▶ lab

lab title

Bulletproof HTML5 Websites with AWS in a Nutshell V1.24

Course title

BackSpace Academy Nutshell Series

# ▶ **Table** of Contents

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▶ **About** the Lab

Please note that not all AWS services are supported in all regions. Please use the US-East-1 (North Virginia) region for this lab.

These lab notes are to support the instructional videos on Bulletproof HTML5 Websites with AWS in a Nutshell Course.

This is a typical use case for S3 and CloudFront to deliver highly available static websites that can handle heavy traffic.
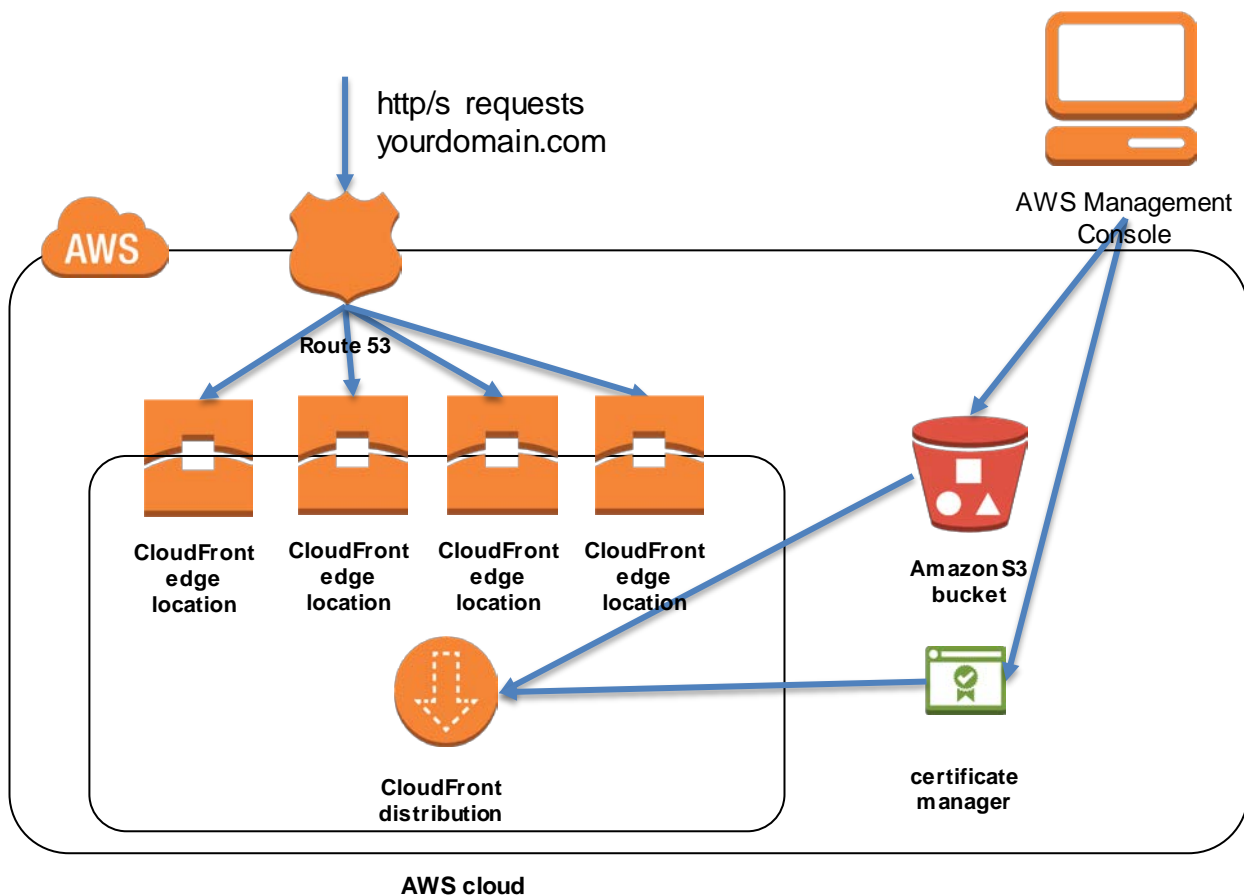
Please note that AWS services change on a weekly basis and it is extremely important you check the version number on this document to ensure you have the lastest version with any updates or corrections.

▶ **Purchasing** a Custom Domain Name

In this section, we will purchase a domain name through AWS Route 53.

*Please note this process will involve paying for a domain name with AWS.

Our S3 bucket must have the same name as our domain name in order for it to be hosted by S3. So, our first task is to purchase a domain name.

