

## Lab 14

### SERVE YOUR FILES USING THE CLOUDFRONT CDN



## STEP 1: Log In to the Amazon Web Service Console

This laboratory experience is about Amazon Web Services and you will use the AWS Management Console in order to complete all the lab steps.

**Amazon Web Services**

**Compute**

- EC2: Virtual Servers in the Cloud
- Lambda PREVIEW: Run Code in Response to Events

**Storage & Content Delivery**

- S3: Scalable Storage in the Cloud
- Storage Gateway: Integrates On-Premises IT Environments with Cloud Storage
- Glacier: Archive Storage in the Cloud
- CloudFront: Global Content Delivery Network

**Database**

- RDS: MySQL, Postgres, Oracle, SQL Server, and Amazon Aurora
- DynamoDB: Predictable and Scalable NoSQL Data Store
- ElastiCache: In-Memory Cache
- Redshift: Managed Petabyte-Scale Data Warehouse Service

**Networking**

- VPC: Isolated Cloud Resources
- Direct Connect: Dedicated Network Connection to AWS
- Route 53: Scalable DNS and Domain Name Registration

**Administration & Security**

- Directory Service: Managed Directories in the Cloud
- Identity & Access Management: Access Control and Key Management
- Trusted Advisor: AWS Cloud Optimization Expert
- CloudTrail: User Activity and Change Tracking
- Config PREVIEW: Resource Configurations and Inventory
- CloudWatch: Resource and Application Monitoring

**Deployment & Management**

- Elastic Beanstalk: AWS Application Container
- OpsWorks: DevOps Application Management Service
- CloudFormation: Templated AWS Resource Creation
- CodeDeploy: Automated Deployments

**Analytics**

- EMR: Managed Hadoop Framework
- Kinesis: Real-time Processing of Streaming Big Data
- Data Pipeline: Orchestration for Data-Driven Workflows

**Application Services**

- SQS: Message Queue Service
- SWF: Workflow Service for Coordinating Application Components
- AppStream: Low Latency Application Streaming
- Elastic Transcoder: Easy-to-use Scalable Media Transcoding
- SES: Email Sending Service
- CloudSearch: Managed Search Service

**Mobile Services**

- Cognito: User Identity and App Data Synchronization
- Mobile Analytics: Understand App Usage Data at Scale
- SNS: Push Notification Service

**Enterprise Applications**

- WorkSpaces: Desktops in the Cloud
- Zocalo: Secure Enterprise Storage and Sharing Service

**Additional Resources**

- Getting Started**  
See our documentation to get started and learn more about how to use our services.
- AWS Console Mobile App**  
View your resources on the go with our AWS Console mobile app, available from Amazon Appstore, Google Play, or iTunes.
- AWS Marketplace**  
Find and buy software, launch with 1-Click and pay by the hour.
- Service Health**  
All services operating normally.  
Updated: Nov 20 2014 12:57:00 GMT-0800
- Service Health Dashboard**
- Set Start Page**  
Console Home

The AWS Management Console is a web control panel for managing all your AWS resources, from EC2 instances to SNS topics. The console enables cloud management for all aspects of the AWS account, including managing security credentials, or even setting up new IAM Users.

### Log in to the AWS Management Console

In order to start the laboratory experience, open the Amazon Console by clicking this button:

[Open AWS Console](#)

Log in with the username **XXXX** and the password **XXXX**



Account:

User Name:

Password:

☐ I have an MFA Token ([more info](#))

[Sign-in using root account credentials](#)

[Terms of Use](#) [Privacy Policy](#)

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## Select the right AWS Region

Amazon Web Services is available in different regions all over the world, and the console lets you provision resources across multiple regions. You usually choose a region that best suits your business needs to optimize your customer's experience, but you must use the region **US**

**West (Oregon)** for this laboratory.

You can select the **US West (Oregon)** region using the upper right dropdown menu on the AWS Console page.

## STEP 2: Create an S3 bucket

Amazon Simple Storage Service (Amazon S3) provides secure, durable, and highly scalable object storage. To upload data (photos, videos, documents etc.), you first create a logical storage bucket in one of the AWS regions. Then you can upload any number of objects to it. Buckets and objects are resources, and Amazon S3 provides APIs and a web management console to manage them.

Amazon S3 can be used alone or together with other AWS services such as Amazon EC2, Amazon Elastic Block Store (Amazon EBS), and Amazon Glacier, as well as third-party storage repositories and gateways. Amazon S3 provides cost-effective object storage for a wide variety of use cases including web applications, content distribution, backup and archiving, disaster recovery, and big data analytics.

You can create an S3 bucket using the S3 dashboard.

Select the S3 service from the Management Console dashboard:

### Storage & Content Delivery



**S3**

Scalable Storage in the Cloud

From the S3 console dashboard, click the blue **Create Bucket** button.

 **AWS** ▾ **Services** ▾ **Storage** ▾

Antonio Angelino ▾ Global ▾ Support ▾

## Welcome to Amazon Simple Storage Service

Amazon S3 is storage for the Internet. It is designed to make web-scale computing easier for developers.

Amazon S3 provides a simple web services interface that can be used to store and retrieve any amount of data, at any time, from anywhere on the web. It gives any developer access to the same highly scalable, reliable, secure, fast, inexpensive infrastructure that Amazon uses to run its own global network of web sites. The service aims to maximize benefits of scale and to pass those benefits on to developers.

