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
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(Min-Yuh Day, Ph.D.)

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)
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

**Professional**
- **Two years** of comprehensive experience designing, operating, and troubleshooting solutions using the AWS Cloud
- SAP

**Associate**
- **One year** of experience solving problems and implementing solutions using the AWS Cloud
- SAA

**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
- AWS Certified Advanced Networking Specialty
- AWS Certified Data Analytics Specialty
- AWS Certified Database Specialty
- AWS Certified Machine Learning Specialty
- AWS Certified Security Specialty

https://aws.amazon.com/certification/
Available AWS Certifications

1. CLF
   - 六個月的基礎 AWS 雲端和產業知識
   - 雲端從業人員

2. SAA
   - 一年使用 AWS 雲端解決問題和實作解決方案的經驗
   - 架構師

3. SAP
   - 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

專家級

- 考試指南中指定的專業領域中的 AWS 雲端技術經驗
- Advanced Networking Specialty
- Data Analytics Specialty
- Database Specialty
- Machine Learning Specialty
- Security Specialty

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)

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

國立臺北大學

2022-02-23
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.


• 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
<table>
<thead>
<tr>
<th>週次 (Week)</th>
<th>日期 (Date)</th>
<th>內容 (Subject/Topics)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2022/02/23</td>
<td>雲端概念概述 (Cloud Concepts Overview)</td>
</tr>
<tr>
<td>2</td>
<td>2022/03/02</td>
<td>雲端經濟與計費 (Cloud Economics and Billing)</td>
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<td>3</td>
<td>2022/03/09</td>
<td>AWS全球基礎設施概述 (AWS Global Infrastructure Overview)</td>
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<td>4</td>
<td>2022/03/16</td>
<td>AWS雲端安全 (AWS Cloud Security)</td>
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<td>5</td>
<td>2022/03/23</td>
<td>網路和內容交付 (Networking and Content Delivery)</td>
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<td>6</td>
<td>2022/03/30</td>
<td>雲端計算 (Cloud Compute)</td>
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<tr>
<td>週次 (Week)</td>
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<td>內容 (Subject/Topics)</td>
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<tr>
<td>7 2022/04/06</td>
<td>放假一天 (Make-up Holiday, No Classes)</td>
<td></td>
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<tr>
<td>8 2022/04/13</td>
<td>雲端儲存 (Cloud Storage)</td>
<td></td>
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<tr>
<td>9 2022/04/20</td>
<td>雲端數據庫 (Cloud Databases)</td>
<td></td>
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<tr>
<td>10 2022/04/27</td>
<td>雲端架構 (Cloud Architecture)</td>
<td></td>
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<td>11 2022/05/04</td>
<td>雲端自動擴展和監控 (Cloud Automatic Scaling and Monitoring)</td>
<td></td>
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<tr>
<td>12 2022/05/11</td>
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<td>13</td>
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<td>學生自主學習 (Self-learning)</td>
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<td>14</td>
<td>2022/05/25</td>
<td>雲端專案成果報告與討論 (Cloud Project Presentation and Discussion)</td>
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<td>2022/06/01</td>
<td>學生自主學習 (Self-learning)</td>
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<td>16</td>
<td>2022/06/08</td>
<td>期末專案成果報告 (Final Project Presentation)</td>
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<td>17</td>
<td>2022/06/15</td>
<td>學生自主學習 (Self-learning)</td>
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<tr>
<td>18</td>
<td>2022/06/22</td>
<td>學生自主學習 (Self-learning)</td>
</tr>
</tbody>
</table>
AWS Products and Services

- Analytics
- Application Integration
- Compute
- Business Applications
- Game Tech
- Internet of Things
- End User Computing
- Migration & Transfer
- Mobile
- Media Services
- Satellite
- Robotics
- AR & VR
- Customer Engagement
- AWS Cost Management
- Database
- Developer Tools
- Machine Learning
- Management & Governance
- Networking & Content Delivery
- Quantum Technologies
- Security, Identity & Compliance
- Storage

