



lab



lab title

Bulletproof HTML5 Websites with AWS in a Nutshell V1.07



Course title

BackSpace Academy
Nutshell Series



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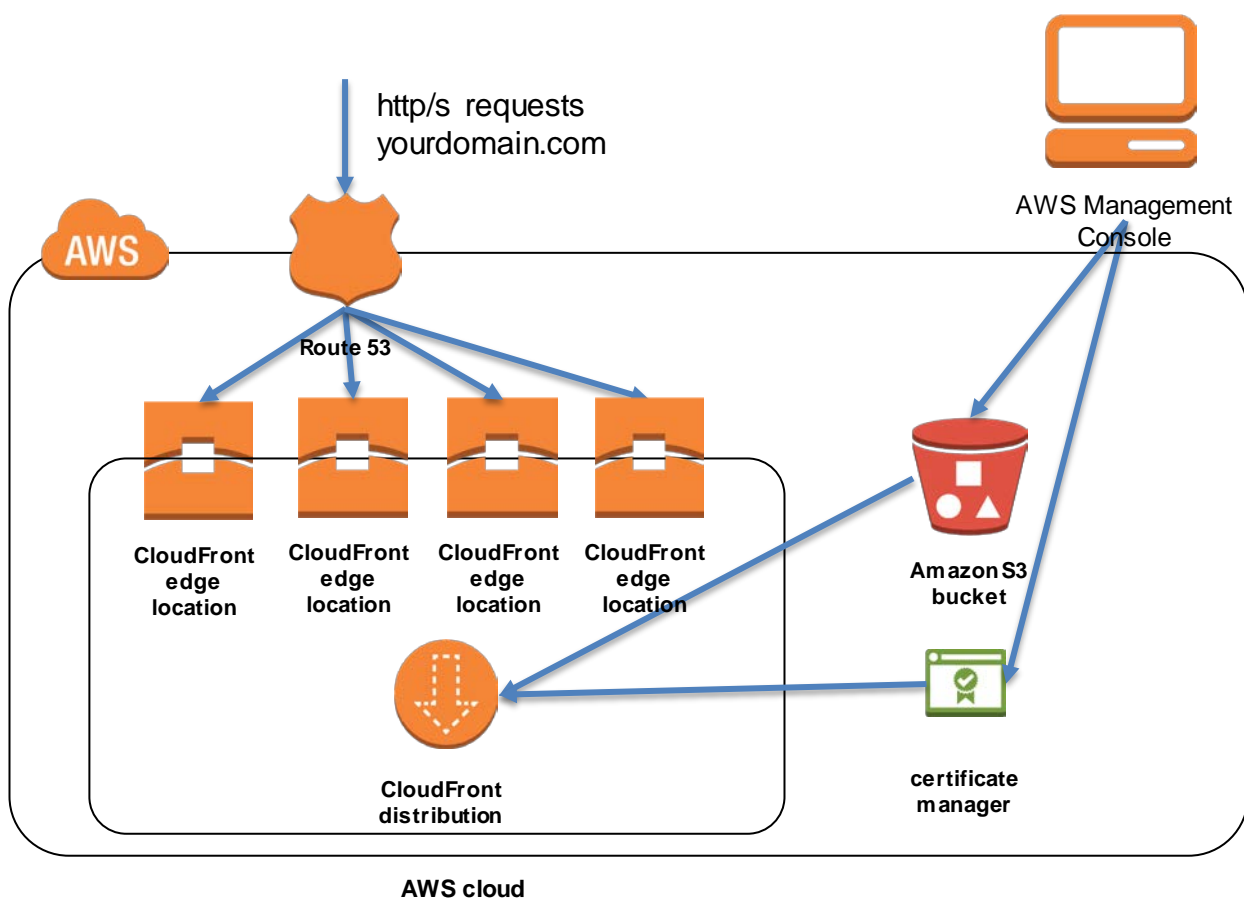
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▶ About the Lab

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 latest version with any updates or corrections.