You can read, write, and delete objects ranging in size from 1 byte to 5 terabytes each. The number of objects you can store is unlimited. Each object is stored in a bucket with a unique key that you assign.

Get started by simply creating a bucket and uploading a test object, for example a photo or .txt file.


**Create Bucket**

### Additional Information

- [Getting Started Guide](#)
- [Documentation](#)
- [All S3 Resources](#)


### S3 at a glance

#### Create




Create a bucket in one of several Regions. You can choose a Region to optimize for latency, minimize costs, or address regulatory environments.

#### Add



Upload objects to your bucket. Amazon S3 durably stores your data in multiple facilities and on multiple devices within each facility.

#### Manage



Manage your data with Amazon S3's lifecycle management capabilities, including the ability to automatically archive objects to even lower cost storage options.

The **Create a Bucket** dialog box appears and you have to enter the **Bucket Name** and select a **Region** from the selection box.

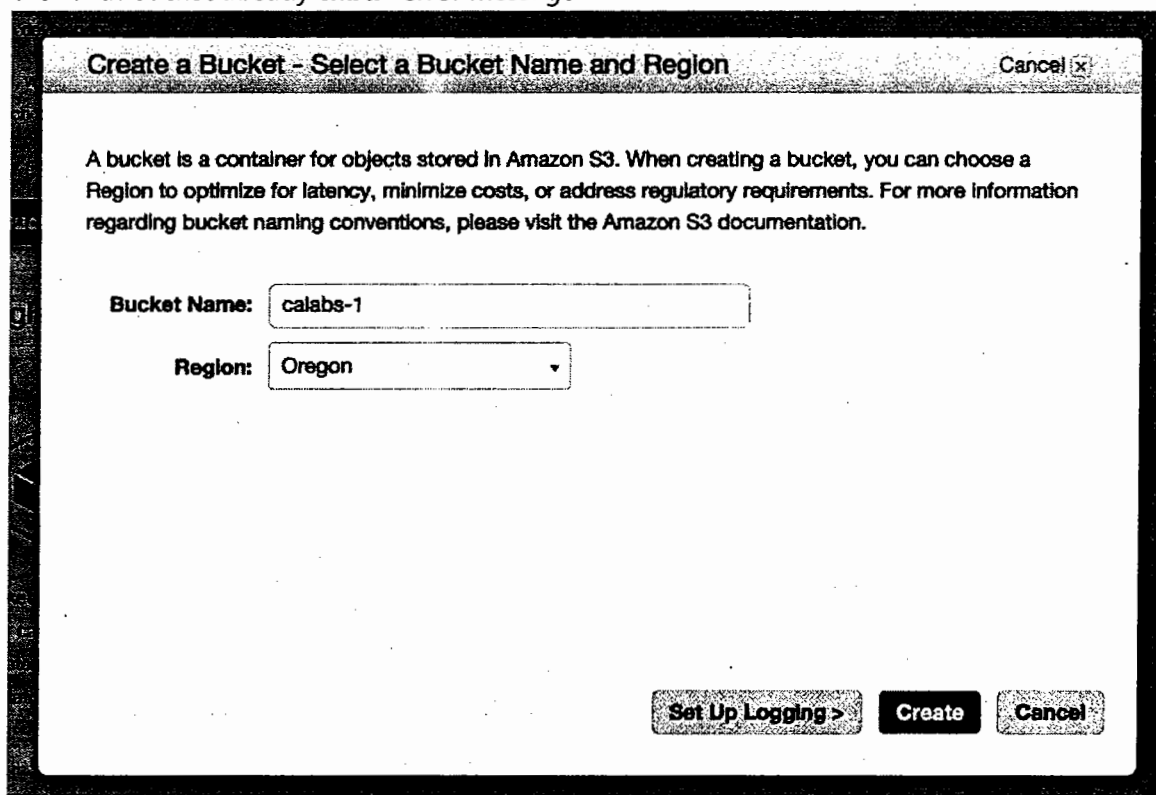
Bucket names must be globally unique, regardless of the AWS region in which you create the bucket, and they must be DNS-compliant.

The rules for DNS-compliant bucket names are:

- ✓ Bucket names must be at least 3 and no more than 63 characters long.
- ✓ Bucket names can contain lowercase letters, numbers, periods, and/or hyphens. Each label must start and end with a lowercase letter or a number.
- ✓ Bucket names must not be formatted as an IP address (e.g., 192.168.1.1).

The following examples are valid bucket names: vepsunbucket , vepsun.bucket , calabs.1 or calabs-bucket .

Please use the following bucket name **calabs-s3cf** and add a numeric suffix if you receive the "That bucket already exists" error message.



**Create a Bucket - Select a Bucket Name and Region** Cancel x

A bucket is a container for objects stored in Amazon S3. When creating a bucket, you can choose a Region to optimize for latency, minimize costs, or address regulatory requirements. For more information regarding bucket naming conventions, please visit the Amazon S3 documentation.

**Bucket Name:** calabs-1

**Region:** Oregon

Set Up Logging > Create Cancel

Click **Create** and the console will display your empty bucket in the buckets list.

