



# Multi-Region Application

## HOMEWORK #4

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Data 228 - Big Data Technologies and Applications

Department of Applied Data Science

San Jose State University

*Faiza Ayoun (015960139)*

*Harsimran Kaur (016003468)*

*Pooja Malage (015294760)*

*Saranya Pandiaraj (015304497)*

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## Build a Multi-Region Serverless Application for Resilience and High Availability

- <https://github.com/enghwa/MultiRegion-Serverless-Workshop>

Please find the source code repo in the below link.

**GitHub Link:** <https://github.com/fayoun/BigData228/tree/main/Assignments/Homework%204>

## 1. Create AWS Cloud9 Environment

### Creating AWS Cloud9 Environment

The screenshot shows the AWS Cloud9 Environments page. The top navigation bar includes 'AWS Cloud9' and 'Environments'. Below the navigation, the environment name 'DataDivasCloud9Env' is displayed. On the right, there are three buttons: 'Open IDE' (with a pencil icon), 'Edit' (with a gear icon), and 'Delete' (with a trash icon). The main area is titled 'Environment details' and contains the following information:

Name	EC2 instance type	Security groups	Environment ARN
DataDivasCloud9Env	t2.micro	sg-073ddafac109615fc [edit]	arn:aws:cloud9:us-east-1:986684184155:environment:8c5a9b94c32d465198514b389d144108
Description	Memory	VPC	Number of members
No description provided	1 GiB	vpc-094169b7e210c755b [edit]	1
Type	vCPU	Subnet	Lifecycle State
EC2	1	subnet-019dfc6867dac635b [edit]	CREATED
Permissions	Storage	EC2 Instance	
Owner	EBS only	Go To Instance [edit]	
Owner ARN		Environment path	
arn:aws:iam::986684184155:root		/home/ec2-user/environment	

### Executing the shell commands in Cloud9

```
ec2-user:~/environment $ nvm install 8.9.1
Downloading and installing node v8.9.1...
Downloaded https://nodejs.org/dist/v8.9.1/node-v8.9.1-linux-x64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v8.9.1 (npm v5.5.1)
ec2-user:~/environment $ nvm alias default v8.9.1
default -> v8.9.1
```

## Verifying right node and npm

```
ec2-user:~/environment $ npm -v
5.5.1
ec2-user:~/environment $ node -v
v8.9.1
ec2-user:~/environment $ $ nvm ls
bash: $: command not found
ec2-user:~/environment $ nvm ls
->      v8.9.1
      v16.14.2
      system
default -> v8.9.1
iojs -> N/A (default)
unstable -> N/A (default)
node -> stable (-> v16.14.2) (default)
stable -> 16.14 (-> v16.14.2) (default)
lts/* -> lts/gallium (-> v16.14.2)
lts/argon -> v4.9.1 (-> N/A)
lts/boron -> v6.17.1 (-> N/A)
lts/carbon -> v8.17.0 (-> N/A)
lts/dubnium -> v10.24.1 (-> N/A)
lts/erbium -> v12.22.11 (-> N/A)
lts/fermium -> v14.19.1 (-> N/A)
lts/gallium -> v16.14.2
```

## Cloning the Workshop Project

```
ec2-user:~/environment $ git clone https://github.com/enghwa/MultiRegion-Serverless-Workshop.git
Cloning into 'MultiRegion-Serverless-Workshop'...
remote: Enumerating objects: 874, done.
remote: Total 874 (delta 0), reused 0 (delta 0), pack-reused 874
Receiving objects: 100% (874/874), 15.52 MiB | 29.60 MiB/s, done.
Resolving deltas: 100% (377/377), done.
```

