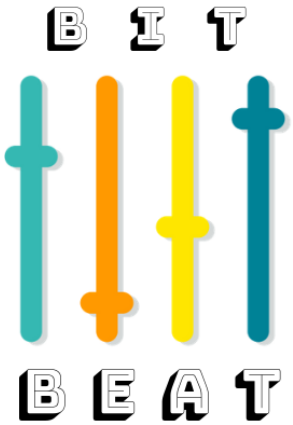
Creating an Amazon CloudFront Distribution using Amazon S3

README



World Domination One Beat At A Time

BitBeat is a new startup that is planning to take the record industry and the world by storm with our new product **BitBanger,** a web-based music mixer app.

At **BitBeat**, the business adage ***customer first*** is more than just a saying—it's a core philosophy and standard operating procedure. **BitBeat** promises to provide nothing but the best customer service to all of its customers. When you think about customer service, it partially means a smiling face and promptly answering customer queries. But, in addition to basic customer services, an additional way to delight your potential customers is with a well-designed website that serves your company's business content as quickly as possible. Studies have shown that a website's sales could drop as much as 1 percent for every 100 millisecond (ms) delay in page load.[1]

As an employee at **BitBeat**, who is responsible for infrastructure and optimization, you need to demonstrate the value of content acceleration to your business leaders. Amazon CloudFront is a fast content delivery network (CDN) service that securely delivers images, data, videos, applications, and APIs to customers globally.

BEFORE GETTING STARTED

Here's some important information to know before starting this hands-on activity.

Activity time: 60 min

Requirements: You must have an AWS Educate account.

Getting help: If you experience any issues as you complete this activity, please ask your instructor for assistance.

[1] "Amazon Found Every 100ms of Latency Cost them 1% in Sales," Gigaspaces, last modified January 20, 2019, https://www.gigaspaces.com/blog/amazon-found-every-100ms-of-latency-cost-them-1-in-sales/

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DID YOU KNOW

Amazon CloudFront is a content delivery web service. It integrates with other Amazon Web Services products to give developers and businesses a simple way to distribute content to end users with low latency, high data transfer speeds, and no minimum usage commitments.

Task overview

This activity applies your knowledge of Amazon Simple Storage Service (Amazon S3) and introduces you to Amazon CloudFront. You will learn how to deliver content and decrease end-user latency using Amazon CloudFront.

Task objectives:

Create an Amazon S3 bucket with a unique global namespace

- Upload an image of your choice
- Create an Amazon CloudFront distribution that will use a CloudFront domain name in the URL to distribute a publicly accessible image file stored in an Amazon S3 bucket

Learning outcomes

By the end of this lab, you will be able to:

- Create an Amazon CloudFront distribution
- Use your Amazon CloudFront distribution to serve an image file
- Delete your Amazon CloudFront distribution when it is no longer required

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Let's get started!

Task 1: Create an Amazon S3 bucket and store an image file

Let's being by creating an Amazon S3 bucket and then store a file. The Amazon S3 buckets needs to be configured to be publicly accessible.

1. In the **AWS Management Console**, on the **Services** menu, click **S3**.
2. In the Amazon S3 console, click Create bucket then configure:

   Bucket name: *Select/create a globally unique bucket name here*

   - Region: *US East (N. Virginia)*

   - Click Next
   - Tags:
     - **Key** – Name
     - **Value** – CloudFront Acceleration
   - Click Next
   - Click Next
   - Click Create bucket
3. On the Amazon S3 Buckets page, click and highlight the Amazon S3 bucket you created.
4. Locate and click the **Permissions** option. The **Block *all* public access** setting is set to ***On***. This needs to be changed.
5. Click Edit to change the settings.
6. **Deselect** the **Block *all* public access** option. Leave all other options **deselected**.
7. Click Save

Pro tip:
Notice all the individual options remain deselected. When deselecting all public access, you must then select the individual options that apply to your situation and security objectives. In a production environment, it is recommended you use the most restrictive settings possible.

Pro tip:
If you receive an error saying that your bucket name is not available, try a different bucket name. For your bucket to work with Amazon CloudFront, the name must conform to DNS naming requirements. The following rules apply for naming Amazon S3 buckets:

- Bucket names must be between 3 and 63 characters long.
- Bucket names can consist only of lowercase letters, numbers, dots (.), and hyphens (-).
- Bucket names must begin and end with a letter or number.

For more information, go to Bucket Restrictions and Limitations https://docs.aws.amazon.com/AmazonS3/latest/dev/BucketRestrictions.html in the *Amazon Simple Storage Service Developer Guide*.

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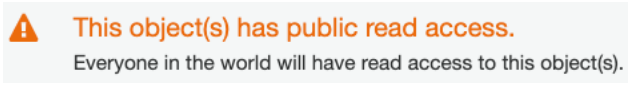
A dialogue box opens asking you to confirm your changes.