This part involves purchasing a domain through the Route 53 service.
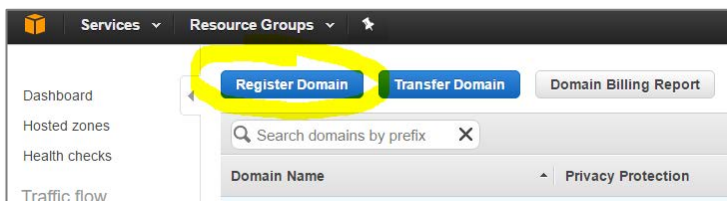
Click on the services menu and Route 53.
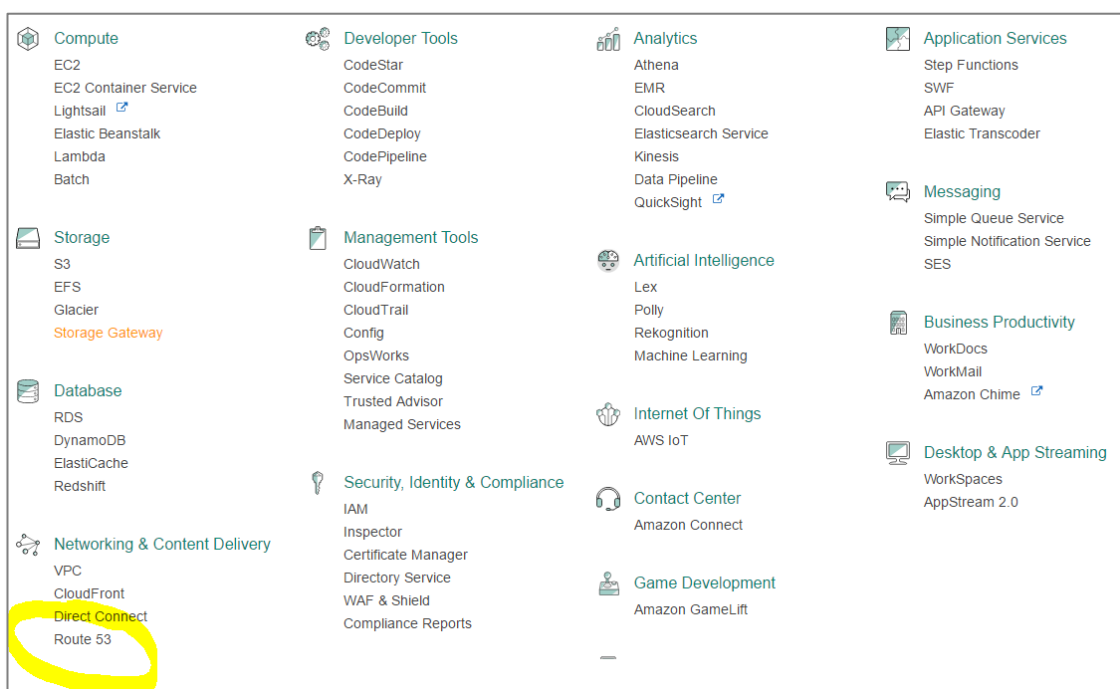
Click on Registered Domains from the menu

Click on Register Domain

Type in the domain name you would like and click *Check* to see if it is available.

If it is available click "add to cart"

Scroll down and click on "Continue"

Complete the process making sure you use a valid email for the domain registration otherwise the process will fail. You should receive an email with a link to verify your email. About 30 minutes after your email address has been verified you should receive an email stating the domain was successfully registered with Route 53.

After the domain has been successfully registered you will see it in the "Registered domains"

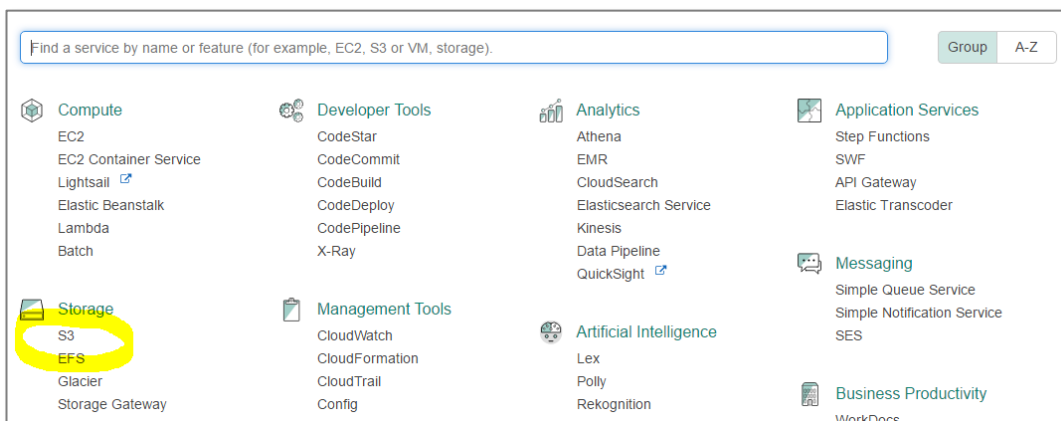| Register Domain	Transfer Domain	Domain Billing Report		

| Search domains by prefix ✕ | | | Displaying 1 to 1 out of 1 domains | |

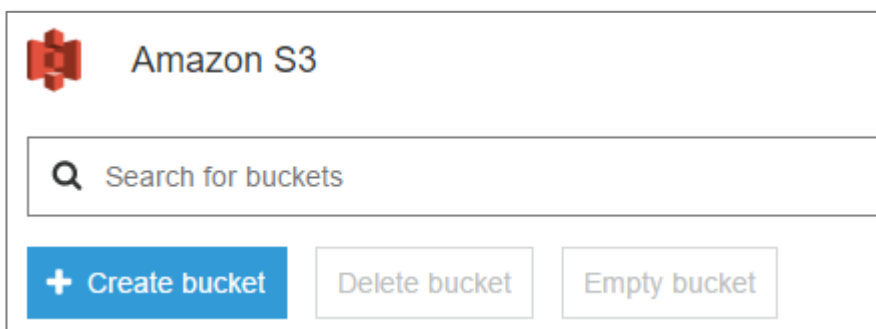| Domain Name ▲	Privacy Protection	Expiration Date	Auto Renew	Transfer Lock
thedevkid.com	All contacts	June 11, 2019	✓	✗

▶ **Creating** an S3 Bucket and Uploading our Website

In this section we will create an S3 bucket and upload our HTML5 website.

Click on the services menu and select S3.

Click on Create Bucket

The create bucket dialog box will appear.

Enter your custom domain name.

Select US East (N. Virginia).

Click Next

Click Next

Select *Manage public permissions*

Select *Grant public read access to this bucket*

Click Next

Click *Create Bucket* to create the bucket.