## 2. Build an API layer

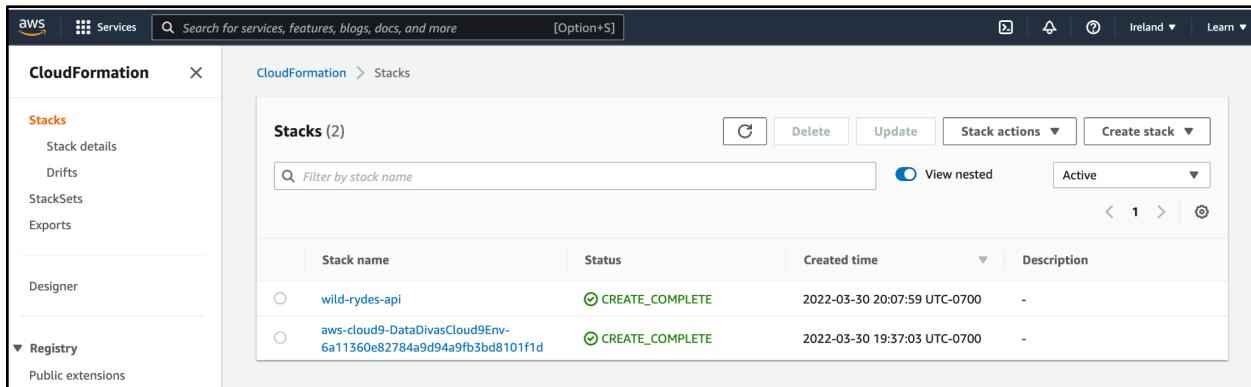
### Using CLI Method

#### 1. Create an S3 bucket to store the app code

```
bash - *p-172-31-18-91.ei x Immediate +  
ec2-user:~/environment $ aws s3 mb s3://multiregion-wildrydesdatadivas-ireland --region eu-west-1  
make_bucket: multiregion-wildrydesdatadivas-ireland  
ec2-user:~/environment $ aws s3 mb s3://multiregion-wildrydesdatadivas-singapore --region ap-southeast-1  
make_bucket: multiregion-wildrydesdatadivas-singapore  
ec2-user:~/environment $ cd /home/ec2-user/environment/MultiRegion-Serverless-Workshop/1_API  
ec2-user:~/environment/MultiRegion-Serverless-Workshop/1_API (master) $ aws cloudformation package \  
> --region eu-west-1 \  
> --template-file wild-rydes-api.yaml \  
> --output-template-file wild-rydes-api-output.yaml \  
> --s3-bucket multiregion-wildrydesdatadivas-ireland  
Uploading to 65dc089c5f6445553f1cc3b732684e25 4516395 / 4516395.0 (100.00%)  
Successfully packaged artifacts and wrote output template to file wild-rydes-api-output.yaml.  
Execute the following command to deploy the packaged template  
aws cloudformation deploy --template-file /home/ec2-user/environment/MultiRegion-Serverless-Workshop/1_API/wild-rydes-api-output.yaml --stack-name <YOUR STACK NAME>
```

#### 2. Package up the API code and push to S3

### Ireland(eu-west-1)



The screenshot shows the AWS CloudFormation console in the Ireland (eu-west-1) region. The left sidebar has 'CloudFormation' selected under 'Stacks'. The main area shows a table of stacks:

Stack name	Status	Created time	Description
wild-rydes-api	CREATE_COMPLETE	2022-03-30 20:07:59 UTC-0700	-
aws-cloud9-DataDivasCloud9Env-6a11360e82784a9d94a9fb3bd8101f1d	CREATE_COMPLETE	2022-03-30 19:37:03 UTC-0700	-

## Singapore(ap-southeast-1)

The screenshot shows the AWS CloudFormation console with the 'CloudFormation' service selected. In the left sidebar, 'Stacks' is chosen. The main area displays a table titled 'Stacks (1)'. A single row is listed: 'wild-rydes-api' with status 'CREATE\_COMPLETE' and created time '2022-03-30 20:10:31 UTC-0700'. There are buttons for 'Delete', 'Update', 'Stack actions', and 'Create stack'.