8. Type in the field, and then click **Confirm**
9. Click **Overview** tab.
10. Click **Upload**
11. Click **Add files**
12. Navigate to http://tinyurl.com/s3static to download and save these files to your desktop. Select the bitbangers.png file or select an image from your computer that you would like to upload.

    If you don't have a file prepared, visit https://unsplash.com/ to find and download an image to your desktop or use one of your own images. Then use that file for this step.

13. Click **Next**
14. To upload, set the permissions step, locate the **Manage public permissions** option, and click the dropdown arrow. Choose the ***Grant public read access to this object(s)*** option from the dropdown window selections. The following notification should display:



15. Click **Next**
16. Click **Next**
17. Click **Upload**
18. Copy the name of your file to your text editor for later use.

    For example, the name of your file could be "bitbangers.png."

19. Click and highlight the file that you uploaded.
20. In the slide out modal, locate the Overview section. Find and locate the **Object URL**, click it, and then copy the link to your clipboard
21. Paste the link in a new browser tab. Press **Enter**.

This will display your image. It also proves that your content is publicly accessible. However, this **IS NOT** the URL you will use when you are ready to distribute your content.

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DID YOU KNOW

Amazon CloudFront speeds up content delivery by leveraging its global network of data centers, known as edge locations, to reduce delivery time by caching your content close to your end users. An **edge location** is where end users access services **located** at AWS. Edge locations are **located** in most of the major cities around the world and are specifically used by CloudFront to distribute content to end users to reduce latency. CloudFront fetches your content from an origin, such as an Amazon S3 bucket, an Amazon EC2 instance, an Amazon Elastic Load Balancer, or your own web server, when it's not already in an edge location. CloudFront can deliver your entire website or application, including dynamic, static, streaming, and interactive content.

Task 2: Create a CloudFront web distribution

Now, you'll configure CloudFront to distribute the image in the Amazon S3 bucket you created in Task 1.

1. In the **AWS Management Console**, on the **Services** menu, locate and select **CloudFront** under the **Network and Content Delivery** category
2. Click **Create Distribution**
3. On the **Select a delivery method for your content** page, in the **Web** section, click **Get Started**
4. Next, configure:

    - On the Create Distribution page, click inside the box next to **Origin Domain Name**, then locate and select the Amazon S3 bucket you created.
    - Leave all the other default settings. Scroll to the bottom of the page. Click **Create Distribution**

On the CloudFront distributions page, locate the **Status** column and notice it shows **In Progress** for your distribution. After CloudFront has created your distribution, the value of the **Status** column for your distribution will change to **Deployed**. At this point, it will be ready to process requests. You can periodically refresh the CloudFront distributions page by clicking the refresh button while the request processes, or watch this Amazon CloudFront video: https://aws.amazon.com/cloudfront/.

The domain name that CloudFront assigns to your distribution appears in the list of distributions. It will look similar to ***dm2afjy05tegj.cloudfront.net***.

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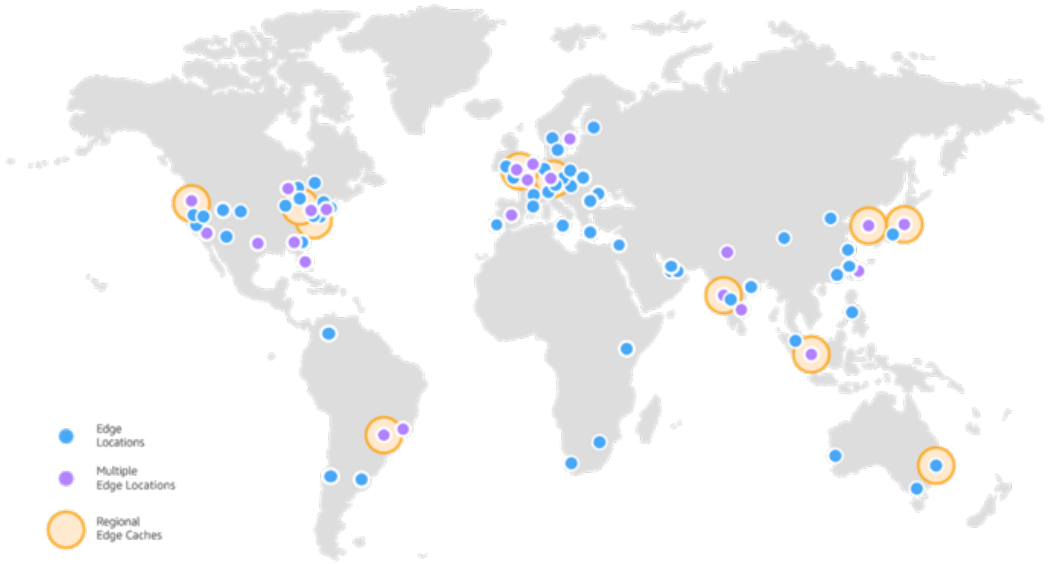
CloudFront now knows where your Amazon S3 origin server is, and you know the domain name associated with the distribution. You can create a link to your Amazon S3 bucket content with that domain name and have CloudFront serve it.