Now it is time to upload our website. You can find free website templates at https://html5up.net/

Select the root domain bucket (yourdomain.com)

Click *Upload*

You want to upload entire directories, including contents, do not Click *Add Files.* Open a Windows File Explorer window and drag the folder from File Explorer and drop on top of the Upload form.
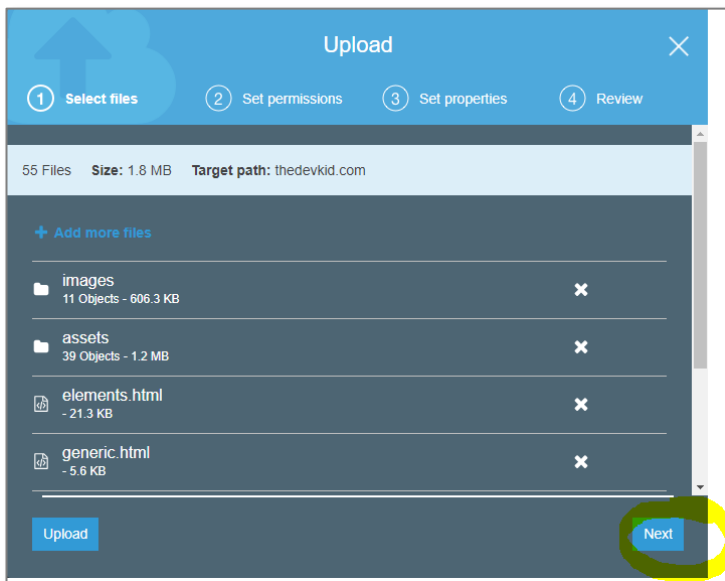
Click "Next"

Select *Manage Public Permissions*

Select *Grant public read access to this object(s)*
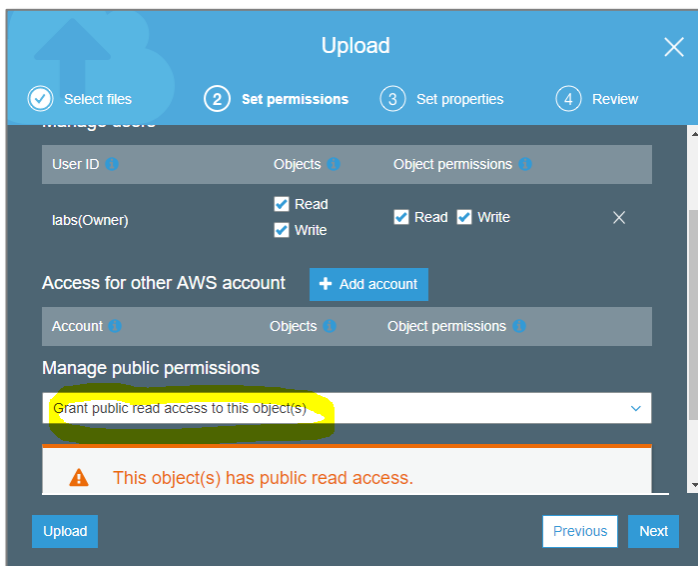
Click *Next*

Select *Standard* for Storage Class and *None* for encryption

Click Next

Click Upload

Your files will now be uploaded.

▶ **Enabling** S3 Website Hosting

In this section we will enable website hosting for our root domain (yourdomain.com) and also redirect requests to the www subdomain (www.yourdomain.com) to our root domain.

Select *Properties*

Select *Static Website Hosting*
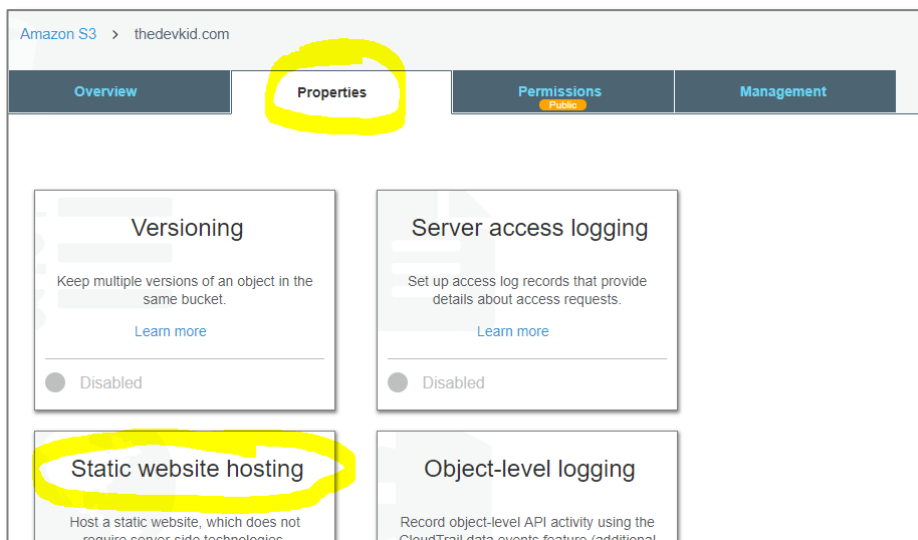
Now Select *Use this bucket to host a website*

Enter the *Index Document* (required)

Enter *Error Document* if available or else enter just enter *index.html* again

Click *Save*

If you go back into *Static Webstite Hosting* you will see the public endpoint for the S3 website.

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

Click on the endpoint to see your website in your browser.

Troubleshooting

If you get either of the following message your object permissions are not set to public.