### 3. Deploy a stack of resources

```
bash - "ip-172-31-18-91.el" Immediate (Javascript (brow x  +)
}
ec2-user:~/environment/MultiRegion-Serverless-Workshop/1_API (master) $ aws cloudformation deploy \
> --region eu-west-1 \
> --template-file wild-rydes-api-output.yaml \
> --stack-name wild-rydes-api \
> --capabilities CAPABILITY_IAM

Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - wild-rydes-api
ec2-user:~/environment/MultiRegion-Serverless-Workshop/1_API (master) $ aws cloudformation deploy \
> --region ap-southeast-1 \
> --template-file wild-rydes-api-output-ap-southeast-1.yaml \
> --stack-name wild-rydes-api \
> --capabilities CAPABILITY_IAM

Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - wild-rydes-api
```

Confirming that API is working by copying the API URL for /ticket

## Ireland(eu-west-1)

The screenshot shows a browser window with the URL 'ccjzsk8xp.f.execute-api.eu-west-1.amazonaws.com/prod/ticket'. The page content is a JSON object: {"Items": [], "Count": 0, "ScannedCount": 0}.

## Singapore(ap-southeast-1)

The screenshot shows a browser window with the URL 'nreh9fxnx9.execute-api.ap-southeast-1.amazonaws.com/prod/ticket'. The page content is a JSON object: {"Items": [], "Count": 0, "ScannedCount": 0}.

Confirming that API is working by copying the API URL for /health

## Ireland(eu-west-1)

← → C



ccjzsk8xpf.execute-api.eu-west-1.amazonaws.com/prod/health

```
{"region": "eu-west-1", "message": "Successful response reading from DynamoDB table."}
```

### Singapore(ap-southeast-1)

← → C



nreh9fxnx9.execute-api.ap-southeast-1.amazonaws.com/prod/health/

```
{"region": "ap-southeast-1", "message": "Successful response reading from DynamoDB table."}
```

## Enable DynamoDB Global Table using CLI

```
bash - "ip-172-31-18-91.ebx" | Immediate (Javascript (brow x +)
ec2-user:~/environment/MultiRegion-Serverless-Workshop/1_API (master) $ aws dynamodb create-global-table \
> --global-table-name SXRTickets \
> --replication-group RegionName=eu-west-1 RegionName=ap-southeast-1 \
> --region eu-west-1
{
  "GlobalTableDescription": {
    "GlobalTableStatus": "CREATING",
    "GlobalTableName": "SXRTickets",
    "ReplicationGroup": [
      {
        "RegionName": "ap-southeast-1"
      },
      {
        "RegionName": "eu-west-1"
      }
    ],
    "CreationDateTime": 1648696978.964,
    "GlobalTableArn": "arn:aws:dynamodb:461442691217:global-table/SXRTickets"
  }
}
```

### 3. Build a UI layer

#### 1. Create the AWS Cognito Identity Pool, S3 bucket and Cloudfront distribution

##### AWS CloudFormation Deploy in eu-west-1 (Ireland)

```
aws cloudformation deploy \
--region eu-west-1 \
--template-file web-ui-stack.yaml \
--stack-name ticket-service-ui \
--capabilities CAPABILITY_IAM
```

```
ec2-user:~/environment/MultiRegion-Serverless-Workshop/1_API (master) $ cd /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI/cfn
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI/cfn (master) $ aws cloudformation deploy \
> --region eu-west-1 \
> --template-file web-ui-stack.yaml \
> --stack-name ticket-service-ui \
> --capabilities CAPABILITY_IAM

Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - ticket-service-ui
```

The screenshot shows the AWS CloudFormation console interface. On the left, there's a sidebar with options like Stacks, Drifts, StackSets, and Exports. The main area shows a list of stacks under 'Stacks (3)'. One stack, 'ticket-service-ui', is highlighted and has a status of 'CREATE\_COMPLETE'. To the right, the 'ticket-service-ui' stack details page is displayed. The 'Outputs' tab is active, showing two entries:

Key	Value	Description	Export name
BucketName	ticket-service-ui-websitebucket-1v6h833bd5d1y	The name of the website bucket	-
CognitoIdentityPoolId	eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015	Cognito Identity Pool Id	ticket-service-ui-CognitoIdentityPoolId

**CognitoIdentityPoolID Value:**

eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015

**BucketName Value:**

Ticket-service-ui-websitebucket-1v6h833bd5d1y

## Cloudfront distribution for S3 Bucket

```
aws cloudformation deploy \
--region eu-west-1 \
--template-file webs3bucket_with_cloudfront.yaml \
--stack-name ticket-service-ui-cloudfront \
--parameter-overrides S3BucketName=ticket-service-ui-websitebucket-1v6h833bd5d1y
```

```
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI/cfn (master) $ aws cloudformation deploy \
> --region eu-west-1 \
> --template-file webs3bucket_with_cloudfront.yaml \
> --stack-name ticket-service-ui-cloudfront \
> --parameter-overrides S3BucketName=ticket-service-ui-websitebucket-1v6h833bd5d1y
```

```
Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - ticket-service-ui-cloudfront
```

The screenshot shows the AWS CloudFormation console interface. On the left, there's a sidebar with options like Stacks, Drifts, StackSets, and Designer. The main area shows a list of stacks under 'CloudFormation > Stacks'. One stack, 'ticket-service-ui-cloudfront', is selected and shown in detail. The 'Outputs' tab is active, displaying the following table:

Key	Value	Description	Export name
CfDistributionDomainNameWithOAI	d16rls6uyd624v.cloudfront.net	Domain name for our cloudfront distribution	-
CfDistributionWithOAI	E2CCGF1I42D5MJ	Id for our cloudfront distribution	-
S3BucketName	ticket-service-ui-websitebucket-1v6h833bd5d1y	Bucket name	-

### CfDistributionDomainNameWithOAI Value:

d16rls6uyd624v.cloudfront.net

## 2. Configure Federated Identities with Cognito

### Creating a New App

The screenshot shows the 'Provide basic information' step of creating a new app. The 'Type' field is set to 'Type' and the 'Details' field is selected. The 'Display name' field contains 'wildryde-TT'. The 'App contact email' field contains 'saranya\_july4@yahoo.co.in'. The 'Business Account' section is marked as optional and shows 'No Business Manager account selected'. A note at the bottom states 'By proceeding, you agree to the [Facebook Platform Terms and Developer Policies](#)'. There are 'Previous' and 'Create app' buttons at the bottom right.

The screenshot shows the Meta for Developers dashboard for the app 'wildryde-TT'. The sidebar includes 'Dashboard', 'Settings', 'Roles', 'Alerts', 'App Review', 'Products' (with 'Add Product' button), 'Activity Log', and 'Help'. The main area shows the app ID '823899738592555' and status 'In development'. A message at the top says 'Still using saranya\_july4@yahoo.co.in? Visit your [developer settings](#) to update your email address and notification settings.' Below are sections for 'Facebook Login', 'Audience Network', and 'App Events'.

### Adding Platform

Select Platform

X

 Website <input checked="" type="checkbox"/>	 Xbox <input type="checkbox"/>
 iOS <input type="checkbox"/>	 PlayStation <input type="checkbox"/>
 Android 12 app stores available <input type="checkbox"/>	
 Windows App <input type="checkbox"/>	
 Page Tab <input type="checkbox"/>	