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with 'AWS', 'Services', and 'Console' dropdowns, along with user information 'Antonio Angelino', 'Global', and 'Support'. Below this, a 'Create Bucket' button and an 'Actions' dropdown are visible. A table on the left lists 'All Buckets (1)' with a single entry 'calabs-1'. The main panel displays the details for 'Bucket: calabs-1'. It includes tabs for 'None', 'Properties', and 'Transfers', with 'Properties' selected. The details section shows:
 

- Bucket: calabs-1
- Region: Oregon
- Creation Date: Wed Feb 25 17:06:11 GMT+100 2015
- Owner: Me

 Below these details are several expandable sections: 'Permissions', 'Static Website Hosting', 'Logging', 'Events', 'Versioning', 'Lifecycle', 'Tags', and 'Requester Pays'.

### STEP 3: Upload a demo image gallery to the S3 Bucket

For completing this step, you need to upload an image gallery to the **calabs-s3cf** bucket. The gallery is composed of:

- ✓ a set of image files
- ✓ an HTML page that lists each image
- ✓ some javascript and css files for enhancing the image visualization

First of all, download the demo gallery ( <http://vepsun-labs.s3-website-us-west-2.amazonaws.com/scripts/gallery.zip> ) and unzip it.

You can upload files to an S3 bucket using the S3 dashboard easily.

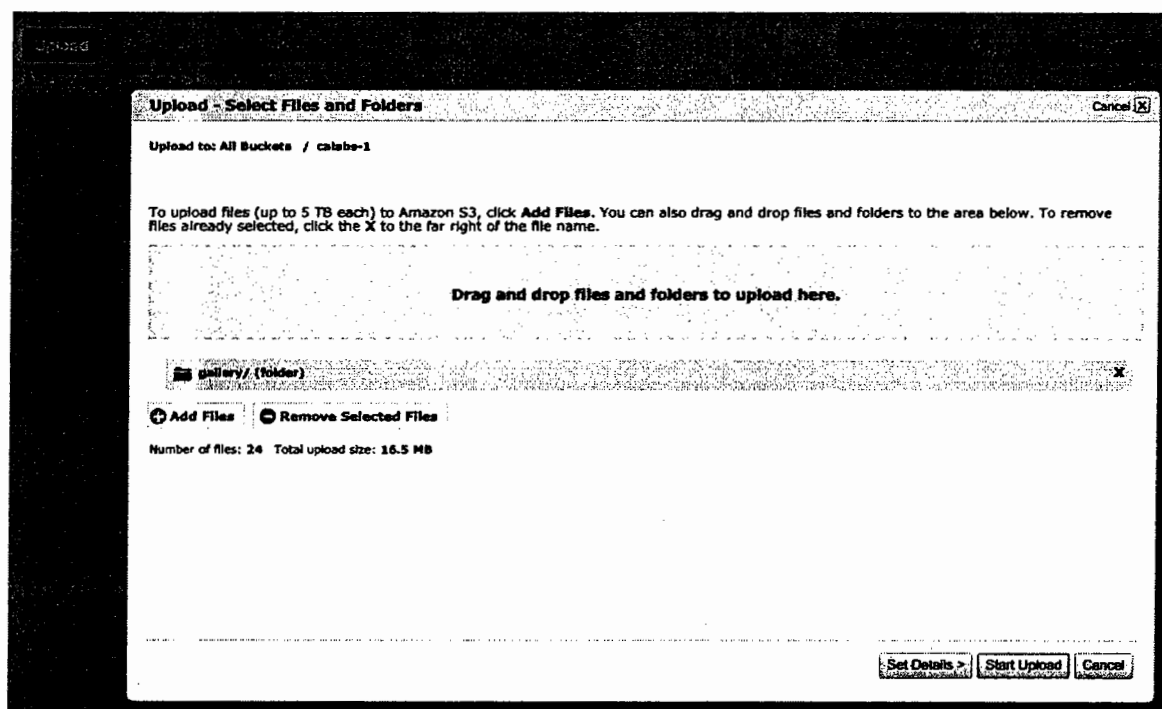
Select the S3 service from the Management Console dashboard:

#### Storage & Content Delivery

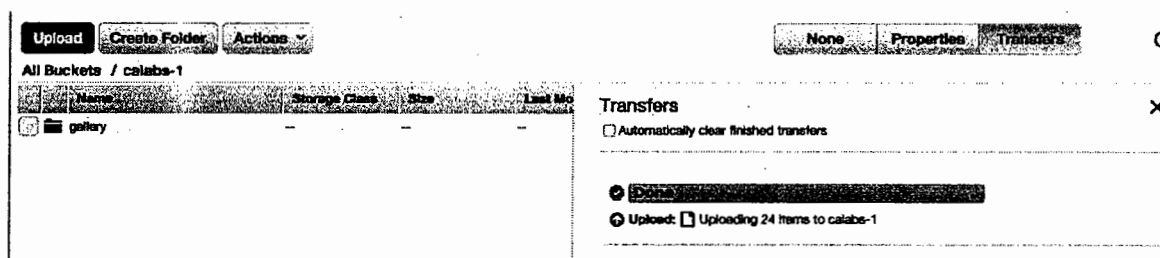


From the S3 console dashboard, select the bucket **calabs-s3cf** and then click on the blue **Upload** button.

Drag and drop the downloaded gallery folder to the upload window and then click **Start Upload**.



