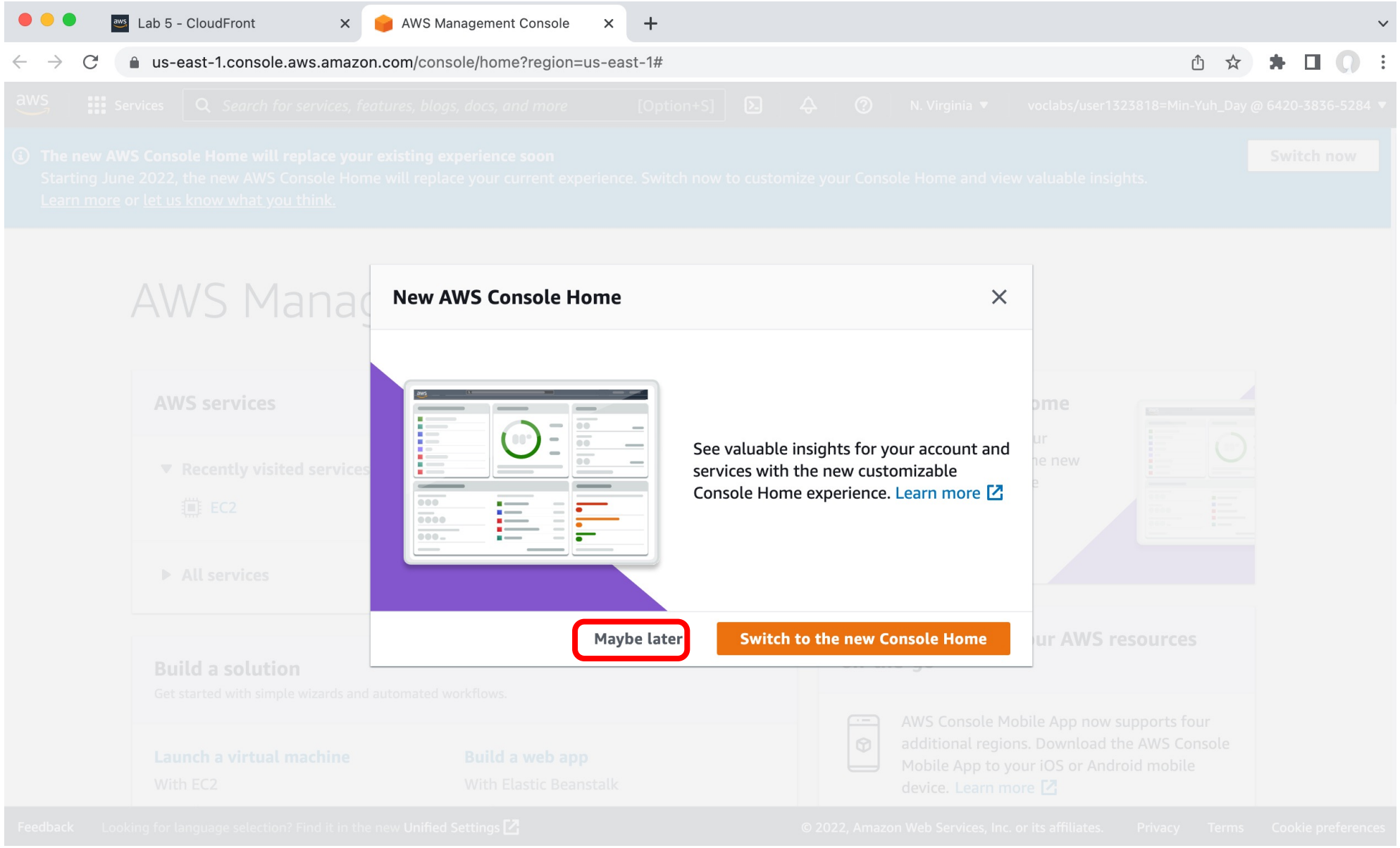

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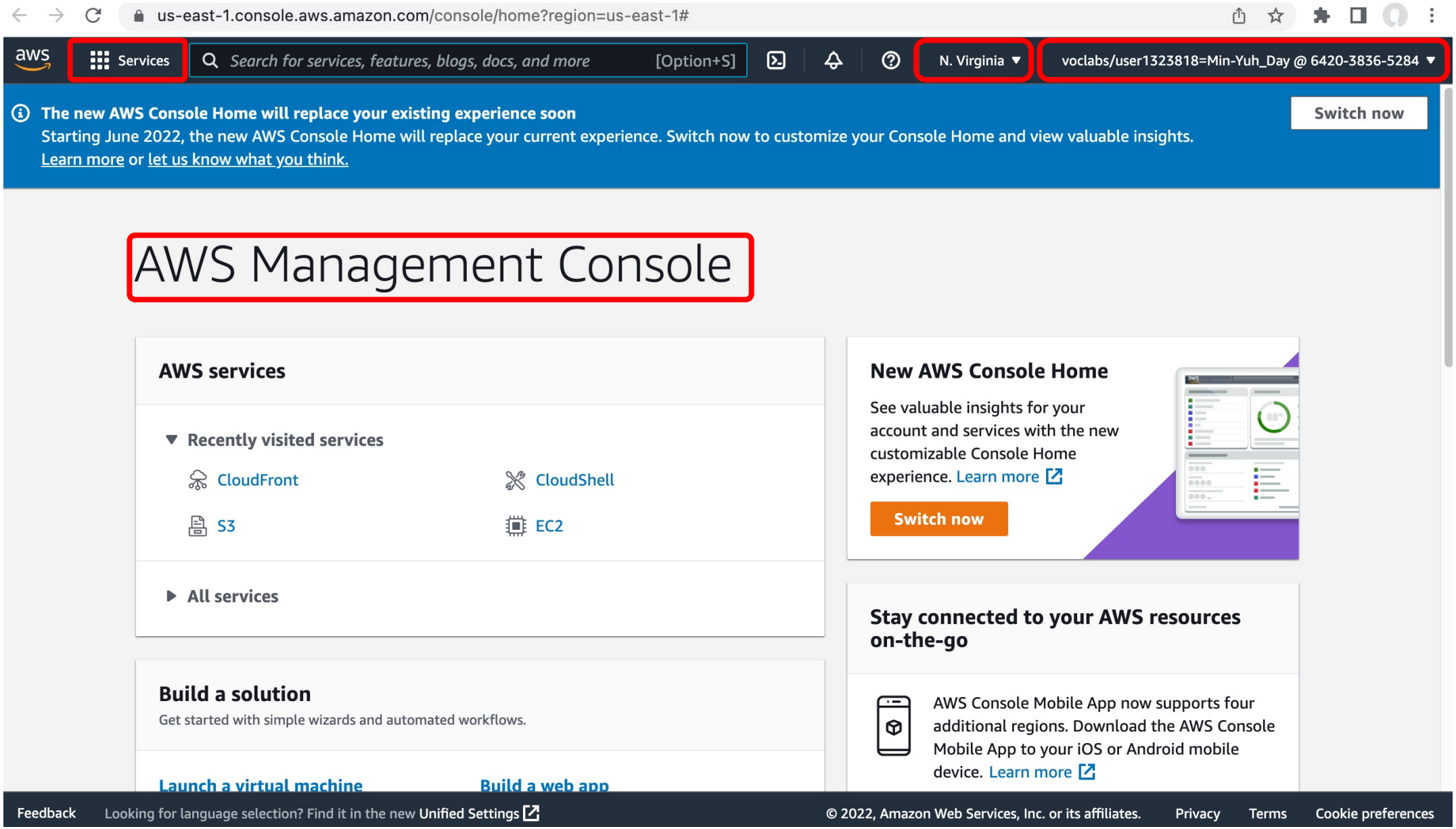

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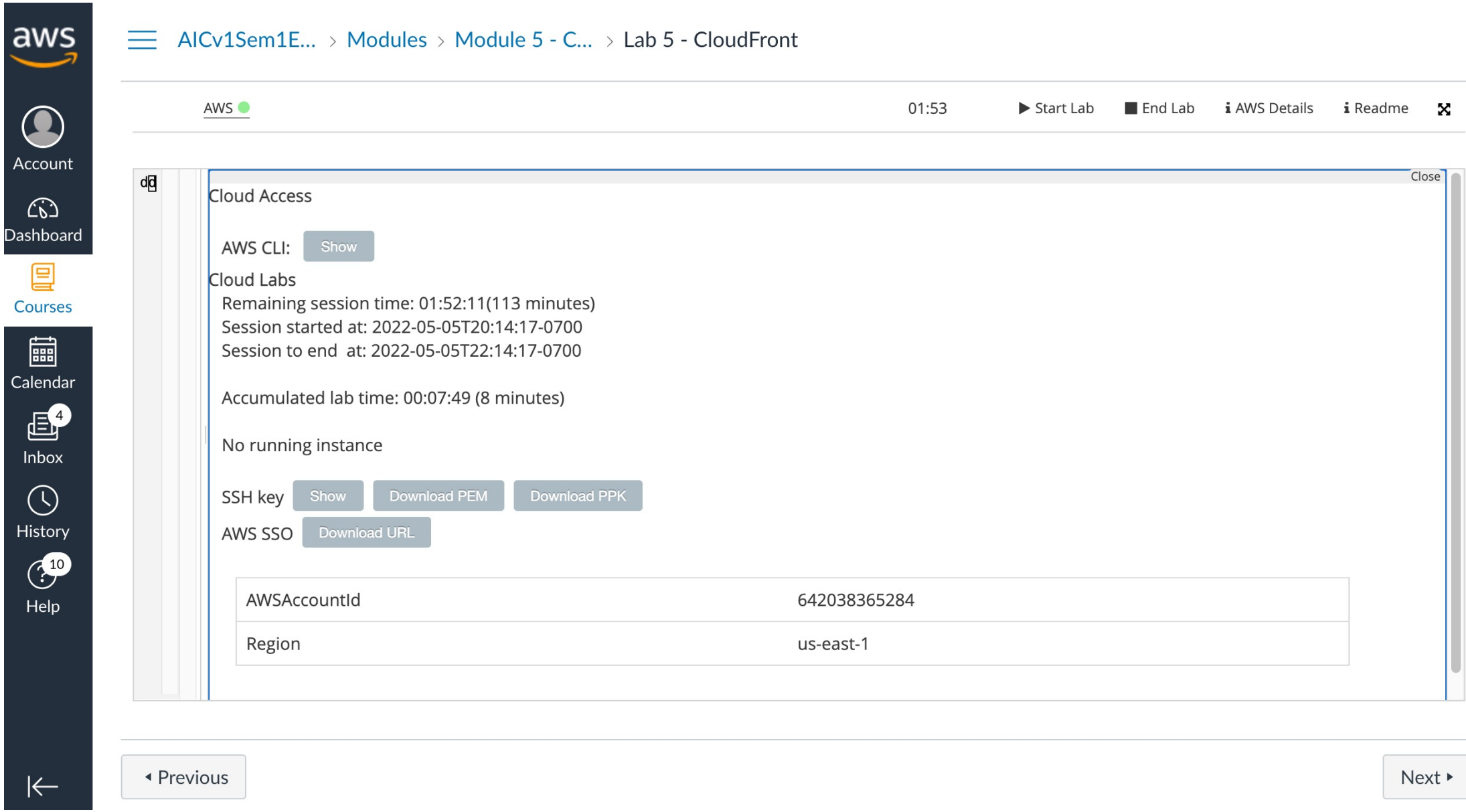


Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

Task 1. Create an S3 bucket using the AWS CLI

4. Choose the **Services** menu, locate the **Developer Tools** services, and select **CloudShell**.
If a welcome pop-up window appears, choose **Close**.
AWS CloudShell is a browser-based shell that gives you command line access to your AWS resources in the selected AWS Region.

5. Copy and paste the following code into a text editor:

```
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```

```
cd ~
aws s3api create-bucket --bucket mydaylabbucket20220506 --region us-east-1
```

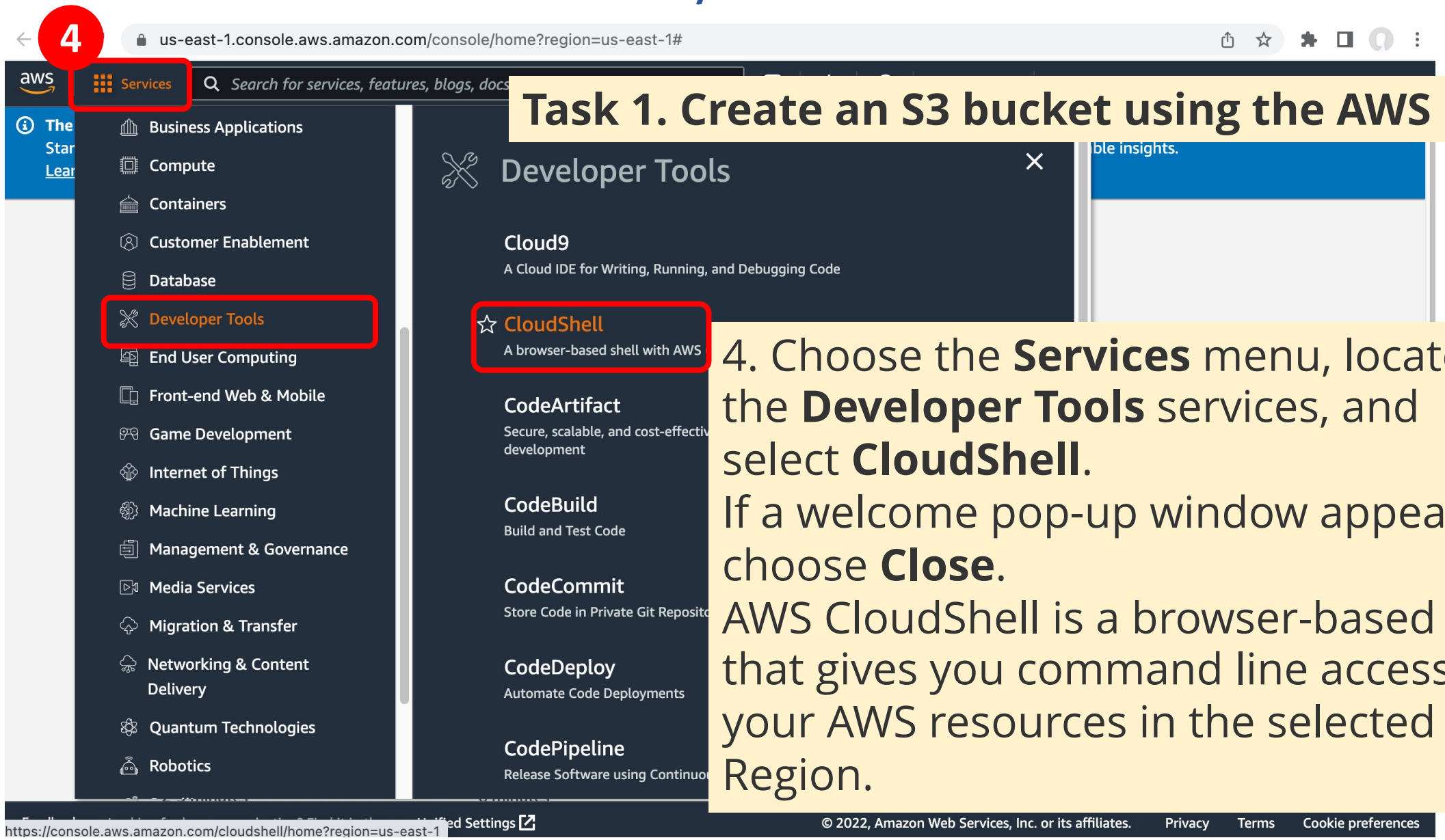
6. In the code that you copied, replace **(bucket-name)** with a unique Domain Name System (DNS)-compliant name for your new bucket.

7. Run the updated code in the CloudShell terminal.
If a pop-up window appears, choose **Paste**.
The output should look similar to the following:

```
{
  "Location": "/mylabbucket12345”
}
```

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

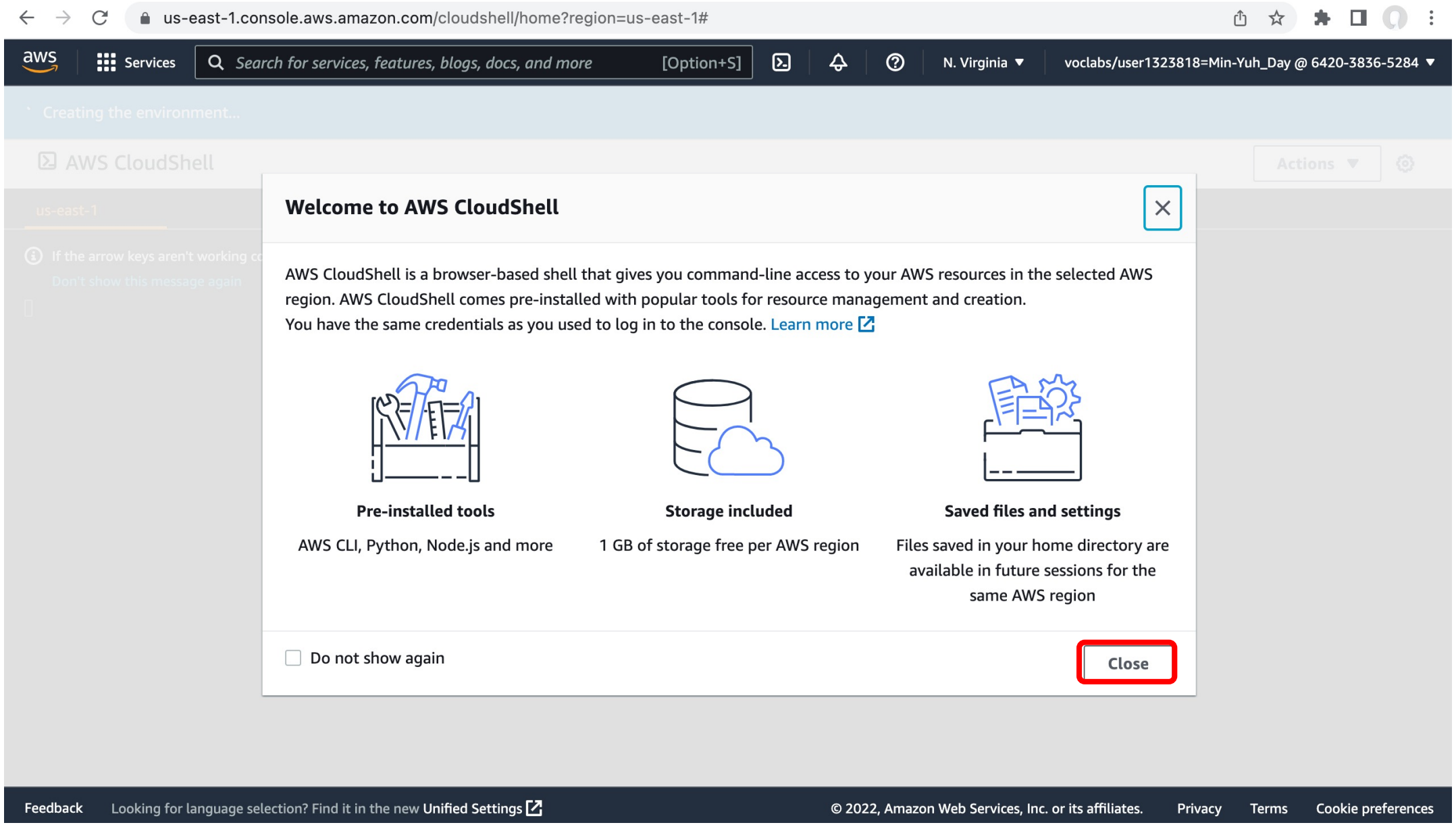
Task 1. Create an S3 bucket using the AWS CLI



4. Choose the **Services** menu, locate the **Developer Tools** services, and select **CloudShell**.
If a welcome pop-up window appears, choose **Close**.
AWS CloudShell is a browser-based shell that gives you command line access to your AWS resources in the selected AWS Region.

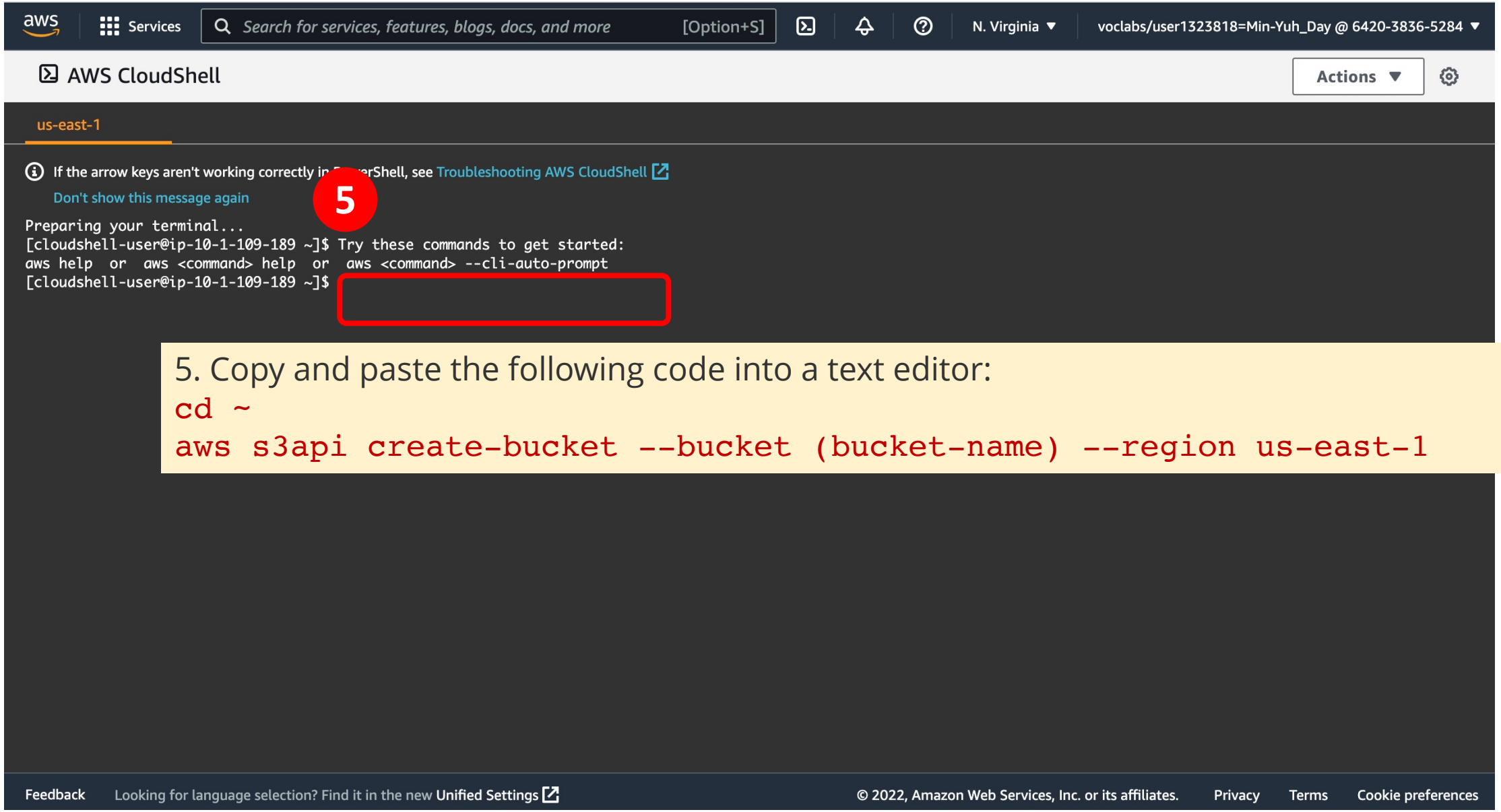
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

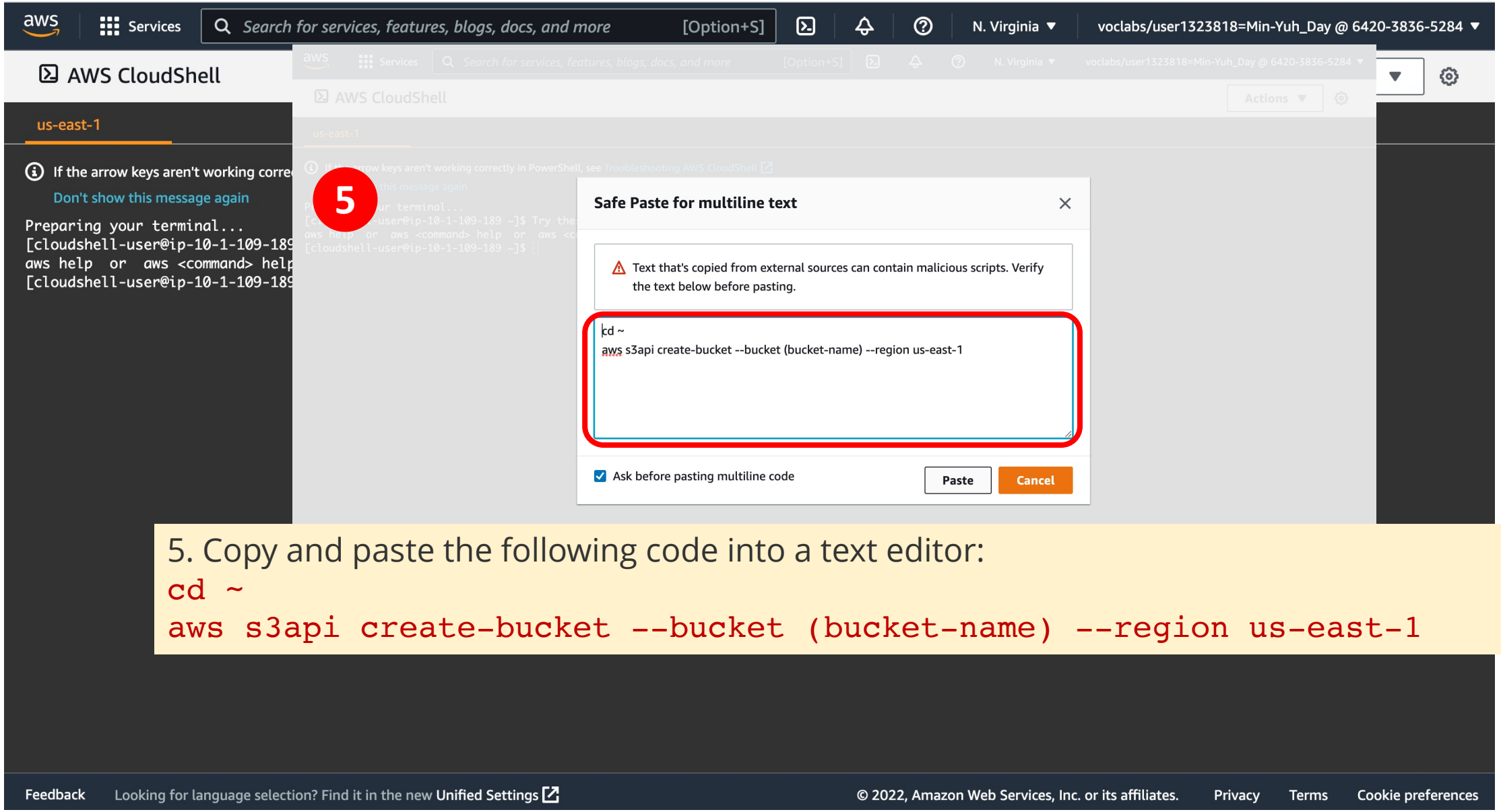


5. Copy and paste the following code into a text editor:

```
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

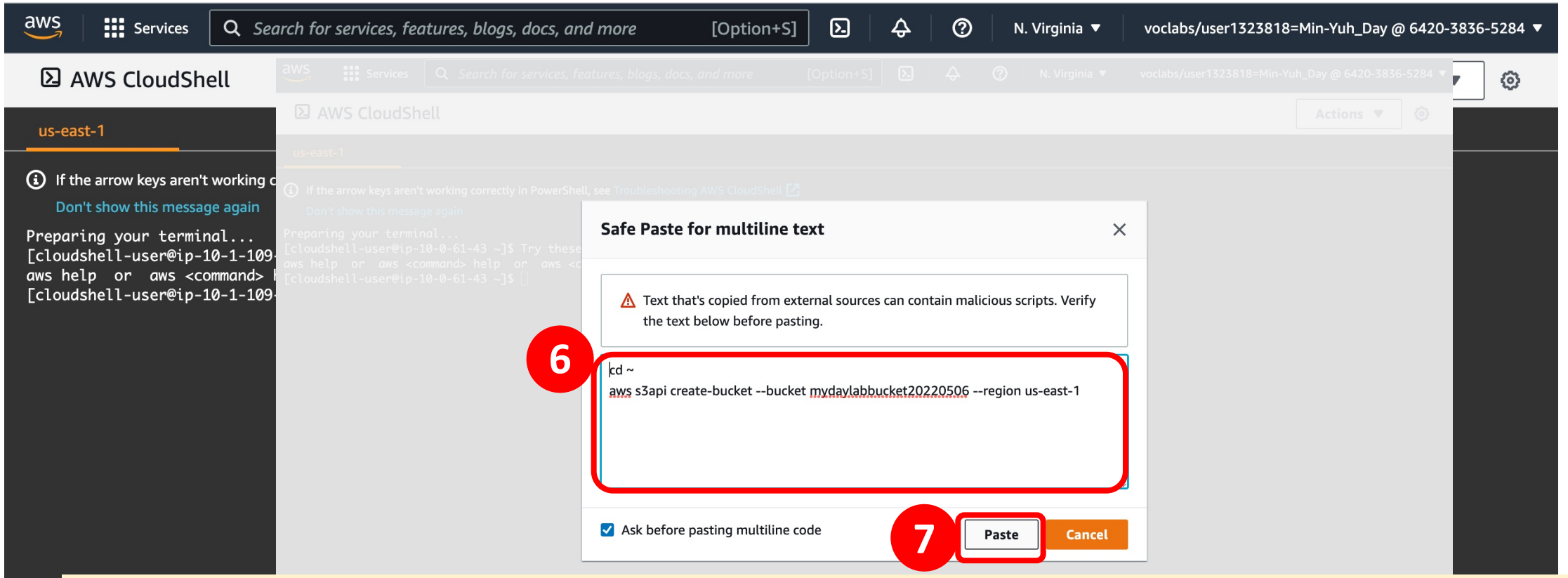


5. Copy and paste the following code into a text editor:

```
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



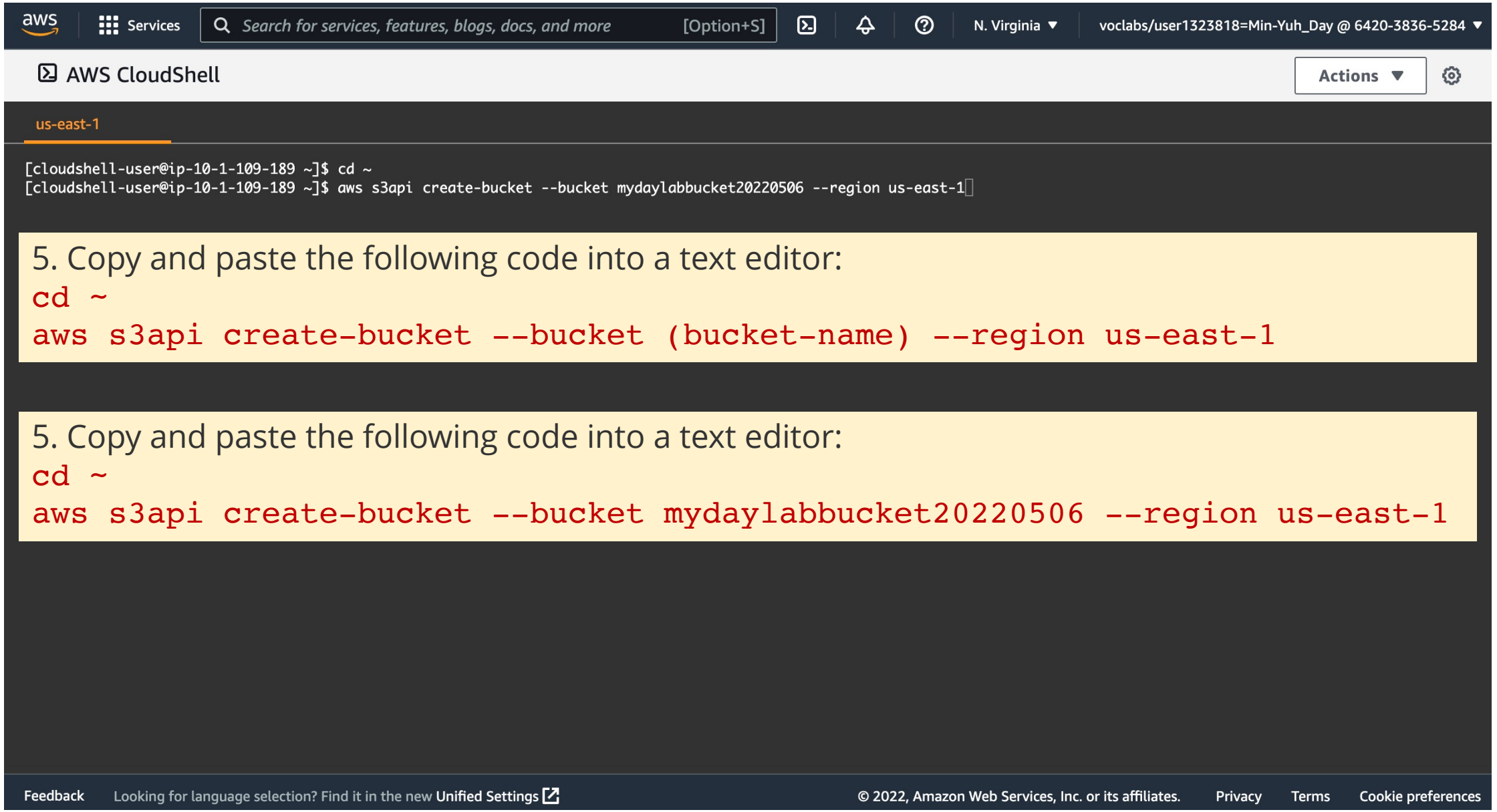
5. Copy and paste the following code into a text editor:

```
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```

5. Copy and paste the following code into a text editor:

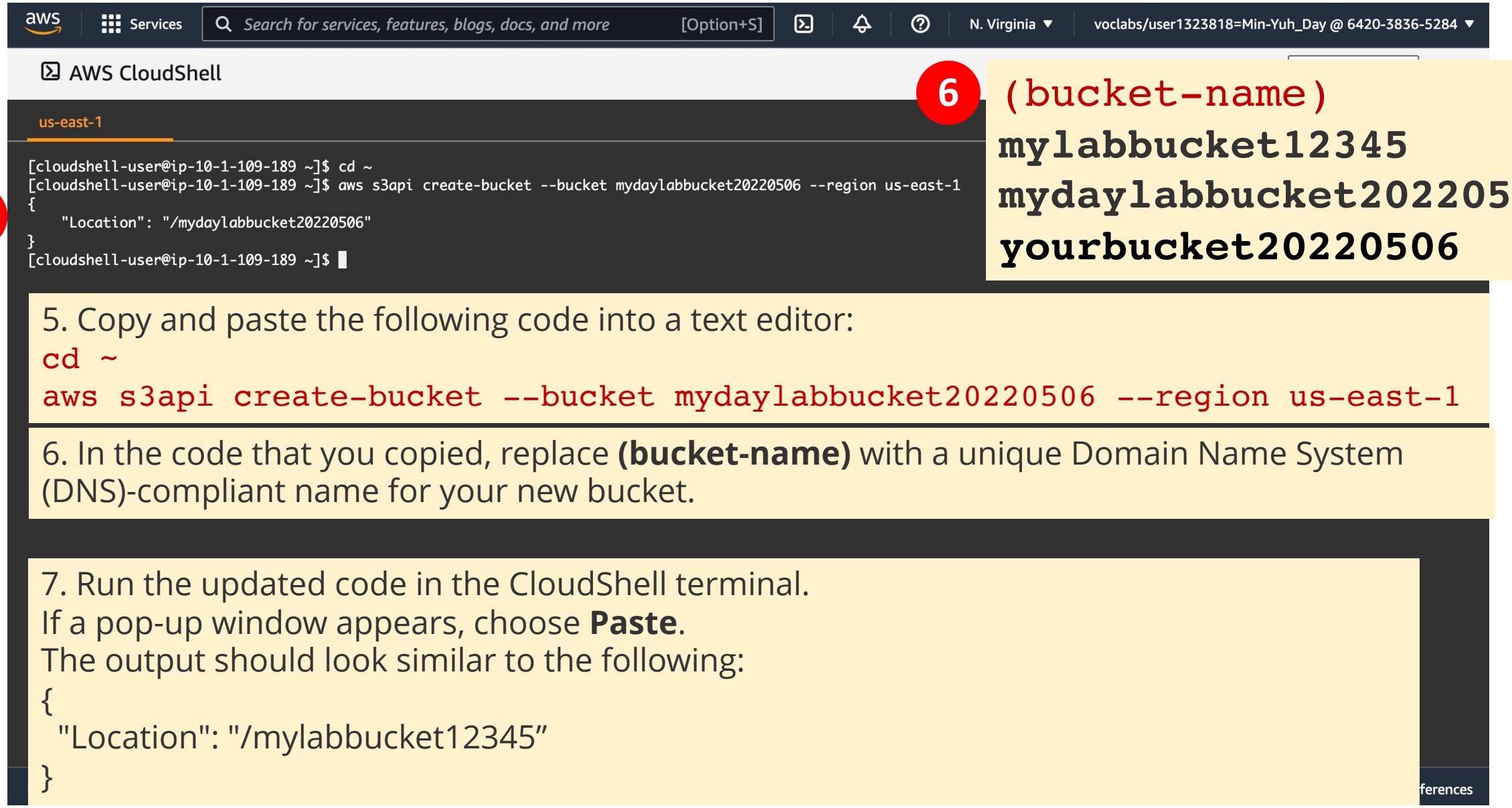
```
cd ~
aws s3api create-bucket --bucket mydaylabbucket20220506 --region us-east-1
```

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



7

6

(bucket-name)
mylabbucket12345
mydaylabbucket20220506
yourbucket20220506

5. Copy and paste the following code into a text editor:

```
cd ~
aws s3api create-bucket --bucket mydaylabbucket20220506 --region us-east-1
```

6. In the code that you copied, replace **(bucket-name)** with a unique Domain Name System (DNS)-compliant name for your new bucket.