Cancel Next

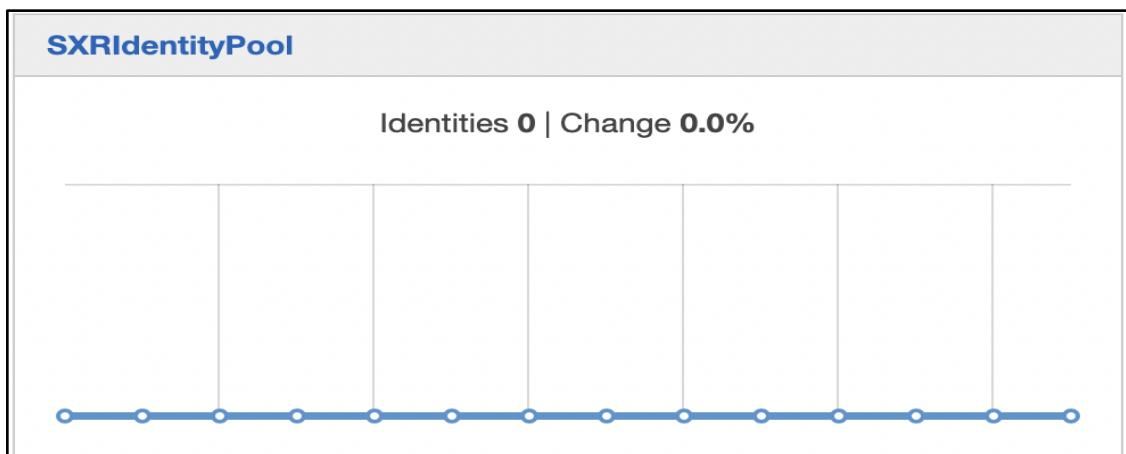
Website

Quick Start X

Site URL

App ID: 823899738592555

Cognito Identity Pool with Facebook as identity provider



## Edit identity pool

From this page you can modify the details of your identity pool. An identity pool must have a unique name and a set of authenticated and unauthenticated roles. The roles are saved with your identity pool and whenever we receive a request to authorize a user we will automatically utilize the roles you specify here. You will be required to specify the identity pool id from this page when initializing the Amazon Cognito client SDK. [Learn more about using IAM roles with Amazon Cognito.](#)

Identity pool name\*

Identity pool ID ⓘ eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015 [\(Show ARN\)](#)

**Identity pool ID: eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015**

### ▼ Authentication providers ⓘ

Amazon Cognito supports the following authentication methods with Amazon Cognito Sign-In or any public provider. If you allow your users to authenticate using any of these public providers, you can specify your application identifiers here. Warning: Changing the application ID that your identity pool is linked to will prevent existing users from authenticating using Amazon Cognito. [Learn more about public identity providers.](#)