Source: [https://aws.amazon.com/](https://aws.amazon.com/)
### AWS Compute

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon EC2</td>
<td>Virtual servers in the cloud</td>
</tr>
<tr>
<td>Amazon Elastic Container Service</td>
<td>Run and manage docker containers</td>
</tr>
<tr>
<td>AWS Batch</td>
<td>Run batch jobs at any scale</td>
</tr>
<tr>
<td>AWS Lambda</td>
<td>Run code without thinking about servers</td>
</tr>
<tr>
<td>AWS Wavelength</td>
<td>Deliver ultra-low latency applications for 5G devices</td>
</tr>
<tr>
<td>Amazon EC2 Auto Scaling</td>
<td>Scale compute capacity to meet demand</td>
</tr>
<tr>
<td>Amazon Elastic Kubernetes Service</td>
<td>Run managed Kubernetes on AWS</td>
</tr>
<tr>
<td>AWS Elastic Beanstalk</td>
<td>Run and manage web apps</td>
</tr>
<tr>
<td>AWS Outposts</td>
<td>Run AWS infrastructure on-premises</td>
</tr>
<tr>
<td>VMware Cloud on AWS</td>
<td>Build a hybrid cloud without custom hardware</td>
</tr>
<tr>
<td>Amazon Elastic Container Registry</td>
<td>Store and retrieve docker images</td>
</tr>
<tr>
<td>Amazon Lightsail</td>
<td>Launch and manage virtual private servers</td>
</tr>
<tr>
<td>AWS Fargate</td>
<td>Run containers without managing servers or clusters</td>
</tr>
<tr>
<td>AWS Serverless Application Repository</td>
<td>Discover, deploy, and publish serverless applications</td>
</tr>
</tbody>
</table>
AWS Database

- **Amazon Aurora**
  High Performance Managed Relational Database

- **Amazon ElastiCache**
  In-memory Caching System

- **Amazon Quantum Ledger Database (QLDB)**
  Fully managed ledger database

- **Amazon Redshift**
  Fast, Simple, Cost-effective Data Warehousing

- **Amazon DynamoDB**
  Managed NoSQL Database

- **Amazon Managed Apache Cassandra Service**
  Managed Cassandra-compatible database

- **Amazon DocumentDB (with MongoDB compatibility)**
  Fully managed document database

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

- **Amazon Neptune**
  Fully Managed Graph Database Service

- **Amazon RDS on VMware**
  Automate on-premises database management

- **Amazon Timestream**
  Fully managed time series database

- **AWS Database Migration Service**
  Migrate Databases with Minimal Downtime

Source: [https://aws.amazon.com/](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 F5x for Lustre
High-performance file system integrated with S3

Amazon F5x 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

CloudEndure Disaster Recovery
Highly automated disaster recovery

AWS Storage Gateway
Hybrid Storage Integration

Source: https://aws.amazon.com/
AWS Networking & Content Delivery

- **Amazon VPC**: Isolated Cloud Resources
- **Amazon Route 53**: Scalable Domain Name System
- **AWS Cloud Map**: Application resource registry for microservices
- **AWS Transit Gateway**: Easily scale VPC and account connections
- **Amazon API Gateway**: Build, Deploy, and Manage APIs
- **AWS PrivateLink**: Securely Access Services Hosted on AWS
- **AWS Direct Connect**: Dedicated Network Connection to AWS
- **Elastic Load Balancing**: Distribute incoming traffic across multiple targets
- **Amazon CloudFront**: Global Content Delivery Network
- **AWS App Mesh**: Monitor and control microservices
- **AWS Global Accelerator**: Improve application availability and performance

Source: [https://aws.amazon.com/](https://aws.amazon.com/)
# AWS Security, Identity & Compliance