403 Forbidden

- Code: AccessDenied
- Message: Access Denied
- RequestId: 3D615DF91F90446F
- HostId: VGBfqeIVfAp1LOs/1QsZzYCa3/V11o75WDkmFpJDPLrJyvqZoqYuRddGnZNaF+QUiKNNtA5nGDk=

```
This XML file does not appear to have any style information associated with it. The document tree is shown below.

▼<ListBucketResult xmlns="http://s3.amazonaws.com/doc/2006-03-01/">
    <Name>backspaceacademy.com</Name>
    <Prefix/>
    <Marker/>
    <MaxKeys>1000</MaxKeys>
    <IsTruncated>false</IsTruncated>
  ▼<Contents>
      <Key>404.html</Key>
      <LastModified>2017-04-27T09:05:21.000Z</LastModified>
      <ETag>"75f1debdb9d7654a9ad312d2a9516a69"</ETag>
      <Size>29422</Size>
      <StorageClass>STANDARD</StorageClass>
    </Contents>
  ▼<Contents>
```

If you find svg images are not showing on your website it is most probably incorrect header information. Upload the specific files again but add Content-type "image/svg+xml" in the Metadata section (you need to scroll down to see it).

▶ **Creating** an SSL Certificate with AWS Certificate Manager

In this section we will use the AWS Certificate Manager to create an SSL certificate we can use to enable HTTPS with CloudFront.

Please note that to require HTTPS between viewers and CloudFront, you must change the AWS region to US East (N. Virginia) before you request or import a certificate.

Click on the services menu and select AWS Certificate Manager.
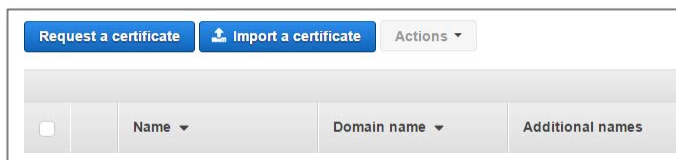
Click *Provision Certificate*
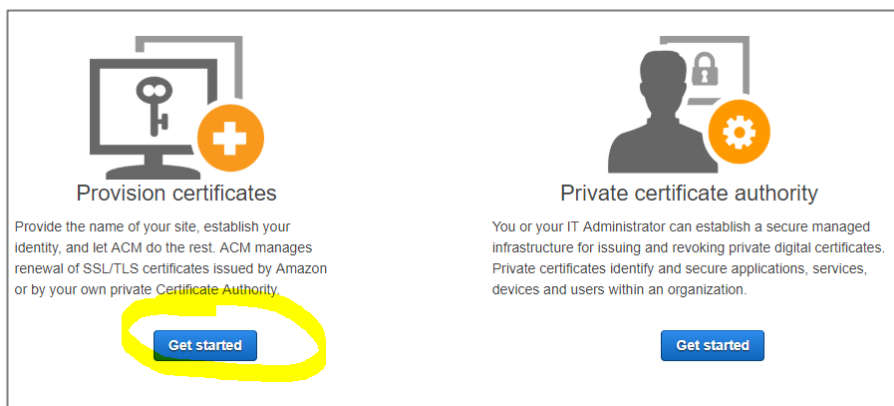
Click *Request a certificate*

Enter the root domain (yourdomain.com)

Click *Add another name to this certificate*

Enter the root domain prefixed with *. (*.yourdomain.com)

Click *Next*

Select *DNS validation*

Click *Review*

Select validation method

Choose how AWS Certificate Manager (ACM) validates your certificate request. Before we issue your certificate, we need to validate that you own or control the domains for which you are requesting the certificate. ACM can validate ownership by using DNS or by sending email to the contact addresses of the domain owner.

○ **DNS validation**

Choose this option if you have or can obtain permission to modify the DNS configuration for the domains in your certificate request. Learn more.

○ **Email validation**

Choose this option if you do not have permission or cannot obtain permission to modify the DNS configuration for the domains in your certificate request. Learn more.

Cancel   Previous   **Review**

Check everything is ok

Click *Confirm and request*

Review

Domain name

The names you want to secure with an SSL/TLS certificate.

Domain name   thedevkid.com
Additional name   *.thedevkid.com

Validation method

The method AWS uses to validate your certificate request.

Validation method   DNS

Cancel   Previous
Confirm and request

After a about a minute you will see messages *Pending validation*

Validation   ❓

Create a CNAME record in the DNS configuration for each of the domains listed below. You must complete this step before AWS Certificate Manager (ACM) can issue your certificate, but you can skip this step for now by clicking **Continue**. To return to this step later, open the certificate request in the ACM Console.

Domain	Validation status
▶ **thedevkid.com**	Pending validation
▶ ***.thedevkid.com**	Pending validation

⬇ Export DNS configuration to a file   You can export all of the CNAME records to a file

Expand the domain
Click *Create record in Route 53*

Click *Create*

There is no need to repeat the process for the wildcard domain as the records are the same.

Click *Continue*

After about 30 minutes the certificate will be validated. You can click the refresh icon to check its status.

▶ **Creating** a CloudFront Distribution

In this section we will use the AWS CloudFront Content Delivery Network (CDN) to cache our site to edge locations across the Globe.

Click on the services menu and select CloudFront.

Click on *Create Distribution*

Select *Web – Get Started*

In *Origin Settings* select your s3 bucket as the *Origin Domain Name*

In Default *Cache Behavior Settings*

Set *Viewer Protocol Policy* to *Redirect HTTP to HTTPS*

Under *Distribution Settings* enter your domain name and subdomains (www.yourdomain.com) into *Alternate Domain Names (CNAMEs)*

Under *Distribution Settings* enter/select your custom SSL certificate

Under *Distribution Settings* enter the index.html file for your website

Under *Distribution Settings* uncheck "Enable iPv6"

Put in a comment so that you easily identify the distribution.

Click *Create Distribution*

The Status of the distribution will change when it has been distributed to the edge locations.

Optional - Requiring HTTPS for Communication Between CloudFront and Your Amazon S3 Origin

If you are creating a secure site you can also require HTTPS for communication between your S3 bucket and CloudFront. This is achieved by disabling website hosting for the S3 bucket. It will then only be possible to view the website through CloudFront.