▶ Purchasing a Custom Domain Name

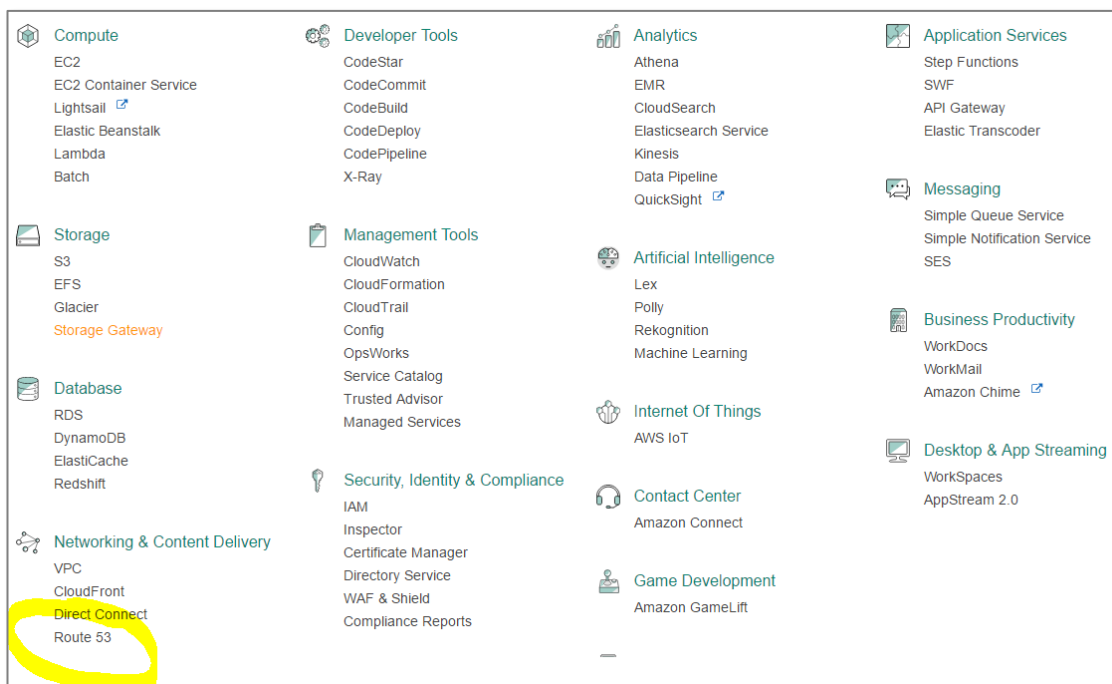
In this section, we will purchase a domain name through AWS Route 53.

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

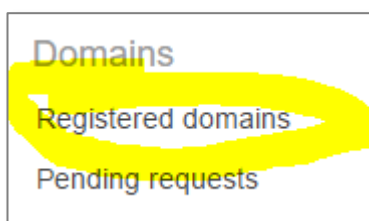
Our S3 bucket must have the same name as our domain name in order for it to be hosted by S3. So, our first task is to purchase a domain name.

This part involves purchasing a domain through the Route 53 service.

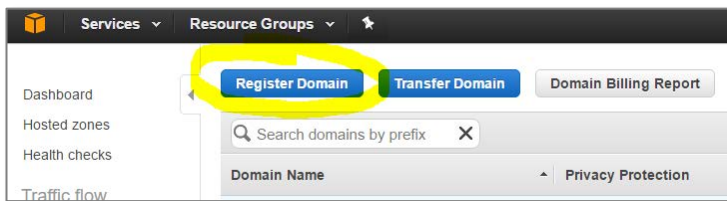
Click on the services menu and Route 53.



Click on Registered Domains from the menu



Click on Register Domain



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

A screenshot of the 'Choose a domain name' form. The form has a sidebar with steps: '1: Domain Search', '2: Contact Details', and '3: Review & Purchase'. The main area has a text input field containing 'backspaceacademy', a dropdown menu showing '.com - \$12.00', and a blue 'Check' button. Below the input fields, there is instructional text: 'To register a domain name, start by finding one that's available. Enter the first part of the name (such as example in example.com), choose an extension (such as .com or .org), and click Check. We'll tell you whether it's available and whether you can get it with other extensions. [Learn more.](#)'

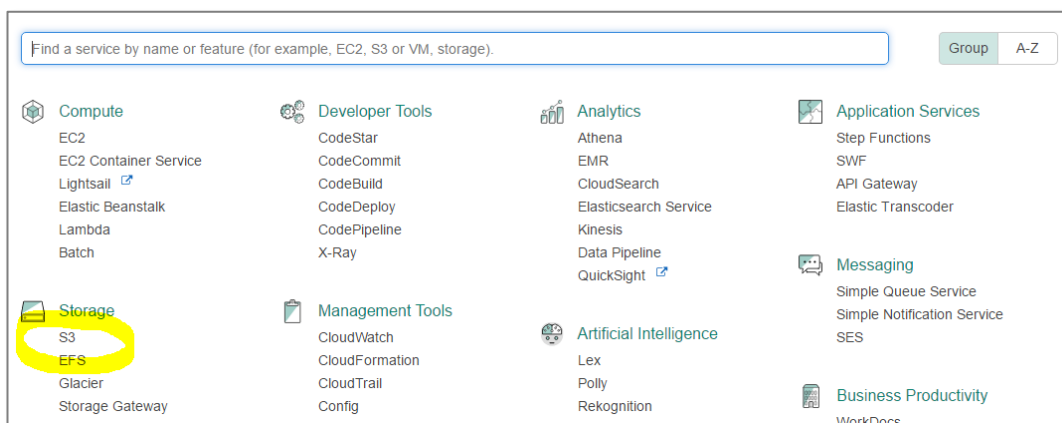
If it is available continue through the process to purchase and register your domain name.