Facebook App ID

## 3. Configure and build the application code

Configuring the attributes in Environment.ts file

```
 1  export const environment = {
 2
 3    production: true,
 4
 5    // TODO: make sure you have the correct region
 6    region: 'eu-west-1',
 7
 8
 9    // TODO: This id can be retrieved in output section of the cognito ui
10    // cloud formation stack.
11    cognitoIdentityPoolId: 'eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015 ',
12
13    // TODO: Facebook app id can be retrieved from the application in your
14    // facebook developer account.
15    facebookAppId: '823899738592555',
16
17    // TODO: The API URL is available in the API Gateway console under Stage
18    // NOTE: don't forget trailing "/" For example:
19    // https://api.example.com/prod/
20    ticketAPI: 'https://ccjzsk8xp.f.execute-api.eu-west-1.amazonaws.com/prod/'
21
22  };
23
```

```

ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ aws s3 sync --delete dist/ s3://ticket-service-ui-websitebucket-1v6h833bd5d1y
upload: dist/assets/js/aws/aws-cognito-sdk.min.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/aws-cognito-sdk.min.js
upload: dist/main.bundle.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/main.bundle.js
upload: dist/data-table.bce071e976865da51100.eot to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/data-table.bce071e976865da51100.eot
upload: dist/data-table.b0aebed744ce7adb780a9.svg to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/data-table.b0aebed744ce7adb780a9.svg
upload: dist/assets/js/aws/amazon-cognito-identity.min.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/amazon-cognito-identity.min.js
upload: dist/inline.bundle.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/inline.bundle.js.map
upload: dist/index.html to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/index.html
upload: dist/favicon.ico to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/favicon.ico
upload: dist/main.bundle.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/main.bundle.js.map
upload: dist/assets/js/aws/amazon-cognito-identity.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/amazon-cognito-identity.js
upload: dist/assets/js/aws/aws-cognito-sdk.min.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/aws-cognito-sdk.min.js.map
upload: dist/polyfills.bundle.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/polyfills.bundle.js
upload: dist/assets/js/aws/aws-cognito-sdk.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/aws-cognito-sdk.js
upload: dist/polyfills.bundle.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/polyfills.bundle.js.map
upload: dist/inline.bundle.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/inline.bundle.js
upload: dist/assets/js/amazon-login.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/amazon-login.js
upload: dist/assets/js/aws/aws-sdk.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/aws-sdk.js
upload: dist/styles.bundle.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/styles.bundle.js
upload: dist/styles.bundle.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/styles.bundle.js.map
upload: dist/views.module.chunk.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/views.module.chunk.js
upload: dist/views.module.chunk.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/views.module.chunk.js.map
upload: dist/assets/js/aws/amazon-cognito-identity.min.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/assets/js/aws/amazon-cognito-identity.min.js.map
upload: dist/vendor.bundle.js to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/vendor.bundle.js
upload: dist/vendor.bundle.js.map to s3://ticket-service-ui-websitebucket-1v6h833bd5d1y/vendor.bundle.js.map
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ 

```

## Build your AngularJS Project

Running npm install to install project dependencies

```

ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI/cfn (master) $ cd /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ npm install
npm WARN deprecated core-js@2.6.12: core-js<3.4 is no longer maintained and not recommended for usage due to the number of issues. Because of the V8 engine warnings, feature detection in old core-js versions could cause a slowdown up to 100x even if nothing is polyfilled. Please, upgrade your dependencies to the actual version of core-js.
npm WARN deprecated @angular/http@4.7.0: Package no longer supported. Use @angular/common instead, see https://angular.io/guide/deprecations#angularhttp
npm WARN deprecated chokidar@1.7.0: Chokidar 2 will break on node v14+. Upgrade to chokidar 3 with 15x less dependencies.
npm WARN notice [SECURITY] lodash has the following vulnerability: 4 high, 2 low. Go here for more details: https://github.com/advisories?query=lodash - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] socket.io has the following vulnerability: 1 moderate. Go here for more details: https://github.com/advisories?query=socket.io - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN deprecated extract-text-webpack-plugin@3.0.0: Deprecated. Please use https://github.com/webpack-contrib/mini-css-extract-plugin
npm WARN deprecated html-webpack-plugin@2.30.1: out of support
npm WARN notice [SECURITY] webpack-dev-server has the following vulnerability: 1 high. Go here for more details: https://github.com/advisories?query=webpack-dev-server - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] moment has the following vulnerability: 1 high. Go here for more details: https://github.com/advisories?query=moment - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] glob-parent has the following vulnerability: 1 moderate. Go here for more details: https://github.com/advisories?query=glob-parent - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN deprecated fsevents@1.2.13: fsevents 1 will break on node v14+ and could be using insecure binaries. Upgrade to fsevents 2.
npm WARN notice [SECURITY] braces has the following vulnerability: 1 low. Go here for more details: https://github.com/advisories?query=braces - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] minimist has the following vulnerability: 1 moderate. Go here for more details: https://github.com/advisories?query=minimist - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] debug has the following vulnerability: 1 low. Go here for more details: https://github.com/advisories?query=debug - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN notice [SECURITY] https-proxy-agent has the following vulnerabilities: 1 critical, 1 moderate. Go here for more details: https://github.com/advisories?query=https-proxy-agent - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.
npm WARN deprecated request@2.88.2: request has been deprecated, see https://github.com/request/request/issues/3142
npm WARN notice [SECURITY] postcss has the following vulnerability: 1 moderate. Go here for more details: https://github.com/advisories?query=postcss - Run `npm i npm@latest -g` to upgrade your npm version, and then `npm audit` to get more info.