Go to the S3 management console and select the bucket.

Select the *Properties* tab

Select *Static website hosting*

Select *Disable website hosting* and then click *Save*
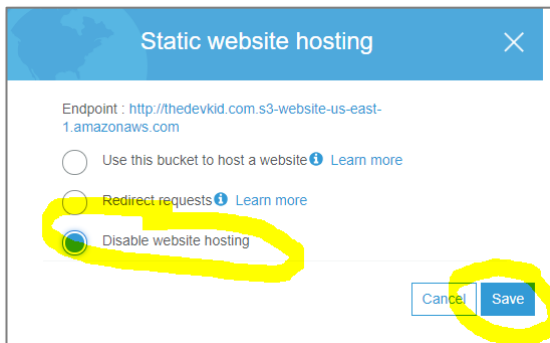
Invalidating a CloudFront Distribution

If you need to change your website and update your CloudFront distribution you can force CloudFront to fetch and update the distribution using invalidations.

To invalidate/update a CloudFront distribution:

Click on the distribution from the list of distributions
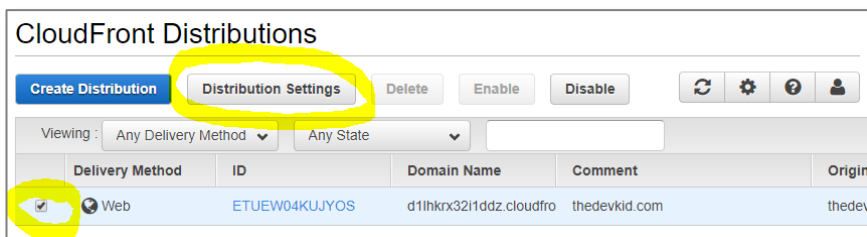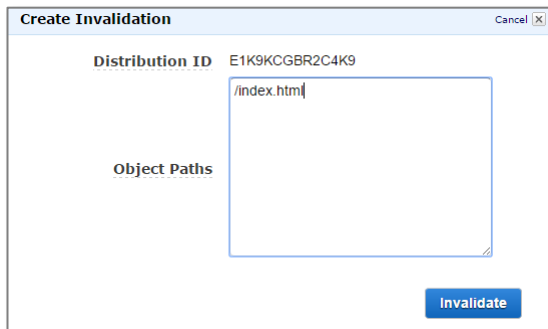
Click on the *Invalidations* tab
Click *Create Invalidation*
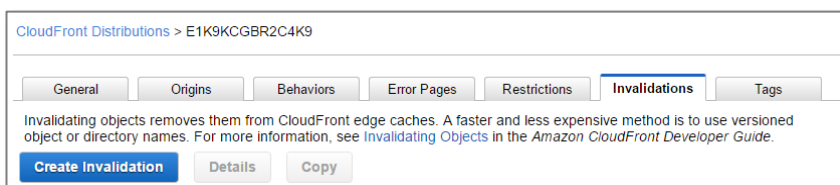
Enter the object path to the file you want to invalidate/update (e.g. /index.html) or use a wildcard symbol to invalidate all the files (e.g. /*)

Click *Invalidate*

This will take some time to complete.

▶ **Routing** Traffic with AWS Route 53

In this section we will direct all requests to our domain name and www subdomain to CloudFront using Route 53 Domain Name Service (DNS).

Go back to the CloudFront Distribution page and copy the distribution domain name
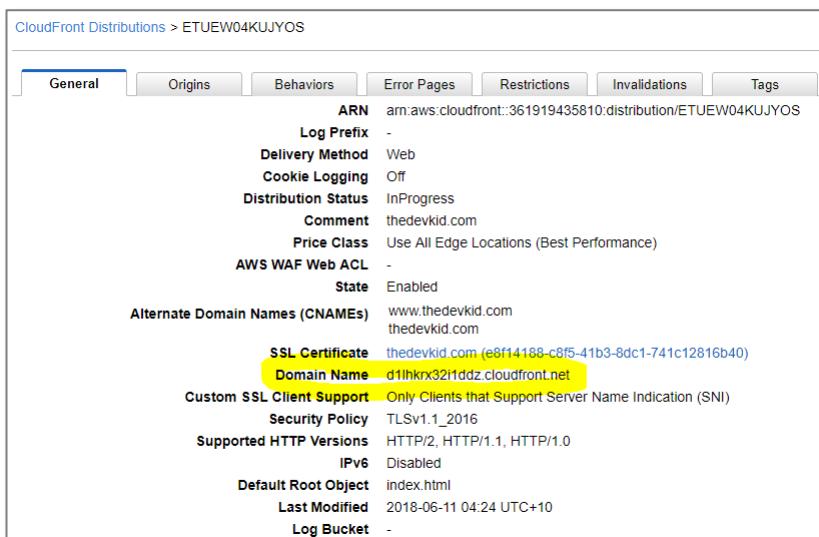
Now go back to the Route 53 Management Console:

Click on the services menu and select Route 53.