7. Run the updated code in the CloudShell terminal.
If a pop-up window appears, choose **Paste**.
The output should look similar to the following:

```
{
  "Location": "/mylabbucket12345”
}
```

Task 2. Add a bucket policy

In this task, you will add a bucket policy through the AWS CLI to make the content publicly available.

8.In the console, choose the **Services** menu, locate the **Storage** section, and choose **S3**.

9.Choose the name of the bucket that you just created.

10.Choose the **Permissions** tab.

11.In the **Bucket policy** section, choose **Edit**.

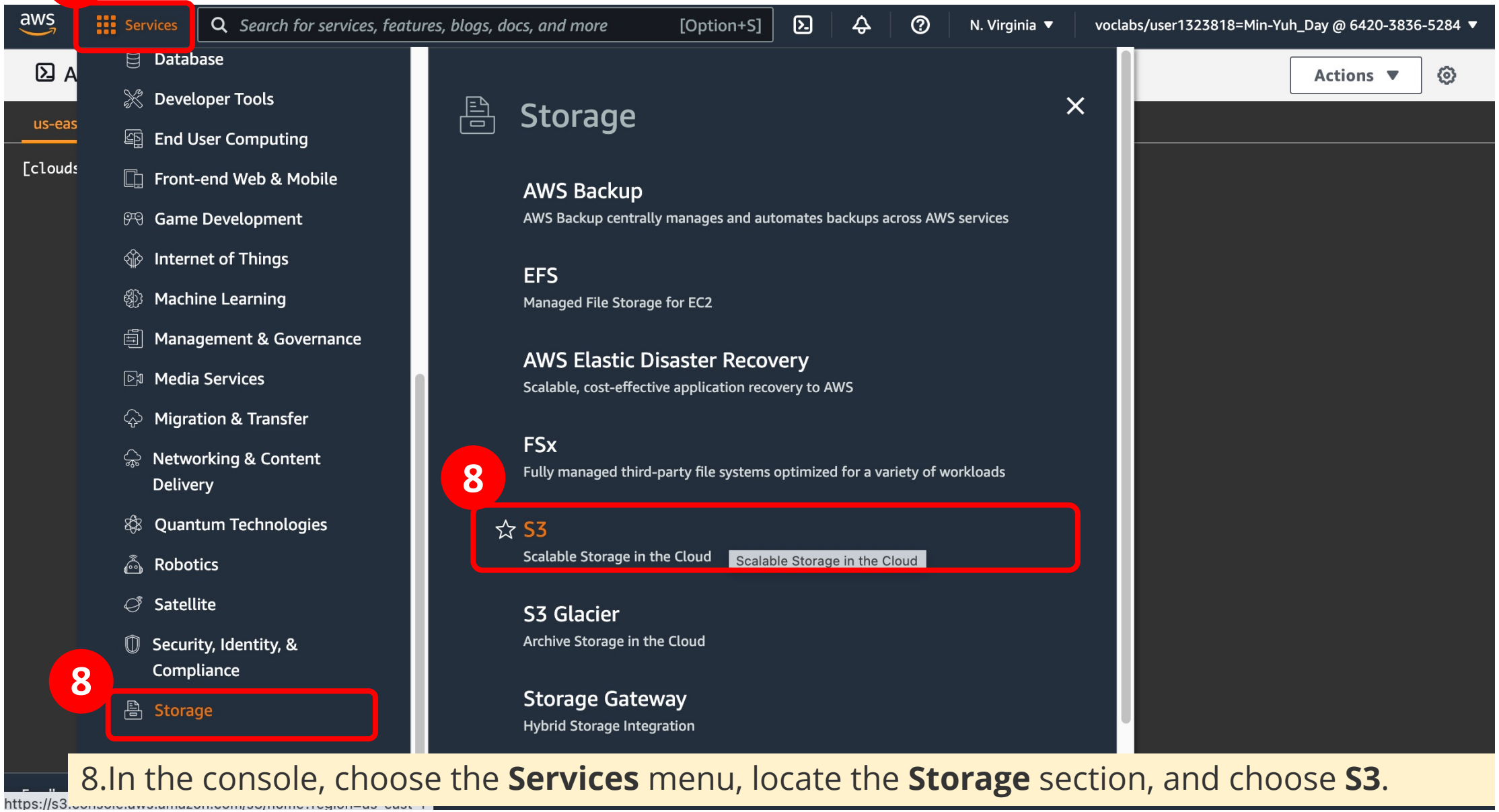
12.To grant public read access for your website, copy and paste the following bucket policy into the policy editor.

```
{
  "Version":"2012-10-17",
  "Statement":[
    {
      "Sid":"PublicReadForGetBucketObjects",
      "Effect":"Allow",
      "Principal":"*",
      "Action":[
        "s3:GetObject"
      ],
      "Resource":[
        "arn:aws:s3:::example-bucket/*"
      ]
    }
  ]
}
```

13.In the policy, replace **example-bucket** with the name of your bucket.

14.At the bottom of the page, choose **Save changes**.

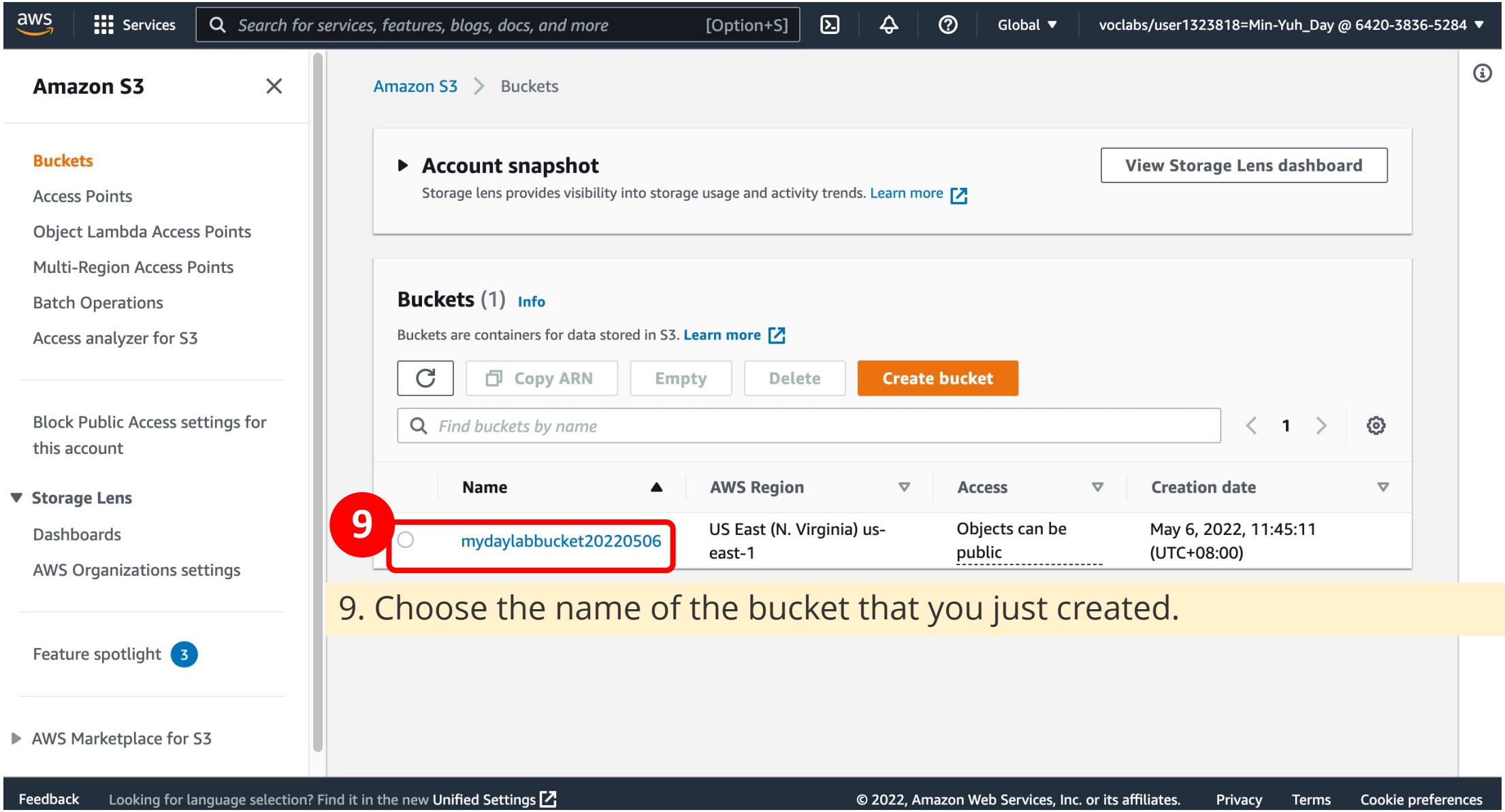
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



8.In the console, choose the **Services** menu, locate the **Storage** section, and choose **S3**.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

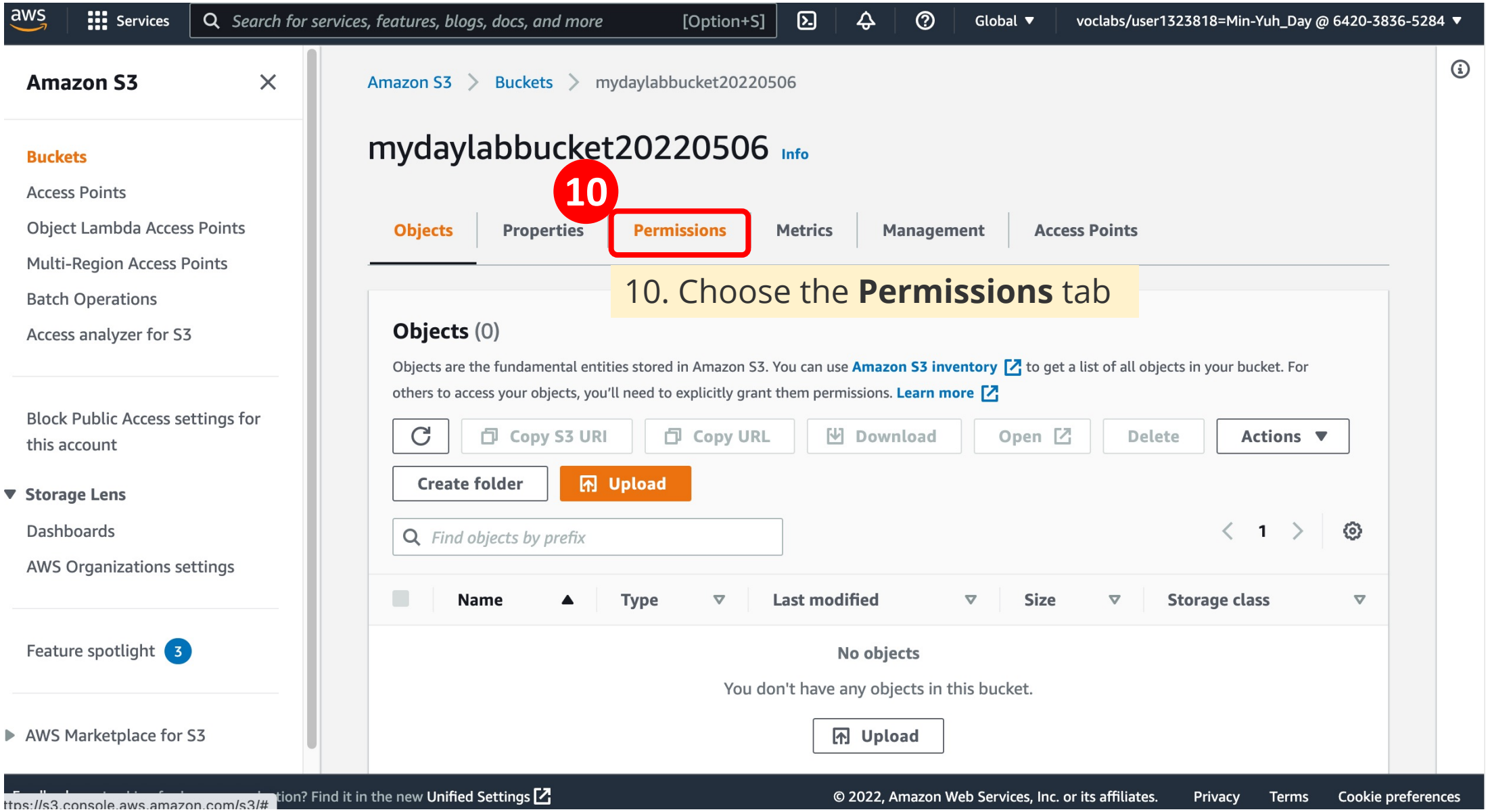
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



9. Choose the name of the bucket that you just created.

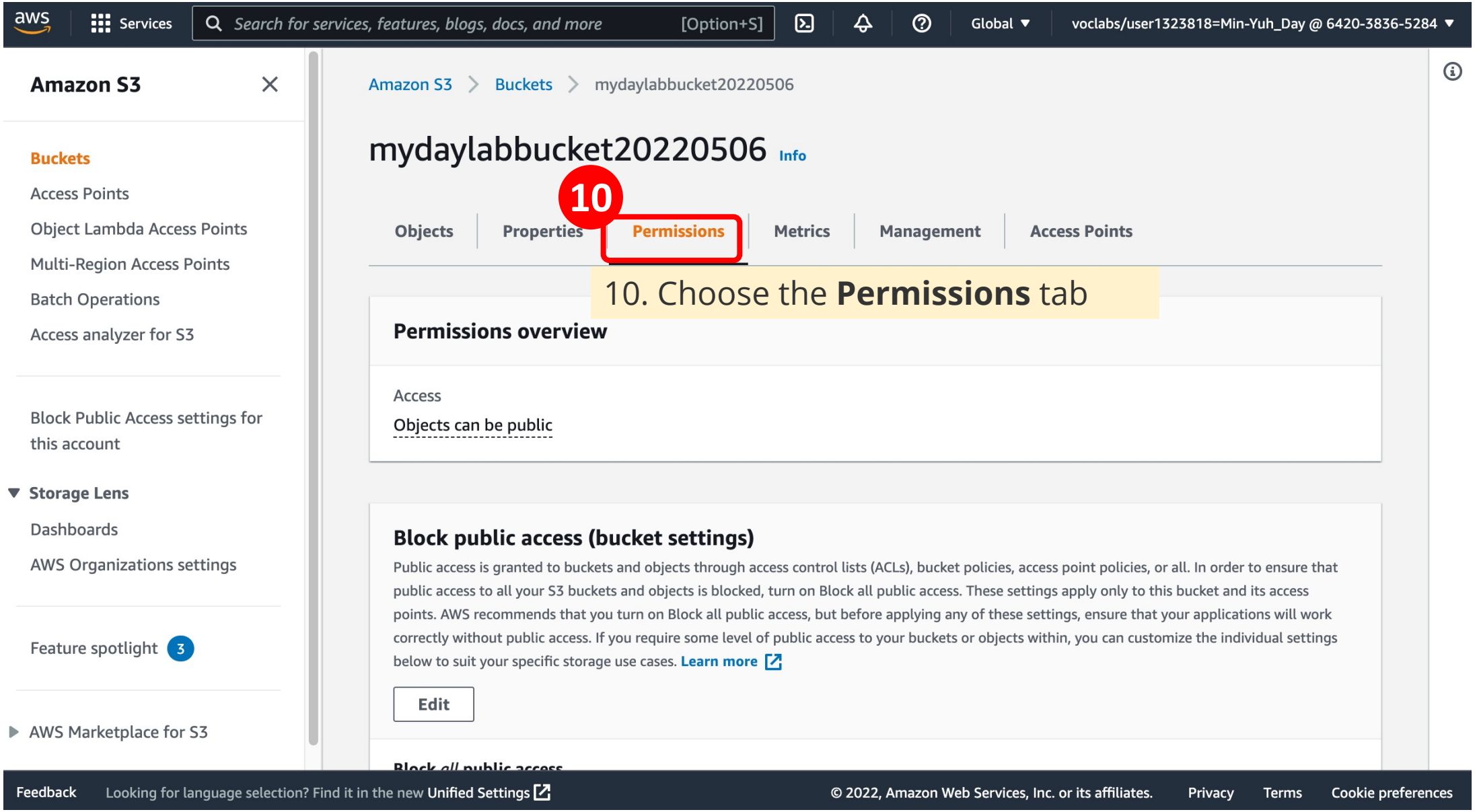
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



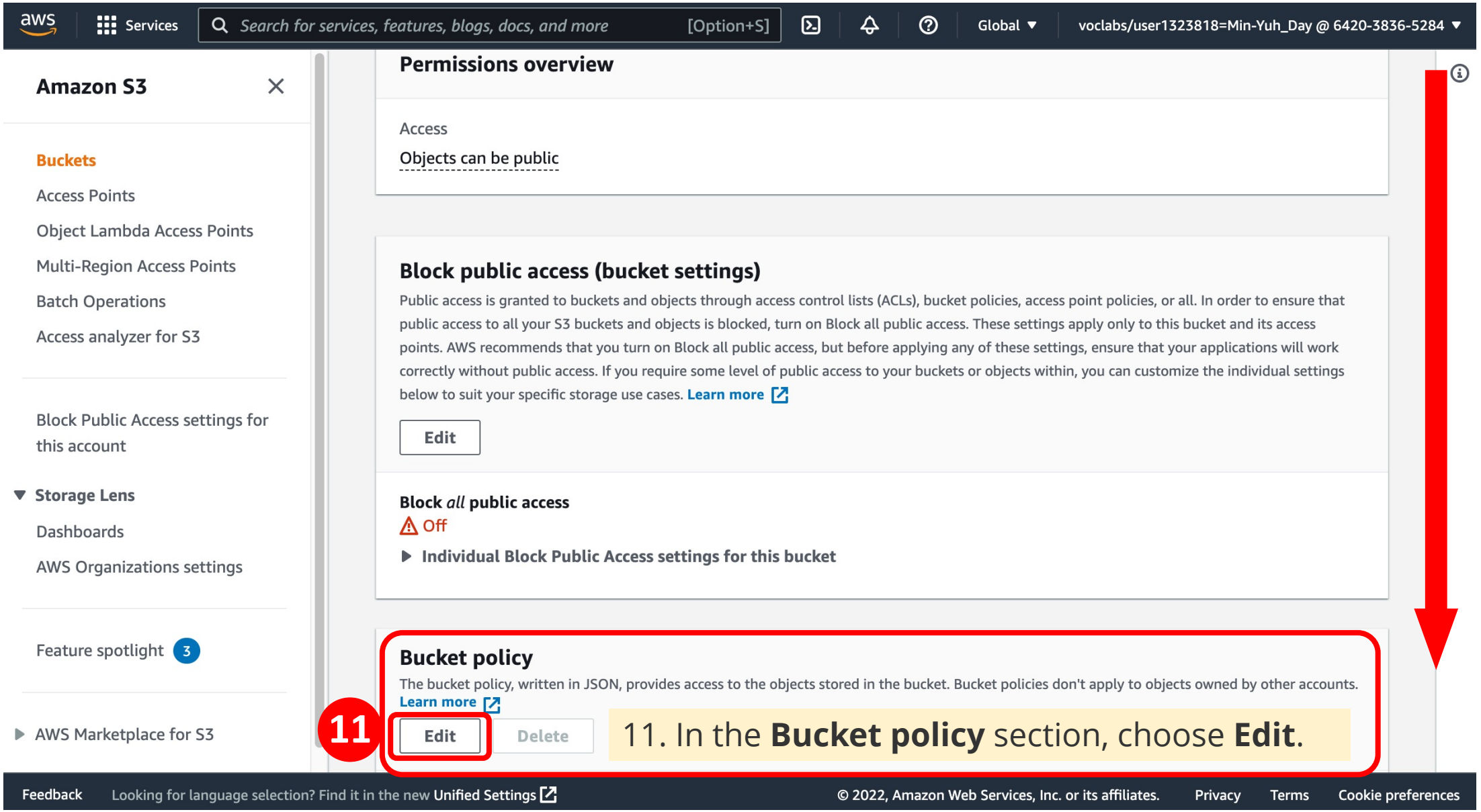
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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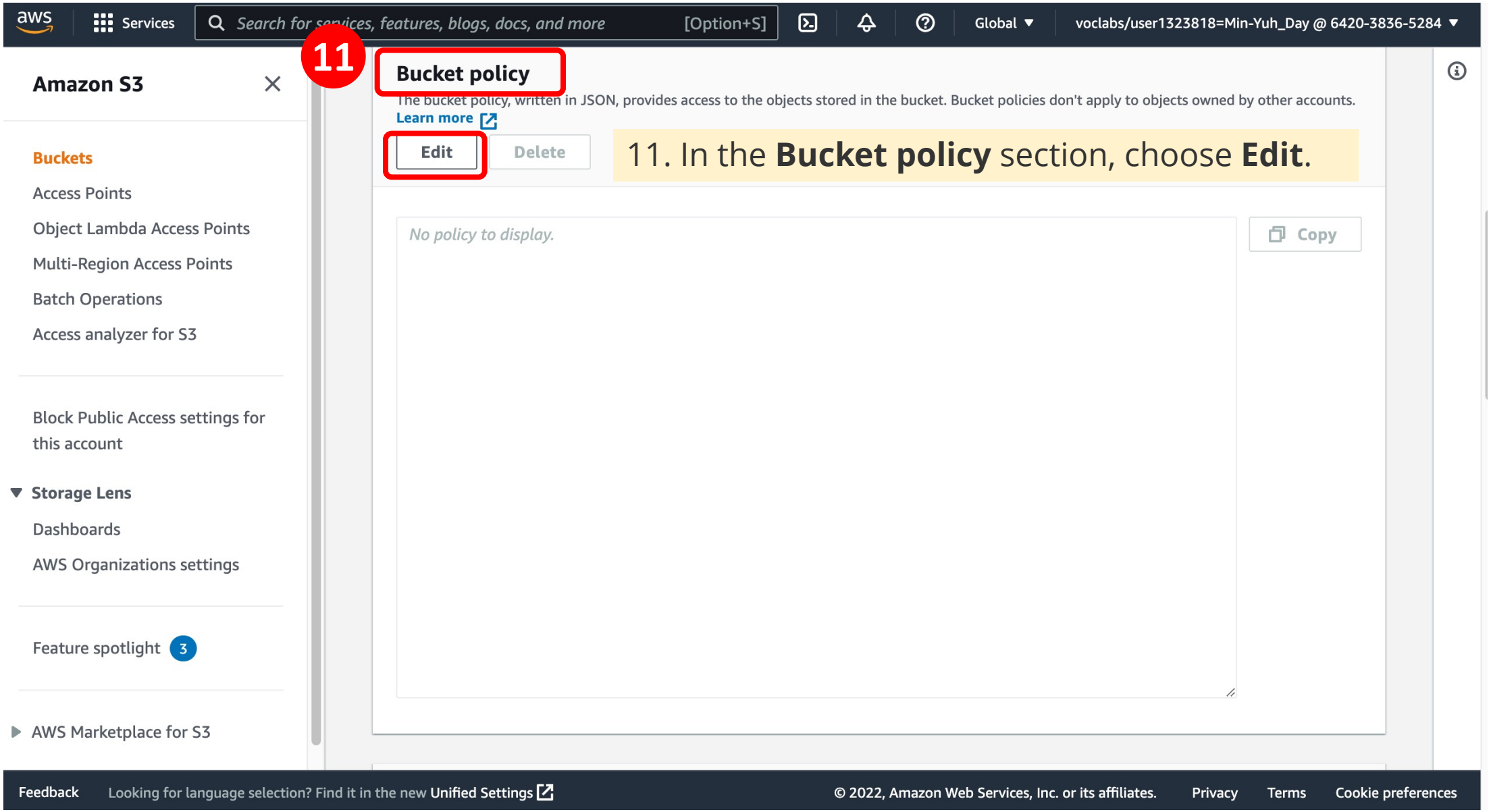
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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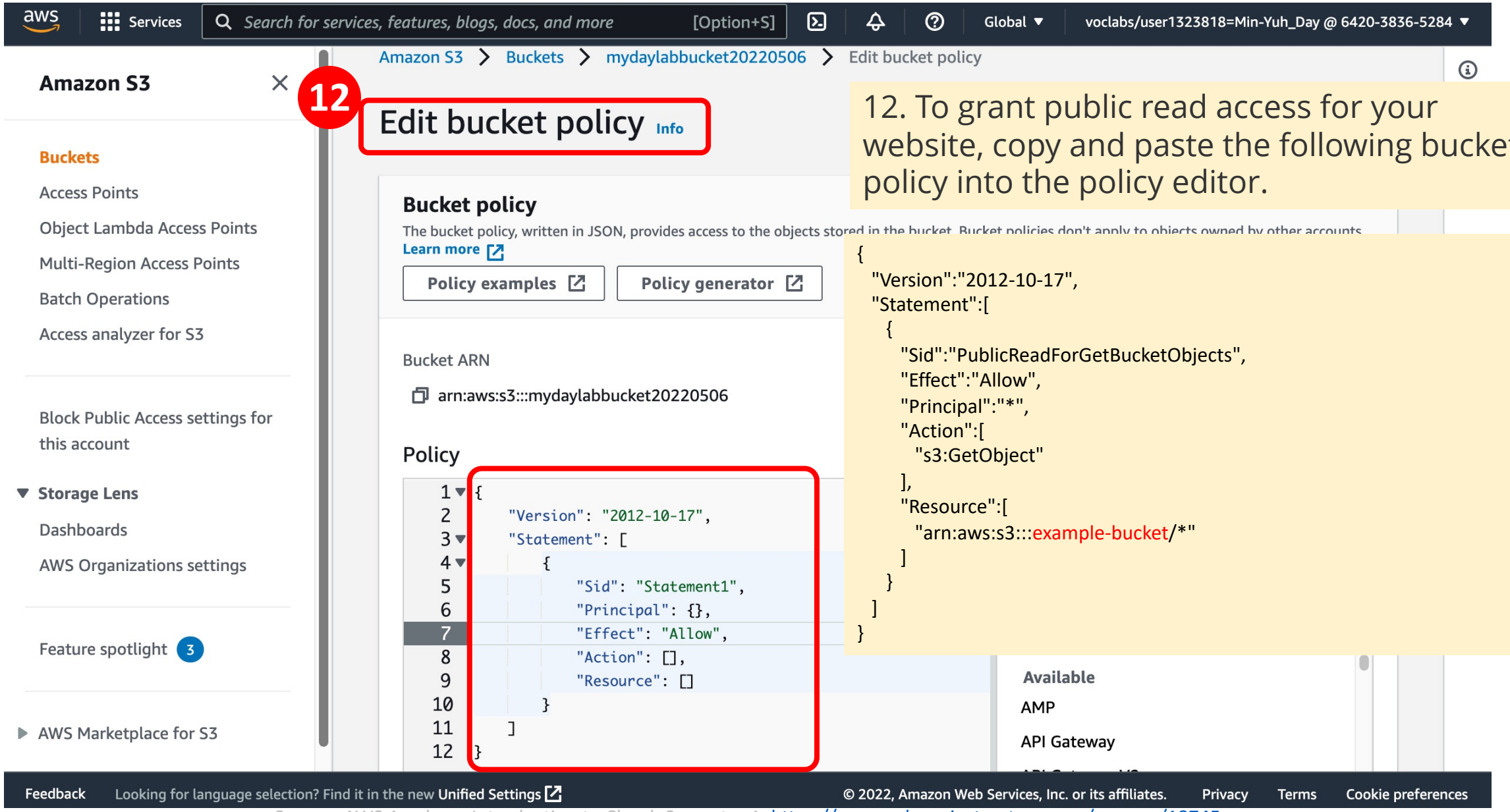
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

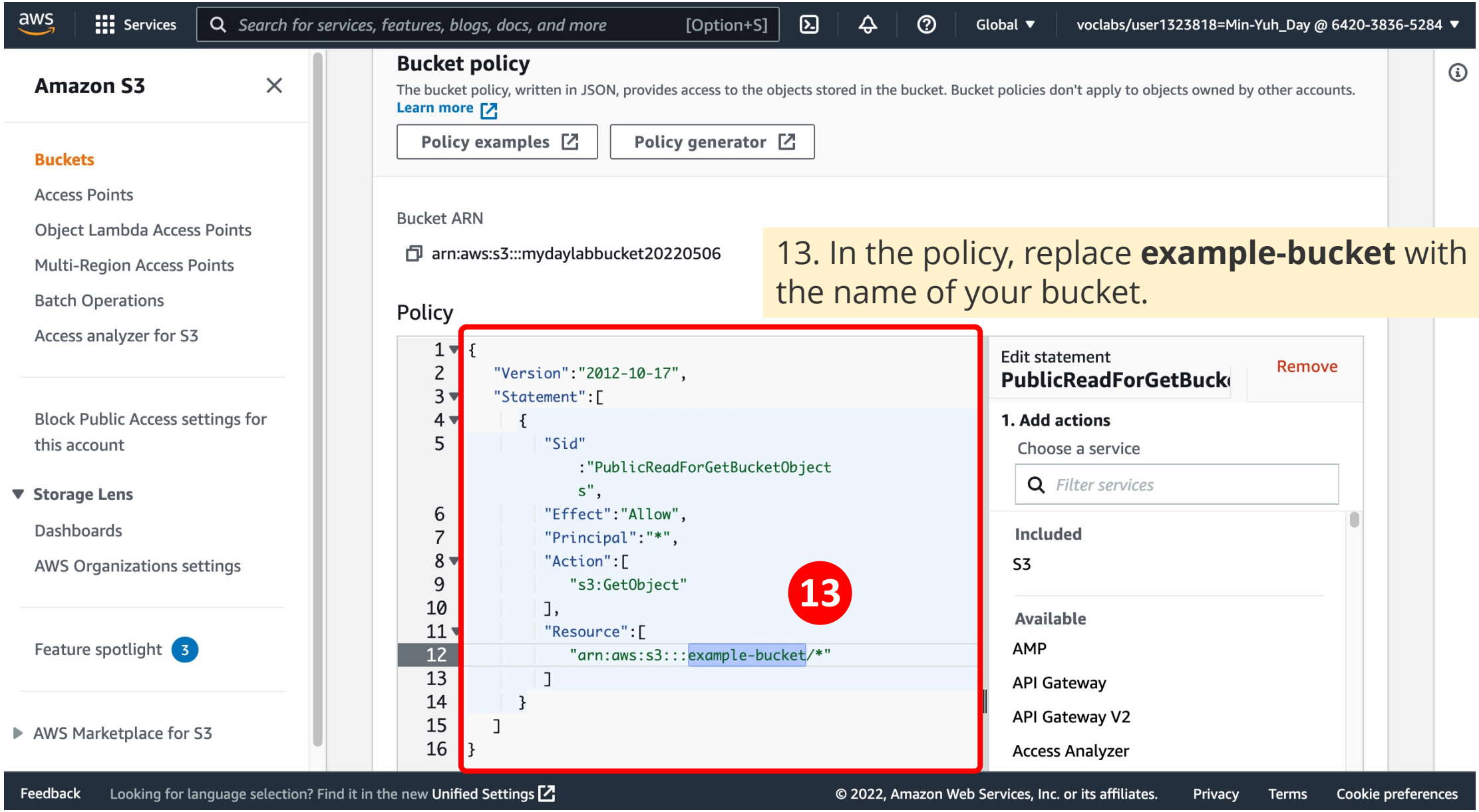


12. To grant public read access for your website, copy and paste the following bucket policy into the policy editor.

```
{
  "Version":"2012-10-17",
  "Statement":[
    {
      "Sid":"PublicReadForGetBucketObjects",
      "Effect":"Allow",
      "Principal":"*",
      "Action":[
        "s3:GetObject"
      ],
      "Resource":[
        "arn:aws:s3:::example-bucket/*"
      ]
    }
  ]
}
```