You can check the transfer progress from the **Transfers** tab. Wait until the upload ends.



The demo gallery is now stored in the S3 bucket.

#### STEP 4: Make S3 files accessible to everyone

All uploaded files are **private** by default and can only be viewed by the AWS account owner, but you can make them accessible to everyone using the AWS Console.

Select the S3 service from the Management Console dashboard:



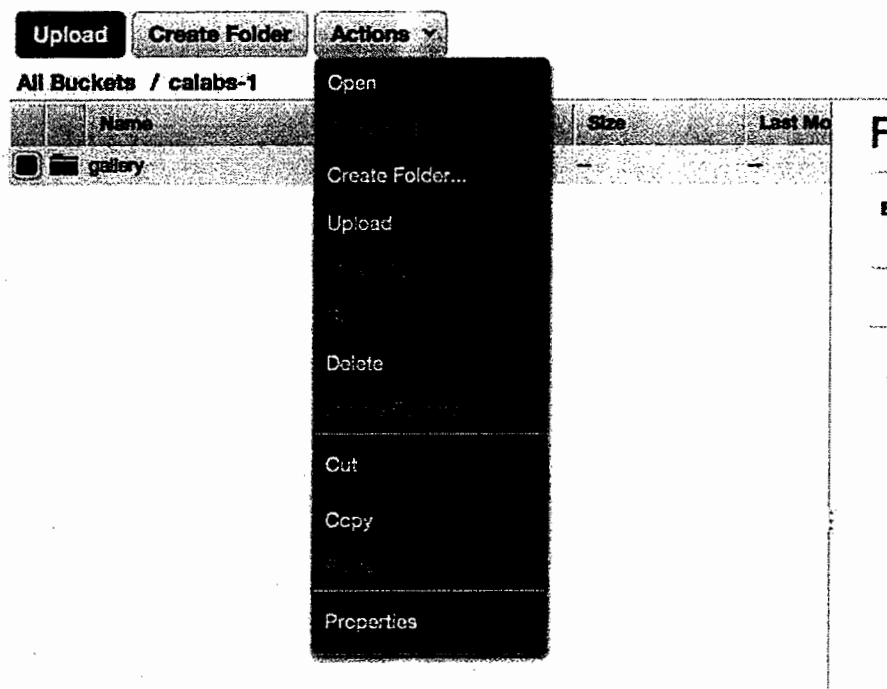
## Storage & Content Delivery



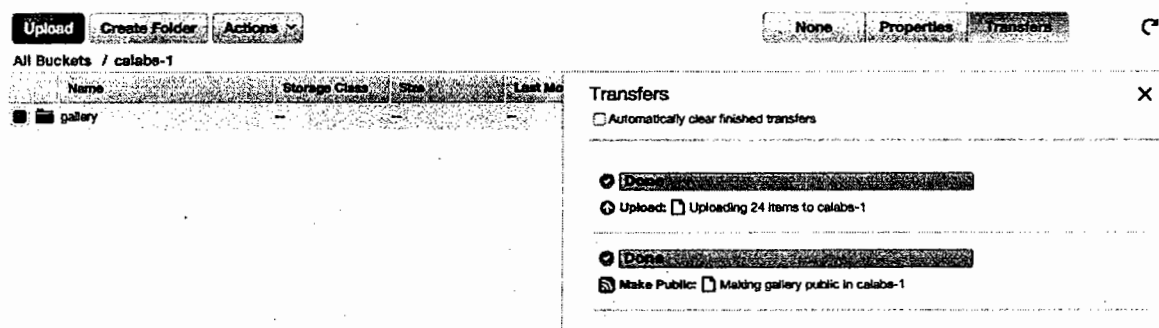
**S3**  
Scalable Storage in the Cloud

From the S3 console dashboard, select the bucket **calabs-s3cf** and then the **gallery** object.

Click the **Actions** button and then click on **Make Public**.



You can check the operation progress in the **Transfers** tab, wait until it ends.



You can check if the previously selected objects are now public by opening the **Link** URL that you can find in the **Properties** tab.

Upload

Create Folder

Actions

None

Properties

Transfers

All Buckets / calabs-1 / gallery

Name	Storage Class	Size	Last Modified
css	-	-	-
images	-	-	-
img	-	-	-
index.html	Standard	3.7 KB	Wed Feb
js	-	-	-

Object: index.html

Bucket: calabs-1

Folder: gallery

Name: index.html

Link: <https://s3-us-west-2.amazonaws.com/calabs-1/gallery/index.html>

Size: 3822

Last Modified: Wed Feb 25 23:49:23 GMT+100 2015

Owner: Me

ETag: 3b0428619b3093ae00c7f1cd575b30b3

Expiry Date: None

Expiration Rule: N/A

Details

Storage Class: ☒ Standard ☐ Reduced Redundancy

Server Side Encryption: ☒ None ☐ AES-256

Save Cancel

Permissions

Metadata

The following screenshot shows a simple image gallery served by the Amazon S3 service.



As you can see, the public object URL is <https://s3-us-west-2.amazonaws.com/calabs-1/gallery/index.html>.

The URL of any S3 object follows this template: `https://s3-<region>.amazonaws.com/<bucket-name>/<object-path><object-name>`

## STEP 5: Create a CloudFront Distribution

Amazon **CloudFront** is a content delivery service (CDN). In Amazon CloudFront, the content is organized into distributions.