Click on Hosted Zones

Click on the hosted zone created by the Route 53 Registrar

Click on *Go to Record Sets*
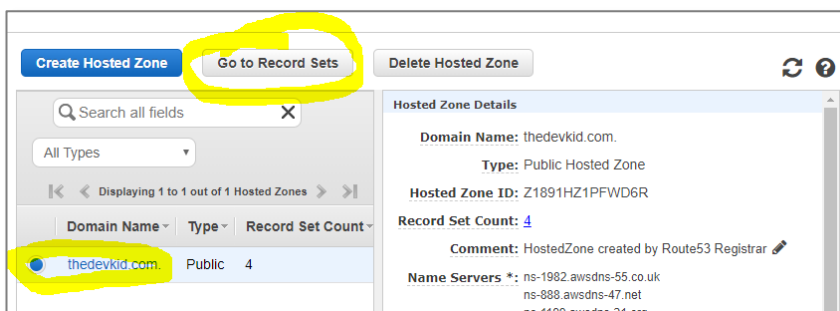
Click on *Create Record Set*

Select *A-IPv4 address* as Type

Check Alias: *Yes*

Leave *Name* empty

Enter the distribution domain name as Alias Target:

Click *Create*

Routing Traffic with a Domain Name from another Registrar

If you have a domain name from another registrar (e.g. GoDaddy) you can still direct traffic for this domain to AWS by replacing the NS records. That way all DNS requests will be directed to AWS name servers. The process is as follows:

1. Create a Route53 hosted zone for the domain
2. Copy the NS records for the hosted zone

3. Replace the NS records in your registrars DNS service with the NS records from your Route53 hosted zone
4. Add the A record to your Route53 hosted zone as detailed previously above.

Route Requests for www Subdomain

Click on *Create Record Set*

Select *CNAME* as Type

Select "No" for Alias.

Enter www for *Name*

Enter your domain name (or the CloudFront domain, either will work) for the www subdomain as Value (without the http:// at the start)

Click on *Create Record Set*

After some time the changes will be propagated to the Internet and you will be able to navigate to your domain name in your browser and see your website.

Checking DNS Propagation Status

The Route 53 entries detailed above will take a while to propagate across the Internet. This could be anywhere from a couple of minutes to an hour. You can check the status of DNS propagation using the following site:

Global DNS Propagation Checker

After the records have successfully propagated you will be able to navigate to your domain name and see your website.

▶ **Redirecting** Domain Traffic to another Domain

In this section we will direct all requests to our domain name and www subdomain to another domain using S3 website redirecting and Route 53 Domain Name Service (DNS). This is useful if we have multiple domain names for the same domain (e.g. xxxx.com, xxxx.net, xxxx.com.au etc).

DNS services must conform to a standard (RFC1912). Subdomains can be routed using CNAME but apex domains cannot. For example, you cannot use a CNAME to redirect to google.com. Also, the A record cannot be used to point to another apex domain not managed by your hosted zone. S3 website redirecting solves this problem by accepting requests for a domain and redirecting them to another domain

*Note only http requests can be redirected using this technique. S3 website redirection does not support https.

Go back to the S3 console

Select the domain bucket
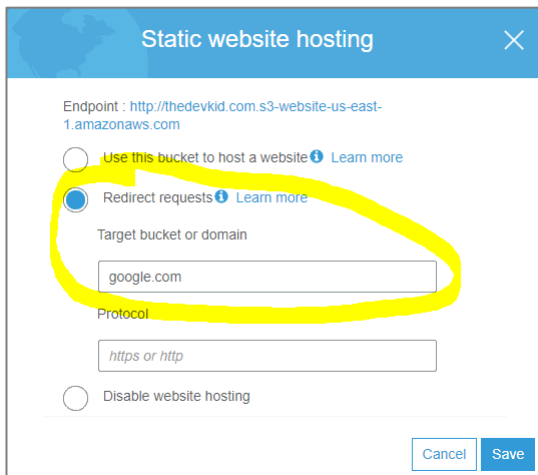
Select "Properties" – "Static Website Hosting"
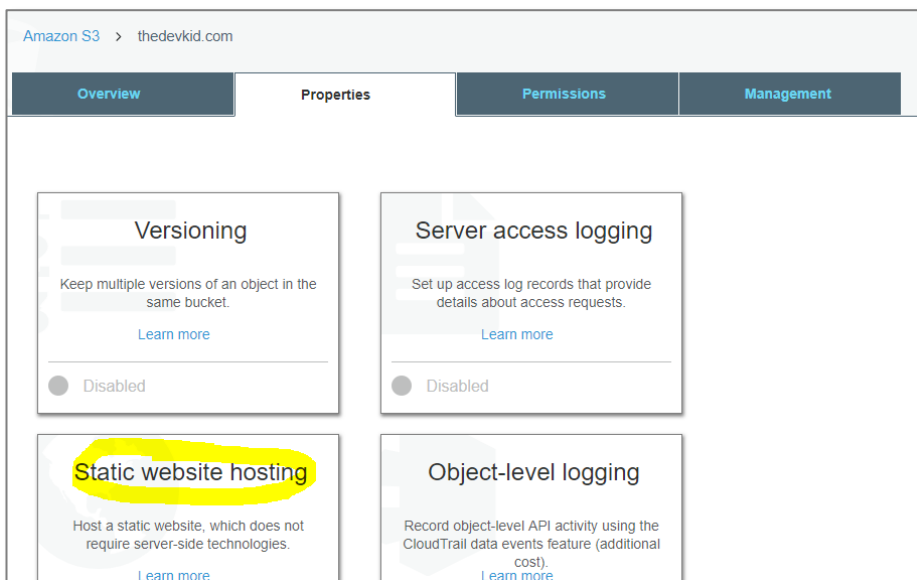
Select "Redirect requests"

Enter a domain name to redirect requests to (you can use google.com if you want to).

Enter protocol.