A screenshot of the 'Choose a domain name' form showing the results of a domain search. The sidebar shows steps: '1: Domain Search', '2: Contact Details', and '3: Review & Purchase'. The main area shows the search results for 'backspaceacademy.com'. The 'Check' button is highlighted with a yellow circle. Below the search results, there is a table titled 'Availability for 'backspaceacademy.com'' with columns: 'Domain Name', 'Status', 'Price /1 Year', and 'Action'. The table shows that 'backspaceacademy.com' is available for \$12.00 per year, with an 'Add to cart' button. Below this, there is a section titled 'Related domain suggestions' with a table showing 'backblankacademy.com' as a suggestion, also available for \$12.00 per year with an 'Add to cart' button.

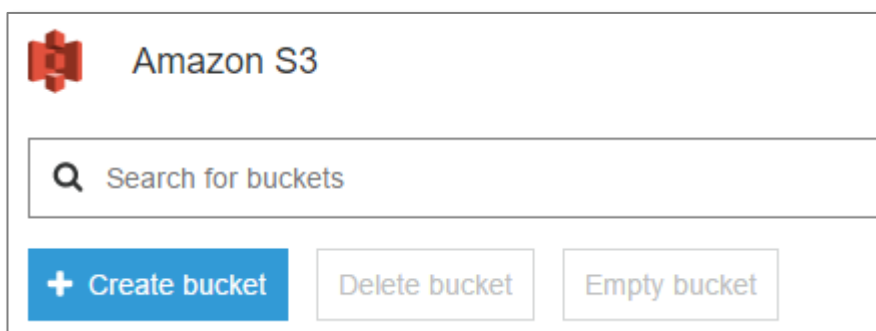
▶ Creating an S3 Bucket and Uploading our Website

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.

The screenshot shows the 'Create bucket' dialog box with the 'Name and region' step selected. The 'Bucket name' field contains 'backspaceacademy.com'. The 'Region' dropdown is set to 'US East (N. Virginia)'. There is a section for 'Copy settings from an existing bucket' with a dropdown menu showing '15 Buckets'. At the bottom, there are 'Create', 'Cancel', and 'Next' buttons.

Create bucket

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

Name and region

Bucket name 1

backspaceacademy.com

Region

US East (N. Virginia)

Copy settings from an existing bucket

Select bucket (optional) 15 Buckets

Create Cancel Next

Enter your custom domain name.

Select US East (N. Virginia).

Click Next

The screenshot shows the 'Create bucket' dialog box with the 'Set properties' step selected. It displays three sections: 'Versioning' (Keep multiple versions of an object in the same bucket, Disabled), 'Logging' (Set up access log records that provide details about access requests, Disabled), and 'Tags' (Use tags to track your cost against projects or other criteria). Each section has a 'Learn more' link. At the bottom, there are 'Previous' and 'Next' buttons.

Create bucket

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

Versioning

Keep multiple versions of an object in the same bucket.

Learn more

Disabled

Logging

Set up access log records that provide details about access requests.

Learn more

Disabled

Tags

Use tags to track your cost against projects or other criteria

Previous Next

Click Next

Create bucket

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

Manage users

Manage public permissions

Group	Objects	Object permissions
Any authenticated AWS user	<input type="checkbox"/> Read <input type="checkbox"/> Write	<input type="checkbox"/> Read <input type="checkbox"/> Write
Everyone	<input checked="" type="checkbox"/> Read <input type="checkbox"/> Write	<input type="checkbox"/> Read <input type="checkbox"/> Write

Previous Next

Select *Manage public permissions*

Select *Read* for Everyone-Objects

Create bucket

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

Name and region [Edit](#)

Bucket name backspaceacademy.com Region US East (N. Virginia)

Properties [Edit](#)

Versioning Disabled

Logging Disabled

Tagging 0 Tags

Permissions [Edit](#)

Users 1

Public permissions Enabled

Previous Create bucket

Click *Create Bucket* to create the bucket.

Our bucket has been created, now repeat the process to create the www subdomain bucket (www.yourdomain.com)

Create bucket

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

Name and region

Bucket name ⓘ

www.backspaceacademy.com

Region

US East (N. Virginia) ▼

Copy settings from an existing bucket

Select bucket (optional) 15 Buckets ▼

Create Cancel Next

Now it is time to upload our website.

Select the root domain bucket (yourdomain.com)

Click *Upload*

PLEASE NOTE THE METHOD FOR UPLOADING ENTIRE DIRECTORIES WASN'T MENTIONED IN THE VIDEO.

You have two options for uploading files:

1. If you want to upload individual files Click *Add Files* and select the files to upload
2. If you want to upload an entire directory, including contents, do not Click *Add Files*. Open a Windows File Explorer window and drag the folder from File Explorer and place on top of the Upload form.

The screenshot shows the 'Upload' wizard in the AWS Management Console. The title bar is blue with a close button. Below the title bar is a progress bar with four steps: 1. Select files (active), 2. Set permissions, 3. Set properties, and 4. Review. The main area is dark blue and contains a large 'Add files' button. At the bottom, there are 'Upload' and 'Next' buttons.