You can create two different kinds of CloudFront **distributions**: **Web Distributions** for HTTP/HTTPS-delivered contents and **RTMP Distributions** for delivering streaming media content to end users in real time. Each distribution has a unique *cloudfront.net* domain name (e.g. *cdn123.cloudfront.net*) that can be used to reference objects through the global network of edge locations.

To use Amazon CloudFront:

- ✓ Store the original versions of your files on one or more origin servers. An **origin server** is the location of the definitive version of an object. Origin servers could be an Amazon S3 bucket, an Amazon EC2 instance, an Elastic Load Balancer or another remote server.
- ✓ Create a distribution to register the origin servers with Amazon CloudFront.
- ✓ Use your distribution's domain name in your web pages, media player, or application. When end users request an object using this domain name, they are automatically routed to the nearest edge location for high-performance delivery of your content.

Select the CloudFront service from the Management Console dashboard:



From the CloudFront console dashboard, click **Create Distribution**.



The distribution creation wizard is divided into two steps. In the first step you need to select the right delivery method for your purpose. Select the **Web distribution** and click the first **Get Started** button.

Step 1: Select delivery method  
Step 2: Create distribution

## Select a delivery method for your content. ?

### Web

Create a web distribution if you want to:

- Speed up distribution of static and dynamic content, for example, .html, .css, .php, and graphics files.
- Distribute media files using HTTP or HTTPS.
- Add, update, or delete objects, and submit data from web forms.
- Use live streaming to stream an event in real time.

You store your files in an origin — either an Amazon S3 bucket or a web server. After you create the distribution, you can add more origins to the distribution.

**Get Started**

### RTMP

Create an RTMP distribution to speed up distribution of your streaming media files using Adobe Flash Media Server's RTMP protocol. An RTMP distribution allows an end user to begin playing a media file before the file has finished downloading from a CloudFront edge location. Note the following:

- To create an RTMP distribution, you must store the media files in an Amazon S3 bucket.
- To use CloudFront live streaming, create a web distribution.

**Get Started**

Cancel

The second step is composed of several sections: **Origin Setting**, **Default Cache Behavior Settings** and **Distribution Settings**.

Select the Amazon S3 Bucket **calabs-s3cf** as Origin Domain Name and don't change any Default Cache Behavior Setting.

Step 1: Select delivery method  
Step 2: Create distribution

## Create Distribution ?

### Origin Settings

Origin Domain Name  ⓘ  
Origin Path  ⓘ  
Origin ID  ⓘ

### Default Cache Behavior Settings

Path Pattern  ⓘ  
Viewer Protocol Policy ☒ HTTP and HTTPS ⓘ  
☐ Redirect HTTP to HTTPS  
☐ HTTPS Only  
Allowed HTTP Methods ☒ GET, HEAD ⓘ  
☐ GET, HEAD, OPTIONS  
☐ GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE  
Cached HTTP Methods  ⓘ  
Forward Headers  ⓘ  
Object Caching ☒ Use Origin Cache Headers ⓘ  
☐ Customize  
Minimum TTL  ⓘ

The time required for deploying a new CloudFront distribution also depends on the number of selected Edge Locations. Select the **Use Only US and Europe** price class to speed up the creation process.

<b>Price Class</b>	Use All Edge Locations (Best Performance)
<b>Alternate Domain Names (CNAMEs)</b>	Use Only US and Europe Use Only US, Europe and Asia Use All Edge Locations (Best Performance)
<b>SSL Certificate</b>	<div>Choose this option if you want your users to use HTTPS or HTTP to access your content with the CloudFront domain name (such as https://d1111111abode8.cloudfront.net/logo.jpg). Important: If you choose this option, CloudFront requires that browsers or devices support TLSv1 or later to access your content.</div> <div>Custom SSL Certificate (stored in AWS IAM): No certificates available </div> <div>Choose this option if you want your users to use HTTPS to access your content with an alternate domain name (such as https://www.example.com/logo.jpg). You first need to upload your certificate to the AWS IAM certificate store (the -path parameter must start with /cloudfront/). <a href="#">Learn More</a></div>

Insert **gallery/index.html** as **Default Root Object** and then click **Create Distribution**.

Cancel Back Create Distribution

CloudFront immediately assigns an **ID** and a **Domain Name** to the distribution and starts updating the edge locations to serve your content.

Distributions
Reports & Analytics
Cache Statistics
Monitoring and Alarming
Popular Objects
Top Referrers
Usage
Viewers
Private Content
How-to Guide
Origin Access Identity

### CloudFront Distributions

Create Distribution
Distribution Settings
Delete
Enable
Disable
Show/Hide Columns
Refresh
?

Viewing: Any Delivery Method Any Status

Viewing 1 to 1 of 1 items

Delivery Method	ID	Domain Name	Origin	CNAME	Status	Last Modified
Web	ESGFNEZ9KQNB	d1jemo61fzmp19.cloudfront.net	calabs-1		In Progress	Enabled 2015-02-26 00:03 UTC+1

After a few minutes, the distribution status changes to **Deployed** and you can start experiencing all the benefits of CloudFront.

Distributions
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### CloudFront Distributions

Create Distribution
Distribution Settings
Delete
Enable
Disable
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?