Click "Save"

Static website hosting ✕

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

○ Use this bucket to host a website ⓘ Learn more

● Redirect requests ⓘ Learn more

Target bucket or domain

google.com

Protocol

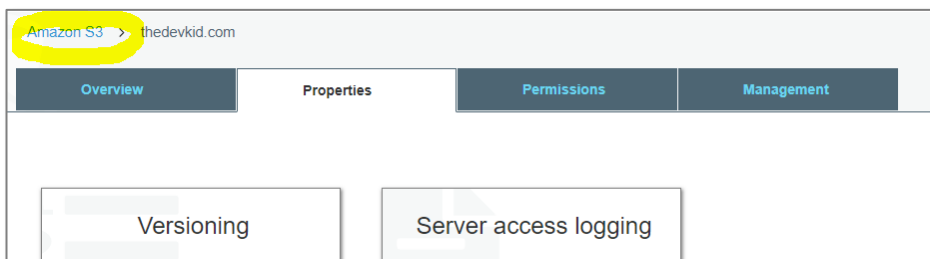https or http

○ Disable website hosting

Cancel Save

Go back to the bucket list

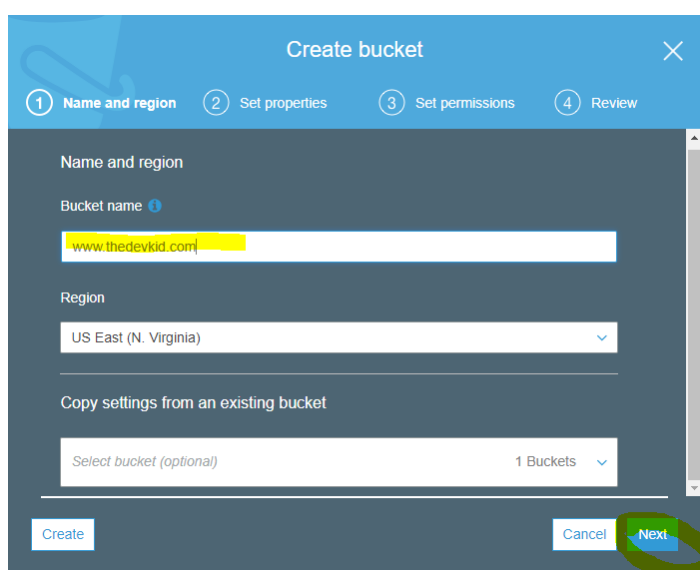Amazon S3 › thedevkid.com

Overview	Properties	Permissions	Management

Versioning   Server access logging

Click *Create bucket*

Enter the www subdomain for the name of the bucket

Click "Next"

Create bucket ✕

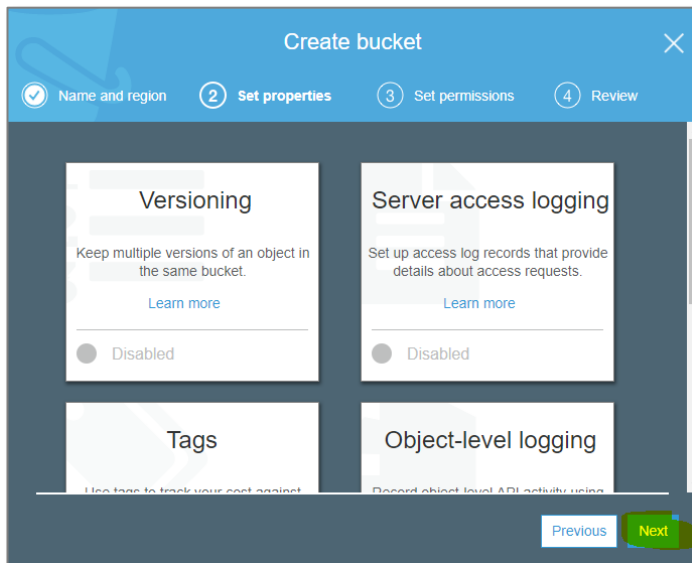① Name and region   ② Set properties   ③ Set permissions   ④ Review

Name and region

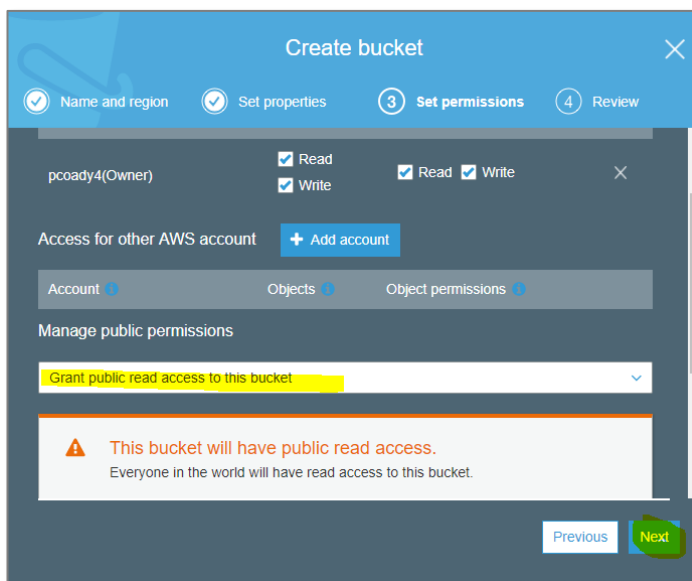Bucket name ⓘ

www.thedevkid.com

Region

US East (N. Virginia)