Click *Next*

Select *Manage Public Permissions*

Check *Everyone – Read*

The screenshot shows the 'Set permissions' step of the 'Upload' wizard. It has a dark blue background. At the top, there are two expandable sections: 'Manage users' (expanded) and 'Manage public permissions' (expanded). Below 'Manage public permissions' is a table with three columns: 'Group', 'Objects', and 'Object permissions'. The table has two rows: 'Any authenticated AWS user' and 'Everyone'. The 'Everyone' row has a checked checkbox for 'Read' and an unchecked checkbox for 'Write'. At the bottom, there are 'Upload', 'Previous', and 'Next' buttons.

Group	Objects	Object permissions
Any authenticated AWS user	<input type="checkbox"/> Read <input type="checkbox"/> Write	<input type="checkbox"/> Read <input type="checkbox"/> Write
Everyone	<input checked="" type="checkbox"/> Read <input type="checkbox"/> Write	<input type="checkbox"/> Read <input type="checkbox"/> Write

Click *Next*

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

Storage class
Choose one depending on your use case scenario and performance access requirements.

☒ Standard ☐ Standard-IA ☐ Reduced redundancy

Encryption
Protect data at rest by using Amazon S3 master-key or by using AWS KMS master-key.

☒ None ☐ Amazon S3 master-key ☐ AWS KMS master-key

Upload **Previous** **Next**

Click Next

Upload

✓ Select files ✓ Set permissions ✓ Set properties 4 Review

Files [Edit](#)
1 Files Size: 15.5 KB

Permissions [Edit](#)
2 grantees

Properties [Edit](#)
Encryption: No Storage class: Standard
Metadata

Previous **Upload**

Click Upload

Your files will now be uploaded.

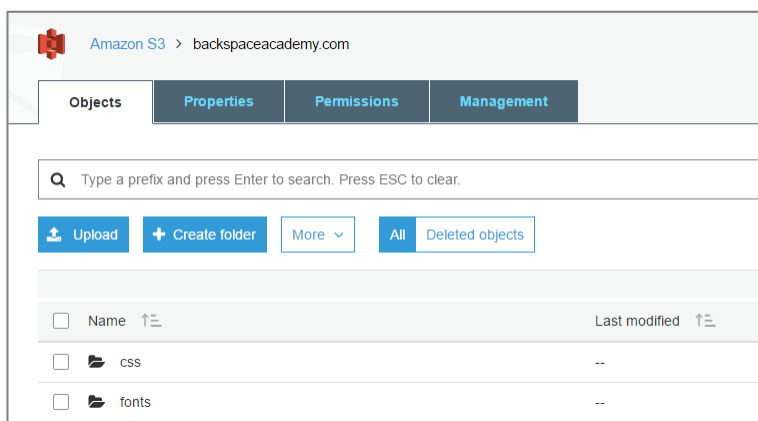
Create folders and upload the rest of your website files into their respective folders.

*Note this process is quite tedious. If you use S3 regularly, CloudBerry Explorer for S3 can help speed this up. It can be downloaded from cloudberrylabs.com.

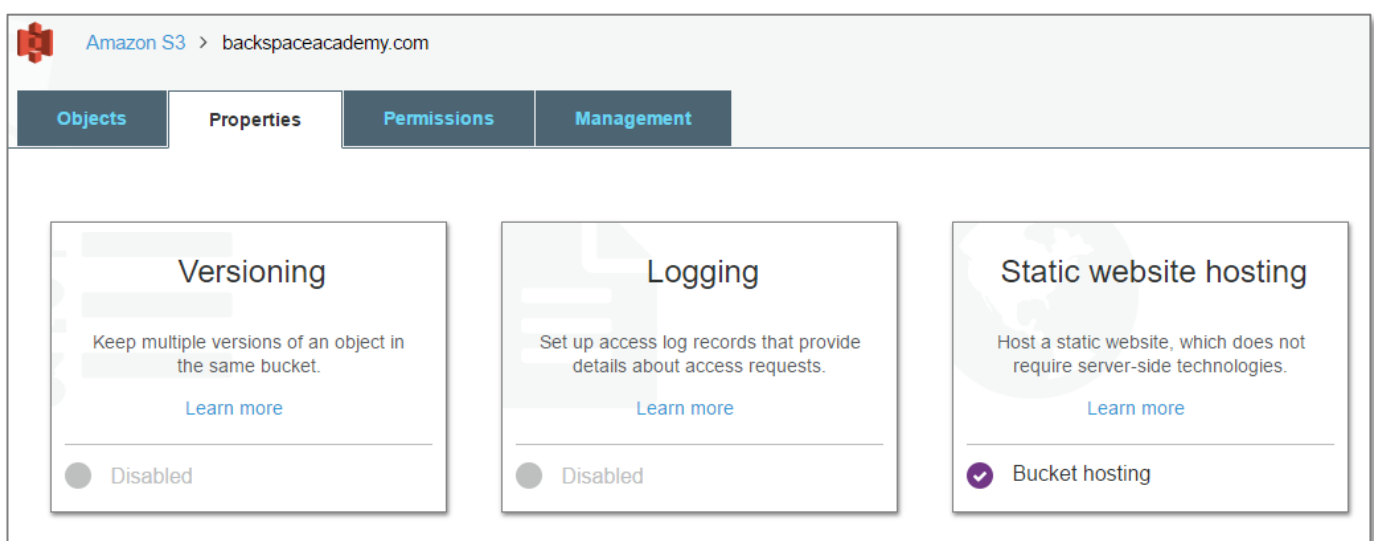
▶ Enabling S3 Website Hosting

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.