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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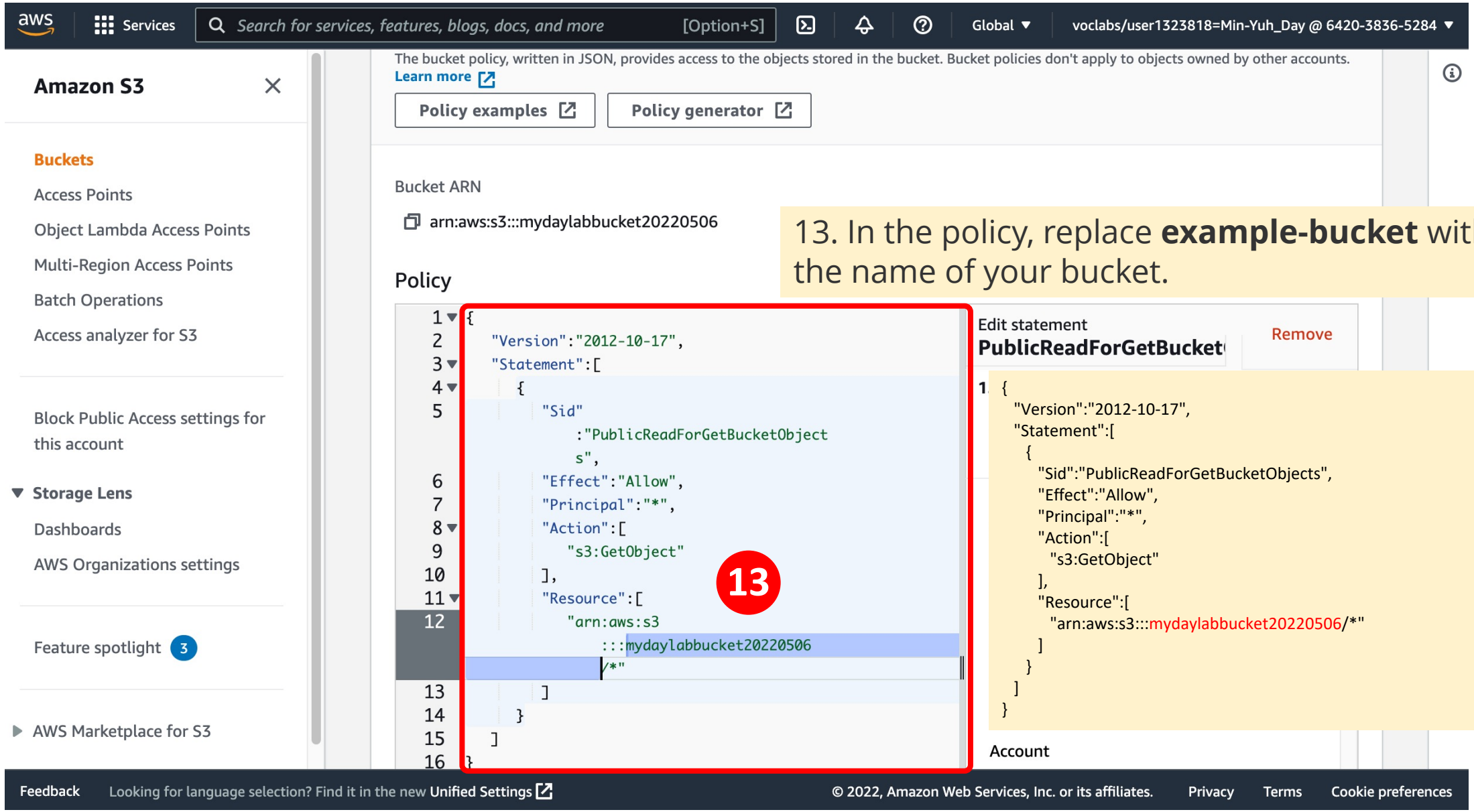
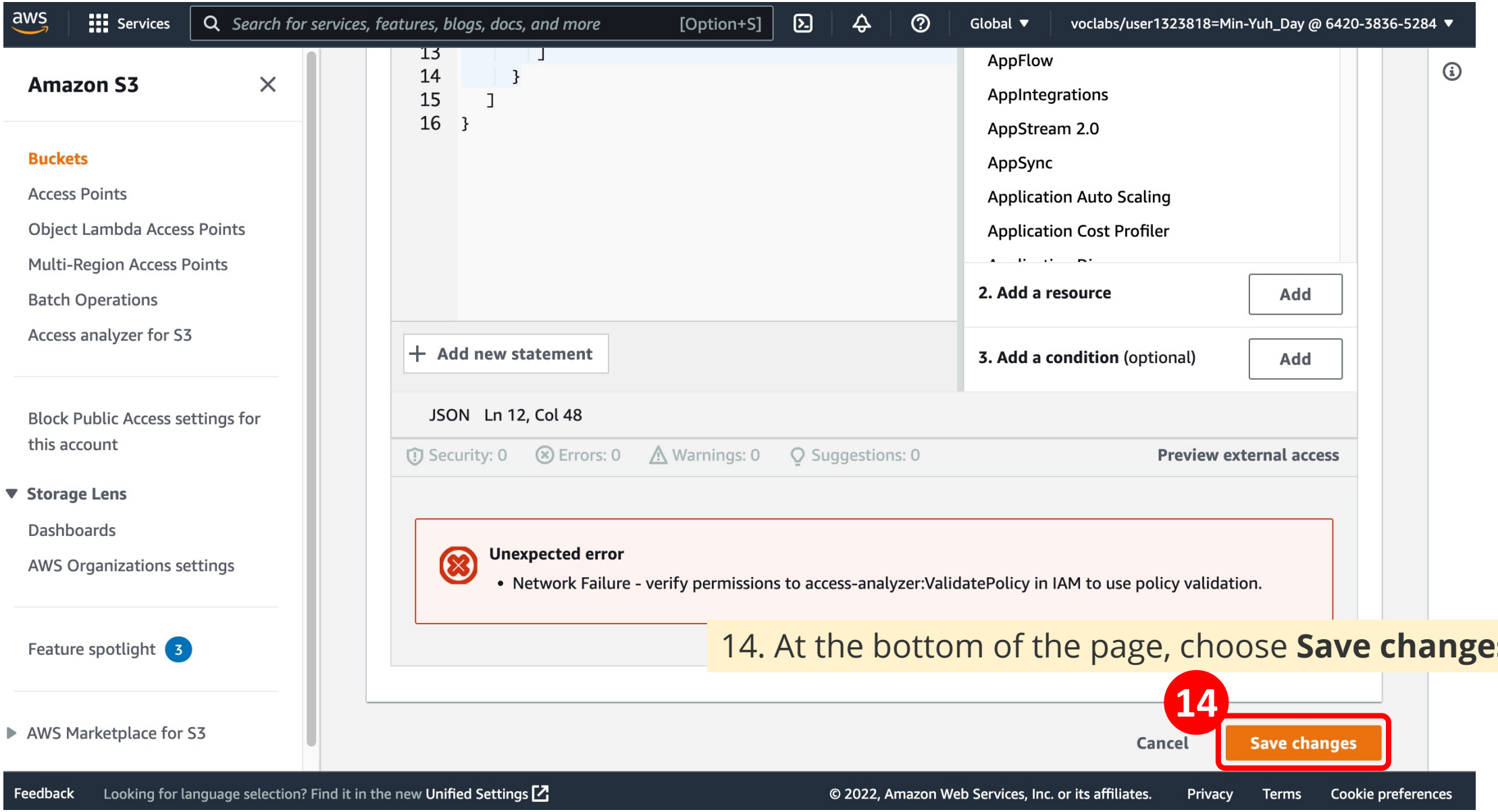
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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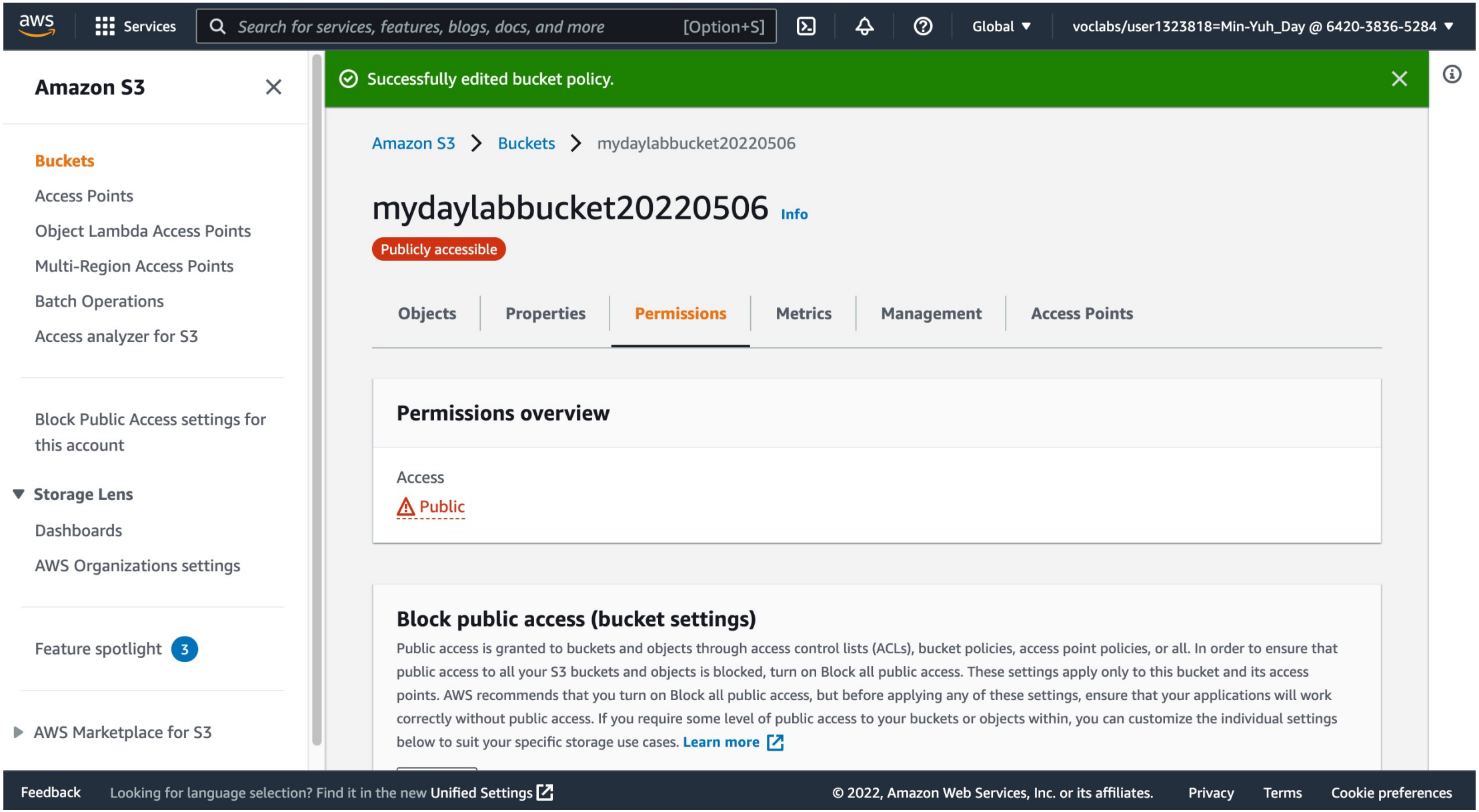
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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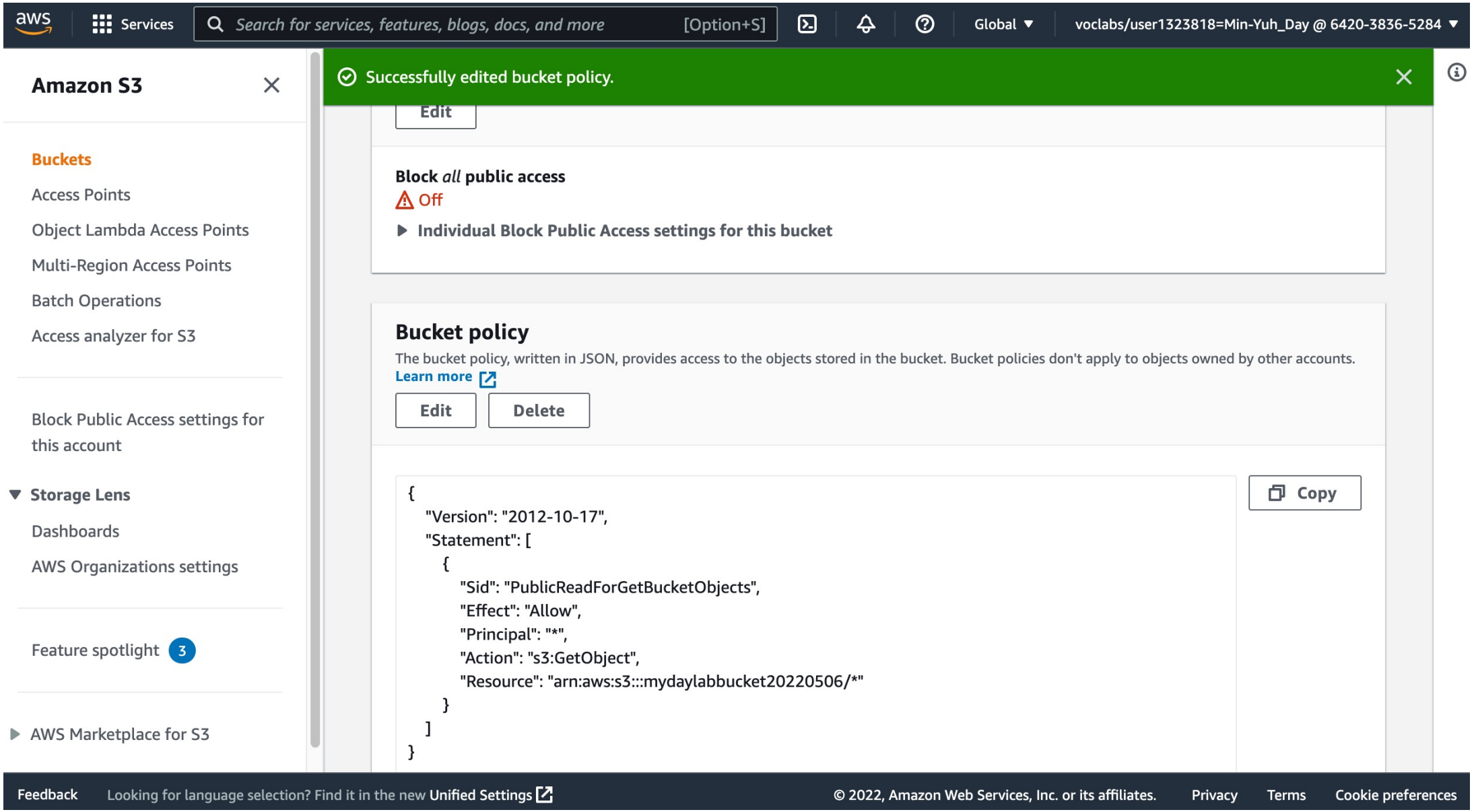
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

Task 3. Upload an HTML document

In this task, you will upload the index.html file for your webpage to the S3 bucket.

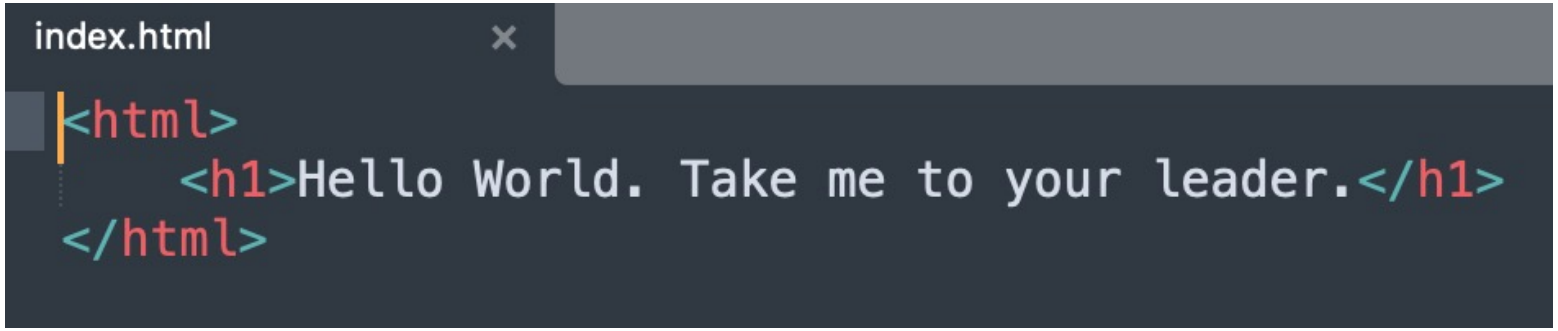
15. Open the context menu (right-click) for the following link, and then choose **Save link as**: index.html
16. Save the index.html file to your local computer.
17. In the console, choose the **Objects** tab.
18. Upload the index.html file to your bucket.
    Choose **Upload**.
    Drag and drop the index.html file onto the upload page. An alternative is to choose **Add files**, navigate to the file, and choose **Open**.
19. Expand the **Permissions** section.
20. Under **Predefined ACLs**, select **Grant public-read access**.
    A warning message similar to **Granting public-read access is not recommend** appears below the setting you selected.
21. Below the warning, check the box next to **I understand...**.
22. At the bottom of the page, choose **Upload**.
23. Choose **Close**.
    The index.html file appears in the **Objects** list.

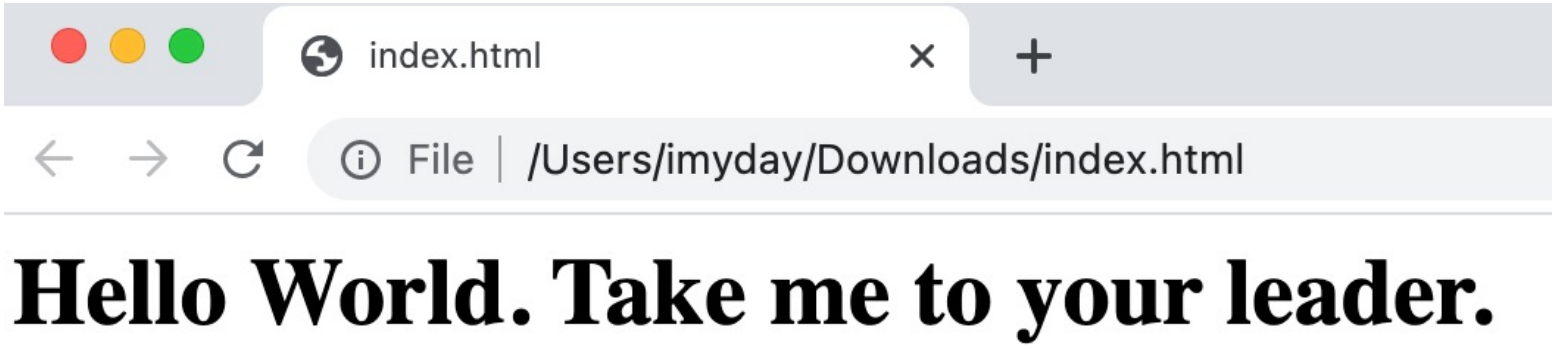
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

15.Open the context menu (right-click) for the following link, and then choose **Save link as**: index.html
16.Save the index.html file to your local computer.

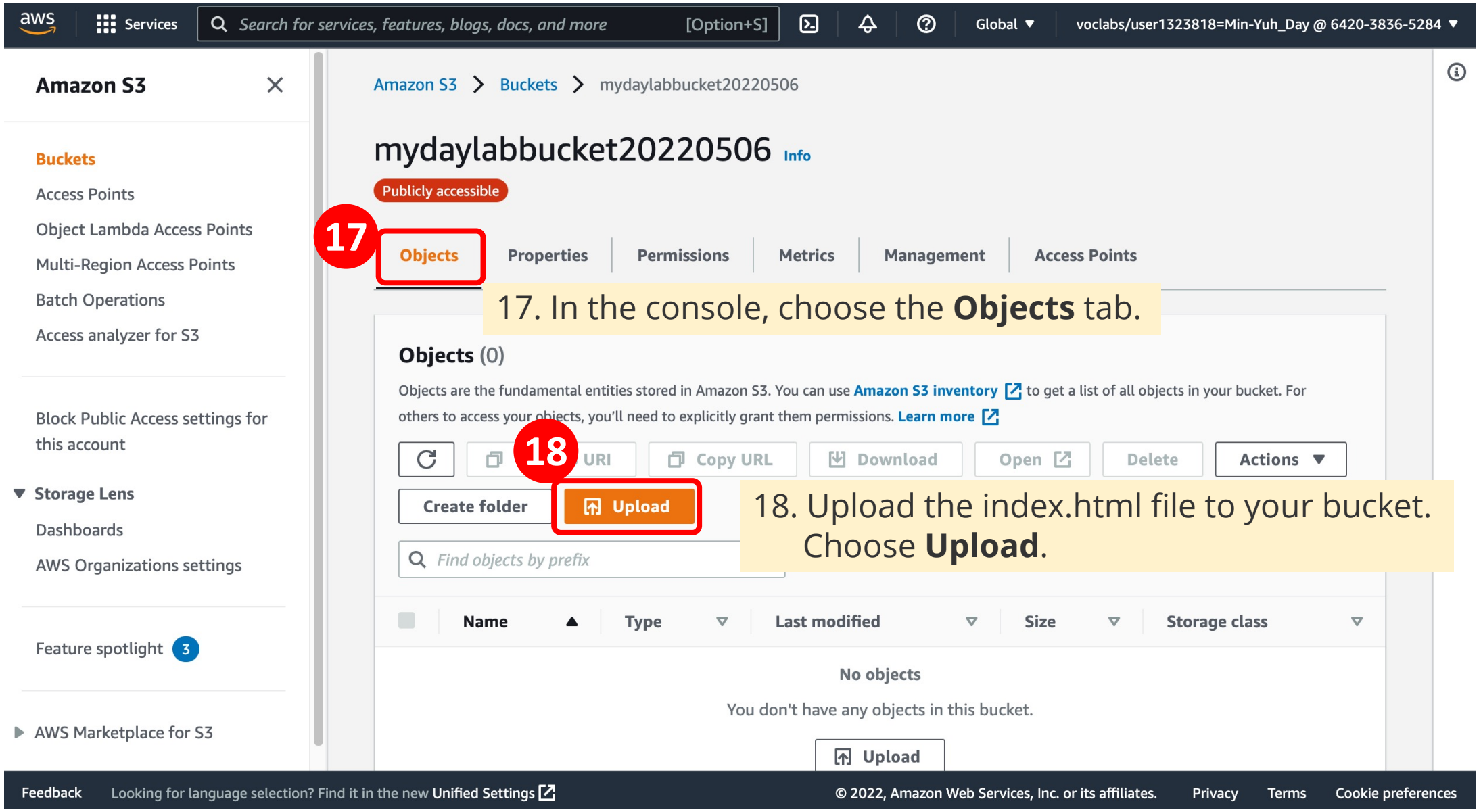
index.html

```
<html>
    <h1>Hello World. Take me to your leader.</h1>
</html>
```





AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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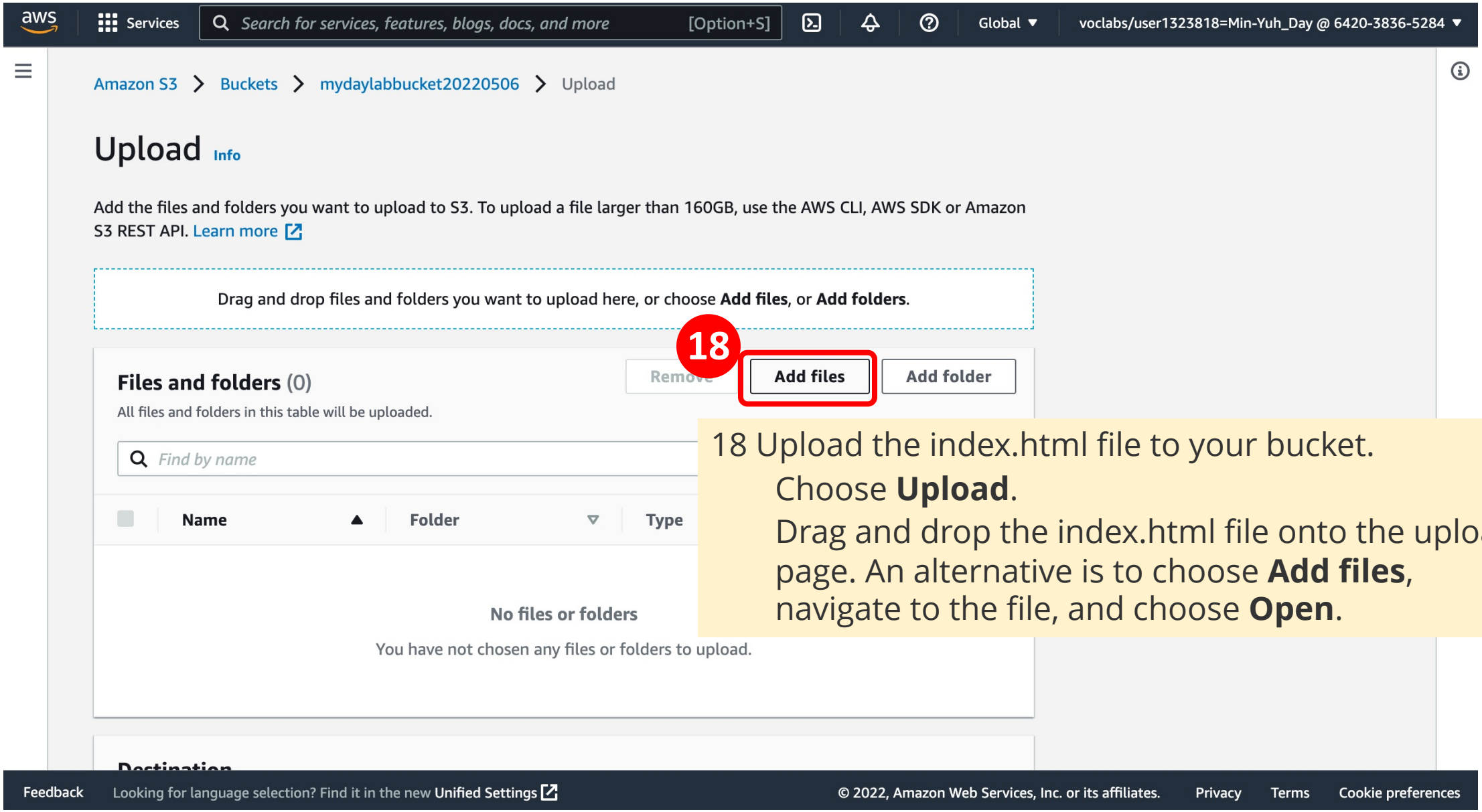
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



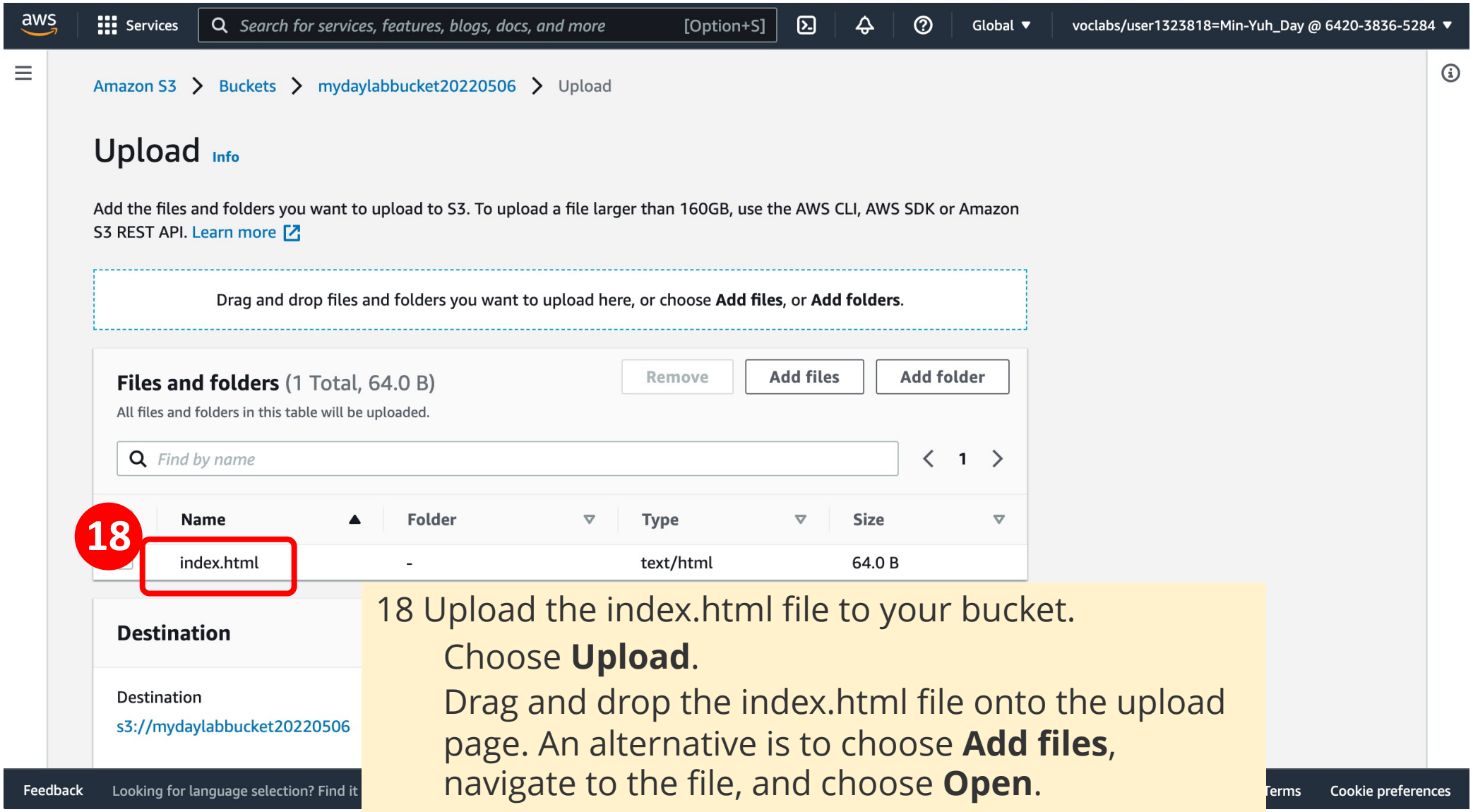
18 Upload the index.html file to your bucket.

Choose **Upload**.

Drag and drop the index.html file onto the upload page. An alternative is to choose **Add files**, navigate to the file, and choose **Open**.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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Drag and drop the index.html file onto the upload page. An alternative is to choose **Add files**, navigate to the file, and choose **Open**.

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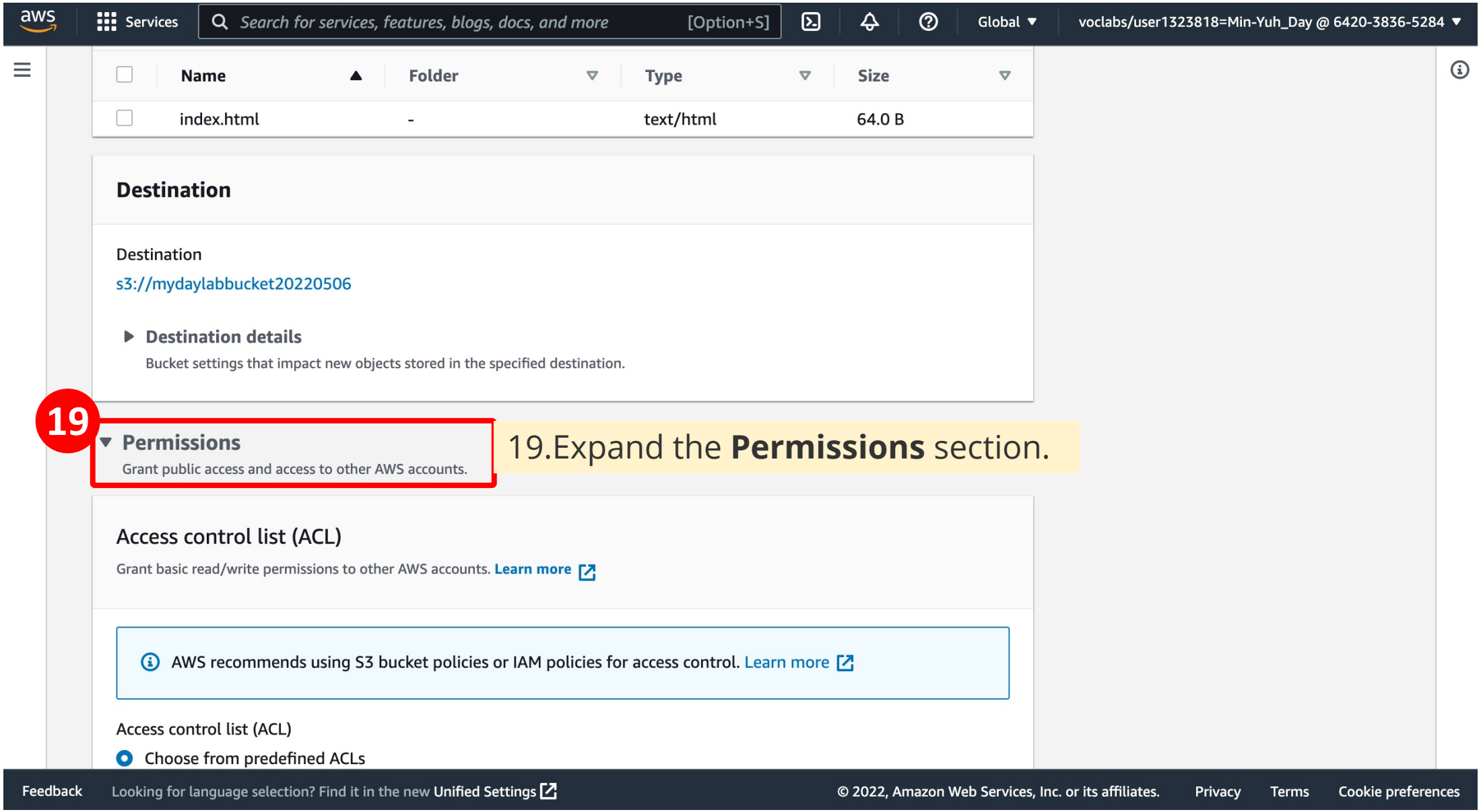
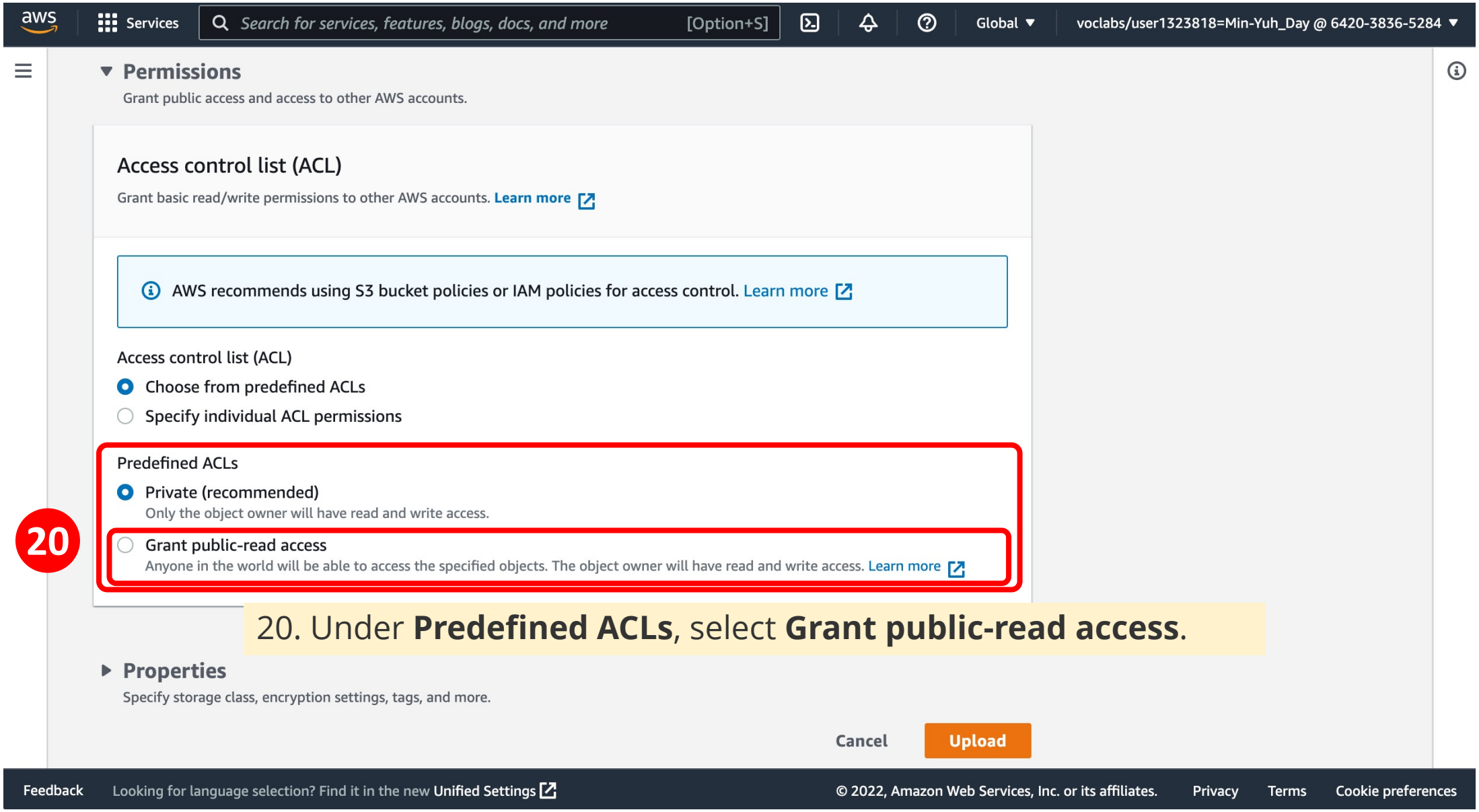
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

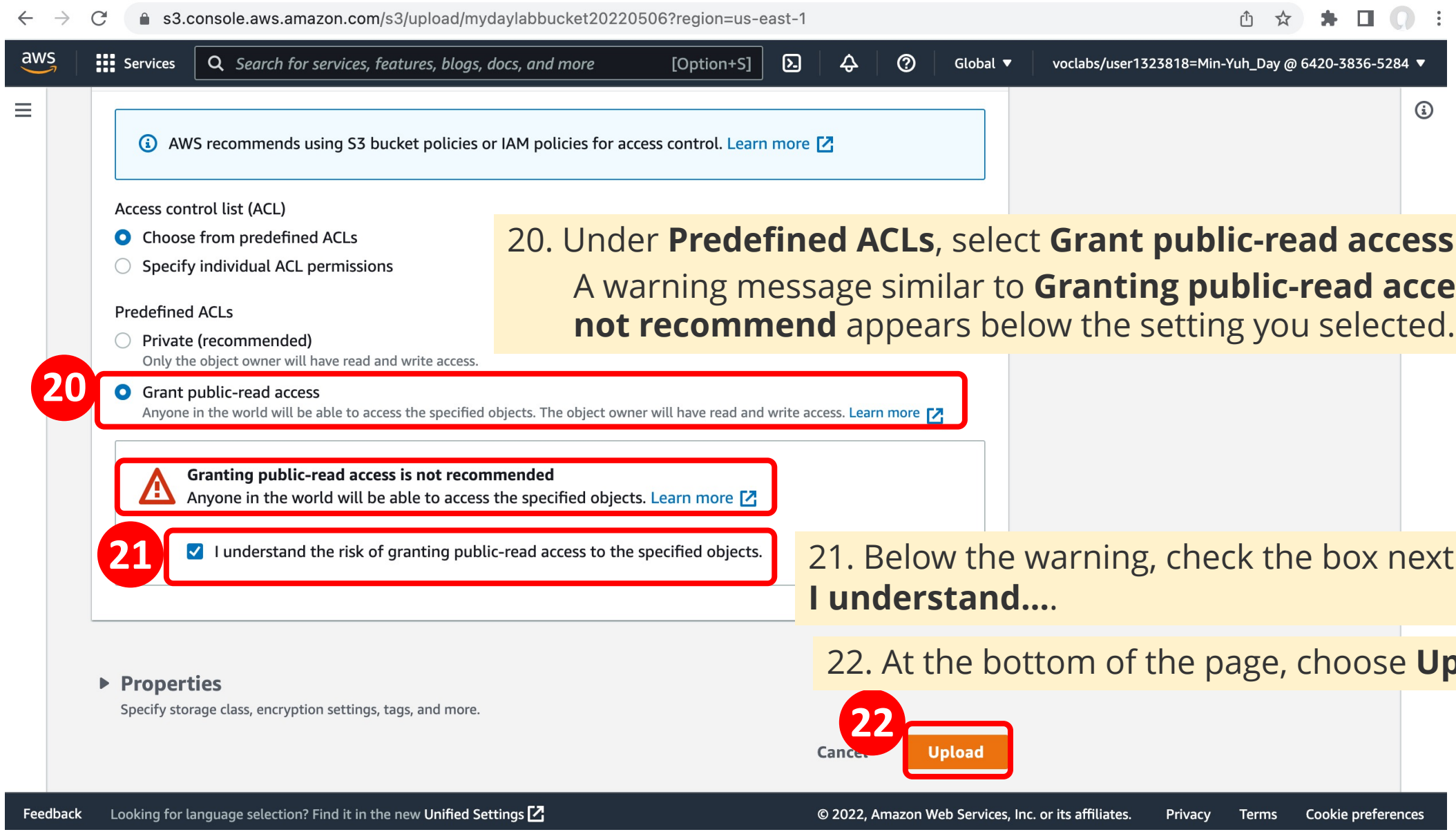
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



20. Under **Predefined ACLs**, select **Grant public-read access**.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



20. Under **Predefined ACLs**, select **Grant public-read access**.

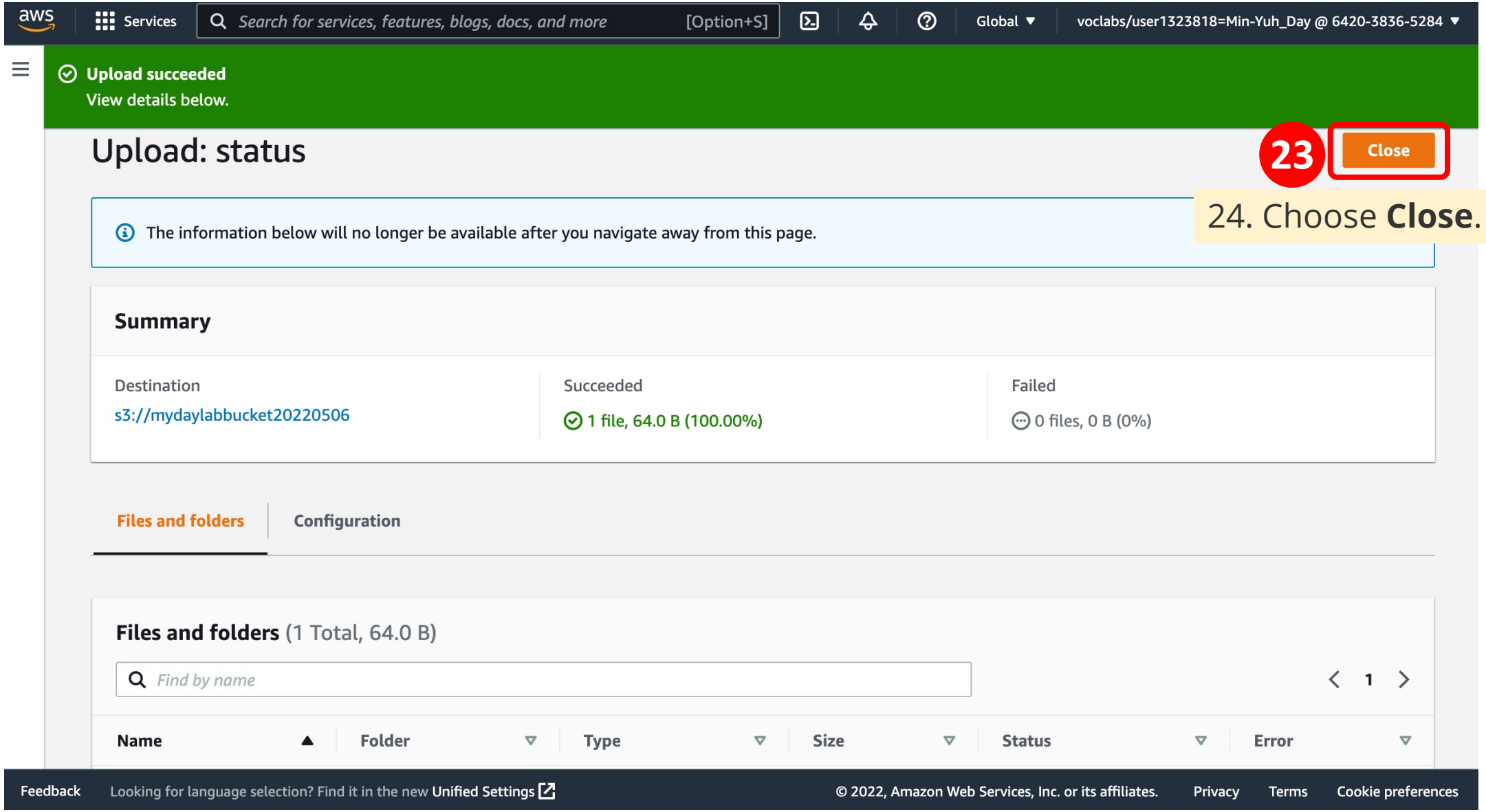
A warning message similar to **Granting public-read access is not recommend** appears below the setting you selected.