Viewing: Any Delivery Method Any Status

Viewing 1 to 1 of 1 items

Delivery Method	ID	Domain Name	Origin	CNAME	Status	Last Modified
Web	ESGFNEZ9KQNB	d1jemo61fzmp19.cloudfront.net	calabs-1		Deployed	Enabled 2015-02-26 00:03 UTC+1

## STEP 6: Test the CloudFront distribution

When the previously created distribution is ready, you can browse the demo gallery boosted by CloudFront Edge locations.

Get the **Domain Name** from the **CloudFront Distributions** list, and then open the following URL:

**`http://<distribution-domain-name>/gallery/index.html`**

Distributions

CloudFront Distributions

Create Distribution

Distribution Settings

Delete

Enable

Disable

Show/Hide Columns

Refresh

?

Viewing

Any Delivery Method

Any Status

Viewing 1 to 1 of 1 items

Delivery Method	ID	Domain Name	Origin	CNAME	Status	State	Last Modified
Web	ESGFNEZ9KLONB	d1jerrx61fzmp19.cloudfront.net	calaba-1	-	Deployed	Enabled	2015-02-26 00:03 UTC+1

Reports & Analytics

Cache Statistics

Monitoring and Alarming

Popular Objects

Top Referrers

Usage

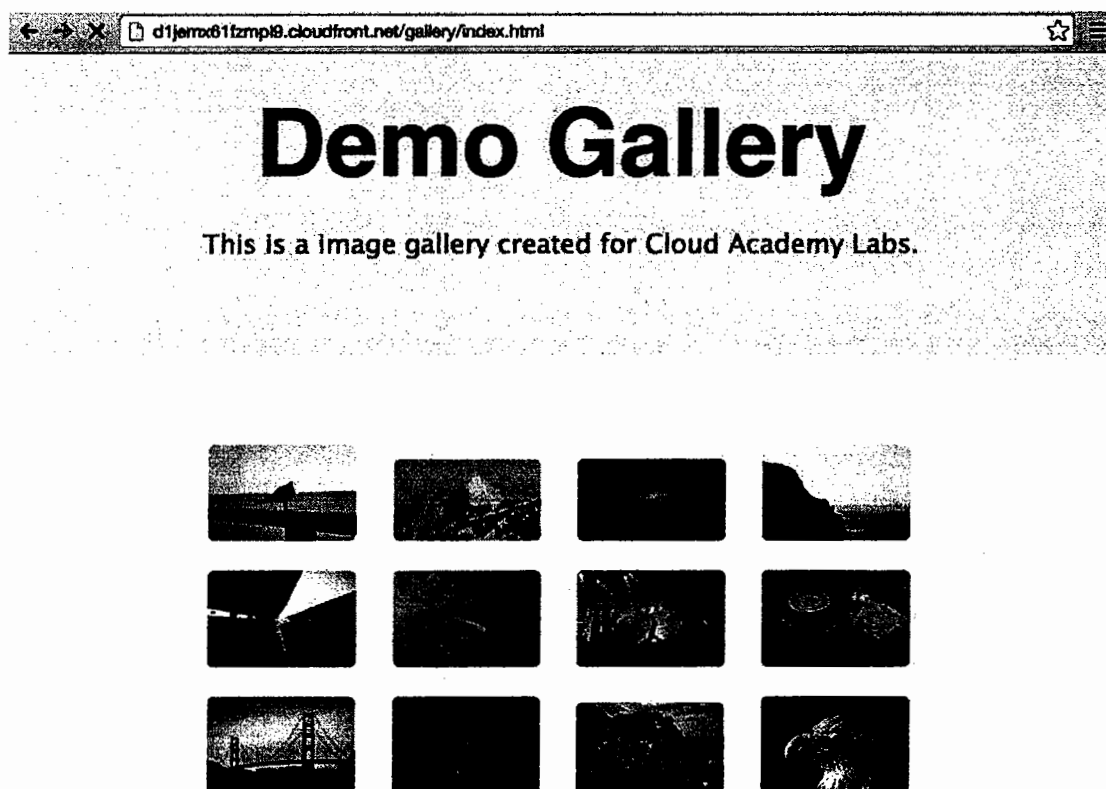
Viewers

Private Content

How-to Guide

Origin Access Identity

You should experience a dramatic increase in the loading speed during image loading.



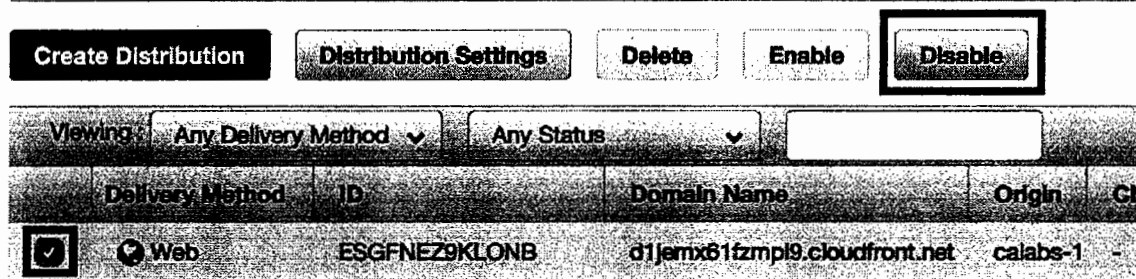
## STEP 7: Disable a CloudFront distribution

If you don't need the distribution anymore, you can disable and then delete it. A disabled distribution is no longer functional and Amazon stops billing for it.