Copy settings from an existing bucket

Select bucket (optional)   1 Buckets

Create   Cancel   Next
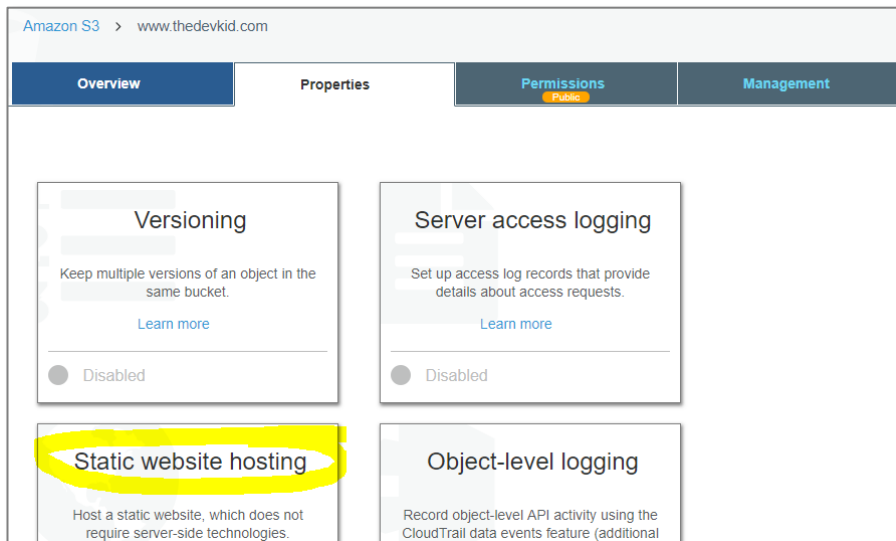
Click "Next"

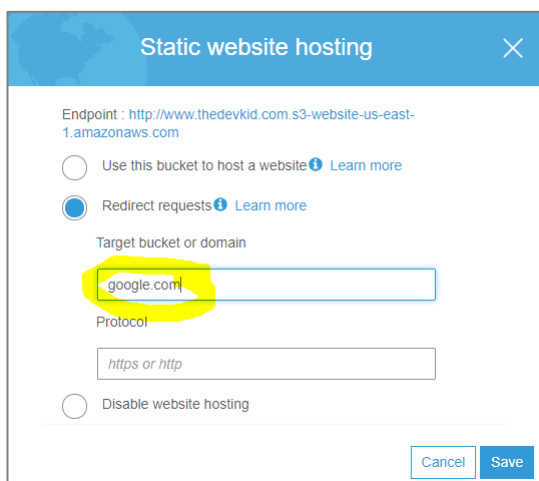Select "Grant public read access to this bucket"

Click "Create Bucket"

After the bucket has been created select the bucket

Select "Properties" – "Static website hosting"

Redirect requests as before to the other domain on http
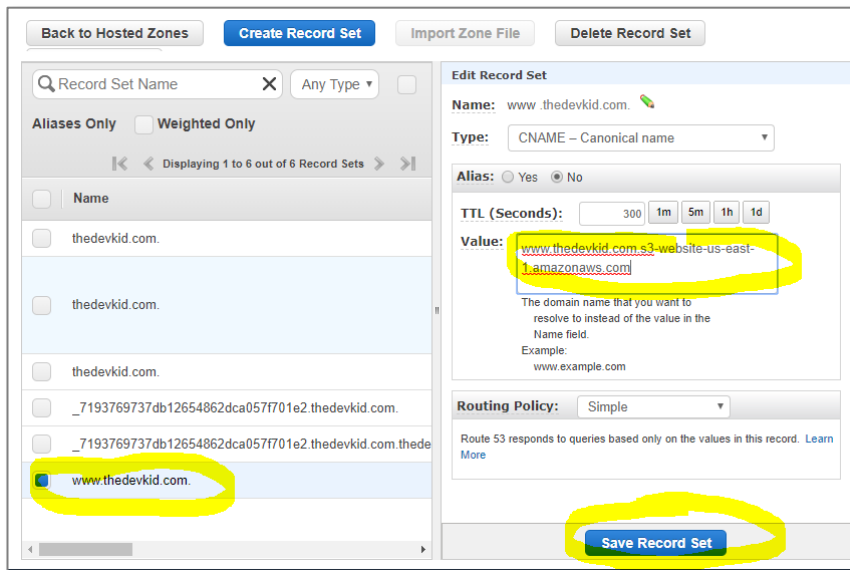
Copy the endpoint for use later

Go back to the Route53 console

Select the domain hosted zone

Click on the CNAME entry

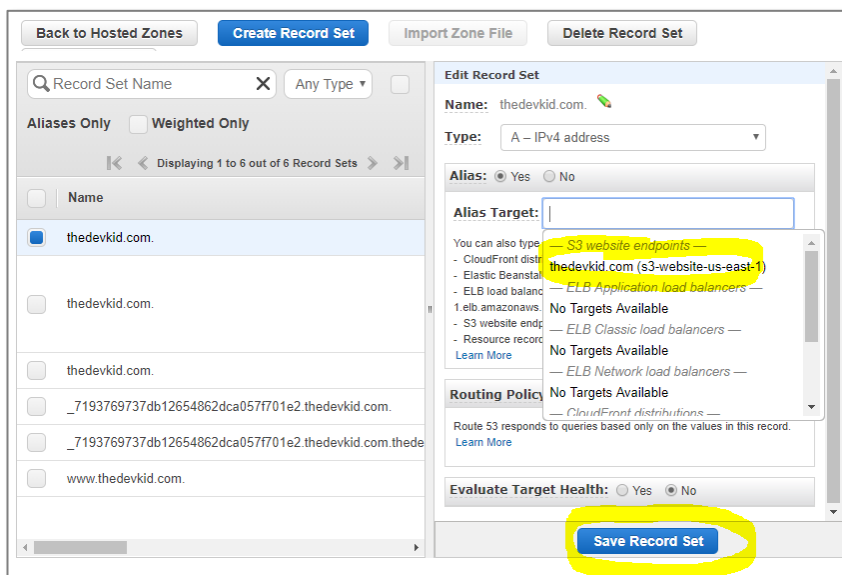Enter the www bucket website endpoint without the "http://"

Click "Save Record Set"

Now select the A record

Change the Alias target to the domain S3 website endpoint

Click "Save Record Set"

After some time the records will have propagated and all requests will be redirected to the other domain.

*Note only http requests can be redirected using this technique. S3 website redirection does not support https.