Amazon CloudFront Infrastructure



DID YOU KNOW

When you create or save changes to your distribution configuration, CloudFront starts to propagate the changes to all edge locations. Until your configuration is updated in an edge location, CloudFront continues to serve your content from that location based on the initial or previous configuration. After your configuration is updated in an edge location, CloudFront immediately starts to serve your content from that location based on the new configuration. Your changes don't propagate to every edge location instantaneously. When propagation is complete, the status of your distribution changes from **In Progress** to **Deployed**.

Simply put, there may be some delay in your content being served from different locations around the world. This latency is due to the fact that your content has to be distributed to edge locations globally; the world is a big place and it takes time to distribute content globally.

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Task 3: Create a link to your object

Now that you have created a publicly accessible Amazon S3 bucket and added it to your newly configured CloudFront, let's create a link to the object.

1. Copy the following HTML into a new text file:

```
<html>
<head>My CloudFront Test</head>
<body>
<p>THIS IS MY CLOUDFRONT TEST PAGE.</p>
<p><img src="http://DOMAIN/OBJECT" alt="my test image" /></p>
</body>
</html>
```

2. In your text file:

   - Replace **DOMAIN** with your CloudFront **Domain Name** for your distribution. You should see this on the CloudFront distributions page.
   - Replace **OBJECT** with the name of the file that you uploaded to your Amazon S3 bucket.

   Example code:

```
<html>
<head>My CloudFront Test</head>
<body>
<p>My text content goes here.</p>
<p><img src="http://d36pvglak3i586.cloudfront.net/bitbangers.png" alt="my test image" /></p>
</body>
</html>
```

3. Save the text **file** to your computer as **testpage.html**.
4. Open the .html page you just created in a browser to ensure that you can see your content.

   Browser → File → Open File….

The browser returns your page with the embedded image file, which has been served from the edge location that CloudFront determined was appropriate to serve the object.

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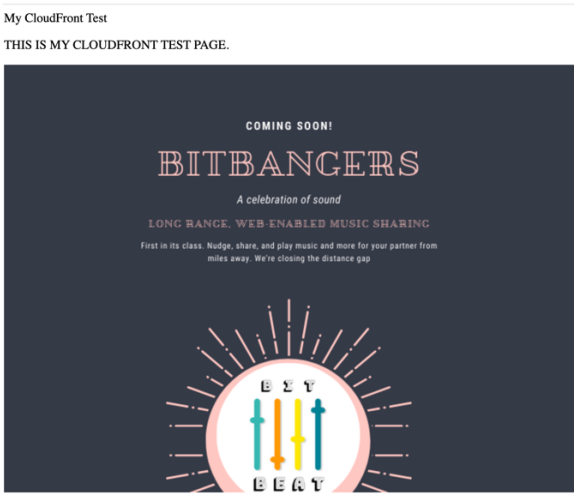
Example .html output:



Great job!

Let's review

You have completed the activity and have successfully created a CloudFront web distribution. In this activity, as a **BitBeat** employee responsible for infrastructure and optimization, you:

- Created an Amazon S3 bucket
- Configured proper Amazon S3 bucket configurations
- Uploaded an image to be used by a CloudFront distribution
- Created an .html test page
- Validated the test image was appropriately served

Test your knowledge

- ☐ What is CloudFront? _____
- ☐ What does CloudFront do? Why is this important? _____
- ☐ How is CloudFront different than Amazon S3?

  _____
- ☐ What is an Amazon edge location? _____

  _____

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☐ Why aren't updates to your CloudFront distribution immediate?

_____

Challenge question

You've just received a call from your colleagues in Singapore. Your colleagues stated that the website is slow in Singapore. What can you do to help resolve the issue?

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Bonus activity 1 – Delete your CloudFront distribution

You can clean up your resources by deleting the CloudFront distribution and the Amazon S3 bucket.

1. In the **AWS Management Console**, select the check box for your CloudFront distribution.
2. At the top of the screen, click **Disable.**
3. Click **Yes, Disable**
4. Click **Close**

Bonus activity 2 – Delete your Amazon S3 bucket

1. On the **Services** menu, click **Amazon S3**.
2. Click the area to the left of your bucket so that you highlight your bucket.

   Do not click the name of your bucket. You only need to highlight your bucket.

3. Click **Delete** then:
   - Enter the name of your bucket.
   - Click **Confirm**

You have now released the resources used by your CloudFront distribution and Amazon S3 bucket.

Resources

https://aws.amazon.com/cloudfront/faqs/
https://aws.amazon.com/cloudfront/streaming/
https://aws.amazon.com/cloudfront/features/
https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/on-demand-streaming-video.html

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