You can disable a distribution using the AWS Management Console. Select the CloudFront service from the Console dashboard:

From the CloudFront console dashboard, select the distribution and click **Disable**.

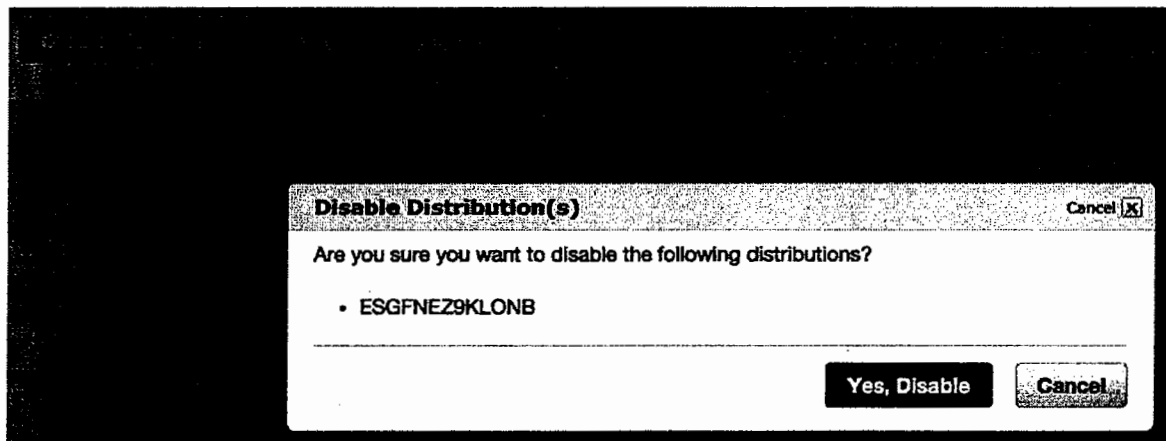
## CloudFront Distributions



The screenshot shows the CloudFront Distributions console. At the top, there are buttons: 'Create Distribution', 'Distribution Settings', 'Delete', 'Enable', and 'Disable'. The 'Disable' button is highlighted with a red box. Below the buttons is a filter bar with 'Viewing: Any Delivery Method' and 'Any Status'. A table lists the distributions. The first distribution is selected with a checkbox.

	Delivery Method	ID	Domain Name	Origin	CNAME
<input checked="" type="checkbox"/>	Web	ESGFNEZ9KLONB	d1jmx61fzmpi9.cloudfront.net	calabs-1	-

When prompted for confirmation, click **Yes, Disable**.



The screenshot shows a confirmation dialog titled 'Disable Distribution(s)'. It asks 'Are you sure you want to disable the following distributions?' and lists 'ESGFNEZ9KLONB'. There are 'Yes, Disable' and 'Cancel' buttons.

**Disable Distribution(s)** Cancel X

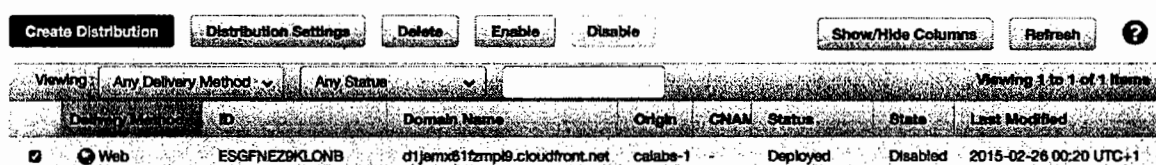
Are you sure you want to disable the following distributions?

- ESGFNEZ9KLONB

**Yes, Disable** **Cancel**

CloudFront needs some minutes for disabling the distribution, take a look at the **State** column to know when the operation completes.

## CloudFront Distributions



The screenshot shows the CloudFront Distributions console after the distribution has been disabled. The 'Status' column now shows 'Disabled' instead of 'Deployed'. There are also 'Show/Hide Columns' and 'Refresh' buttons.

	Delivery Method	ID	Domain Name	Origin	CNAME	Status	State	Last Modified
<input checked="" type="checkbox"/>	Web	ESGFNEZ9KLONB	d1jmx61fzmpi9.cloudfront.net	calabs-1	-	Deployed	Disabled	2015-02-26 00:20 UTC+1



## STEP 8: Delete a CloudFront distribution

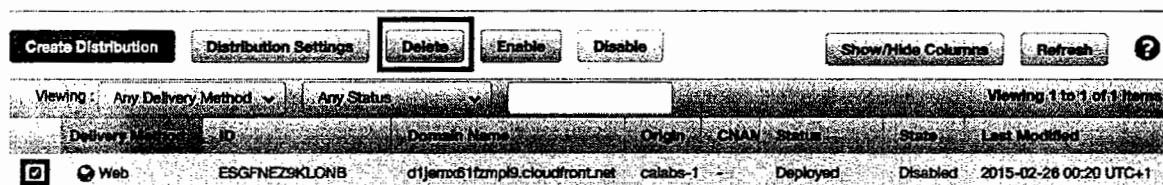
You can delete a disabled distribution using the AWS Management Console.