21. Below the warning, check the box next to **I understand….**

22. At the bottom of the page, choose **Upload**.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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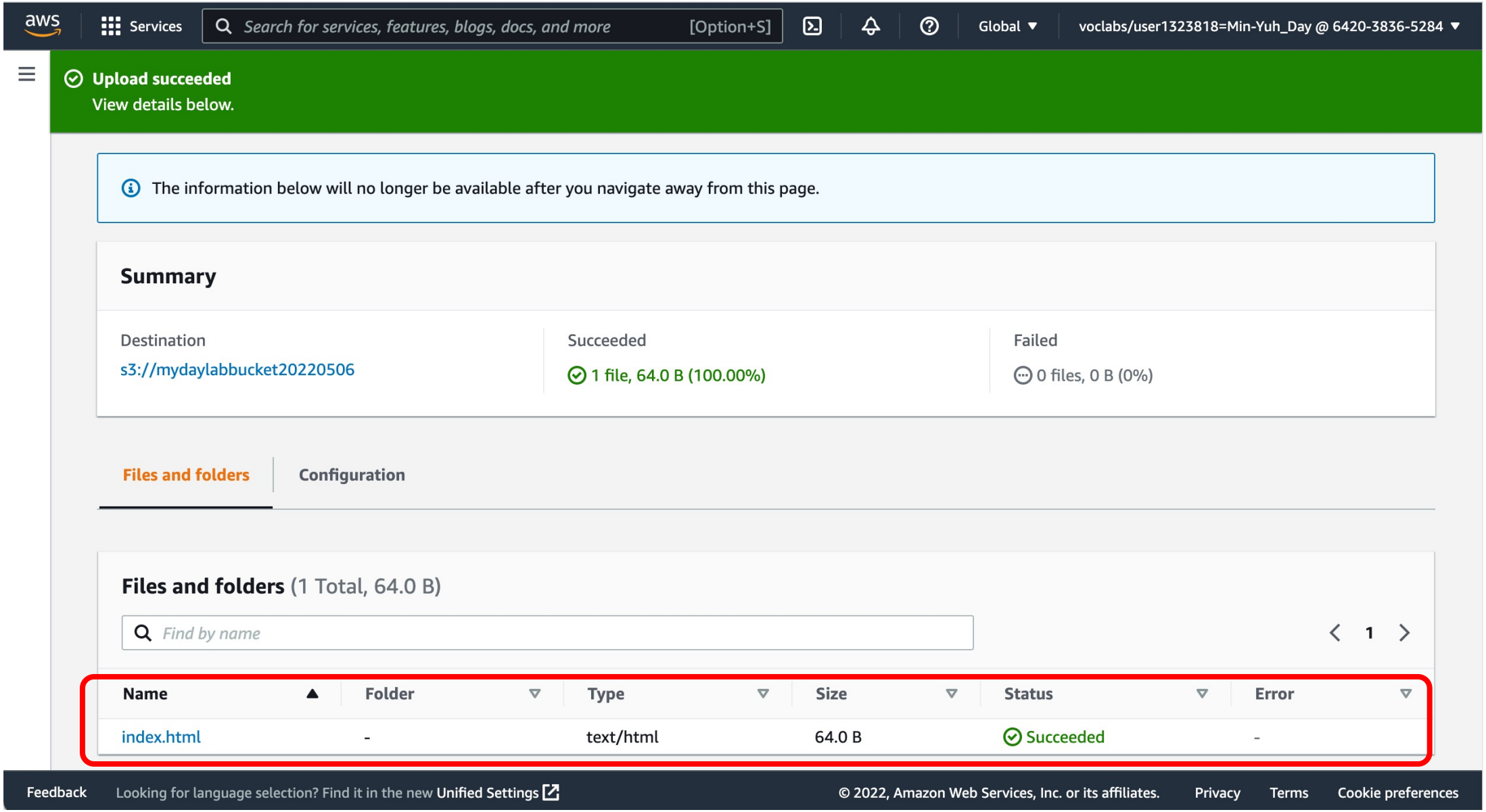
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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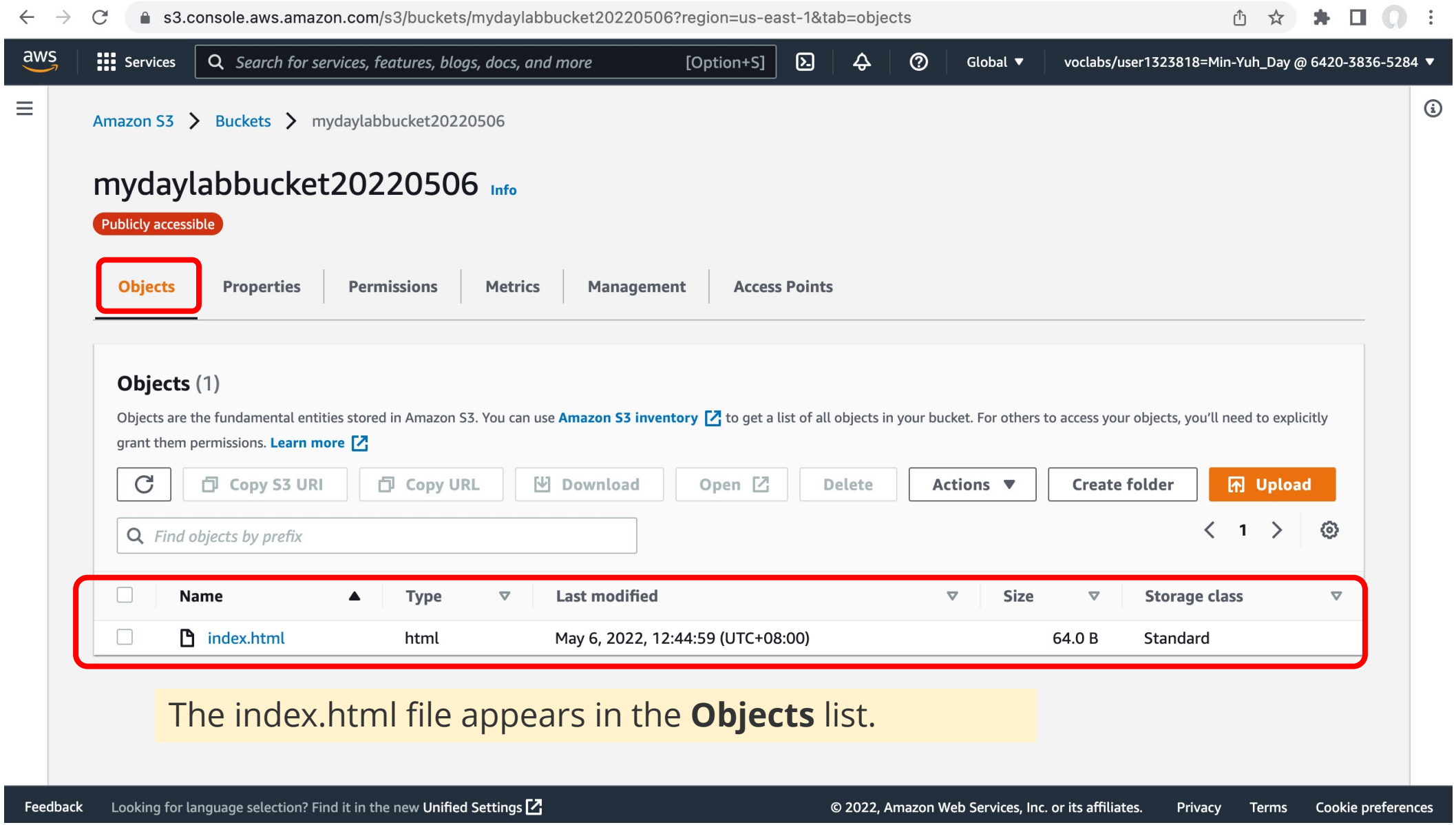
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



The index.html file appears in the **Objects** list.

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Task 4. Test your website

24. Select the **Properties** tab, and scroll down to the **Static website hosting** section.

25. Choose **Edit**.

26. Select **Enable**.

27. In the **Index document** text box, enter index.html

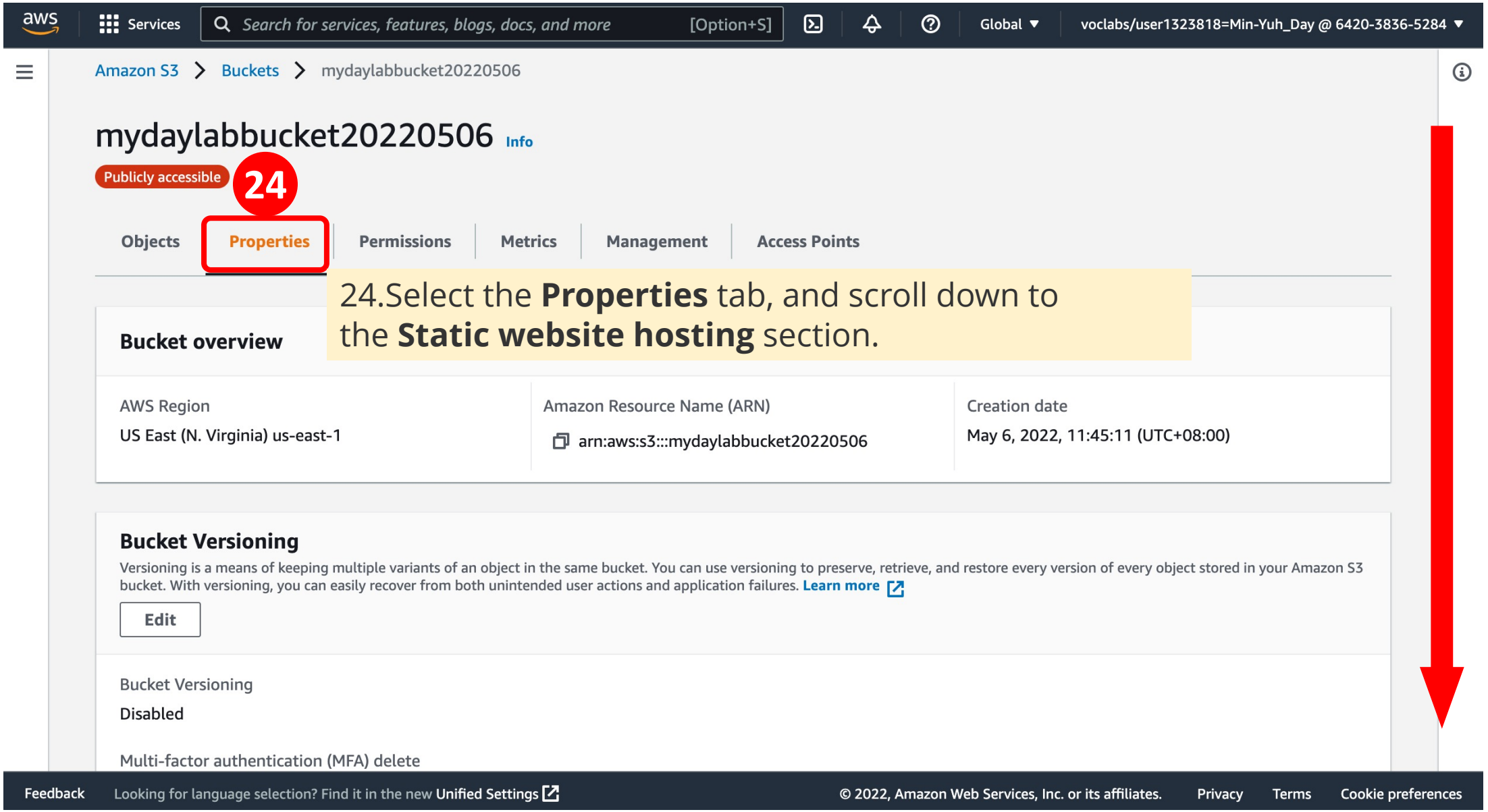
28. Select **Save changes**.

29. Scroll down to the **Static website hosting** section again, and copy the **Bucket website endpoint** URL to your clipboard.

30. Open a new tab in your web browser, paste the URL you just copied, and press **Enter**.

    The **Hello World** webpage should display. You have successfully hosted a static website using an S3 bucket!

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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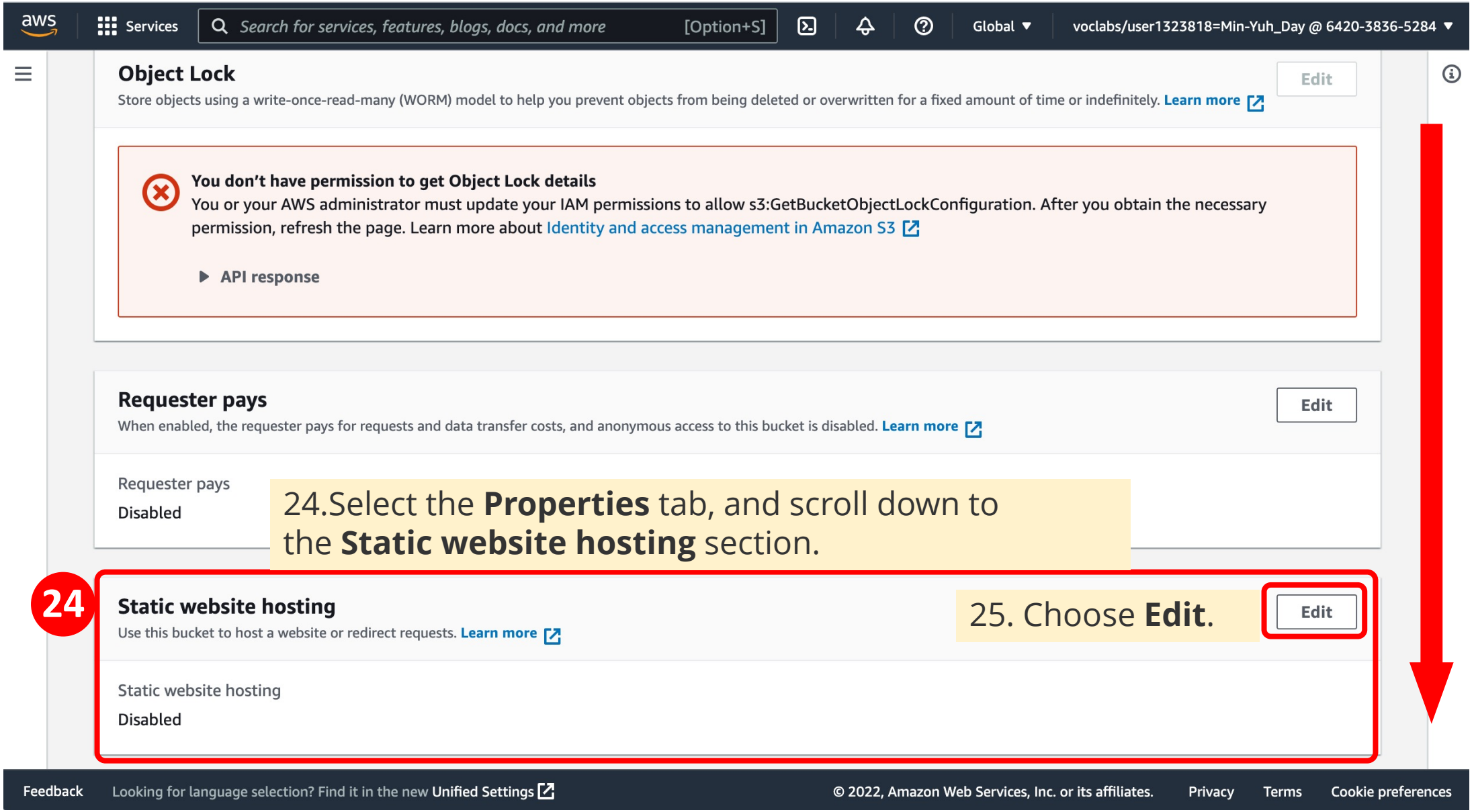
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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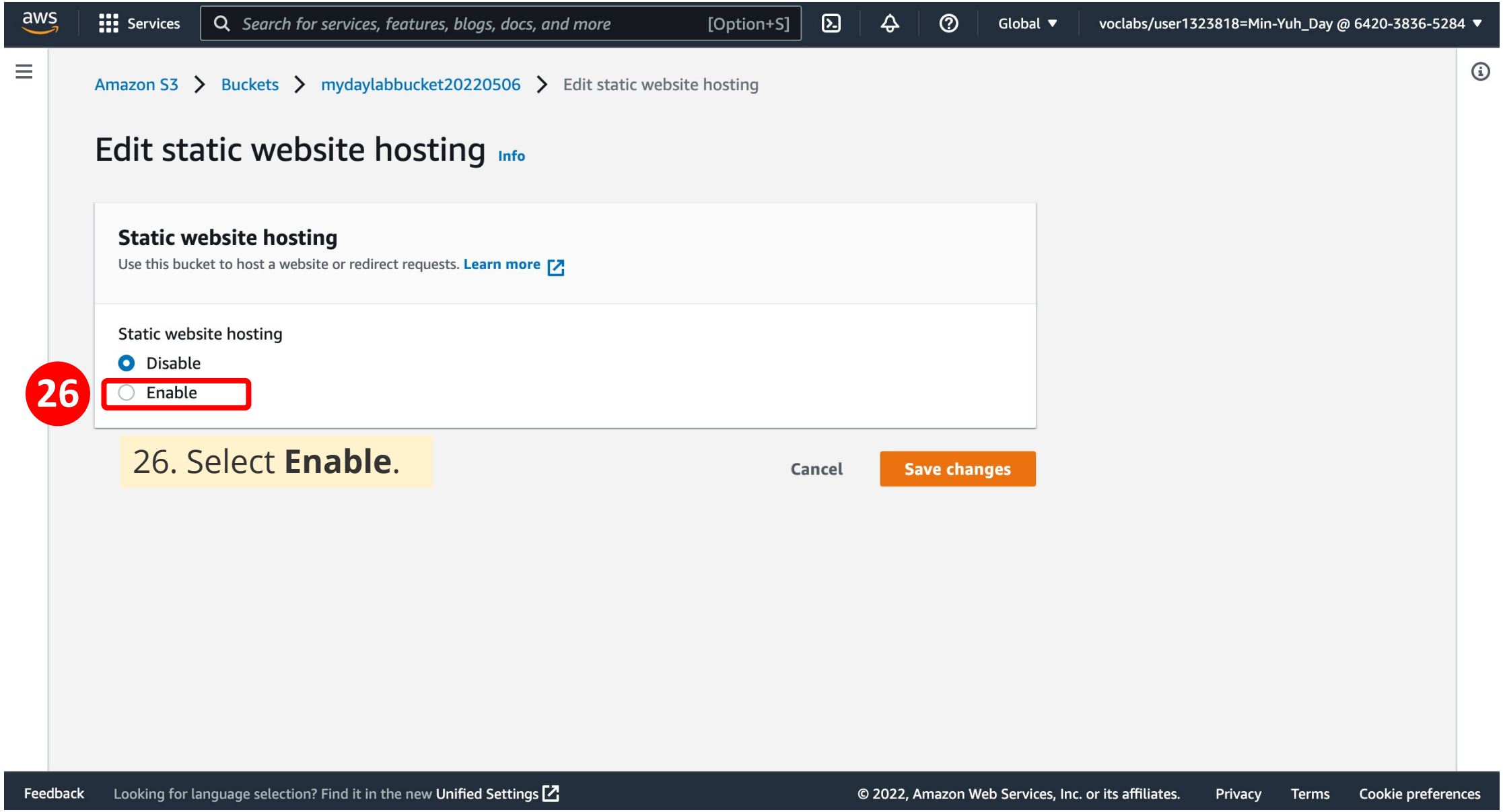
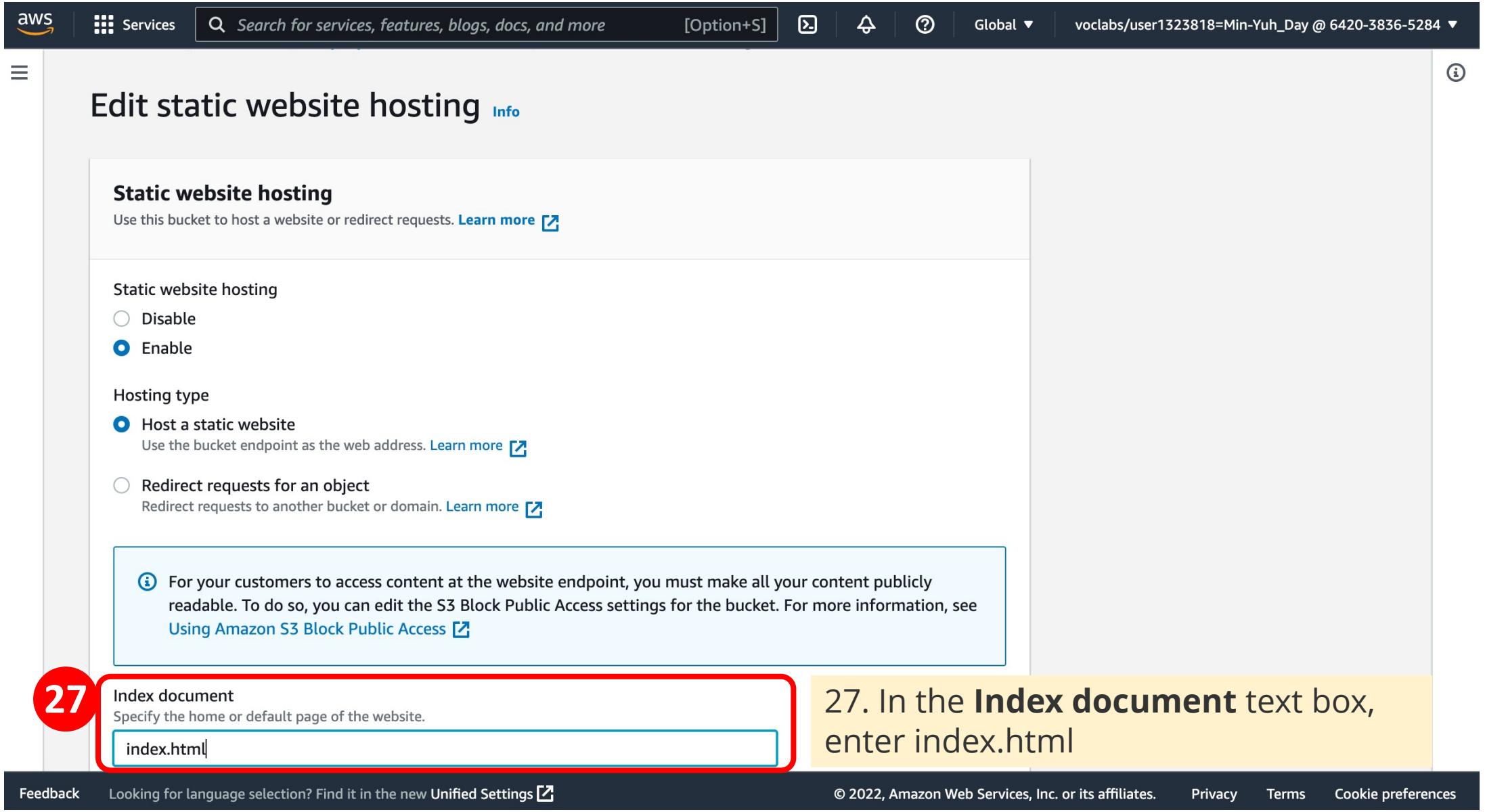
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

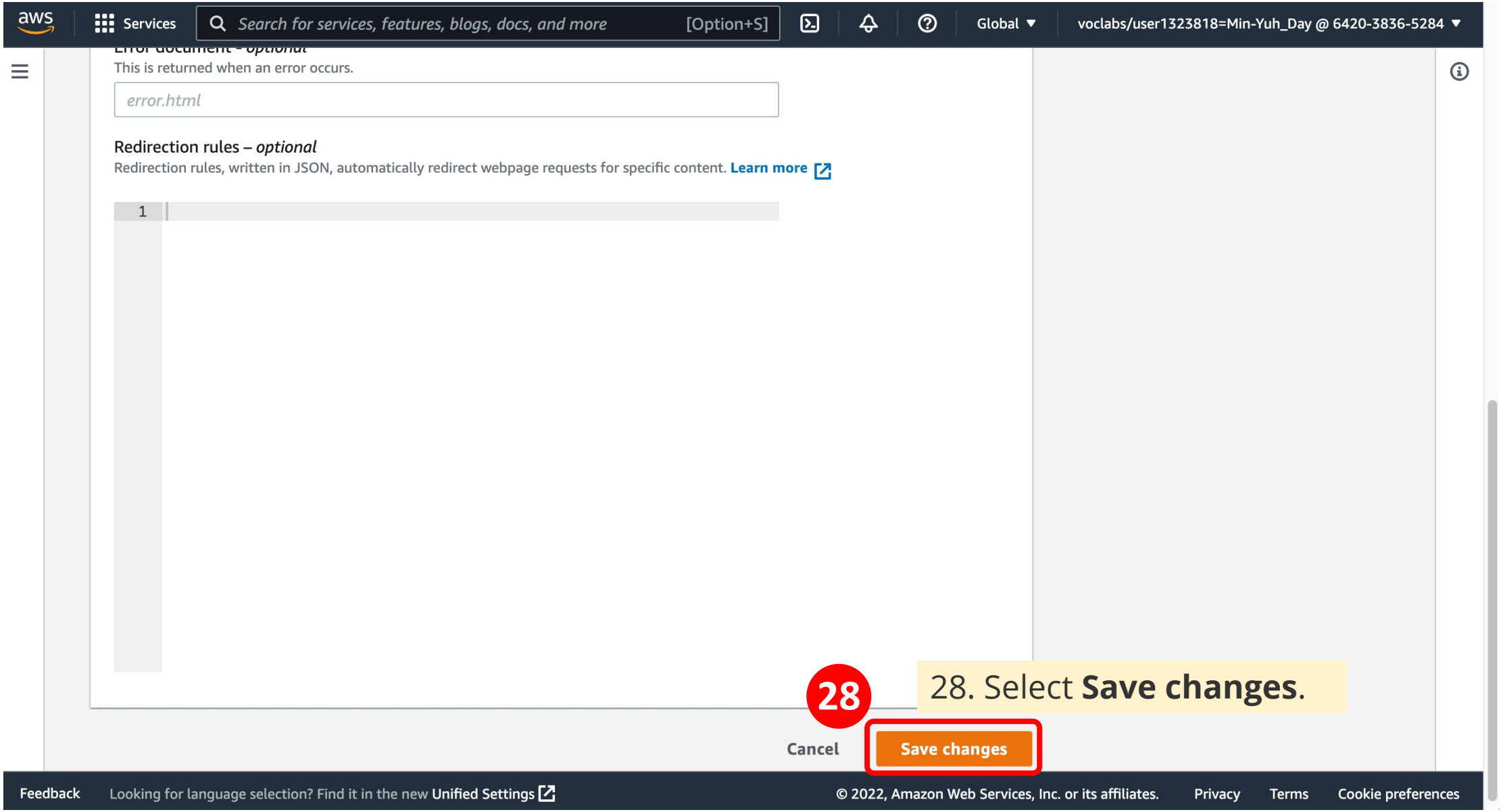
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



27. In the **Index document** text box, enter index.html

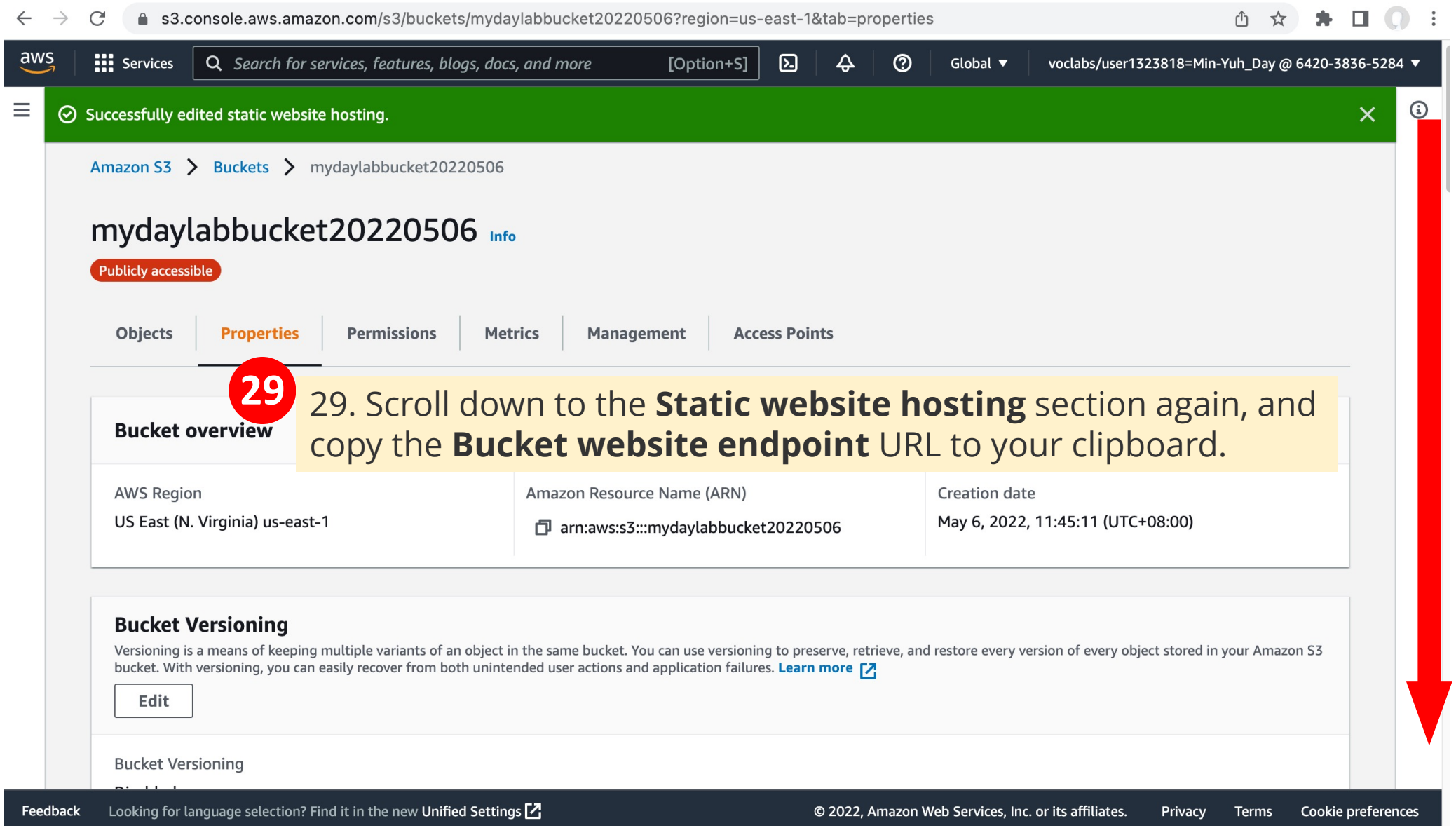
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



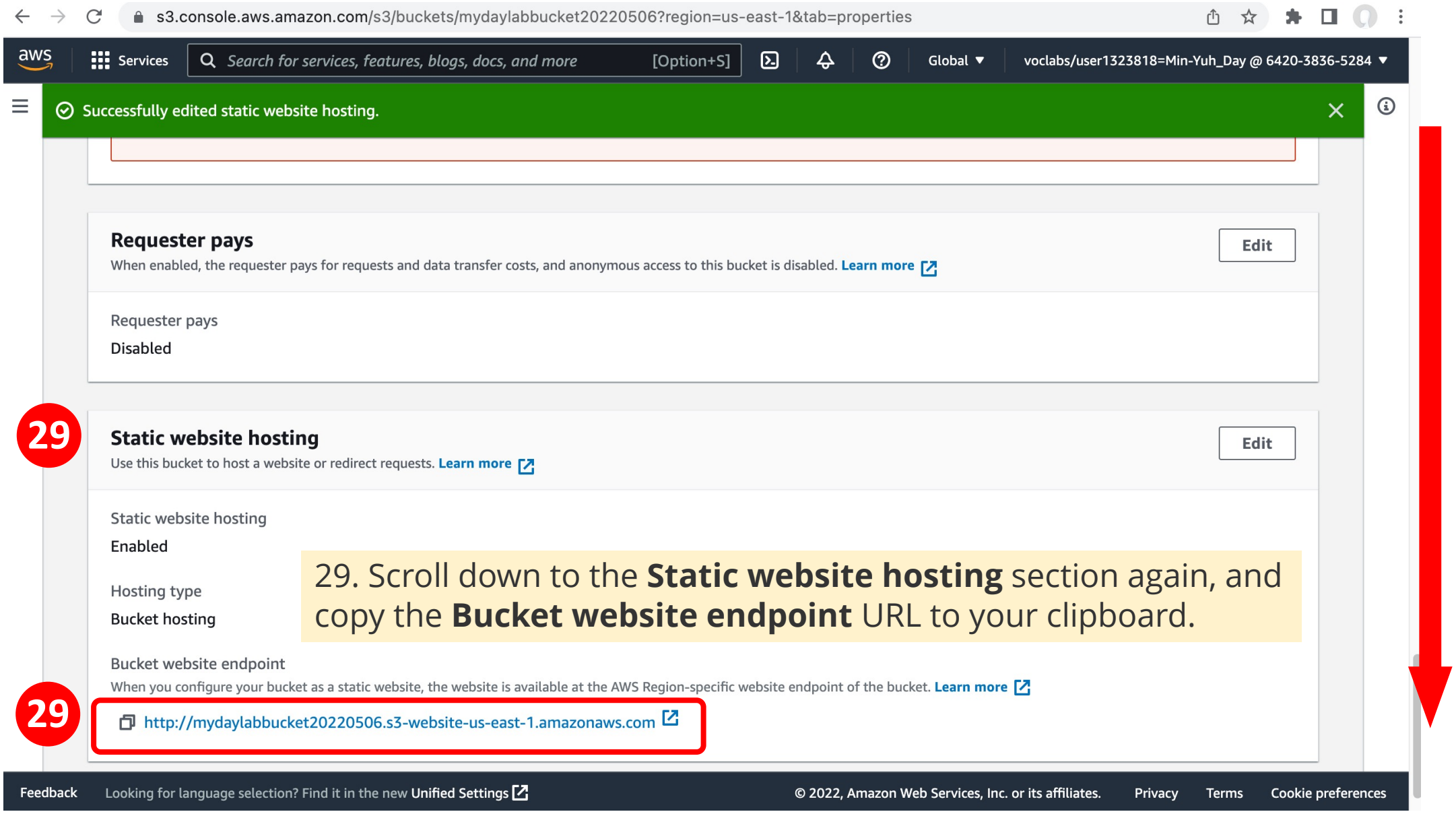
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

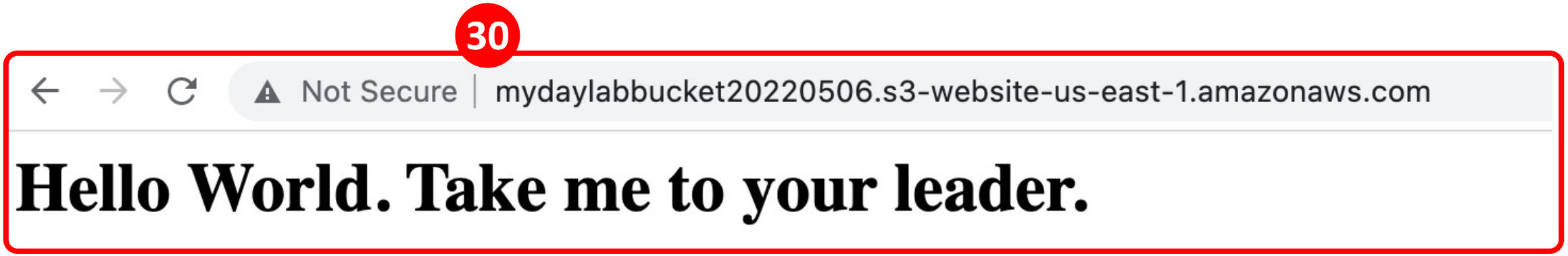
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

http://mydaylabbucket20220506.s3-website-us-east-1.amazonaws.com/



30. Open a new tab in your web browser, paste the URL you just copied, and press **Enter**. The **Hello World** webpage should display. You have successfully hosted a static website using an S3 bucket!