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS Identity &amp; Access Management</td>
<td>Manage User Access and Encryption Keys</td>
</tr>
<tr>
<td>Amazon GuardDuty</td>
<td>Managed Threat Detection Service</td>
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<tr>
<td>AWS Artifact</td>
<td>On-demand access to AWS compliance reports</td>
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<tr>
<td>AWS Directory Service</td>
<td>Host and Manage Active Directory</td>
</tr>
<tr>
<td>AWS Resource Access Manager</td>
<td>Simple, secure service to share AWS resources</td>
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<tr>
<td>AWS Shield</td>
<td>DDoS Protection</td>
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<tr>
<td>Amazon Cognito</td>
<td>Identity Management for your Apps</td>
</tr>
<tr>
<td>Amazon Inspector</td>
<td>Analyze Application Security</td>
</tr>
<tr>
<td>AWS Certificate Manager</td>
<td>Provision, Manage, and Deploy SSL/TLS Certificates</td>
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<tr>
<td>AWS Firewall Manager</td>
<td>Central Management of Firewall Rules</td>
</tr>
<tr>
<td>AWS Secrets Manager</td>
<td>Rotate, Manage, and Retrieve Secrets</td>
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<tr>
<td>AWS Single Sign-On</td>
<td>Cloud Single Sign-On (SSO) Service</td>
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<tr>
<td>Amazon Detective</td>
<td>Investigate potential security issues</td>
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<tr>
<td>Amazon Macie</td>
<td>Discover, Classify, and Protect your Data</td>
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<tr>
<td>AWS CloudHSM</td>
<td>Hardware-based Key Storage for Regulatory Compliance</td>
</tr>
<tr>
<td>AWS Key Management Service</td>
<td>Managed Creation and Control of Encryption Keys</td>
</tr>
<tr>
<td>AWS Security Hub</td>
<td>Unified security and compliance center</td>
</tr>
<tr>
<td>AWS WAF</td>
<td>Filter Malicious Web Traffic</td>
</tr>
</tbody>
</table>

Source: [https://aws.amazon.com/](https://aws.amazon.com/)
AWS Cost Management

AWS Cost Explorer
Analyze Your AWS Cost and Usage

AWS Budgets
Set Custom Cost and Usage Budgets

AWS Cost and Usage Report
Access Comprehensive Cost and Usage Information

Reserved Instance Reporting
Dive Deeper into Your Reserved Instances (RIs)

Savings Plans
Save up to 72% on compute usage with flexible pricing

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

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

Securely deliver content with low latency and high transfer speeds

Reduce latency by delivering data through 310+ globally dispersed Points of Presence (PoPs) with automated network mapping and intelligent routing.

Improve security with traffic encryption and access controls, and use AWS Shield Standard to defend against DDoS attacks at no additional charge.

Cut costs with consolidated requests, customizable pricing options, and zero fees for data transfer out from AWS origins.

Customize the code you run at the AWS content delivery network (CDN) edge using serverless compute features to balance cost, performance, and security.

1 TB of data transfer out with the AWS Free Tier

https://aws.amazon.com/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.
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

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

AWS Academy Introduction to Cloud: Semester 1 is an exploration of cloud computing. In this course, students explore cloud computing services, applications, and use cases. Students dive into cloud computing best practices and learn how cloud computing helps users develop a global infrastructure to support use cases at scale while also developing and inventing innovative technologies.

This course provides students with classroom instruction that introduces cloud computing skills and accelerates students toward the next steps in their educational journey. The content of this course is aligned to the K–12 Computer Science Framework Practices including computational thinking. The seven core practices of computer science describe the behaviors and ways of thinking that computationally literate
# AWS Academy Introduction to Cloud: Semester 1 [18745]
## Module 5 Content Delivery: Lab 5 - Amazon CloudFront

<table>
<thead>
<tr>
<th>Module</th>
<th>Content</th>
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<tr>
<td>▪ Student Guide</td>
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<td>▪ Lab 4.1 - EC2</td>
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<tr>
<td>▪ Lab 4.2 - S3</td>
<td>Viewed</td>
</tr>
<tr>
<td>▪ Module 4 Knowledge Check</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

| Module 5 - Content Delivery |  |
| ▪ Student Guide |  |
| ▪ Lab 5 - CloudFront |  |
| ▪ Module 5 Knowledge Check | 100 pts | Score at least 80.0 |

Source: AWS Academy Introduction to Cloud: Semester 1, [https://awsacademy.instructure.com/courses/18745](https://awsacademy.instructure.com/courses/18745)
Module 5 Lab: Using CloudFront as a CDN for a Website

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Access the AWS Management Console
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Access the AWS Management Console

1. To start the lab session, choose Start Lab in the upper-right corner of the page.
Access the AWS Management Console

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

**Access the AWS Management Console**

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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) to distribute content from storage in the Amazon Simple Storage Service (Amazon S3).