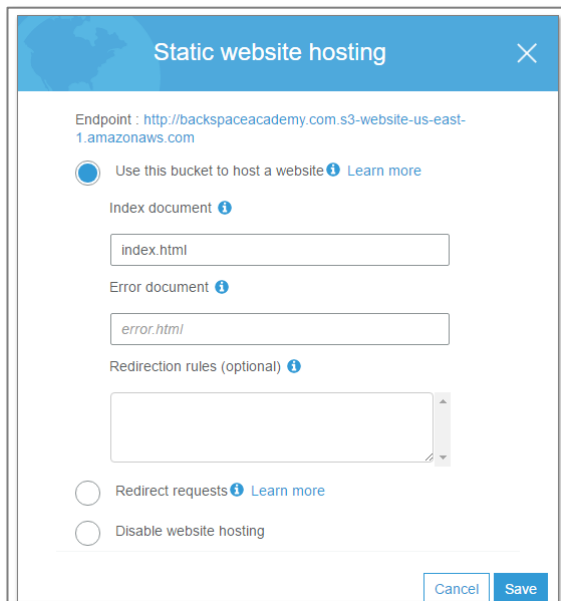
Select the root domain bucket (yourdomain.com)



Now select *Properties*



Now Select *Static Website Hosting*



The image shows a 'Static website hosting' configuration window. At the top, it displays the endpoint: `http://backspaceacademy.com.s3-website-us-east-1.amazonaws.com`. Below this, there are two radio buttons. The first, 'Use this bucket to host a website', is selected and has a 'Learn more' link. The second is 'Disable website hosting'. Under the selected option, there are three input fields: 'Index document' with 'index.html', 'Error document' with 'error.html', and 'Redirection rules (optional)' which is empty. At the bottom, there are 'Cancel' and 'Save' buttons.

Now Select *Use this bucket to host a website*

Enter the *Index Document* (required)

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

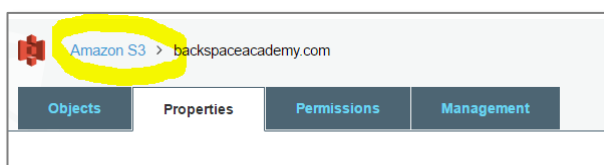
Click *Save*

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

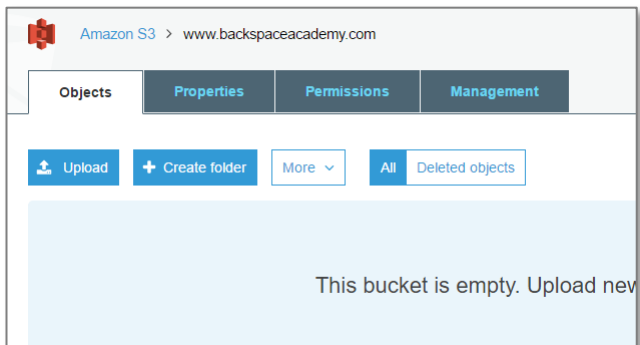
Endpoint : `http://yourdomain.com.s3-website-us-east-1.amazonaws.com`

Redirecting www Subdomain Requests

Now go back to the S3 dashboard

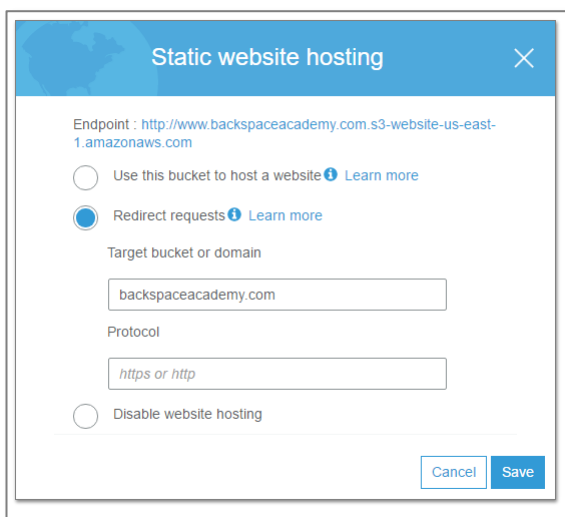


Now select the *www* subdomain bucket (`www.yourdomain.com`)