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

Task 5. Create a CloudFront distribution to serve your website

In this task, you will create an Amazon CloudFront distribution to serve your website.

31. Choose the **Services** menu, locate the **Networking & Content Delivery** section, and choose **CloudFront**.

32. Choose **Create Distribution**.

33. Under **Web**, choose **Get Started**.

34. Choose the text box next to **Origin Domain Name** and select the endpoint from your S3 bucket.

35. For **Viewer Protocol Policy**, ensure that **HTTP and HTTPS** is selected.

36. Scroll to the bottom of the page and select **Create Distribution**.

    A new CloudFront distribution displays in the distributions list. The **Status** will say *In Progress* until your website has been distributed. This may take up to 20 minutes.

    When the **Status** says *Deployed*, you can test your distribution.

37. Copy the **Domain Name** value for your distribution and save it to a text editor to use in a later step.

Task 5. Create a CloudFront distribution to serve your website

38. Create a new HTML file to test the distribution.
    Find and download an image from the internet.
    Navigate to your S3 bucket and upload the image file to it, making sure to grant public access as you did when uploading the HTML file earlier in this lab.
    Create a new text file using Notepad and copy the following text into it:

```
<html>
    <head>My CloudFront Test</head>
    <body> <p>My test content goes here.</p>
           <p><img src="http://domain-name/object-name" alt="my test image">
    </body>
</html>
```

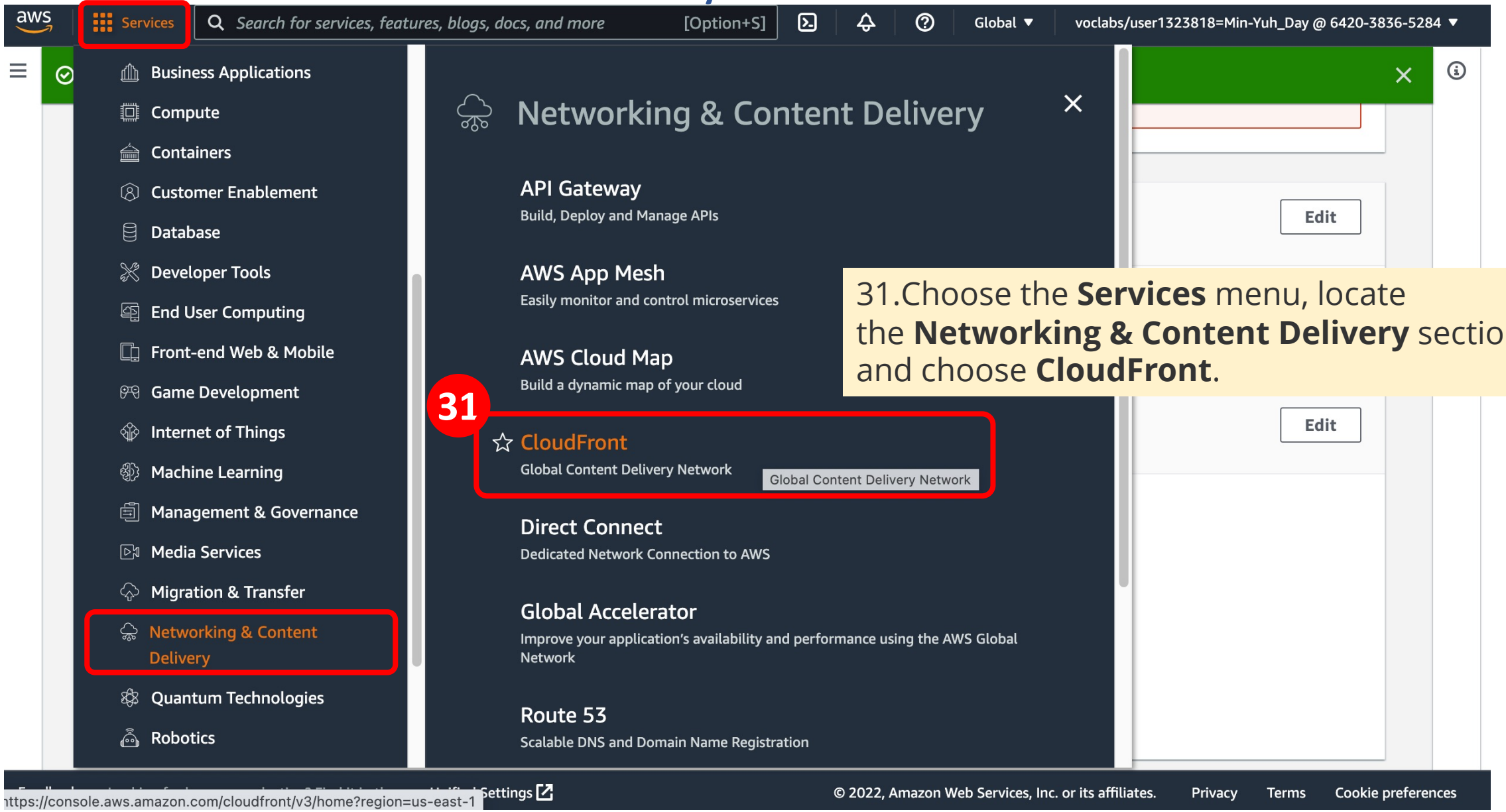
    Replace **domain-name** with the domain name that you copied earlier for your CloudFront distribution.
    Replace **object-name** with the file name of the picture file that you uploaded to your S3 bucket.
    The edited line of code should look similar to the following:

```
<p><img src="http://d2f1zrxb2zaf30.cloudfront.net/picture.jpg" alt="my test image">
```

    Save the text file with an HTML extension.
39. Use an internet browser to open the HTML file that you just created.

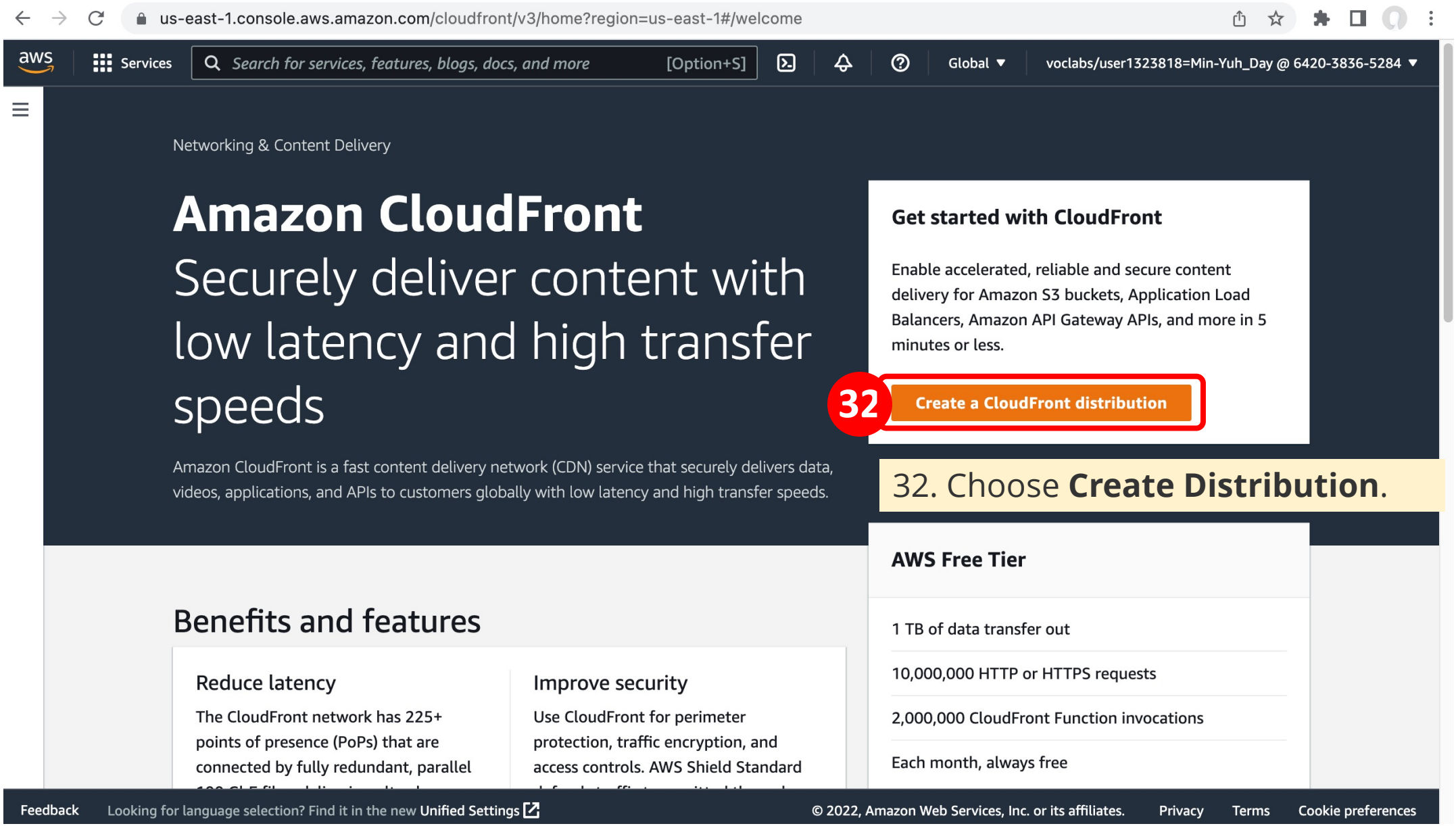
If the image that you uploaded shows, your CloudFront distribution was successful. If not, repeat the lab.

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



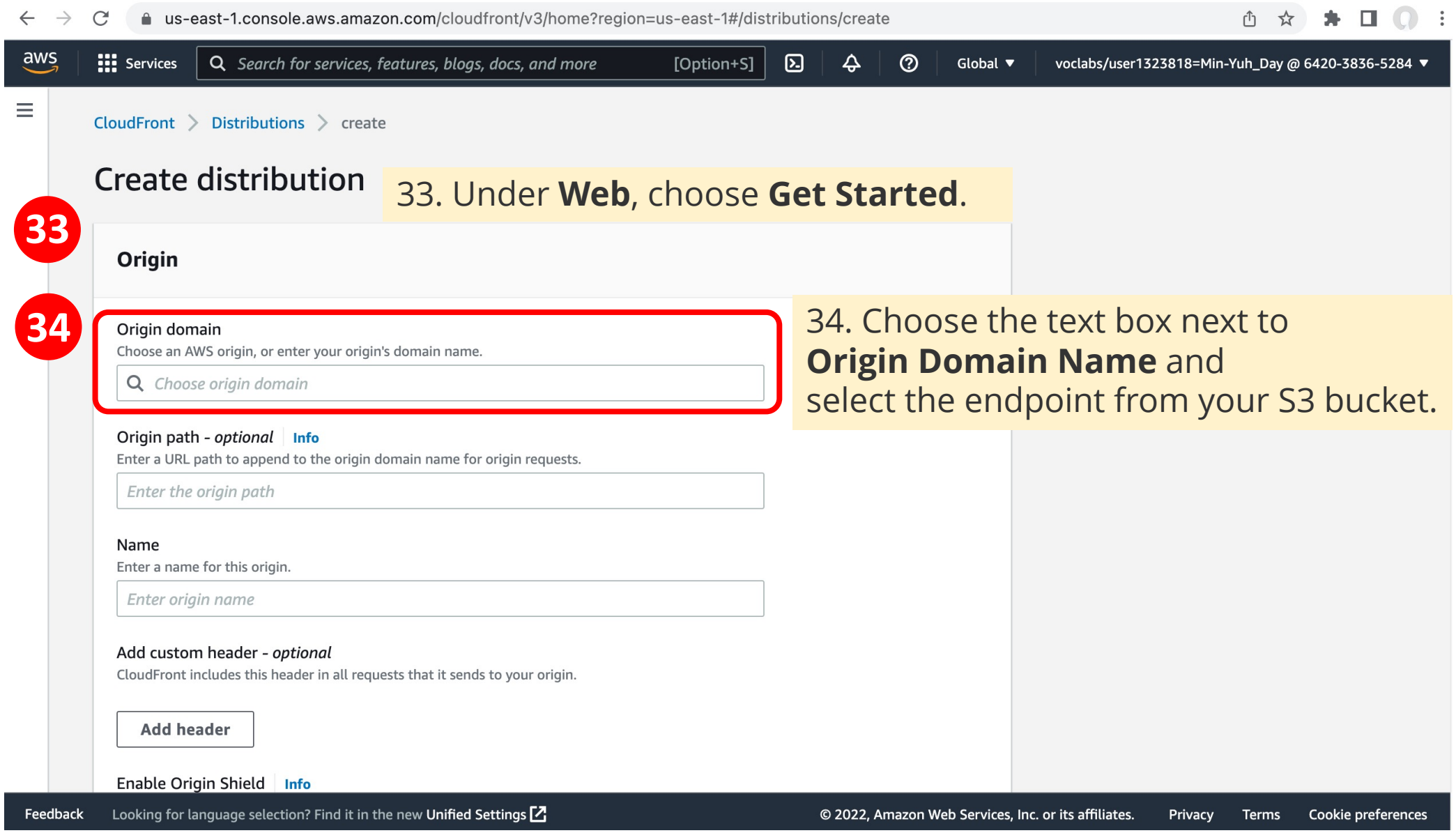
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



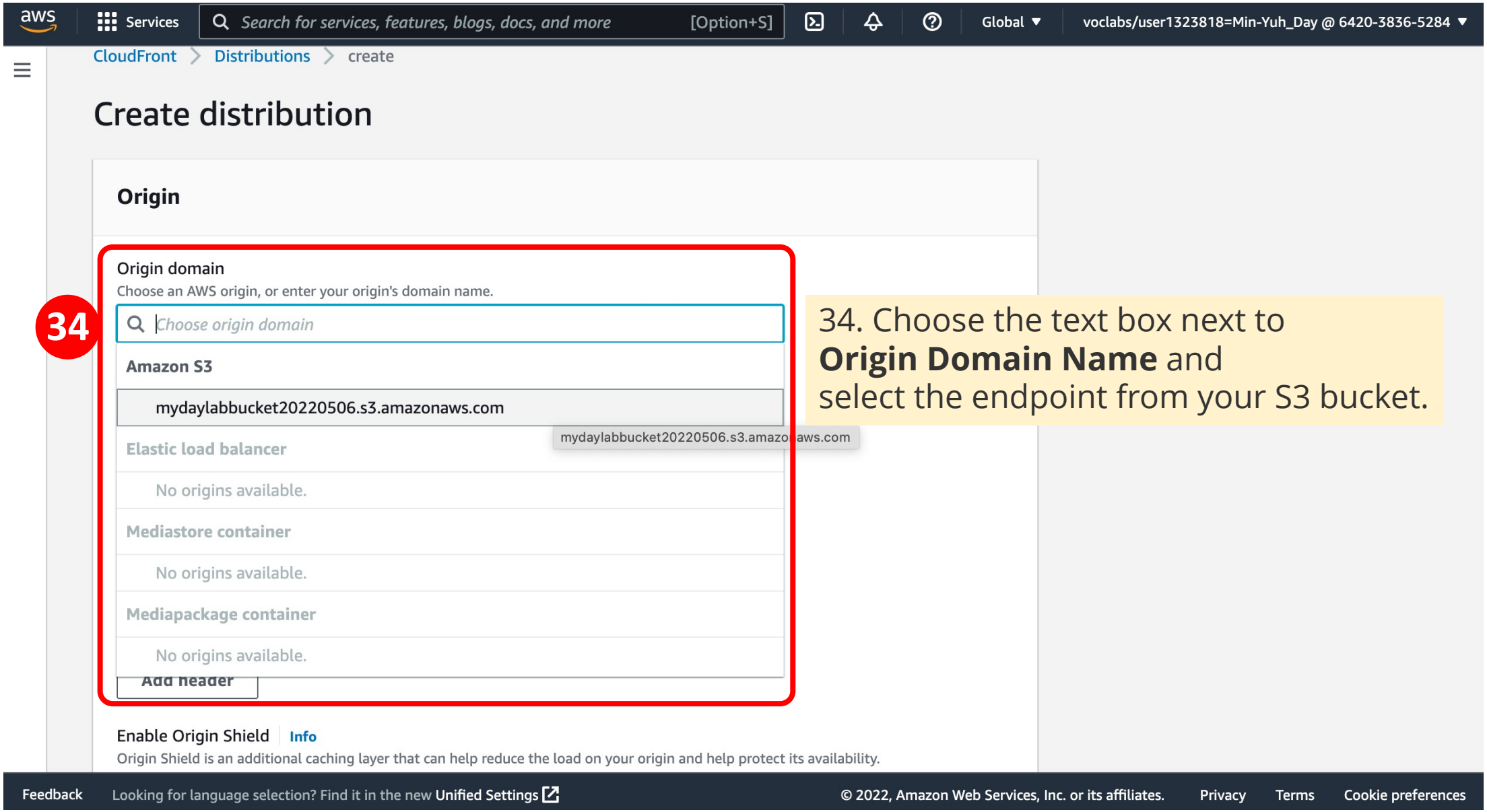
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

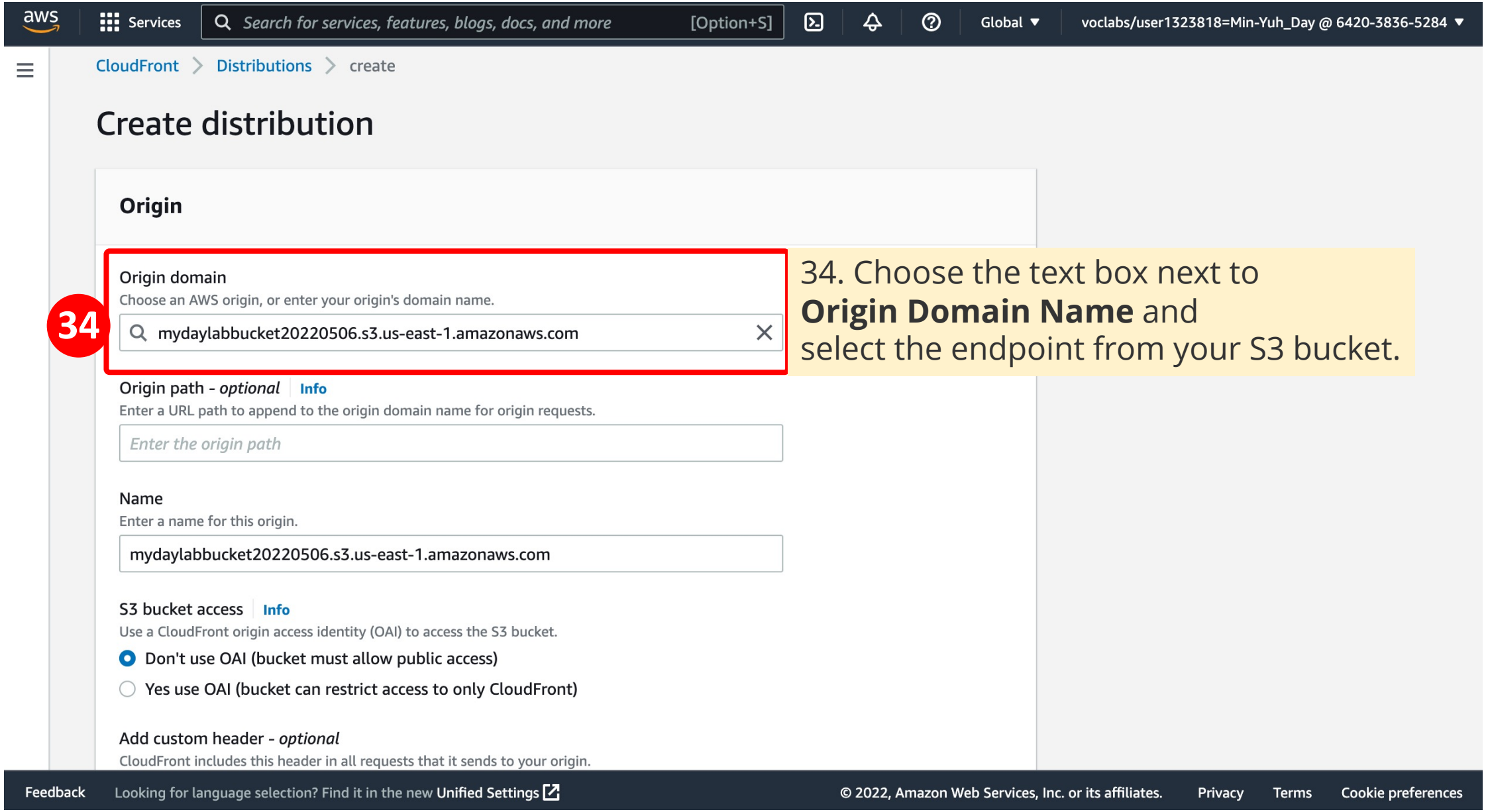
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



34. Choose the text box next to **Origin Domain Name** and select the endpoint from your S3 bucket.

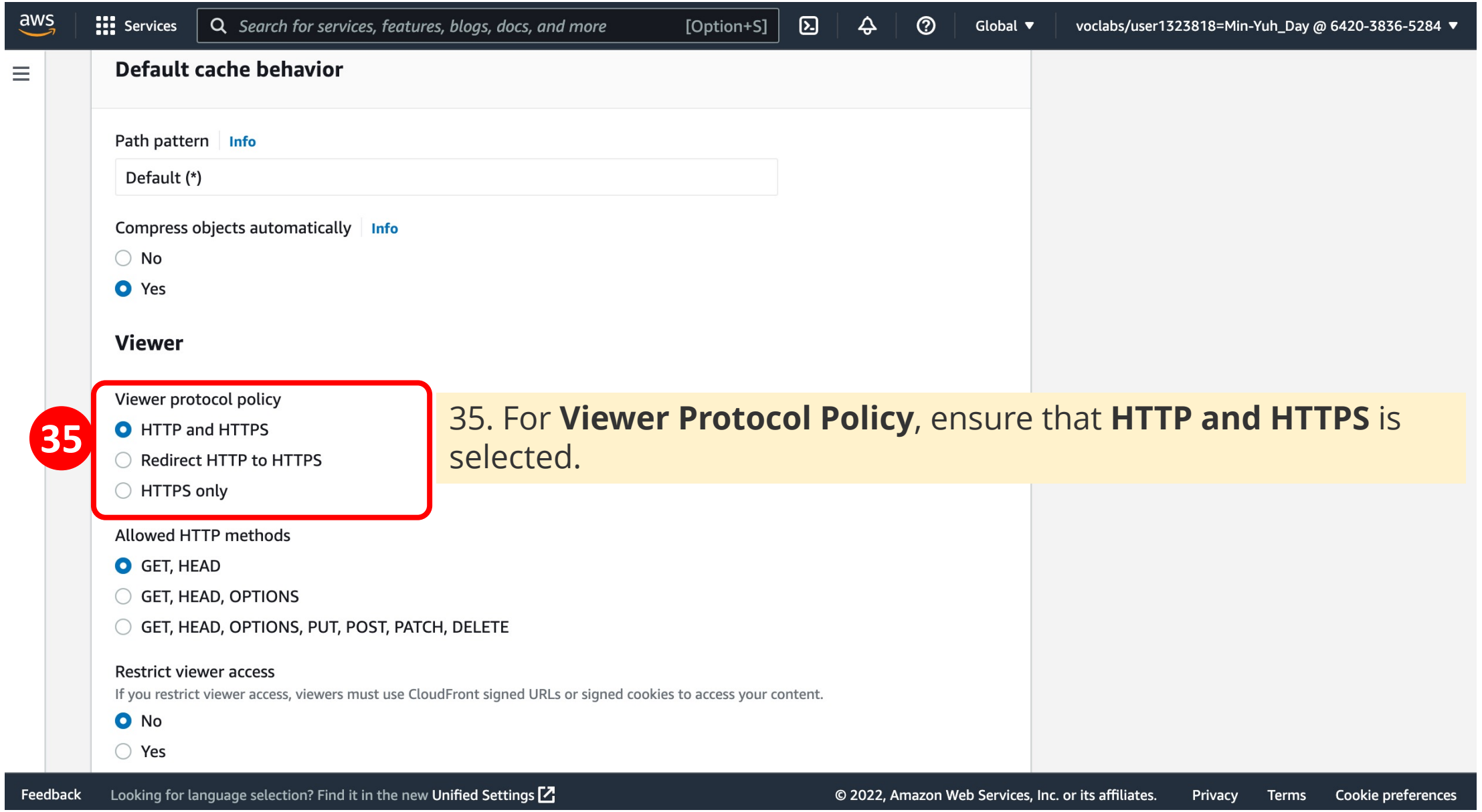
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

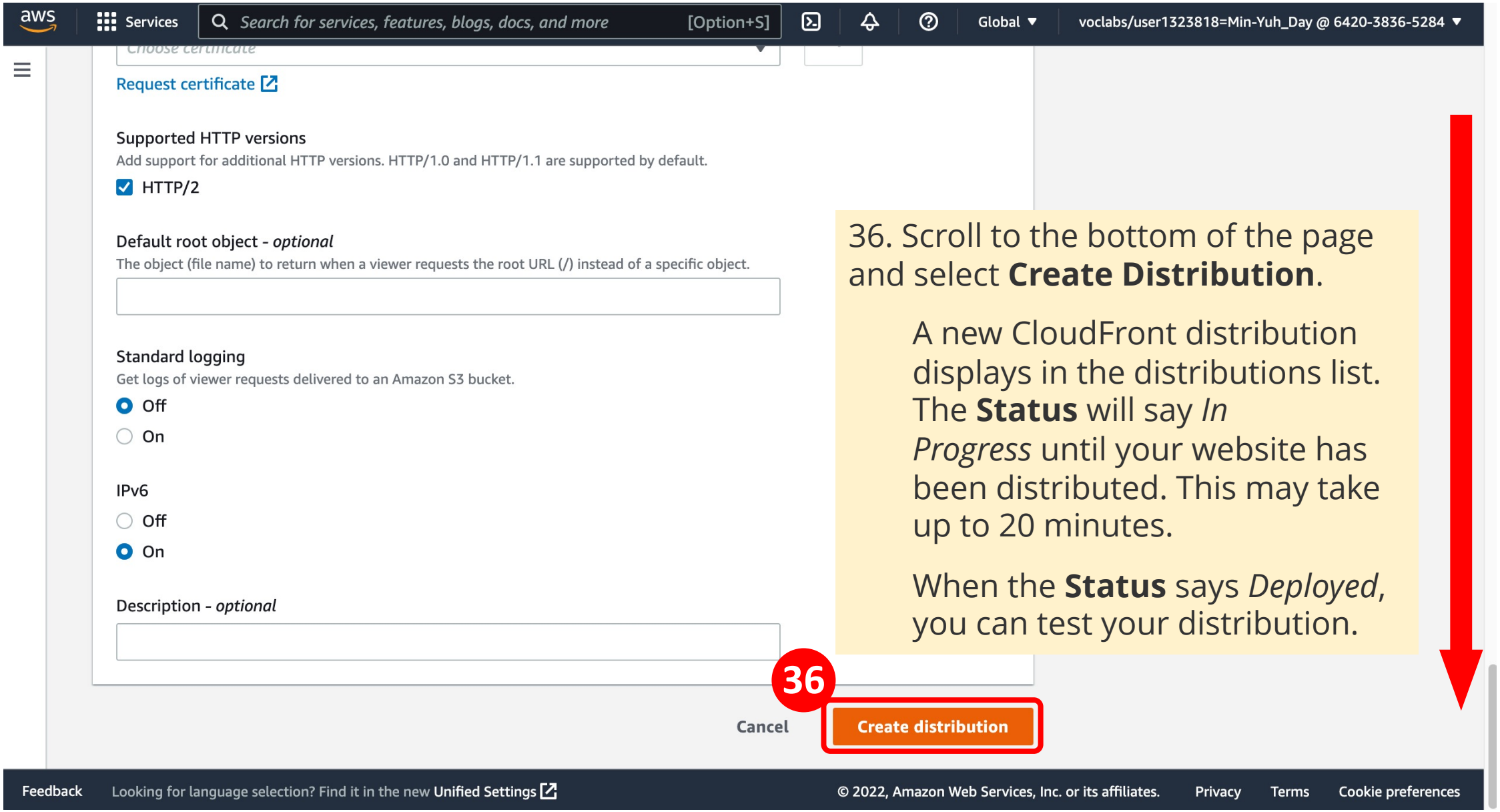
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



35. For **Viewer Protocol Policy**, ensure that **HTTP and HTTPS** is selected.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



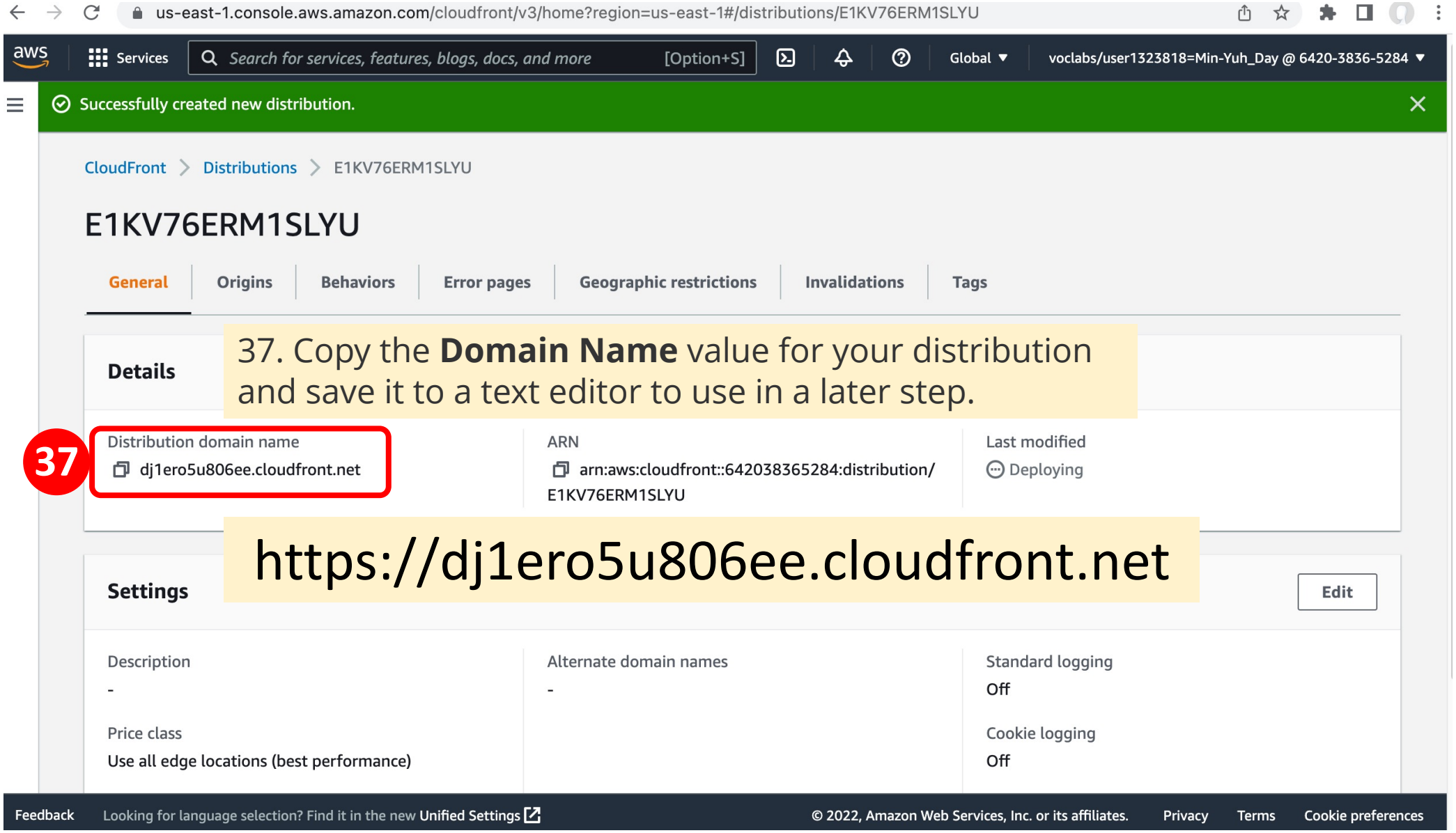
36. Scroll to the bottom of the page and select **Create Distribution**.

A new CloudFront distribution displays in the distributions list. The **Status** will say *In Progress* until your website has been distributed. This may take up to 20 minutes.

When the **Status** says *Deployed*, you can test your distribution.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

38. Create a new HTML file to test the distribution.

Find and download an image from the internet.
Navigate to your S3 bucket and upload the image file to it, making sure to grant public access as you did when uploading the HTML file earlier in this lab.
Create a new text file using Notepad and copy the following text into it:

```
<html>
    <head>My CloudFront Test</head>
    <body> <p>My test content goes here.</p>
            <p><img src="http://domain-name/object-name" alt="my test image">
    </body>
</html>
```

Replace **domain-name** with the domain name that you copied earlier for your CloudFront distribution.
Replace **object-name** with the file name of the picture file that you uploaded to your S3 bucket.
The edited line of code should look similar to the following:

```
<p><img src="http://d2f1zrxb2zaf30.cloudfront.net/picture.jpg" alt="my test image">
```

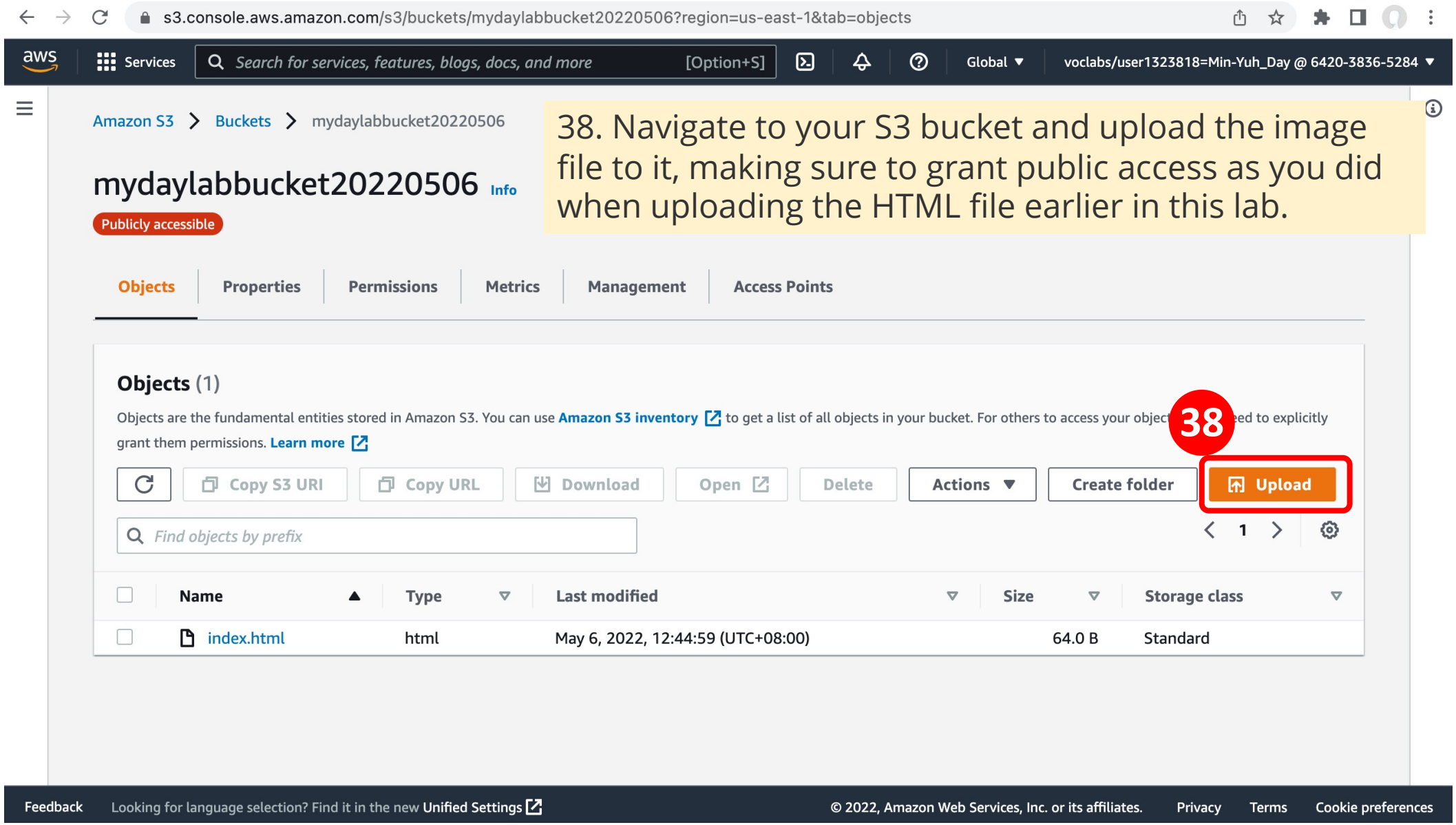
Save the text file with an HTML extension.