Select the CloudFront service from the Console dashboard:



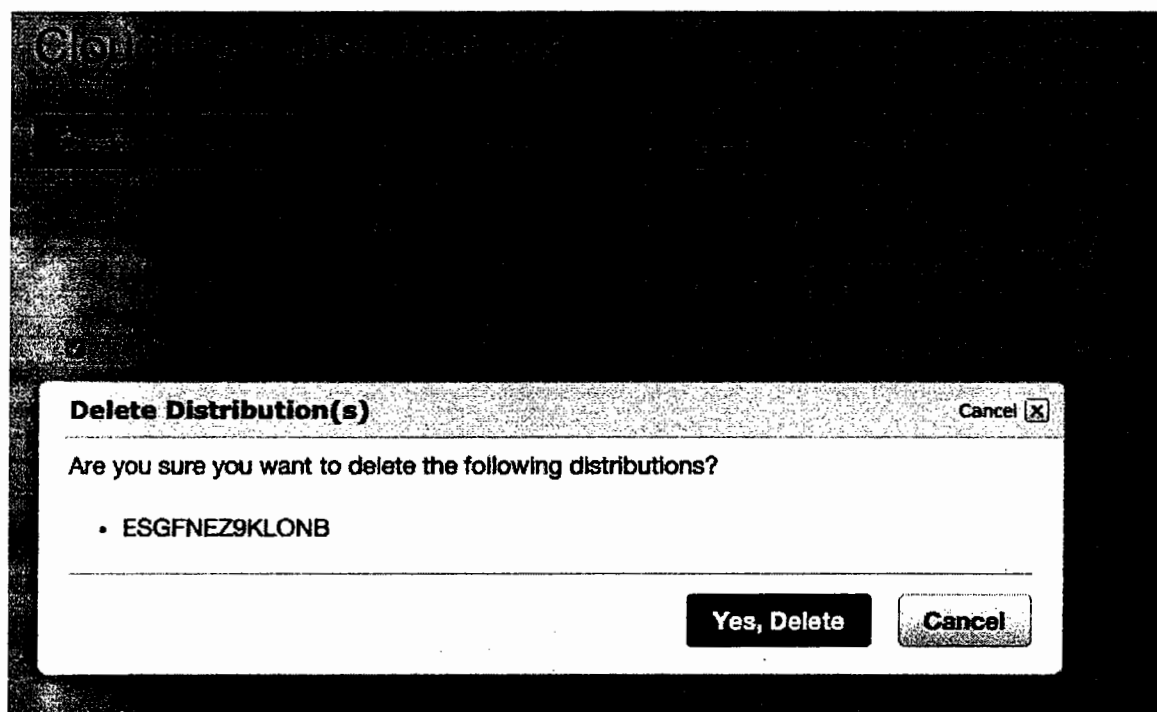
From the CloudFront console dashboard, select the disabled distribution and click **Delete**.

### CloudFront Distributions



Create Distribution	Distribution Settings	<b>Delete</b>	Enable	Disable	Show/Hide Columns	Refresh	?
Viewing: Any Delivery Method Any Status							
Delivery	ID	Domain Name	Origin	CHAN	Status	State	Last Modified
Web	ESGFNEZ9KLONB	d1jmx61fzmp19.cloudfront.net	calabs-1	Deployed	Disabled		2015-02-26 00:20 UTC+1

When prompted for confirmation, click **Yes, Delete**.



The distribution will immediately disappear from the distribution list and it is no longer available.

## STEP 9: Destroy an S3 bucket

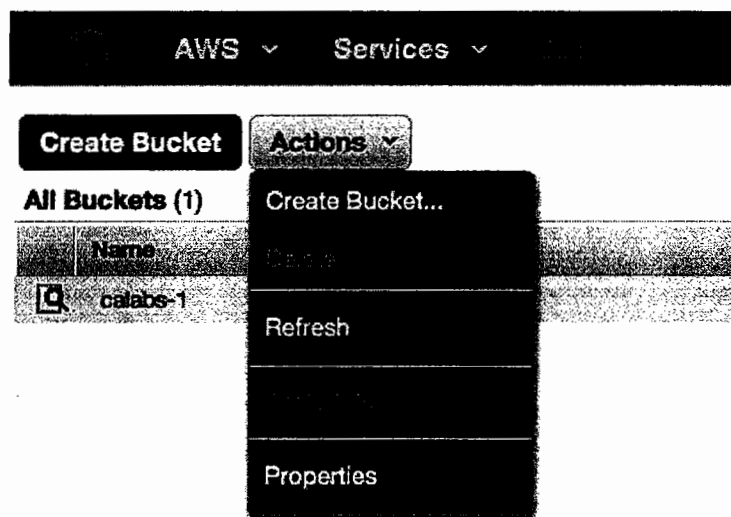
You can destroy an S3 bucket using the S3 dashboard, and all objects within the bucket will be deleted.

Select the S3 service from the Management Console dashboard:

### Storage & Content Delivery



From the S3 console dashboard, select the bucket `calabs-s3cf` and then click the **Actions** gray button.



Click **Delete** from the drop-down menu and then confirm the action when the confirmation popup appears.

If you receive an error message, check and see if the bucket is empty and try again.