Select *Properties*

Select *Static Website Hosting*

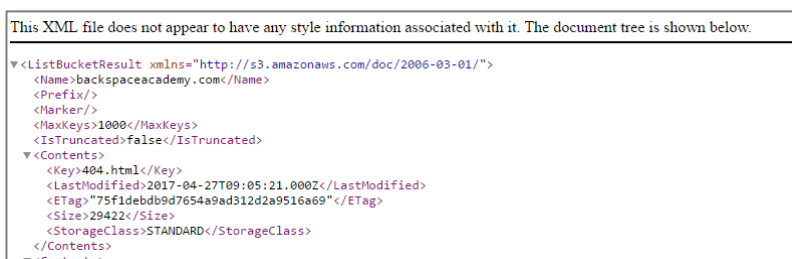


Redirect all requests to the target root domain (yourdomain.com)

Click **Save**

Troubleshooting

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



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).

Upload

1 Select files 2 Set permissions 3 Set properties 4 Review

☒ Standard ☐ Standard-IA ☐ Reduced redundancy

Encryption
Protect data at rest by using Amazon S3 master-key or by using AWS KMS master-key.

☒ None ☐ Amazon S3 master-key ☐ AWS KMS master-key

Metadata
Metadata is a set of name-value pairs. You cannot modify object metadata after it is uploaded.

Header	Value	
Content-Type	image/svg+xml	Save
x-amz-meta-	Header value	Save

Upload Previous Next

If you find svg images are not showing on your website and you used CloudBerry Explorer to upload, the http headers for svg files are incorrect.

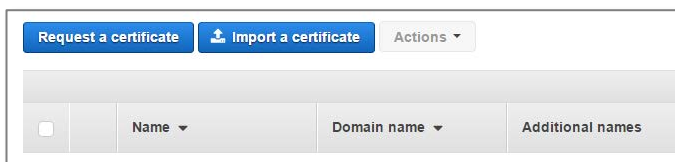
If you are using CloudBerry then right click on the image and select *Set HTTP Headers*. Content-Type should be image/svg+xml

If you need to change multiple files then set up an upload rule (requires paid version) for svg files in CloudBerry or use the S3 management console to upload the files.

▶ 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.

Click on the services menu and select AWS Certificate Manager.



Click *Request a Certificate*

A screenshot of the 'Request a certificate' wizard in the AWS Certificate Manager console. The wizard has three steps: 'Step 1: Add domain names', 'Step 2: Review and request', and 'Step 3: Validation'. The first step is active. A blue box at the top states: 'You can use AWS Certificate Manager certificates only with Elastic Load Balancing and Amazon CloudFront. [Learn more.](#)'. Below this is the 'Add domain names' section. It includes instructions: 'Type the fully qualified domain name of the site you want to secure with an SSL/TLS certificate (for example, www.example.com). Use an asterisk (*) to request a wildcard certificate to protect several sites in the same domain. For example: *.example.com protects www.example.com, site.example.com and images.example.com.' There is a table with one row: 'Domain name*' with the value 'www.example.com' and a 'Remove' button. Below the table is a blue button 'Add another name to this certificate'. Further instructions state: 'You can add additional names to this certificate. For example, if you're requesting a certificate for "www.example.com", you might want to add the name "example.com" so that customers can reach your site by either name. [Learn more.](#)' At the bottom, there is a note: '*At least one domain name is required'. On the right side of the bottom are 'Cancel' and 'Review and request' buttons.

Enter the root domain (yourdomain.com)

Click *Add another name to this certificate*

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

Add domain names

Type the fully qualified domain name of the site you want to secure with an SSL/TLS certificate (for example, `www.example.com`). Use an asterisk (*) to request a wildcard certificate to protect several sites in the same domain. For example: `*.example.com` protects `www.example.com`, `site.example.com` and `images.example.com`.

Domain name*	Remove
<input type="text" value="backspaceacademy.com"/>	
<input type="text" value="*.backspaceacademy.com"/>	

[Add another name to this certificate](#)

You can add additional names to this certificate. For example, if you're requesting a certificate for `"www.example.com"`, you might want to add the name `"example.com"` so that customers can reach your site by either name. [Learn more](#).

*At least one domain name is required

[Cancel](#) [Review and request](#)

When you receive the validation email, open the link and validate the certificate.

After you click the validation link in the email the certificate will be marked as issued.

« < Viewing 1 to 4 of 4 certificates > »						
<input type="checkbox"/>	Name ▾	Domain name ▾	Additional names	Status ▾	Type ▾	In use? ▾
<input type="checkbox"/>		backspaceacademy.com	*.backspaceacademy.com	Issued	Amazon Issued	Yes

▶ 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*

CloudFront Distributions

Create Distribution Distribution Settings Delete Enable Disable

Viewing: Any Delivery Method Any State

Delivery Method	ID	Domain Name	Comments
-----------------	----	-------------	----------

Select *Web – Get Started*

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 upload content to the origin.