38

index2.html

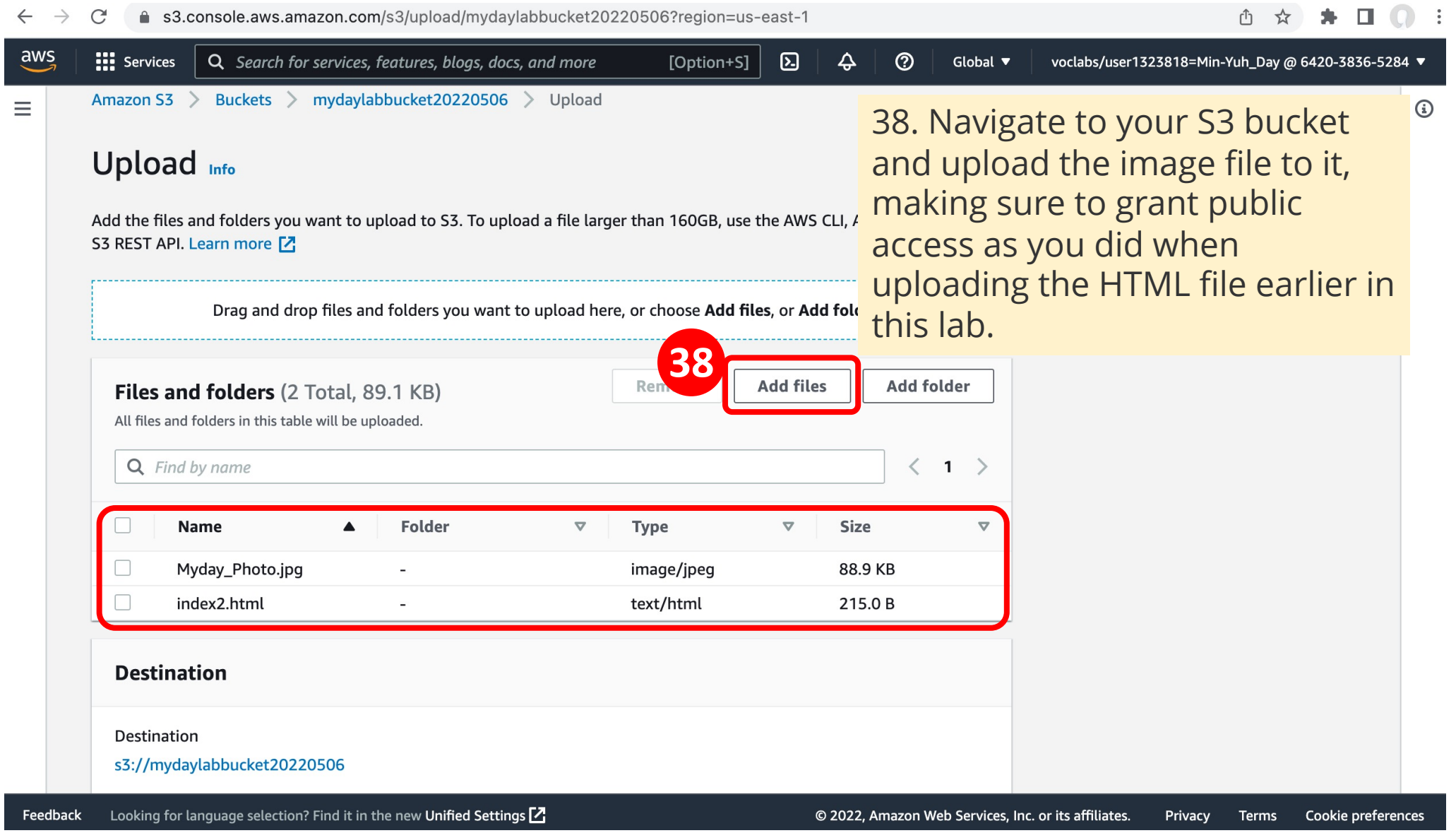
```
1  <html>
2      <head>My CloudFront Test</head>
3      <body>
4          <p>Min-Yuh Day at AWS S3 CloudFront</p>
5          <p><img src="https://dj1ero5u806ee.cloudfront.net/Myday_Photo.jpg" alt="Myday image">
6      </body>
7  </html>
```

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

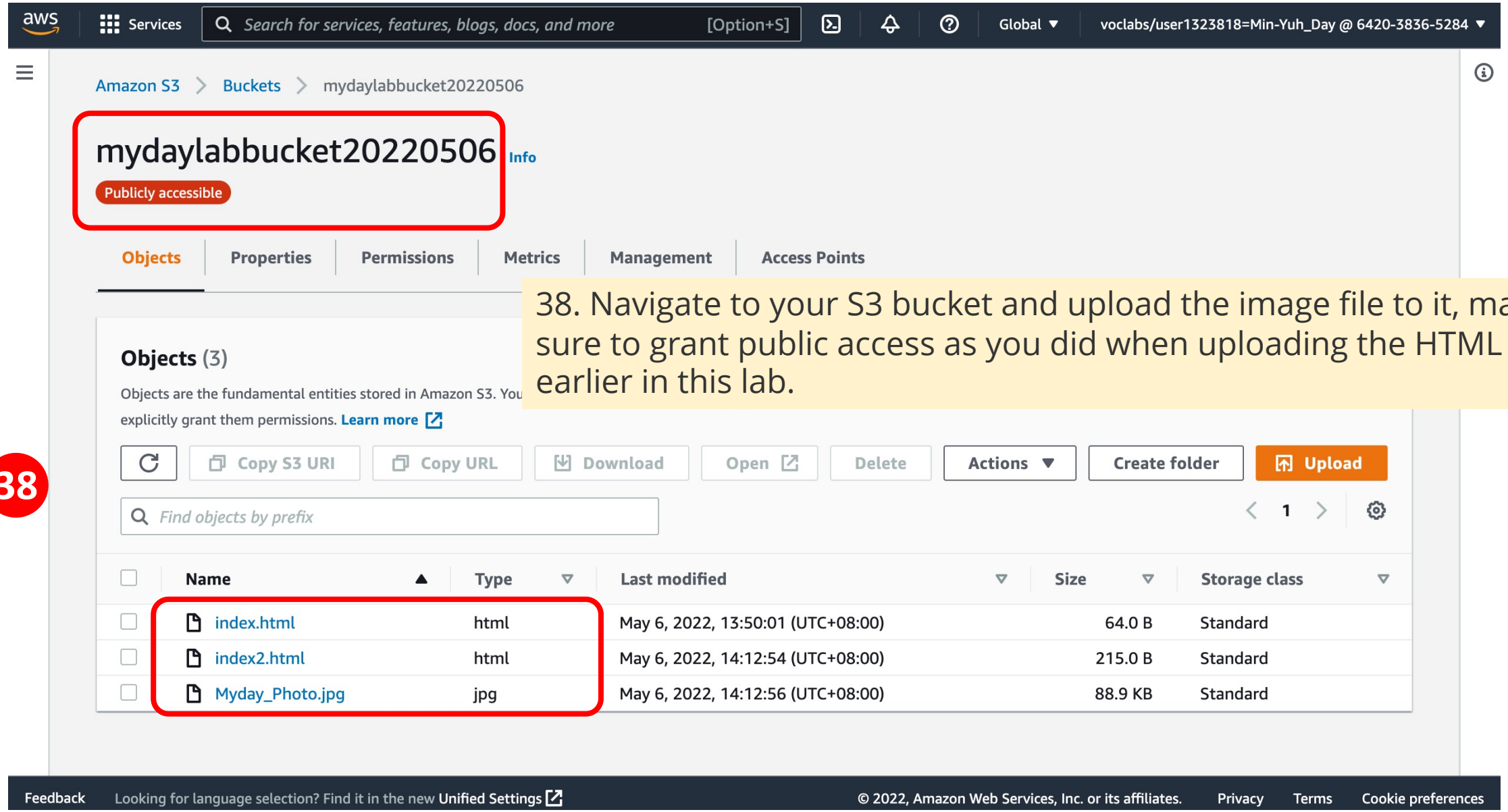
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



38. Navigate to your S3 bucket and upload the image file to it, making sure to grant public access as you did when uploading the HTML file earlier in this lab.

Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

39 https://dj1ero5u806ee.cloudfront.net/index2.html

39. Use an internet browser to open the HTML file that you just created.
If the image that you uploaded shows, your CloudFront distribution was successful. If not, repeat the lab.

index2.html

```
1  <html>
2      <head>My CloudFront Test</head>
3      <body>
4          <p>Min-Yuh Day at AWS S3 CloudFront</p>
5          <p><img src="https://dj1ero5u806ee.cloudfront.net/Myday_Photo.jpg" alt="Myday image">
6      </body>
7  </html>
```

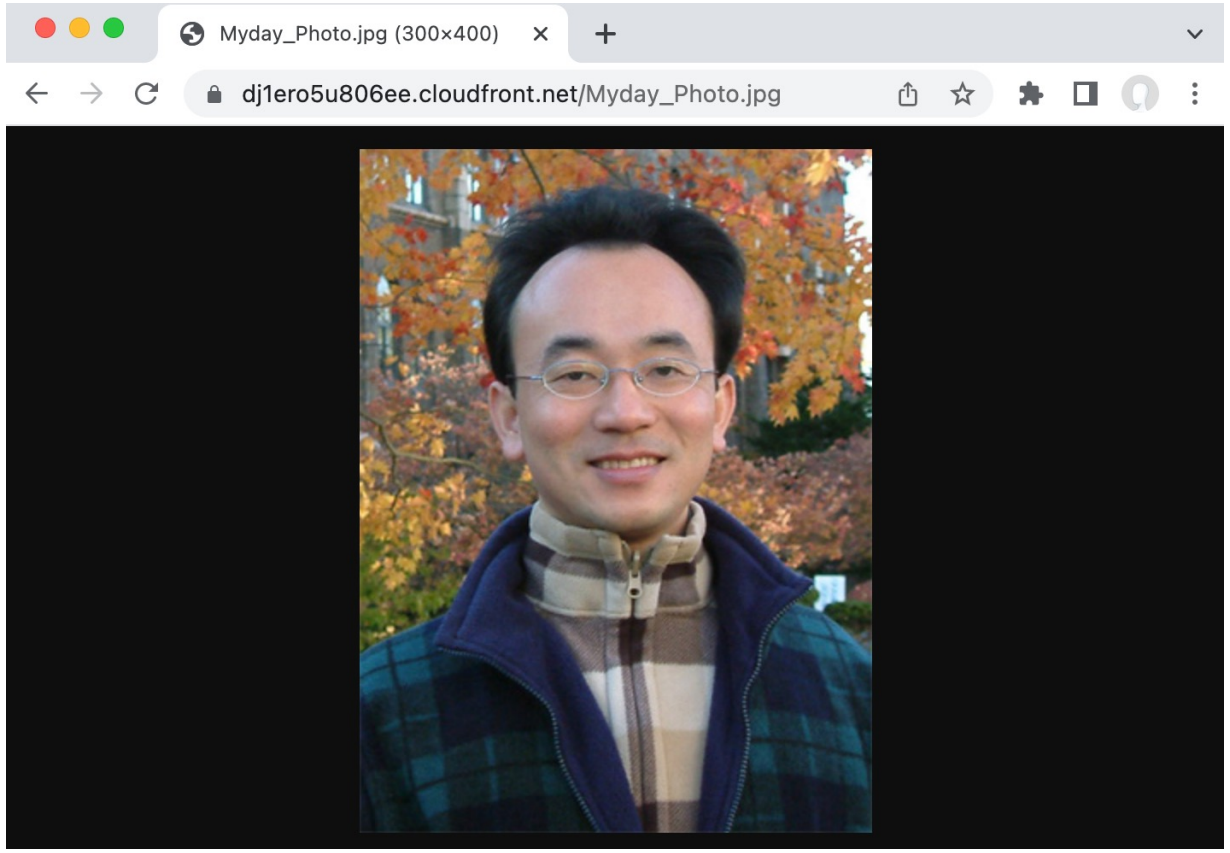
```
<html>
    <head>My CloudFront Test</head>
    <body>
        <p>Min-Yuh Day at AWS S3 CloudFront</p>
        <p><img src="https://dj1ero5u806ee.cloudfront.net/Myday_Photo.jpg"
alt="Myday image">
    </body>
</html>
```

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

39. Use an internet browser to open the HTML file that you just created.
If the image that you uploaded shows, your CloudFront distribution was successful. If not, repeat the lab.

39

https://dj1ero5u806ee.cloudfront.net/Myday_Photo.jpg



Lab complete

Congratulations! You have completed the lab.

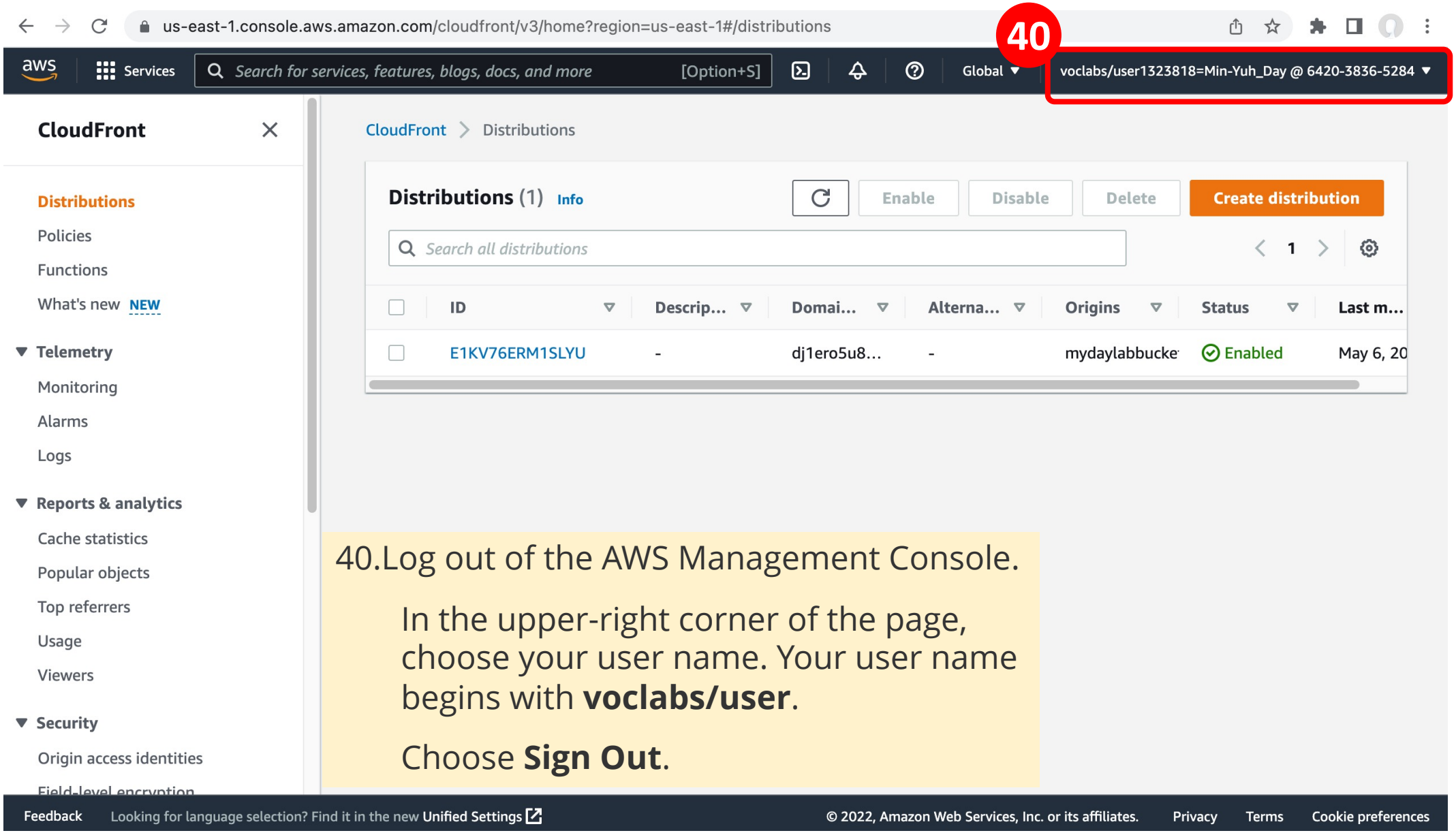
40. Log out of the AWS Management Console.

    In the upper-right corner of the page, choose your user name. Your user name begins with **voclabs/user**.

    Choose **Sign Out**.

41. Choose **End Lab** at the top of this page, and then select **Yes** to confirm that you want to end the lab.

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



40. Log out of the AWS Management Console.

    In the upper-right corner of the page, choose your user name. Your user name begins with **voclabs/user**.

    Choose **Sign Out**.

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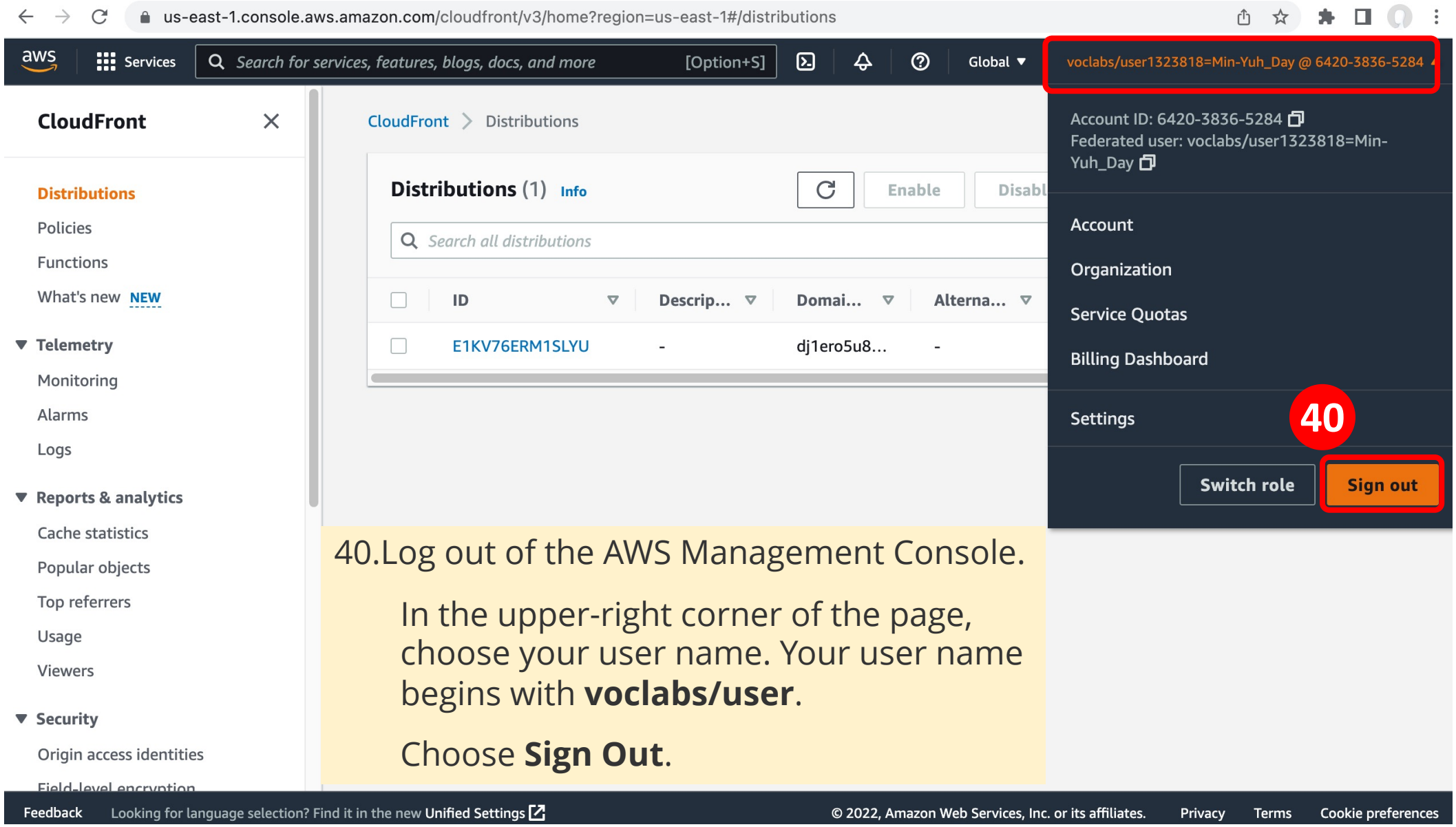
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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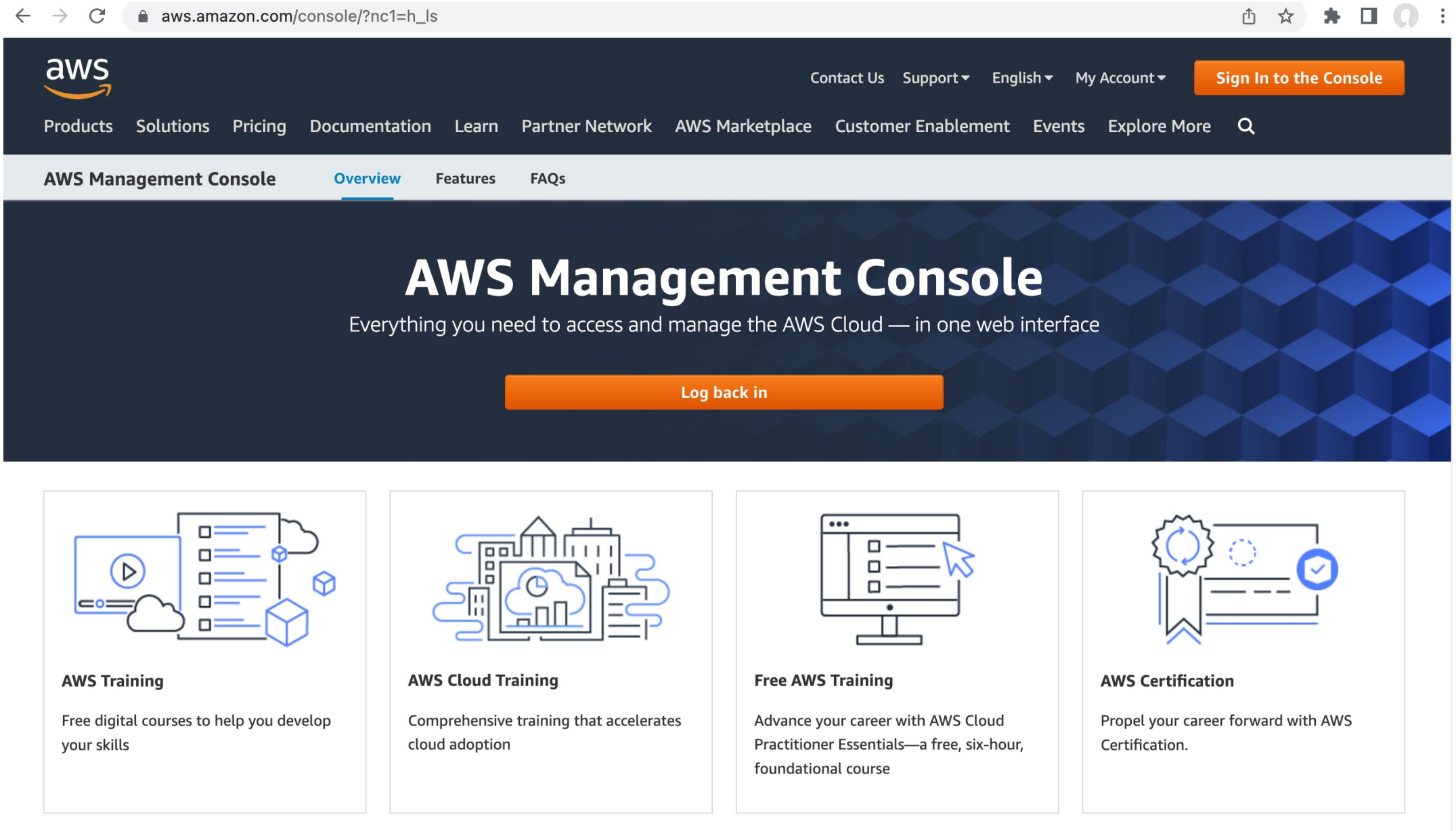
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



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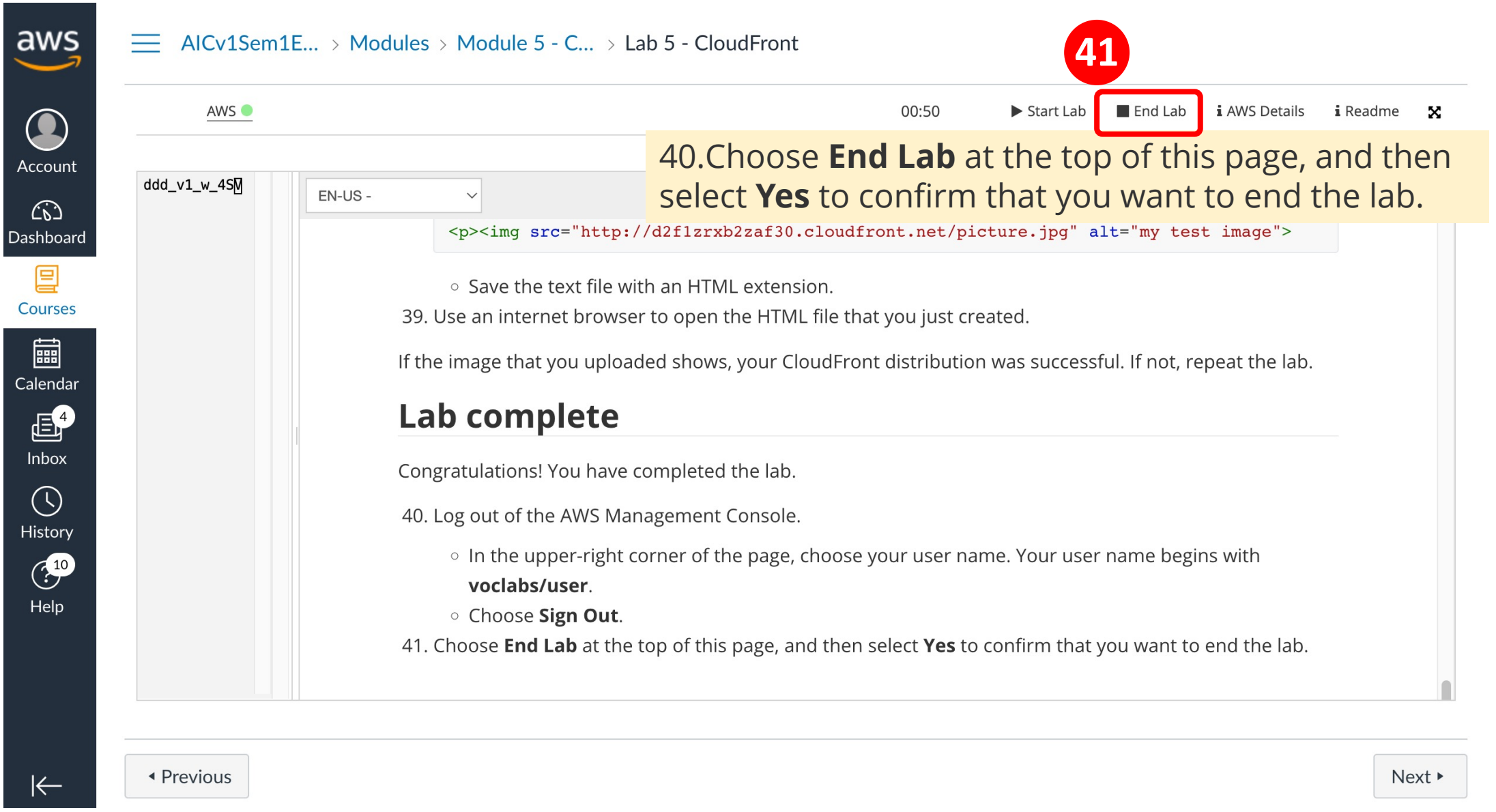
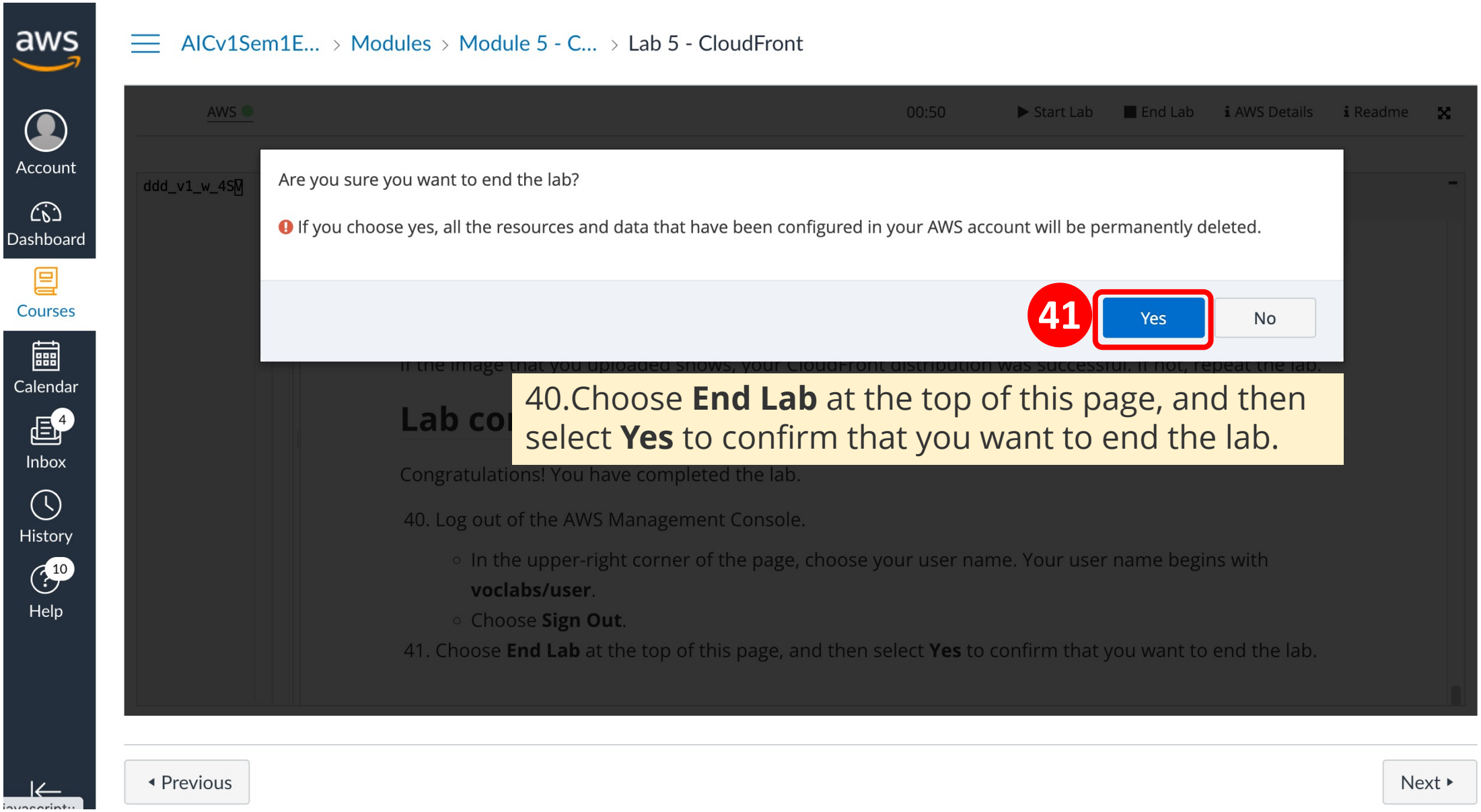
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

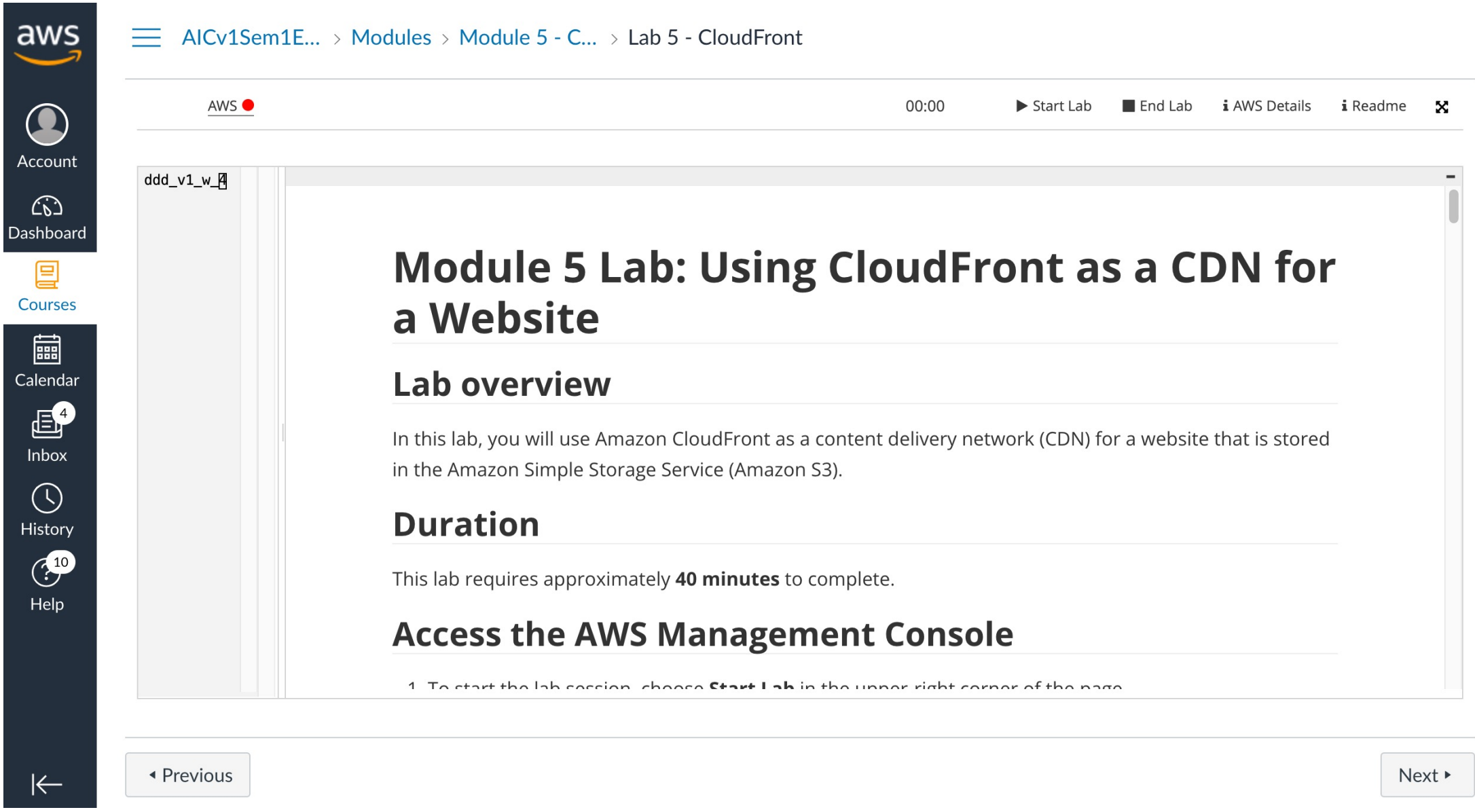


AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



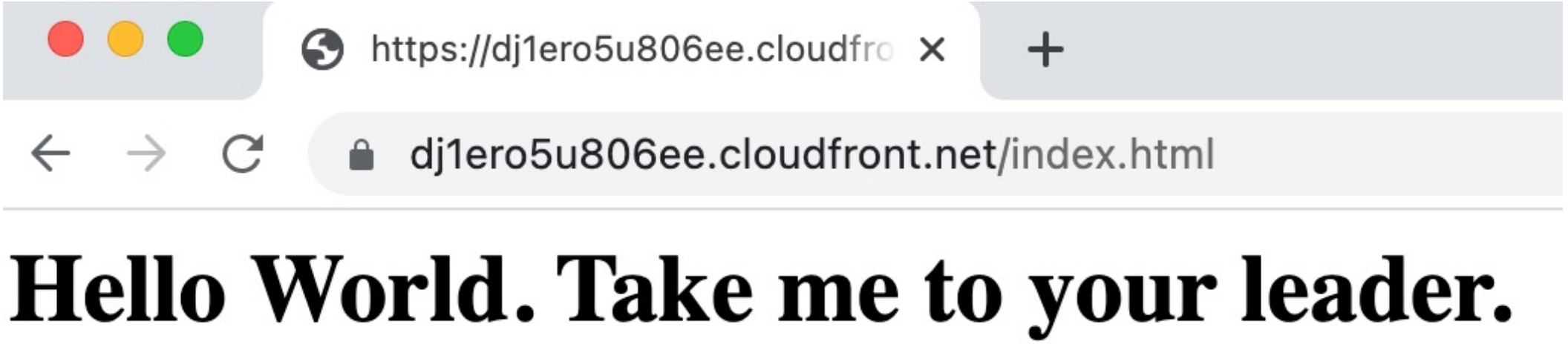
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