Duration

This lab requires approximately 40 minutes to complete.

Access the AWS Management Console

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

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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

AWS Management Console

AWS services

- Recently visited services
  - CloudFront
  - CloudShell
  - S3
  - EC2
- All services

New AWS Console Home
See valuable insights for your account and services with the new customizable Console Home experience. Learn more

Stay connected to your AWS resources on-the-go
AWS Console Mobile App now supports four additional regions. Download the AWS Console Mobile App to your iOS or Android mobile device. Learn more

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:

```bash
cd ~
aws s3api create-bucket --bucket (bucket-name) --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 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](https://awsacademy.instructure.com/courses/18745)
Welcome to AWS CloudShell

AWS CloudShell is a browser-based shell that gives you command-line access to your AWS resources in the selected AWS region. AWS CloudShell comes pre-installed with popular tools for resource management and creation. You have the same credentials as you used to log in to the console. Learn more

Pre-installed tools
AWS CLI, Python, Node.js and more

Storage included
1 GB of storage free per AWS region

Saved files and settings
Files saved in your home directory are available in future sessions for the same AWS region

Do not show again
Close
5. Copy and paste the following code into a text editor:

```bash
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```
5. Copy and paste the following code into a text editor:

```bash
cd ~
aws s3api create-bucket --bucket (bucket-name) --region us-east-1
```
5. Copy and paste the following code into a text editor:

```
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:

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

```
cd ~
aws s3api create-bucket --bucket mydaylabbucket20220506 --region us-east-1
5. Copy and paste the following code into a text editor:

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

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

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

```json
{
    "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.
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

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](https://aws.amazon.com/s3/inventory) to get a list of all objects in your bucket. For others to access your objects, you’ll need to explicitly grant them permissions. [Learn more](https://aws.amazon.com/s3/permissions)
10. Choose the Permissions tab
11. In the **Bucket policy** section, choose **Edit**.
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.
13. In the policy, replace `example-bucket` with the name of your bucket.
14. At the bottom of the page, choose Save changes.
Amazon S3

Buckets
Access Points
Object Lambda Access Points
Multi-Region Access Points
Batch Operations
Access analyzer for S3

Block Public Access settings for this account

Storage Lens
Dashboards
AWS Organizations settings

Feature spotlight

AWS Marketplace for S3

Successfully edited bucket policy.

Amazon S3 ➔ Buckets ➔ mydaylabbucket20220506

mydaylabbucket20220506 info

Publicly accessible

Permissions overview

Access
Public

Block public access (bucket settings)
Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to all your S3 buckets and objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to your buckets or objects within, you can customize the individual settings below to suit your specific storage use cases. Learn more.

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

Block all public access
- Off
  ▶ Individual Block Public Access settings for this bucket

Bucket policy
The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts.

**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.
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.

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

**Hello World. Take me to your leader.**

Source: AWS Academy Introduction to Cloud: Semester 1, [https://awsacademy.instructure.com/courses/18745](https://awsacademy.instructure.com/courses/18745)
17. In the console, choose the **Objects** tab.

18. Upload the `index.html` file to your bucket. Choose **Upload**.
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**.
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.

**Permissions**

Grant public access and access to other AWS accounts.

**Access control list (ACL)**

Grant basic read/write permissions to other AWS accounts. [Learn more](#)

- AWS recommends using S3 bucket policies or IAM policies for access control. [Learn more](#)

Access control list (ACL)

Choose from predefined ACLs
20. Under **Predefined ACLs**, select **Grant public-read access**.
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**.
AWS Academy Introduction to Cloud: Semester 1  
Module 5 Content Delivery: Lab 5 - Amazon CloudFront

23. Choose Close.

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

Summary

Destination
s3://mydaylabbucket20220506

Succeeded
1 file, 64.0 B (100.00%)

Failed
0 files, 0 B (0%)

Files and folders

Files and folders (1 Total, 64.0 B)

<table>
<thead>
<tr>
<th>Name</th>
<th>Folder</th>
<th>Type</th>
<th>Size</th>
<th>Status</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>index.html</td>
<td>-</td>
<td>text/html</td>
<td>64.0 B</td>
<td>Succeeded</td>
<td>-</td>
</tr>
</tbody>
</table>
The `index.html` file appears in the **Objects** list.
**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!
24. Select the **Properties** tab, and scroll down to the **Static website hosting** section.
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.
29. Scroll down to the **Static website hosting** section again, and copy the **Bucket website endpoint** URL to your clipboard.

http://mydaylabbucket20220506.s3website-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!
**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
   <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"></p>
   </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:
   ```html
   <p><img src="http://d2f1zrb2zaf30.cloudfront.net/picture.jpg" alt="my test image"></p>
   ```
   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.
31. Choose the **Services** menu, locate the **Networking & Content Delivery** section, and choose **CloudFront**.
Amazon CloudFront

Securely deliver content with low latency and high transfer speeds

Amazon CloudFront is a fast content delivery network (CDN) service that securely delivers data, videos, applications, and APIs to customers globally with low latency and high transfer speeds.

Benefits and features

Reduce latency
The CloudFront network has 225+ points of presence (PoPs) that are connected by fully redundant, parallel AWS backbone.

Improve security
Use CloudFront for perimeter protection, traffic encryption, and access controls. AWS Shield Standard helps protect your data from distributed denial of service (DDoS) attacks.

AWS Free Tier

- 1 TB of data transfer out
- 10,000,000 HTTP or HTTPS requests
- 2,000,000 CloudFront Function invocations
- Each month, always free

Get started with CloudFront

Enable accelerated, reliable and secure content delivery for Amazon S3 buckets, Application Load Balancers, Amazon API Gateway APIs, and more in 5 minutes or less.

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

**Domain Name:**

https://dj1ero5u806ee.cloudfront.net
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
<html>
  <head>
    My CloudFront Test
  </head>
  <body>
    My test content goes here.
  </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:

```html
<p><img src="http://domain-name/object-name" alt="my test image">
</p>
```

Save the text file with an HTML extension.
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.
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.
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.
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. 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.

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

Congratulations! You have completed the lab.
40. Choose **End Lab** at the top of this page, and then select **Yes** to confirm that you want to end the lab.

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

Access the AWS Management Console

1. To start the lab session, choose Start Lab in the upper-right corner of the page.
Hello World. Take me to your leader.
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.
Web Application with AWS Core Services
AWS Application Services

AWS Development and DevOps Services

AWS Serverless Architecture
AWS Serverless Airline Booking

Where next?

Select your flight

Review your selection

Payment details

Heitor F. Lessa

50,241 Points

10% Next Tier Progress

Preferences

Dietary requirements

Luggage

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=MyoOeHTa2ag
Build a Serverless Web Application
Build a Serverless Web Application

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

**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.

**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

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

Source: https://aws.amazon.com/getting-started/projects/build-serverless-web-app-lambda-apigateway-s3-dynamodb-cognito/
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/
Build a Serverless Web Application with Amazon S3, AWS Lambda, Amazon API Gateway, Amazon DynamoDB, and Amazon Cognito

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

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

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

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

3 Serverless Backend

Amazon DynamoDB provides a persistence layer where data can be stored by the API's Lambda function.
Build a Serverless Web Application
with Amazon S3, AWS Lambda, Amazon API Gateway,
Amazon DynamoDB, and Amazon Cognito

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

4

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

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

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