Get Started

In *Origin Settings* enter your domain name (yourdomain.com) as the *Origin Domain Name*

Origin Settings

Origin Domain Name backspaceacademy.com.s3.amazonaws.com ⓘ

Origin Path — Amazon S3 Buckets — backspaceacademy.com.s3.amazonaws.com ⓘ

Origin ID S3-backspaceacademy.com ⓘ

Restrict Bucket Access ☐ Yes ☒ No ⓘ



Origin Custom Headers

Header Name	Value
<input type="text"/>	<input type="text"/>

In *Default Cache Behavior Settings*

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

Default Cache Behavior Settings

Path Pattern	Default (*)	
Viewer Protocol Policy	<div><input type="radio"/> HTTP and HTTPS</div> <div><input checked="" type="radio"/> Redirect HTTP to HTTPS</div> <div><input type="radio"/> HTTPS Only</div>	

Under *Distribution Settings* enter your domain name into *Alternate Domain Names (CNAMEs)*

Distribution Settings

Price Class	Use All Edge Locations (Best Performance) ▼	?
AWS WAF Web ACL	None ▼	?
Alternate Domain Names (CNAMEs)	backspaceacademy.com	?

Under *Distribution Settings* enter/select your SSL certificate

SSL Certificate

Default CloudFront Certificate (*.cloudfront.net)

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://d111111abcde8.cloudfront.net/logo.jpg>).

Important: If you choose this option, CloudFront requires that browsers or devices support TLSv1 or later to access your content.

Custom SSL Certificate (example.com):

Choose this option if you want your users to access your content by using an alternate domain name, such as <https://www.example.com/logo.jpg>. You can use a certificate stored in AWS Certificate Manager (ACM) in the US East (N. Virginia) Region, or you can use a certificate stored in IAM.

backspaceacademy.com (900ce1fd-7cb8-4d39... ▾


↻

Request or Import a Certificate with ACM

[Learn more](#) about using custom SSL/TLS certificates with CloudFront.

[Learn more](#) about using ACM.

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

Default Root Object 

Click *Create Distribution*

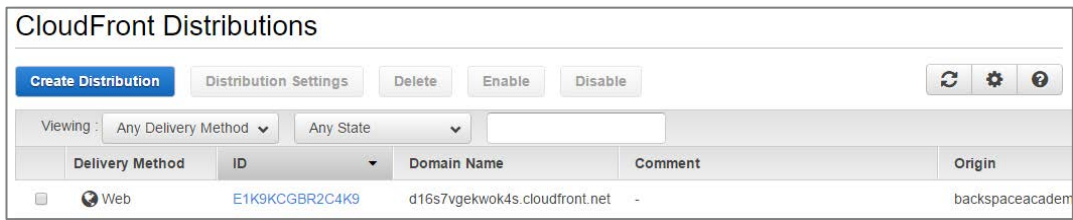
The Status of the distribution will change when it has been distributed to the edge locations.

Invalidating a CloudFront Distribution

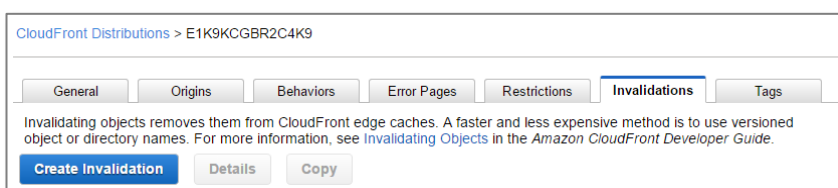
If you need to change your website and update your CloudFront distribution you can force CloudFront to fetch and update the distribution using invalidations.

To invalidate/update a CloudFront distribution:

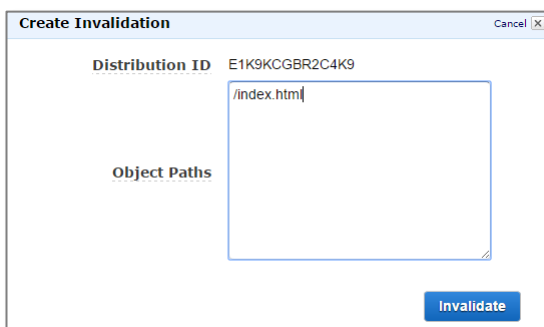
Click on the distribution from the list of distributions



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. `/*`)



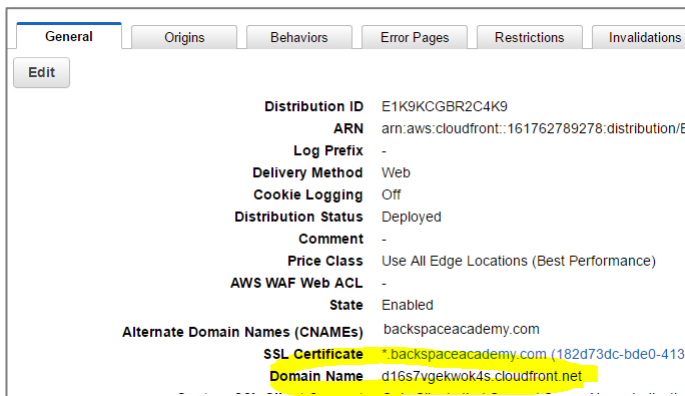
Click *Invalidate*

This will take some time to complete.