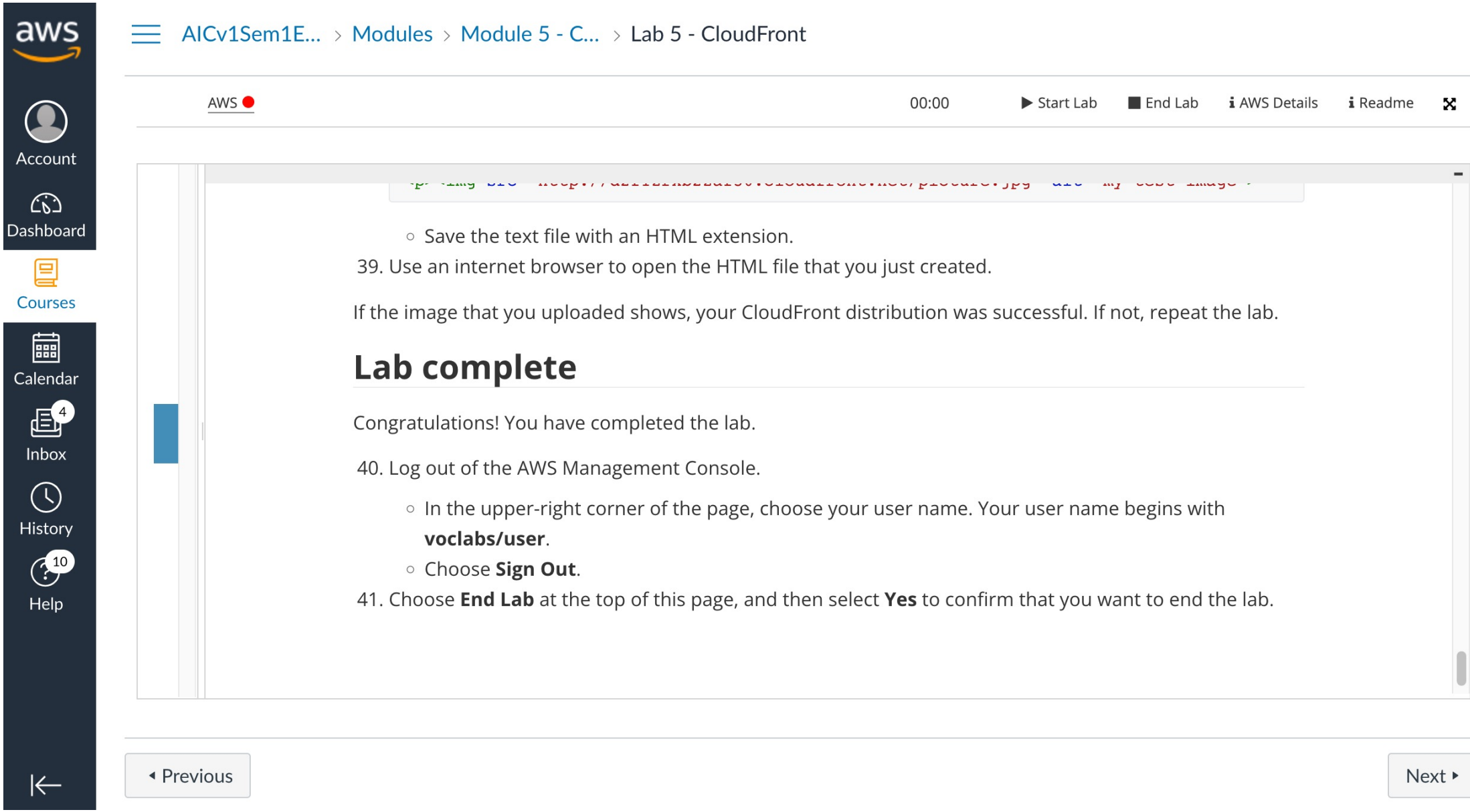
AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

https://dj1ero5u806ee.cloudfront.net/index.html



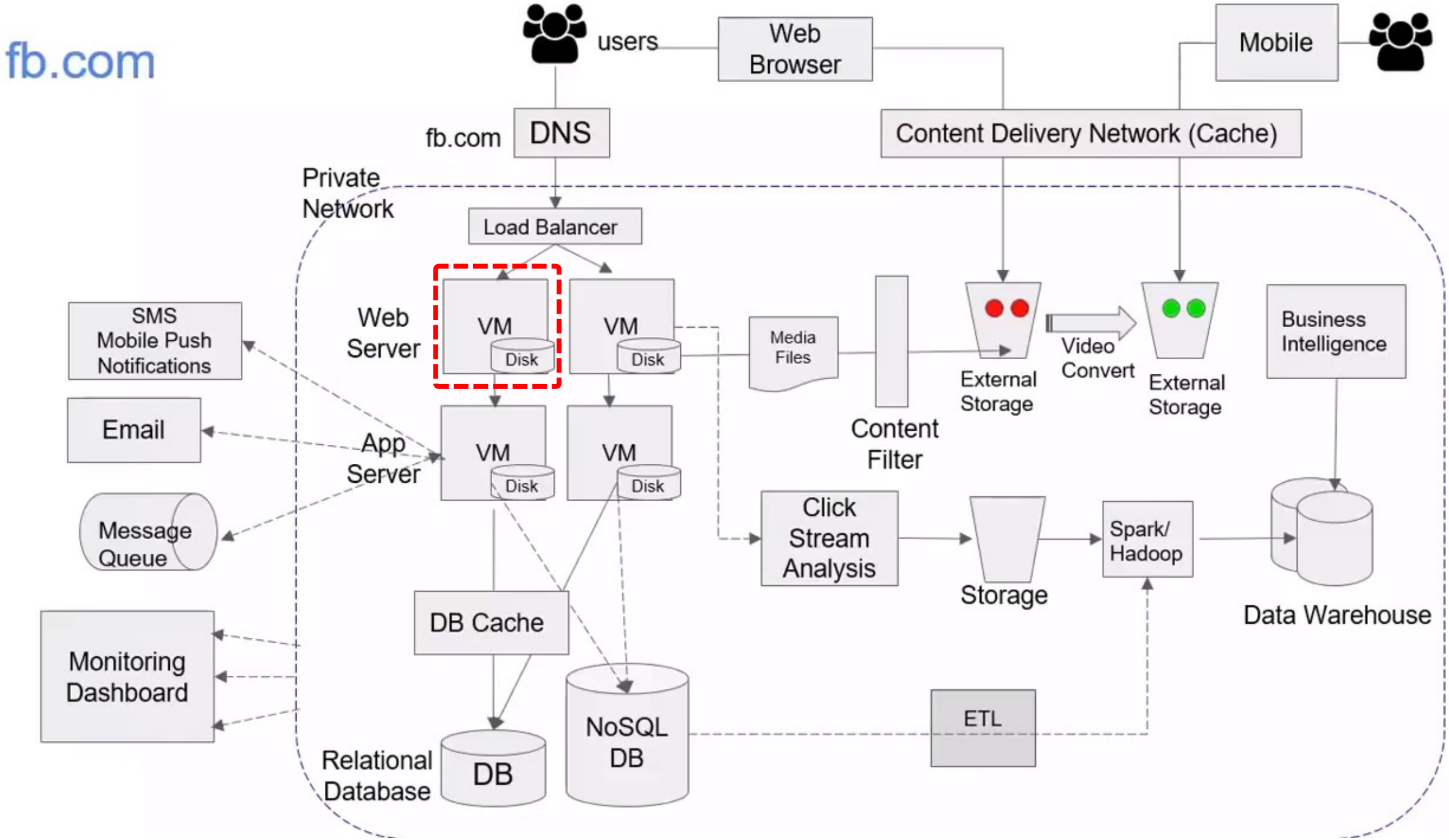
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

AWS Academy Introduction to Cloud: Semester 1
Module 5 Content Delivery: Lab 5 - Amazon CloudFront



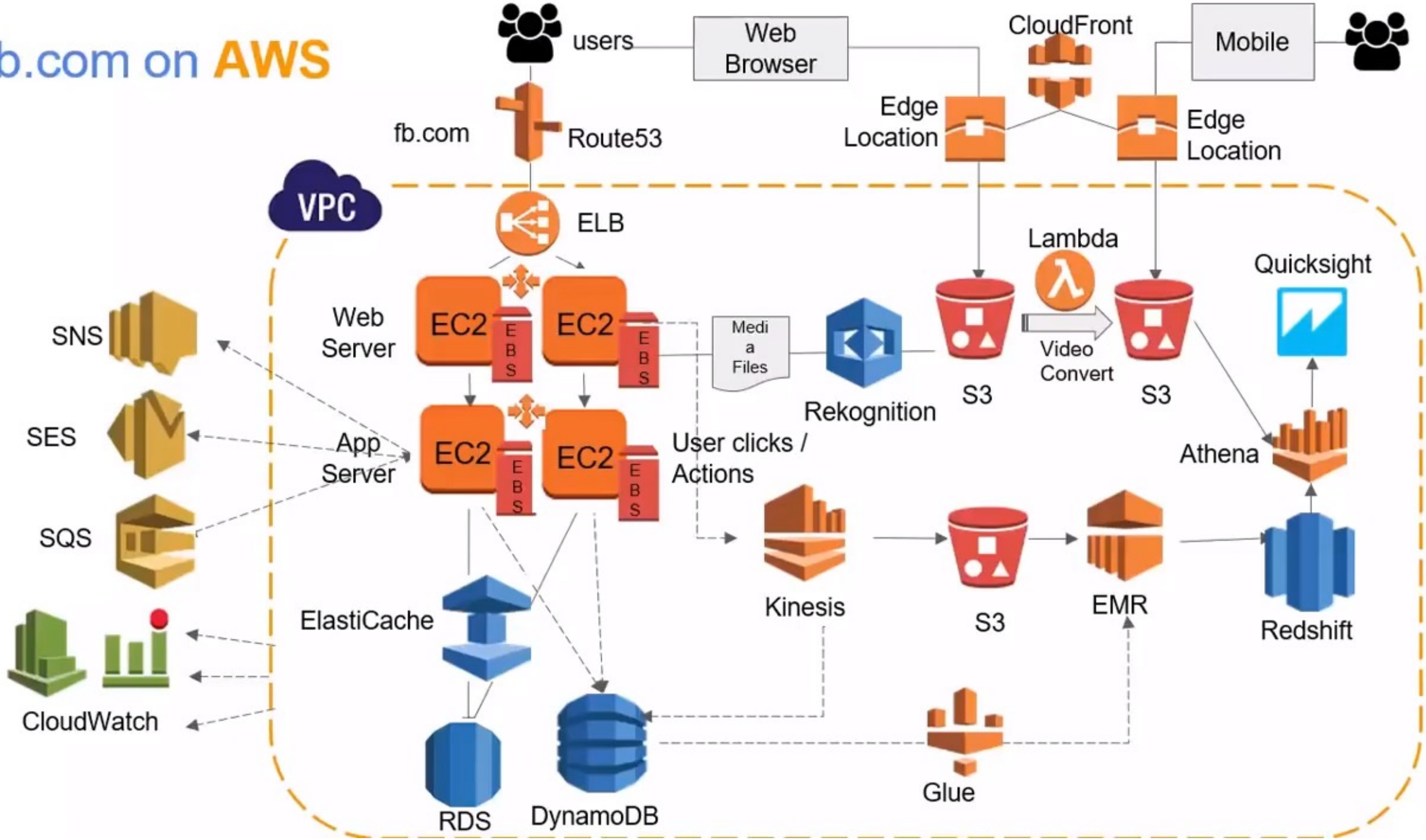
Source: AWS Academy Introduction to Cloud: Semester 1, https://awsacademy.instructure.com/courses/18745

Web Application with AWS Core Services



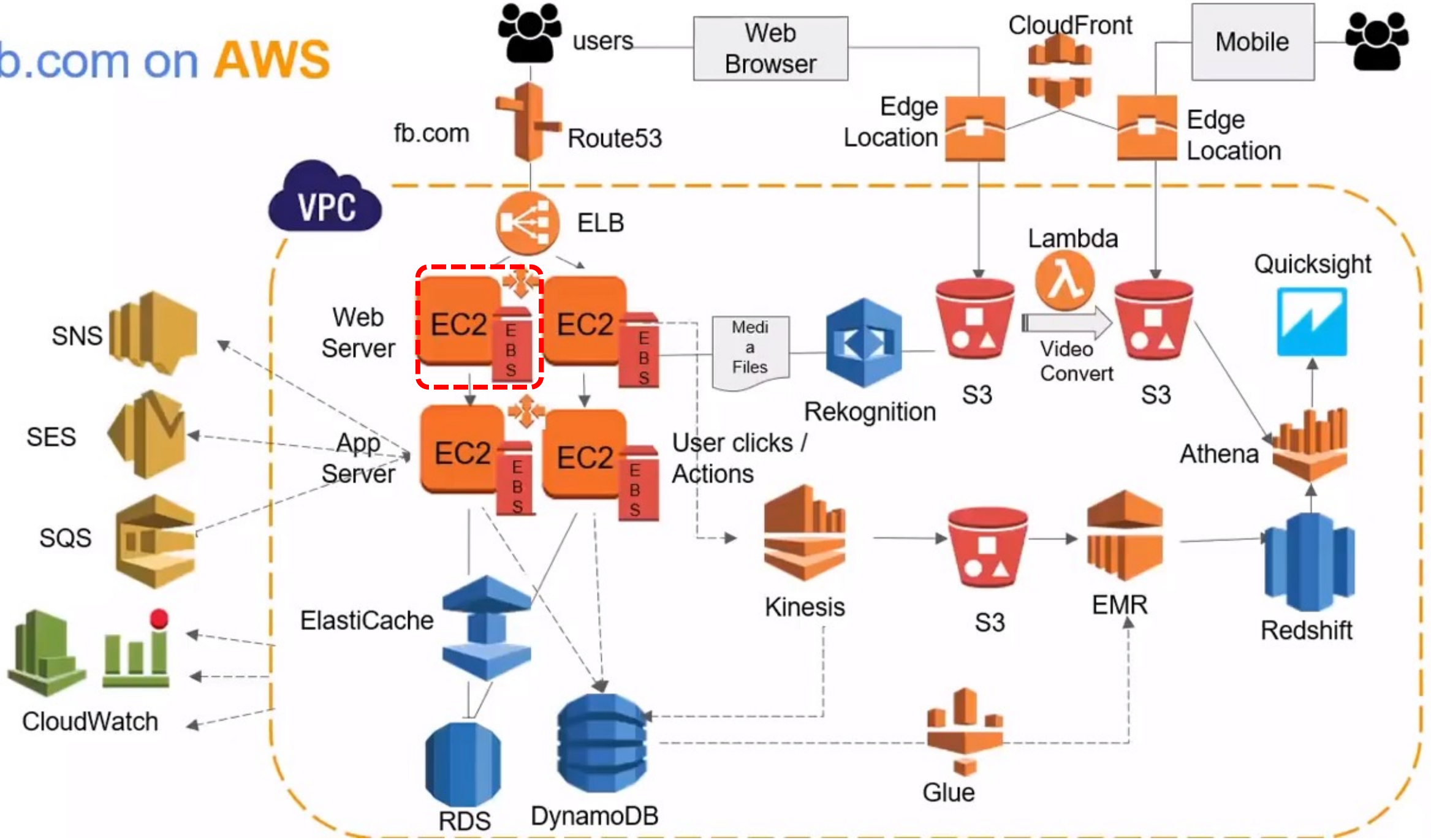
Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

fb.com on AWS



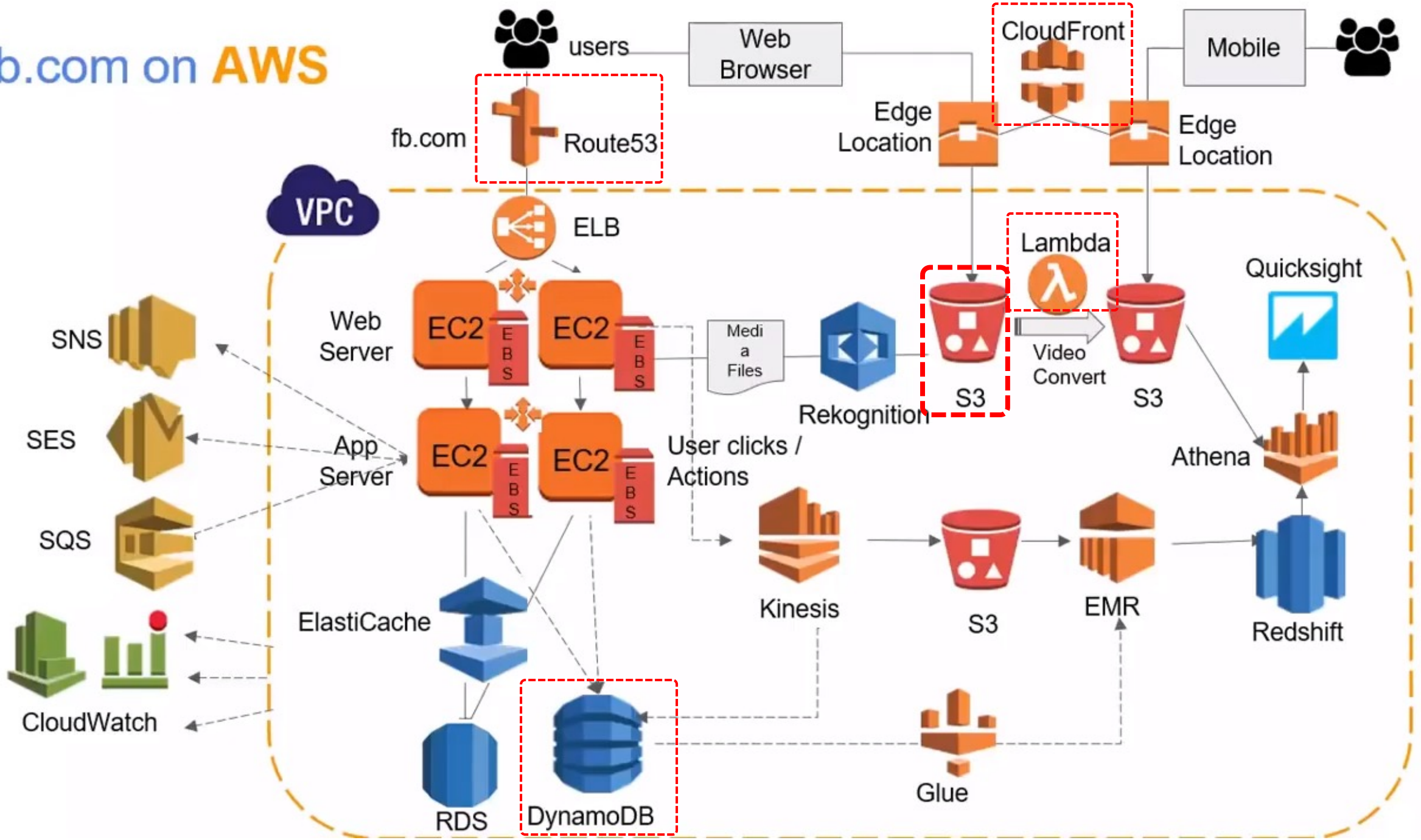
Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

fb.com on AWS



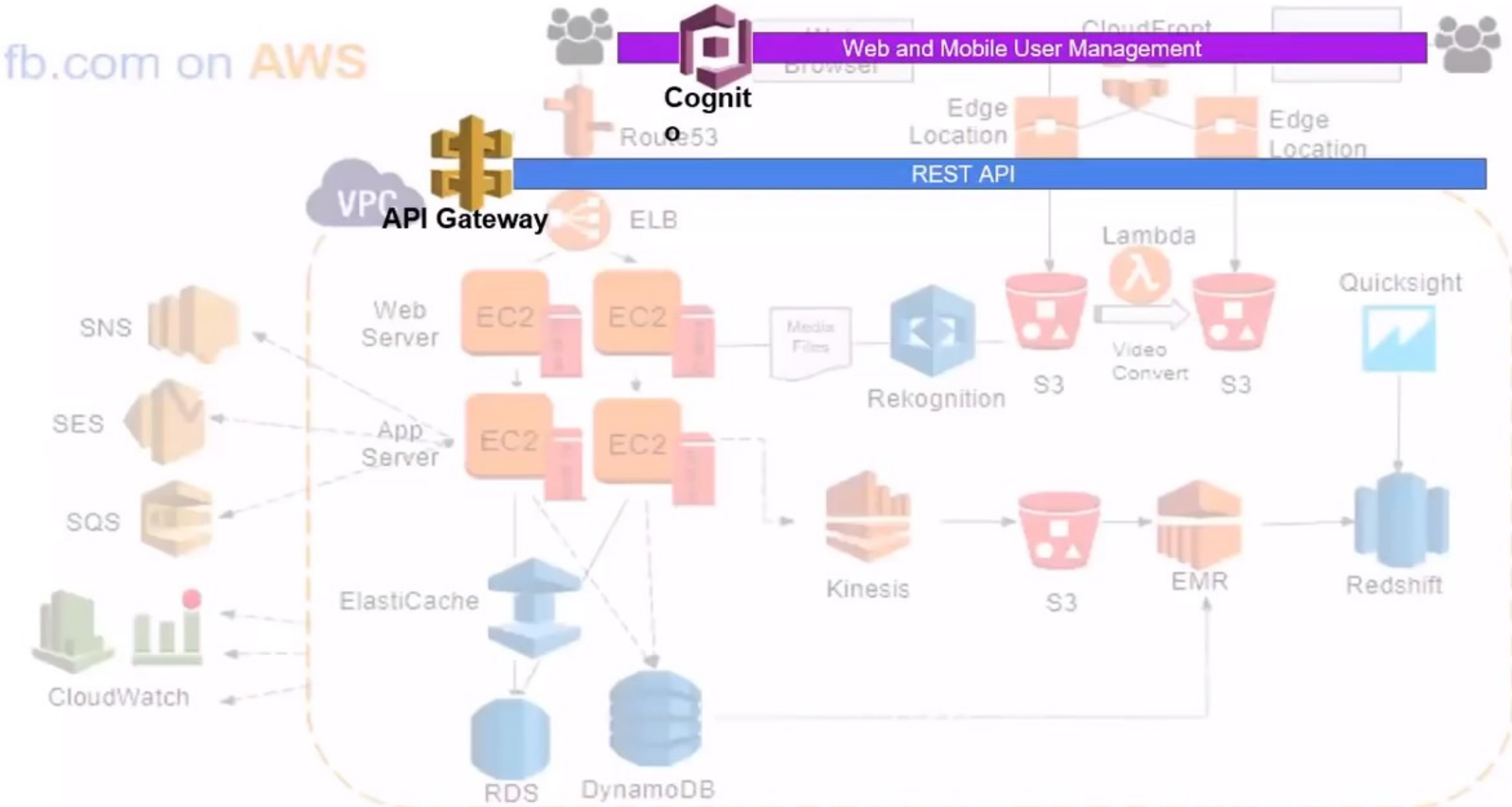
Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

fb.com on AWS



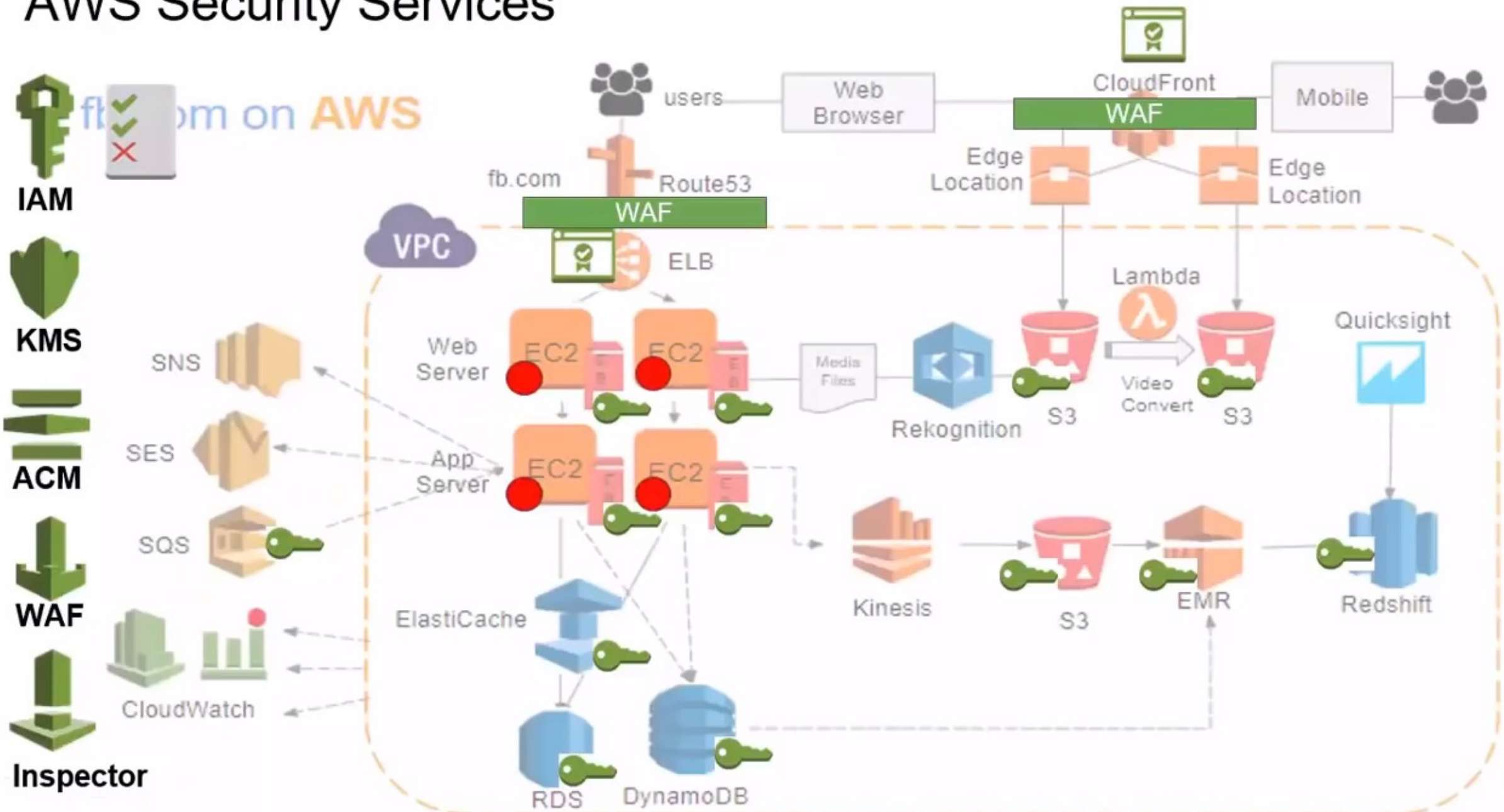
Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

AWS Application Services



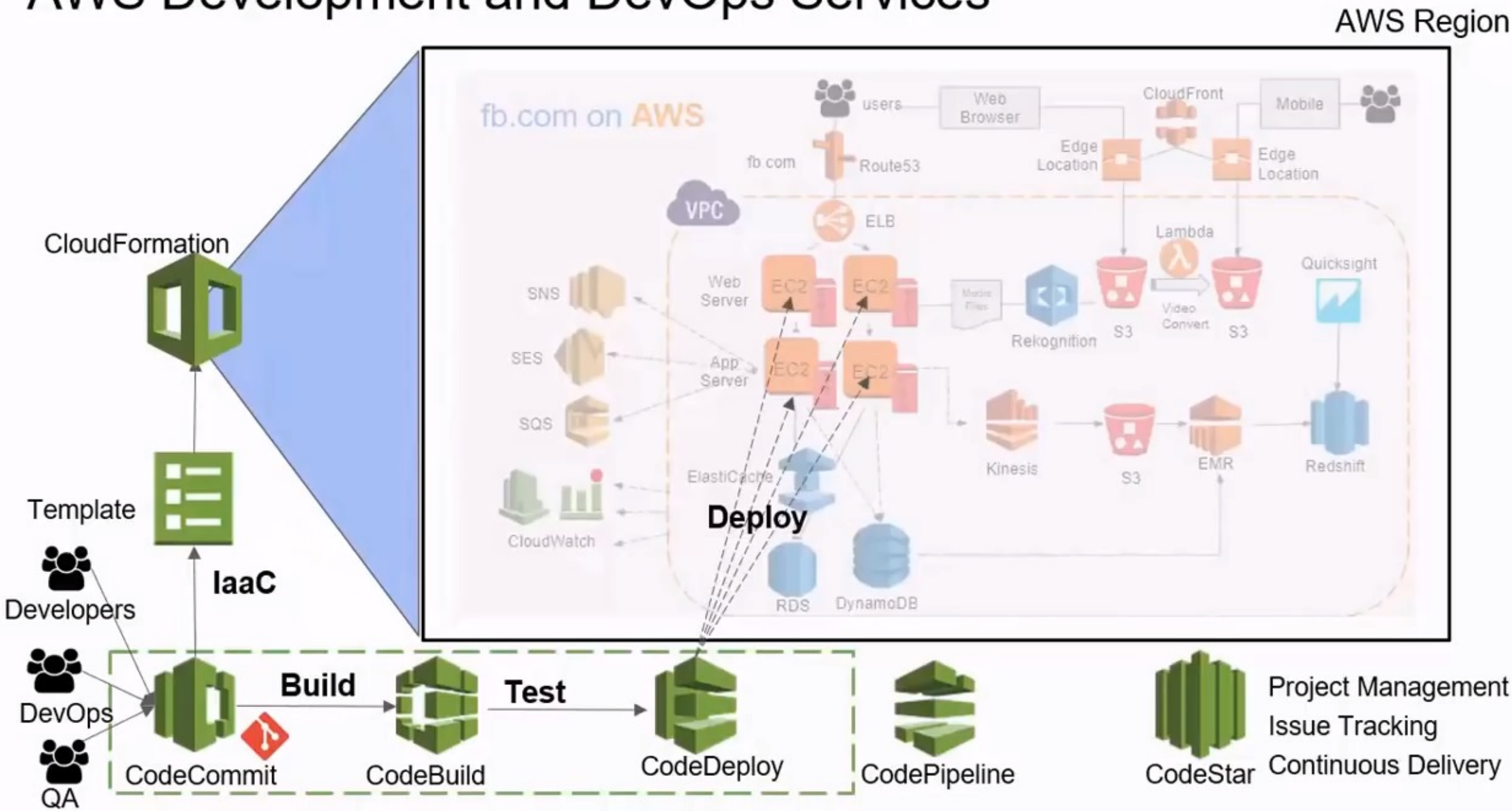
Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

AWS Security Services



Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

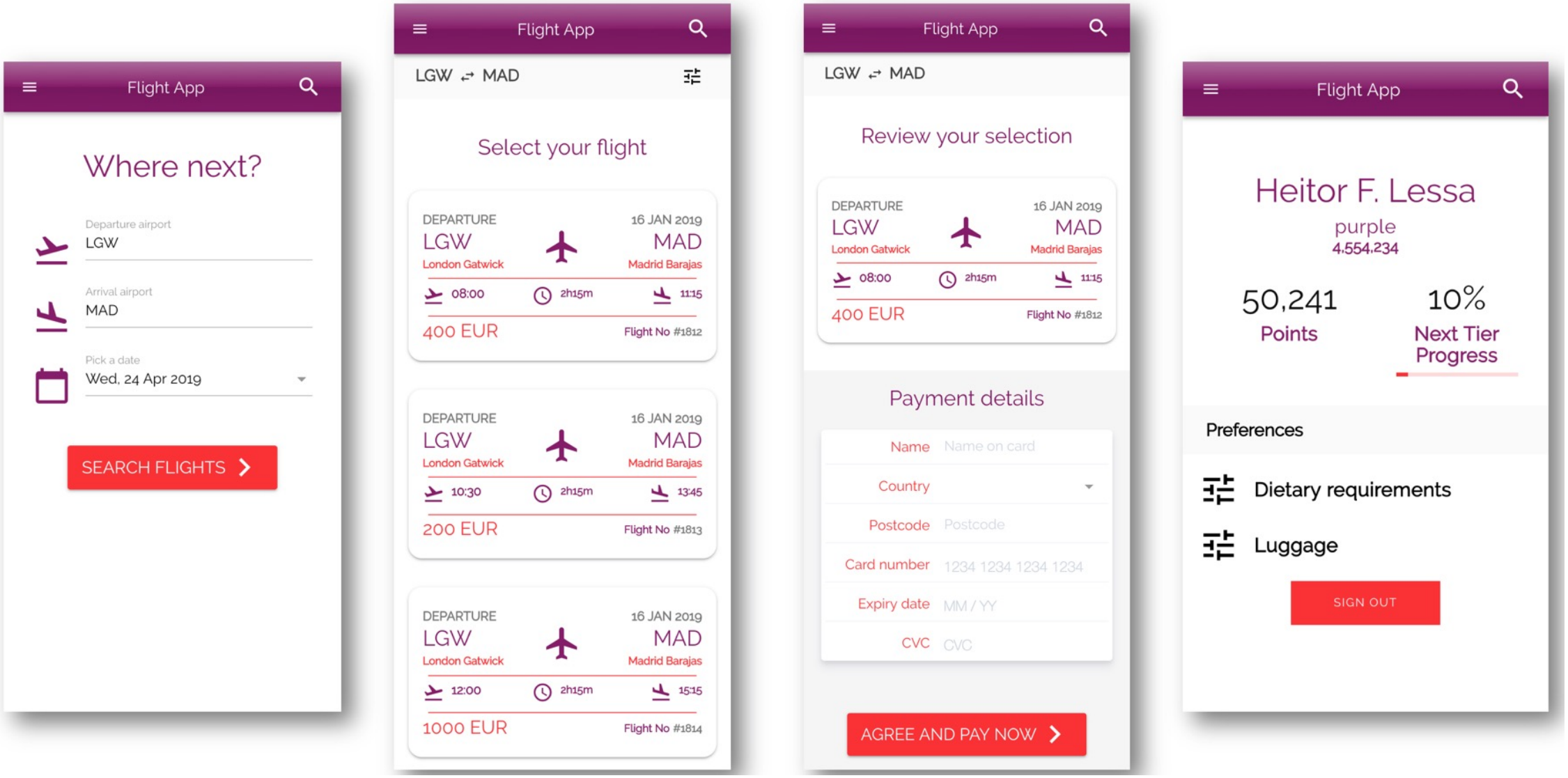
AWS Development and DevOps Services



Source: AWS Training Center (2019), Introduction to AWS Services, https://youtu.be/Z3SYDTMP3ME

AWS Serverless Architecture

AWS Serverless Airline Booking



Source: https://github.com/aws-samples/aws-serverless-airline-booking

AWS Serverless Airline Booking Stack

UI/UX

Quasar framework

Vue.js

AWS Amplify

Stripe Elements

Data/Lang

Amazon DynamoDB

Python

Typescript

JavaScript

API/Auth

AWS AppSync

Amazon API Gateway

Amazon Cognito

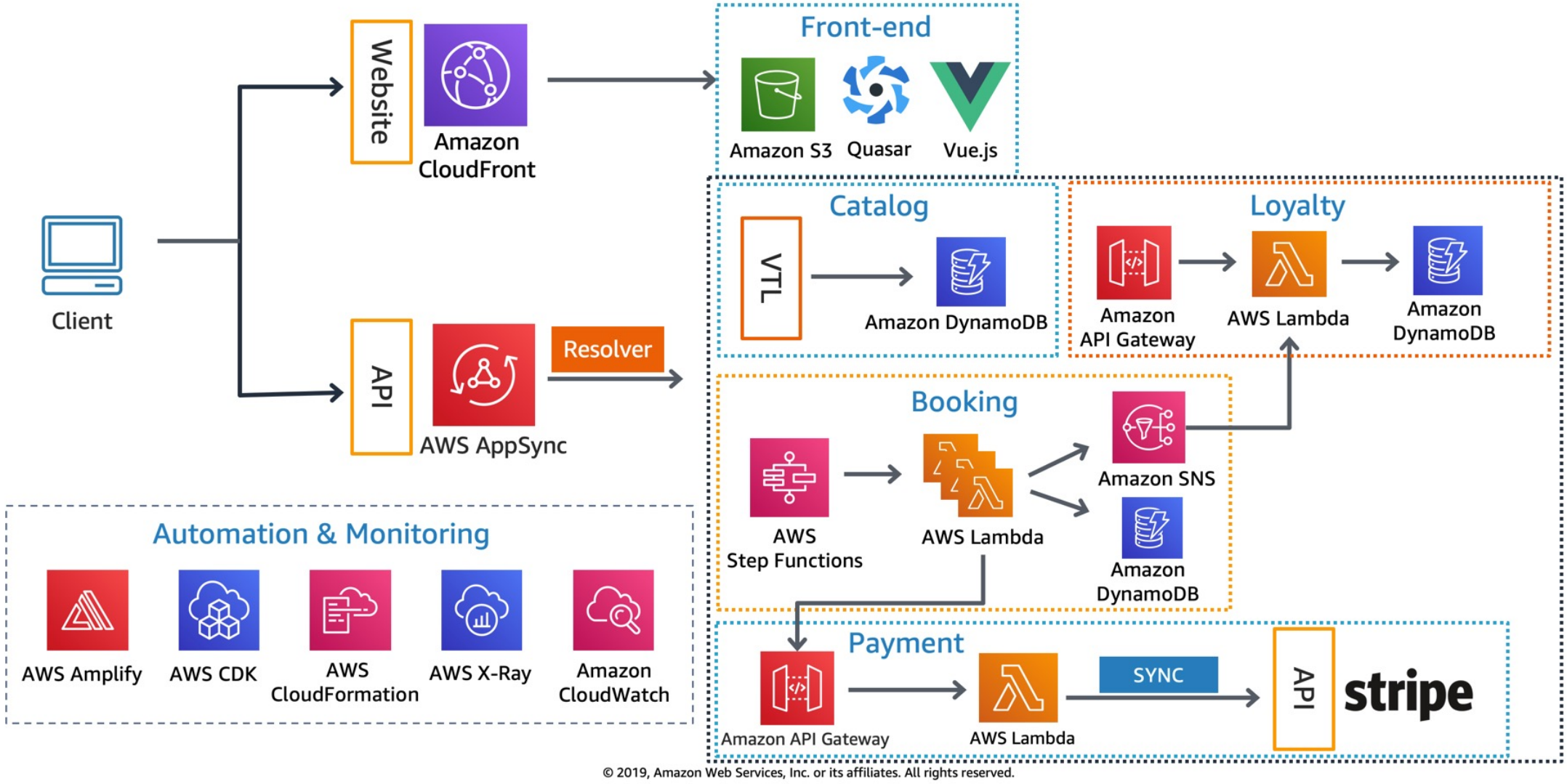
Messaging

Amazon SNS

AWS Step Functions

Source: https://github.com/aws-samples/aws-serverless-airline-booking

AWS Serverless Airline Booking
High level infrastructure architecture



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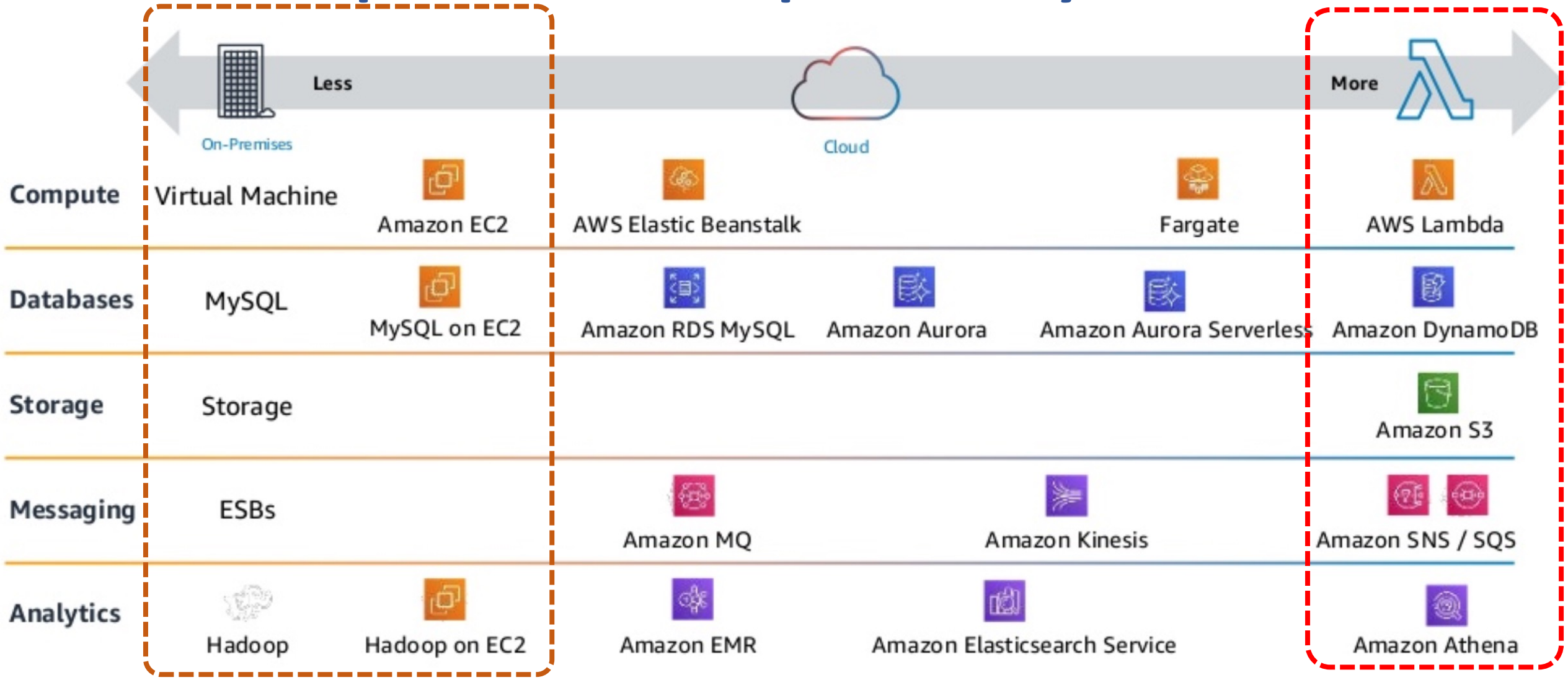
Source: https://github.com/aws-samples/aws-serverless-airline-booking

AWS Serverless Architecture

AWS Operational Responsibility Models



Source: Heitor Lessa (2019), How to build a full stack serverless airline ticketing web app, https://www.youtube.com/watch?v=MyoOeHTp2pg

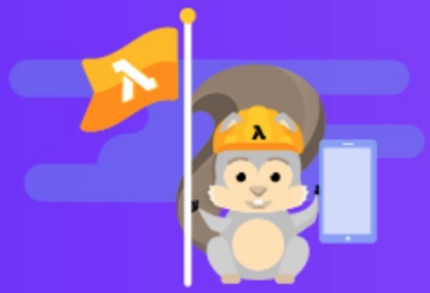
Build a Serverless Web Application

Build a Serverless Web Application

Projects on AWS:

Build a Serverless Web Application

with AWS Lambda, Amazon API Gateway, Amazon S3, Amazon DynamoDB, and Amazon Cognito



Introduction | 1 Host a static website | 2 Manage users | 3 Build a serverless backend | 4 Deploy a RESTful API | 5 Terminate resources

Overview

In this tutorial, you'll create a simple serverless web application that enables users to request unicorn rides from the Wild Rydes fleet. The application will present users with an HTML based user interface for indicating the location where they would like to be picked up and will interface on the backend with a RESTful web service to submit the request and dispatch a nearby unicorn. The application will also provide facilities for users to register with the service and log in before requesting rides.

AWS Experience: Beginner

Time to complete: 2 hours

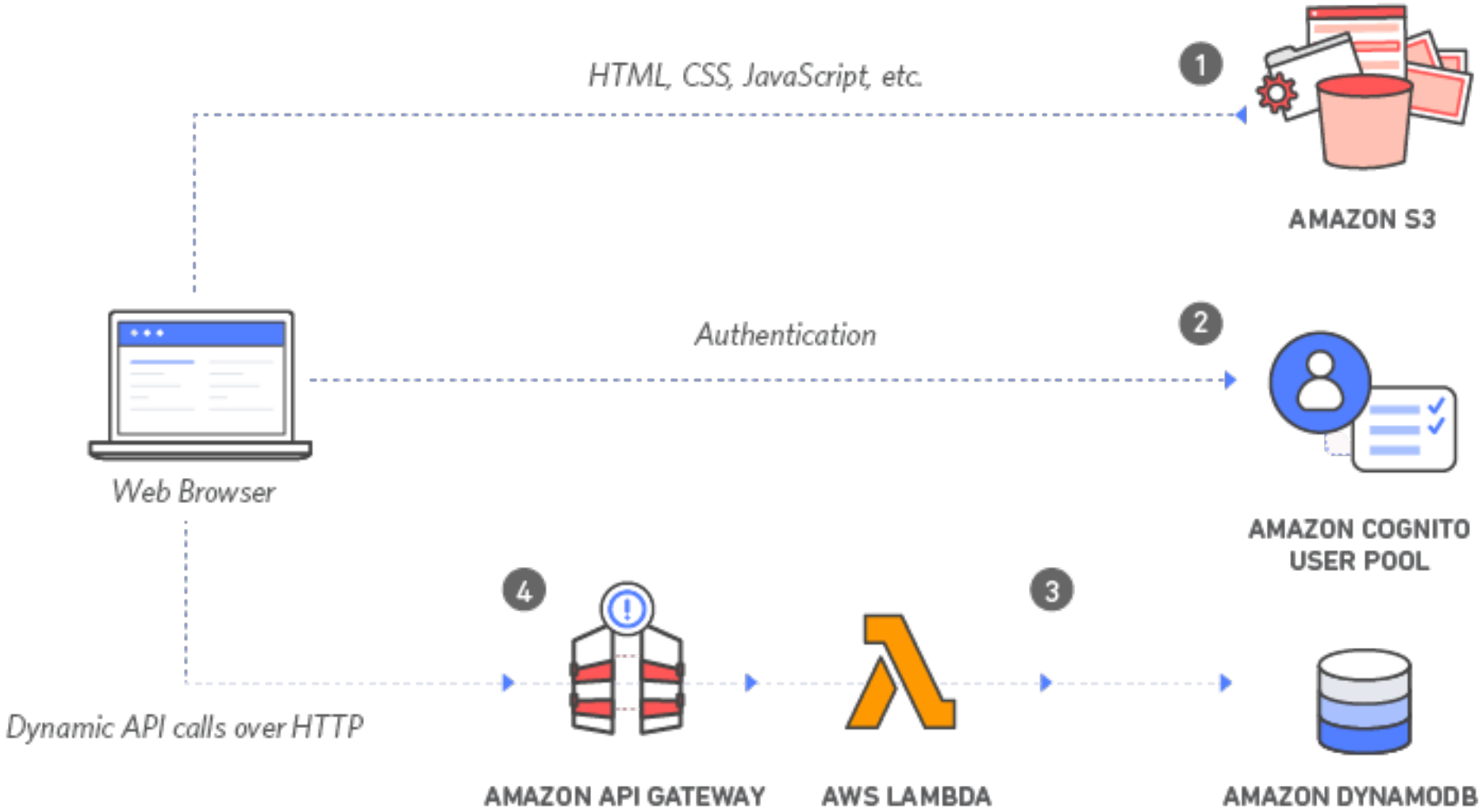
Cost to complete: Each service used in this architecture is eligible for the AWS Free Tier. If you are outside the usage limits of the Free Tier, completing this tutorial will cost you less than $0.25*.

Application Architecture

Source: https://aws.amazon.com/getting-started/projects/build-serverless-web-app-lambda-apigateway-s3-dynamodb-cognito/

Build a Serverless Web Application

with Amazon S3, AWS Lambda, Amazon API Gateway, Amazon DynamoDB, and Amazon Cognito



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Build a Serverless Web Application

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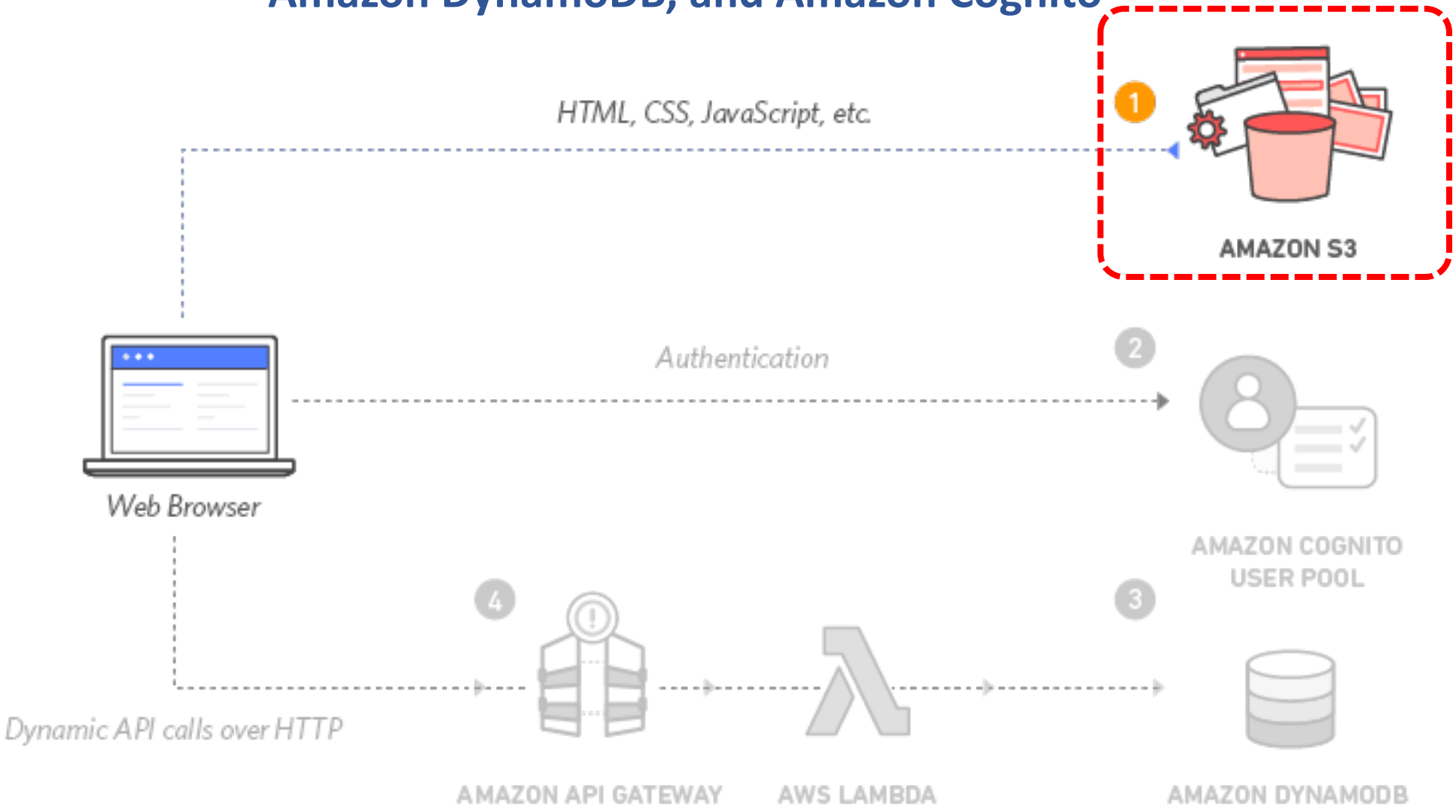
1



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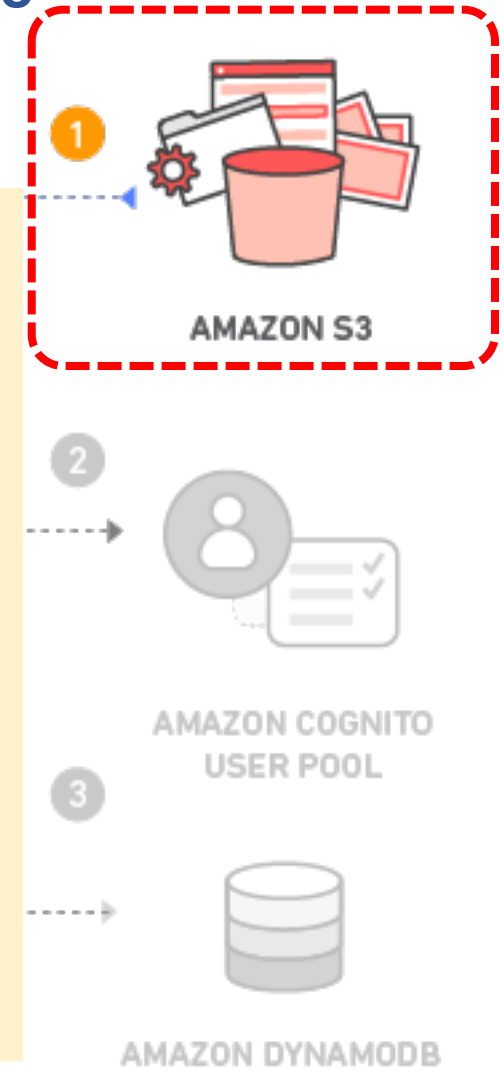
1

HTML, CSS, JavaScript, etc.



Static Web Hosting

Amazon S3 hosts static web resources including HTML, CSS, JavaScript, and image files which are loaded in the user's browser.

Source: https://aws.amazon.com/getting-started/projects/build-serverless-web-app-lambda-apigateway-s3-dynamodb-cognito/

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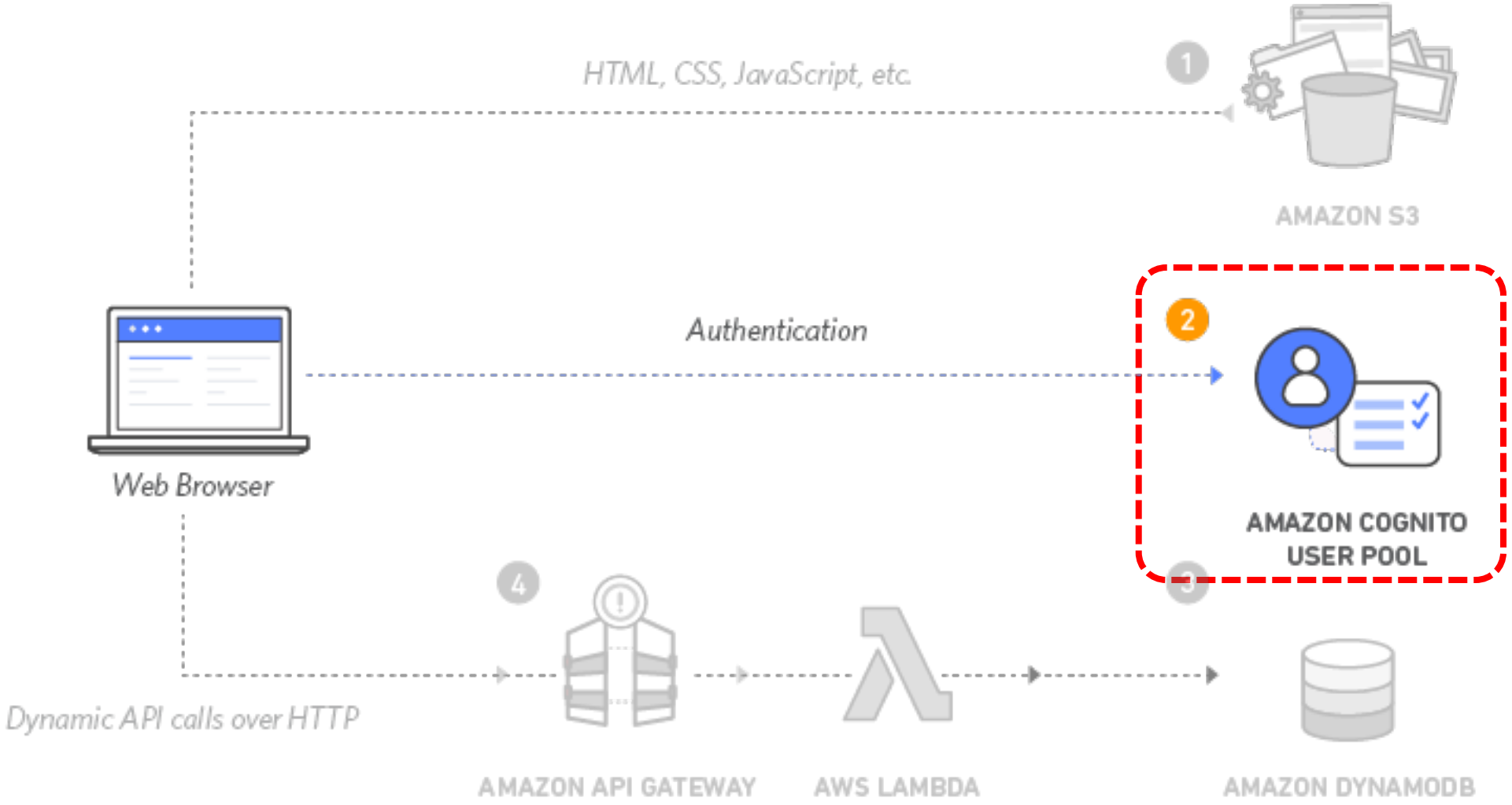
2



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Build a Serverless Web Application

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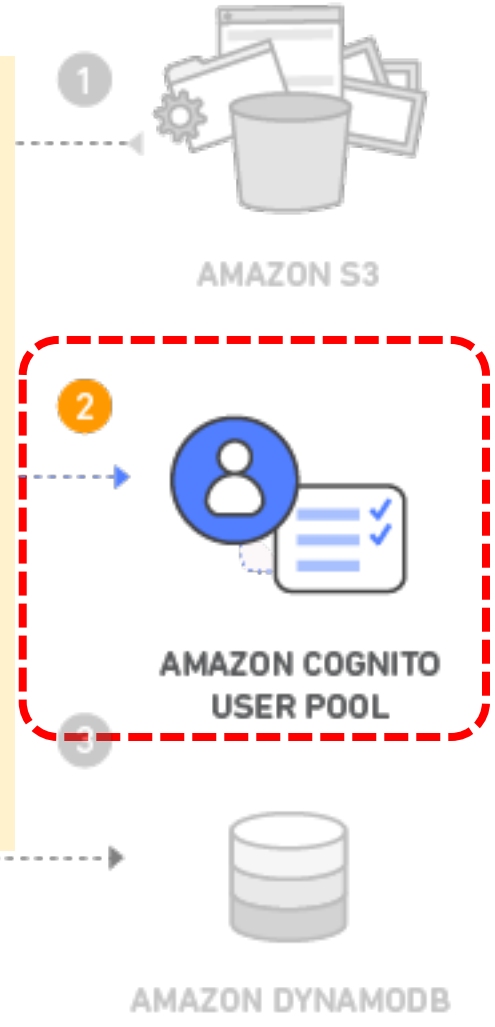
2

User Management

Amazon Cognito provides user management and authentication functions to secure the backend API.



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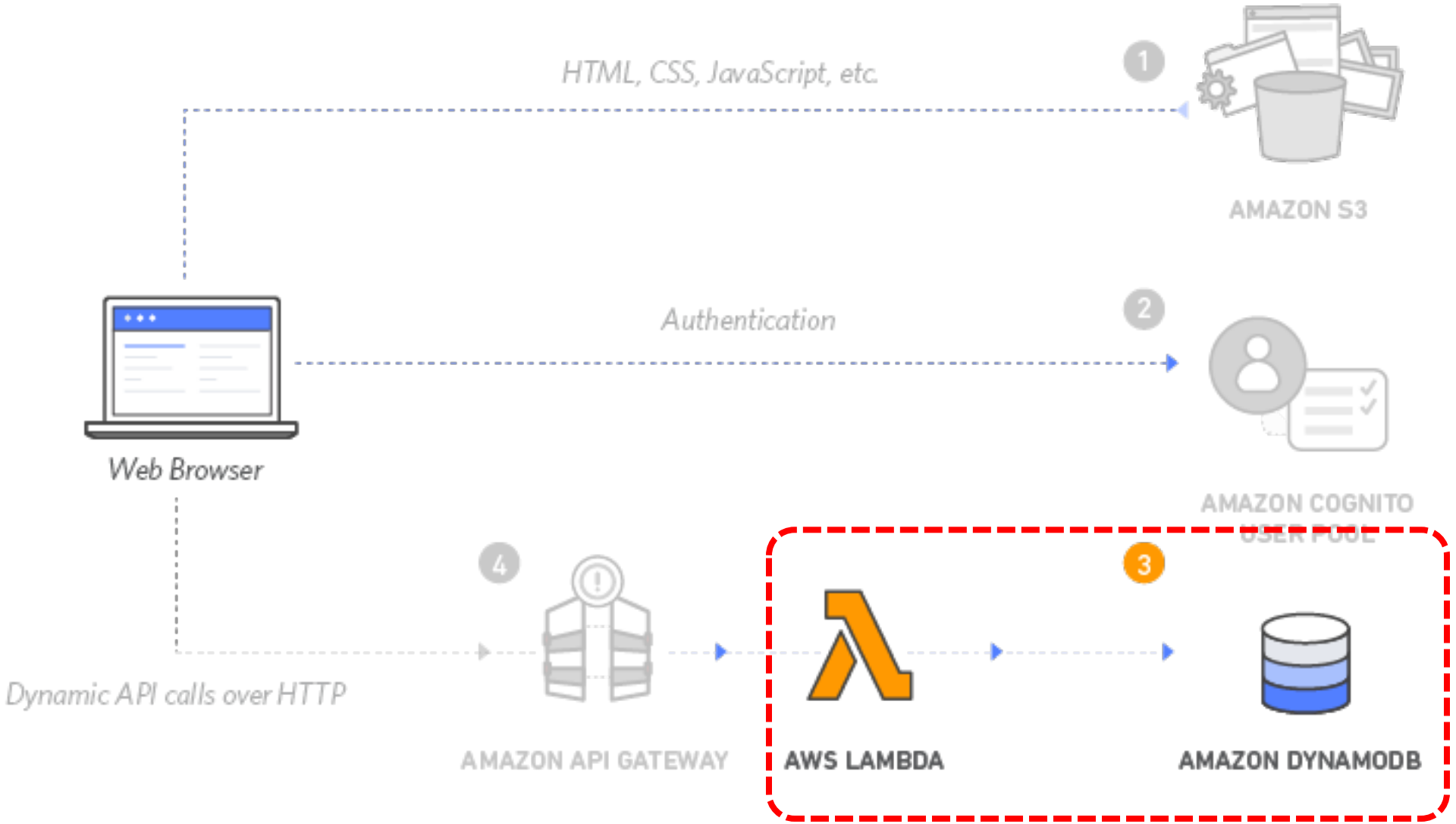

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Build a Serverless Web Application

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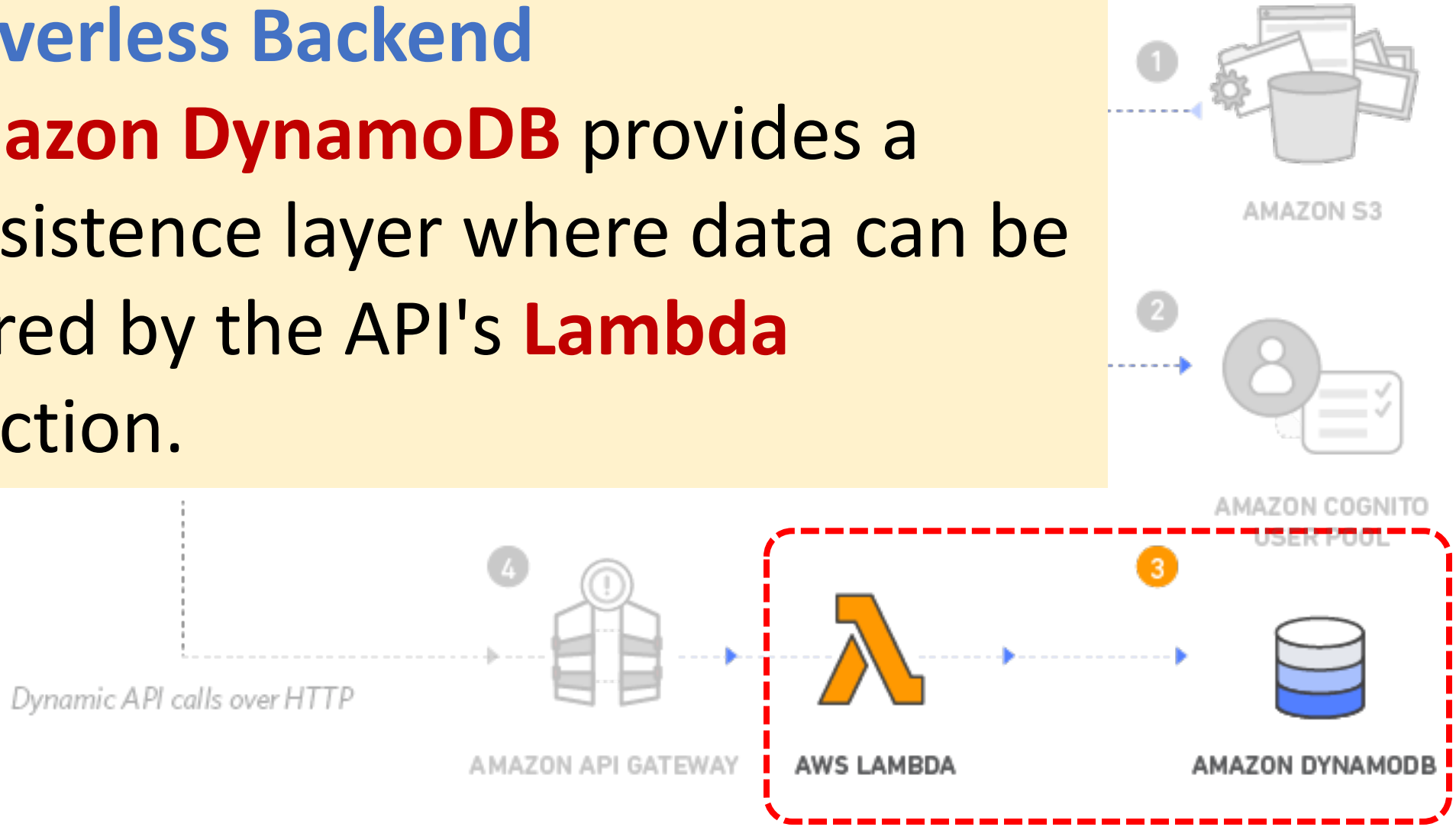
3

Serverless Backend

Amazon DynamoDB provides a persistence layer where data can be stored by the API's **Lambda** function.



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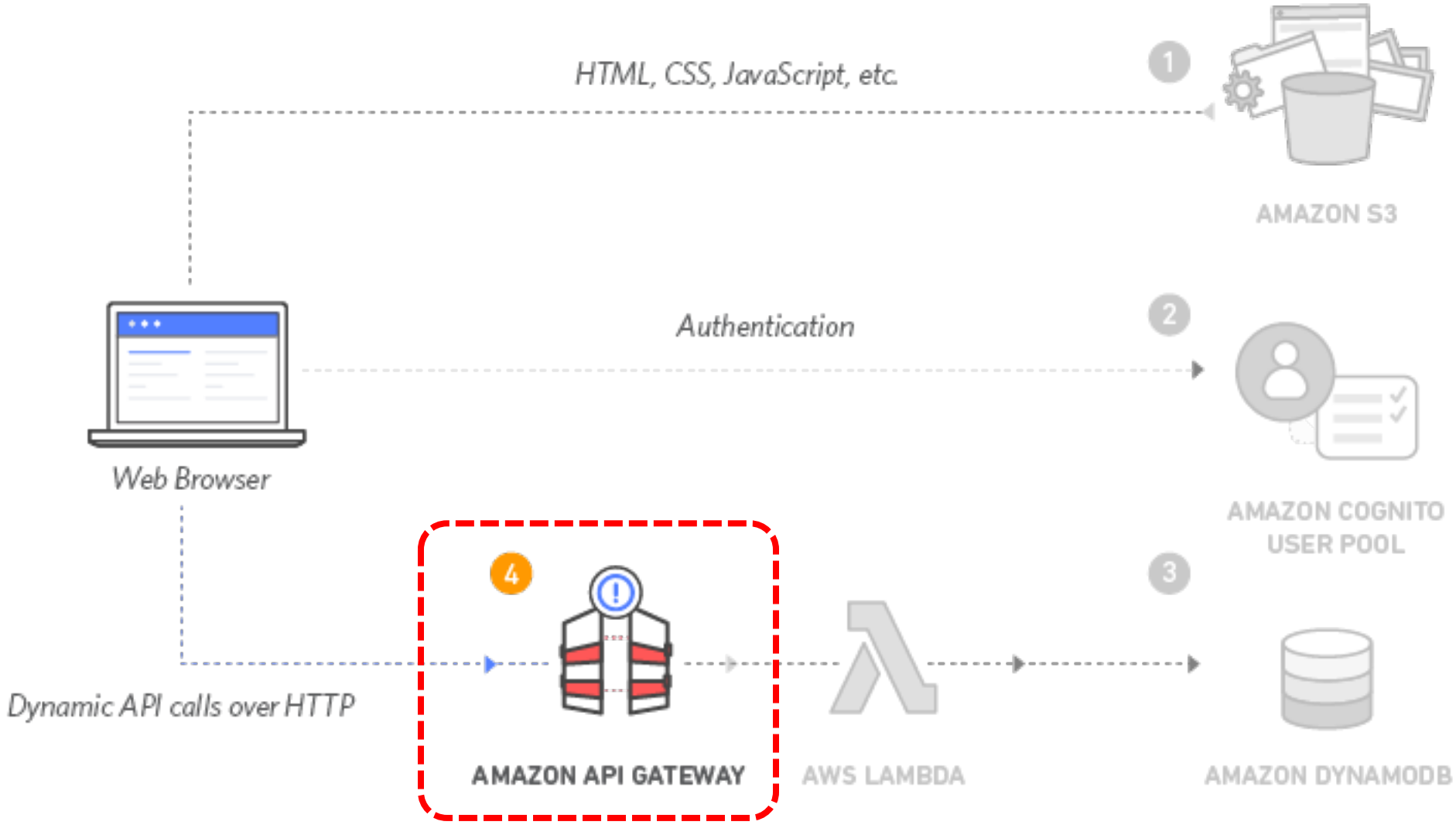

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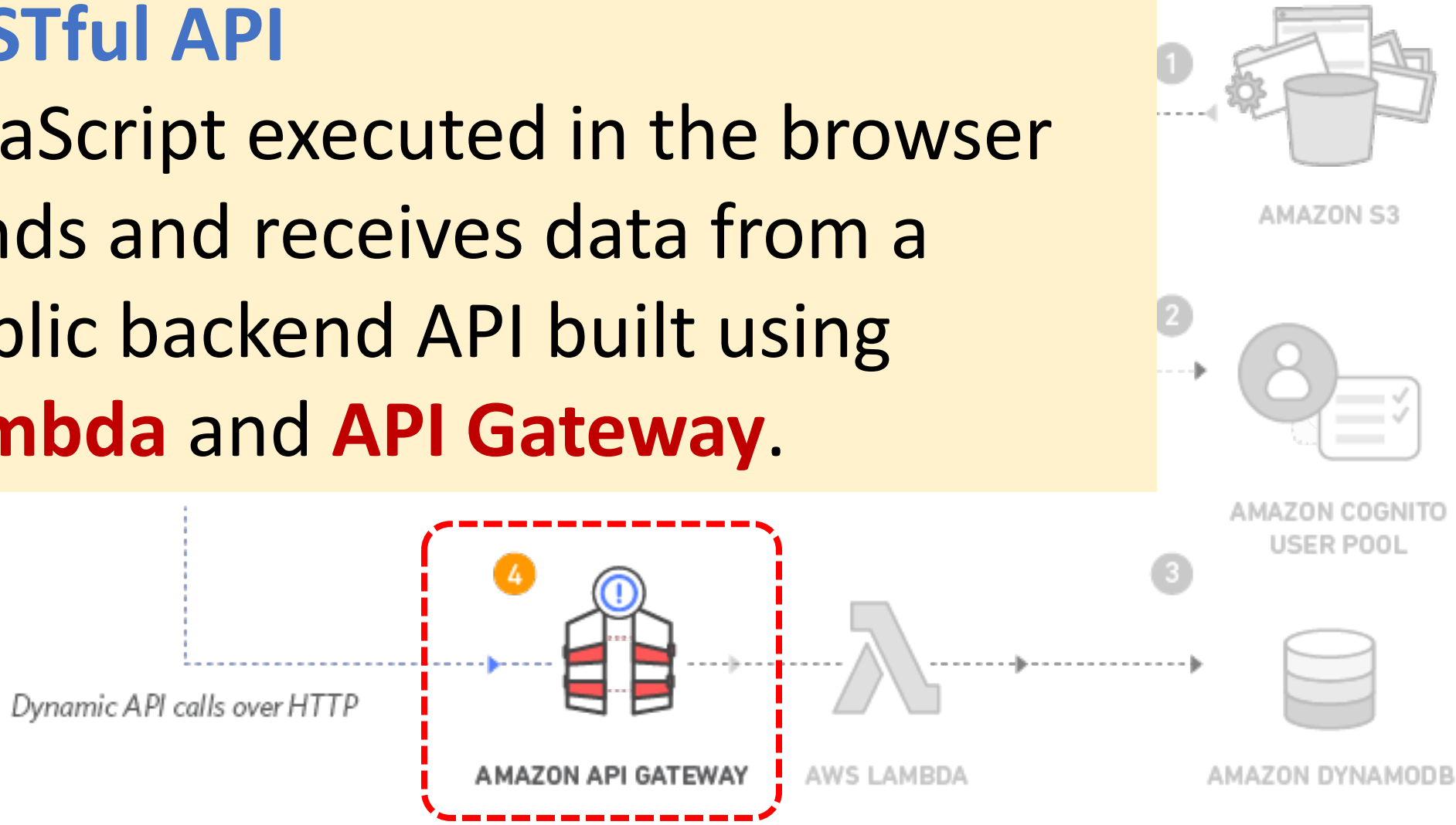
4

RESTful API

JavaScript executed in the browser sends and receives data from a public backend API built using **Lambda** and **API Gateway**.



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5

Terminate resources

Resource Cleanup

You will terminate an **Amazon S3** bucket, an **Amazon Cognito** User Pool, an **AWS Lambda** function, an **IAM** role, a **DynamoDB** table, a **REST API**, and a **CloudWatch** Log.

It is a best practice to delete resources you are no longer using to avoid unwanted charges.

Source: https://aws.amazon.com/getting-started/projects/build-serverless-web-app-lambda-apigateway-s3-dynamodb-cognito/

Summary

- AWS Content Delivery Network: Lab 5 Using CloudFront as a CDN for a Website
  - AWS Academy Introduction to Cloud: Semester 1
  - Module 5 Content Delivery
  - Lab 5 - Amazon CloudFront

References

- https://aws.amazon.com/certification/
- https://www.aws.training/
- https://aws.amazon.com/training/awsacademy/
- https://aws.amazon.com/education/awseducate/
- **AWS Academy Introduction to Cloud: Semester 1**
  - https://awsacademy.instructure.com/courses/18745
- **AWS Certified Cloud Practitioner**
  - https://aws.amazon.com/certification/certified-cloud-practitioner/
- **AWS Certified Solutions Architect – Associate**
  - https://aws.amazon.com/certification/certified-solutions-architect-associate/
- **AWS Cloud Practitioner Essentials (Second Edition)**
  - https://aws.amazon.com/training/course-descriptions/cloud-practitioner-essentials/
- **Architecting on AWS**
  - https://aws.amazon.com/training/course-descriptions/architect/

雲端運算基礎入門

Introduction to Cloud Computing

Q & A

AWS Content Delivery Network: Lab 5
Using CloudFront as a CDN for a Website

Time: 2022/5/6 (Friday) 18:30-20:30

Place: 電資406室, 國立臺北大學 (NTPU)

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