▶ Routing Traffic with AWS Route 53

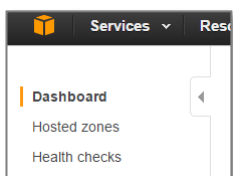
In this section we will direct all requests to our domain name and www subdomain to CloudFront using Route 53 Domain Name Service (DNS).

Go back to the CloudFront Distribution page and copy the distribution domain name

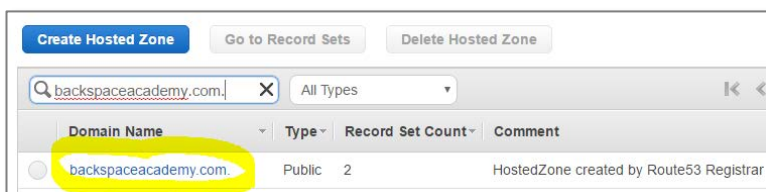


Now go back to the Route 53 Management Console:

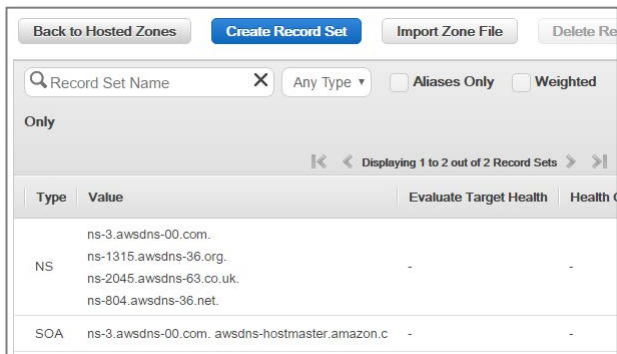
Click on the services menu and select Route 53.



Click on Hosted Zones



Click on the hosted zone created by the Route 53 Registrar



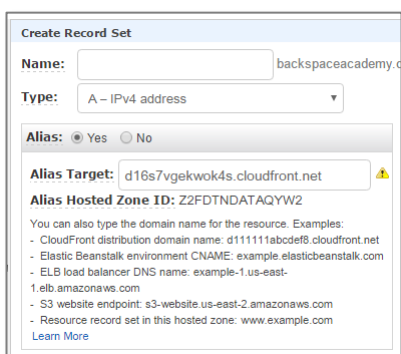
Click on *Create Record Set*

Select *A-IPv4 address* as Type

Check Alias: *Yes*

Leave *Name* empty

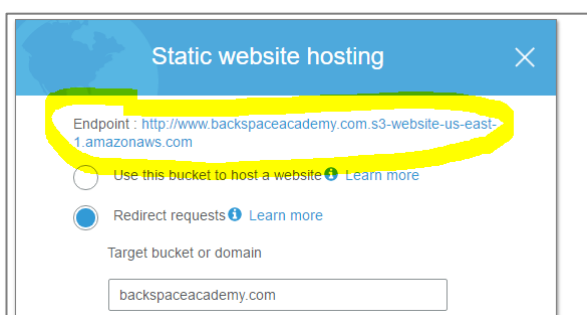
Enter the distribution domain name as Alias Target:



Click *Create*

Open the S3 service in another screen and go to the properties of the *www* subdomain bucket.

Copy the *www* website endpoint



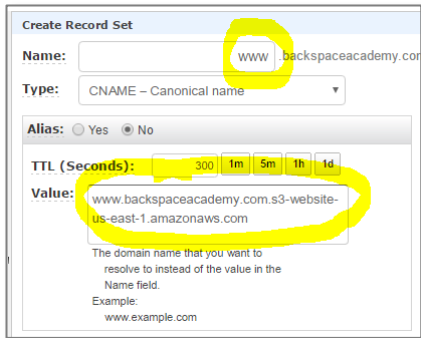
Go back to the Route 53 Management Console

Click on *Create Record Set*

Select *CNAME* as Type

Enter *www* for *Name*

Enter the S3 website endpoint for the *www* subdomain as *Value* (without the *http://* at the start)



The screenshot shows the 'Create Record Set' form in the AWS Route 53 console. The 'Name' field is set to 'www' and the 'Value' field is set to 'www.backspaceacademy.com.s3-website-us-east-1.amazonaws.com'. The 'Type' is set to 'CNAME - Canonical name' and the 'TTL (Seconds)' is set to '300'. The 'Alias' option is set to 'No'.

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.

Enabling HTTPS on the WWW Sub Domain

Although I personally do not bother enabling https on the *www* subdomain, the process is the same as for the root domain:

1. Create a CloudFront distribution using the *www* S3 Static website endpoint as the origin server.
2. Reference the SSL certificate in CloudFront.
3. Create a CNAME entry pointing to the CloudFront distribution domain.