```

```

> https://opencollective.com/core-js
> https://www.patreon.com/zloirock

Also, the author of core-js ( https://github.com/zloirock ) is looking for a good job -)

> es5-ext@0.10.59 postinstall /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI/node_modules/es5-ext
> node -e "try{require('./_postinstall')}{catch(e){}}"

> uglifyjs-webpack-plugin@0.4.6 postinstall /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI/node_modules/uglifyjs-webpack-plugin
> node lib/post_install.js

> node-sass@4.14.1 postinstall /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI/node_modules/node-sass
> node scripts/build.js

Binary found at /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI/node_modules/node-sass/vendor/linux-x64-57/binding.node
Testing binary
Binary is fine
npm notice created a lockfile as package-lock.json. You should commit this file.
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@2.3.2 (node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@2.3.2: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.7 (node_modules/watchpack-chokidar2/node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@^1.0.0 (node_modules/webpack-dev-server/node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@^1.0.0 (node_modules/karma/node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})

added 1385 packages in 52.792s

```

## Building the app

```

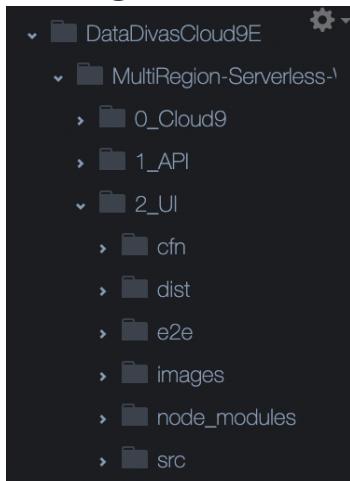
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ npm run build

> srx-ui@0.0.0 build /home/ec2-user/environment/MultiRegion-Serverless-Workshop/2_UI
> ng build

Date: 2022-03-31T01:34:03.081Z
Hash: 6e7760fe9333ea6c3ae4
Time: 13398ms
chunk {inline} inline.bundle.js, inline.bundle.js.map (inline) 5.83 kB [entry] [rendered]
chunk {main} main.bundle.js, main.bundle.js.map (main) 41.3 kB [vendor] [initial] [rendered]
chunk {polyfills} polyfills.bundle.js, polyfills.bundle.js.map (polyfills) 235 kB [inline] [initial] [rendered]
chunk {styles} styles.bundle.js, styles.bundle.js.map (styles) 574 kB [inline] [initial] [rendered]
chunk {vendor} vendor.bundle.js, vendor.bundle.js.map (vendor) 3 MB [initial] [rendered]
chunk {views.module} views.module.chunk.js, views.module.chunk.js.map () 396 kB [main] [rendered]
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ 

```

## Creating a dist/ folder containing the compiled app



## 4. Upload the application

aws s3 sync --delete dist/ s3://ticket-service-ui-websitebucket-1v6h833bd5d1y

This screenshot shows the 'Basic' settings for a Facebook app named 'wildryde-TT'. The app ID is 823899738592555. The app domains listed are d16rls6uyd624v.cloudfront.net. The privacy policy URL is http://d16rls6uyd624v.cloudfront.net/. The contact email is saranya\_july4@yahoo.co.in. The category is set to Education. The app icon is a placeholder image. The app purpose is described as accessing and using data from Facebook's Platform on behalf of the user.

## Went Live:

This screenshot shows the same 'Basic' settings page as the previous one, but with a 'Live' status indicator at the top. The app is now live on the platform.

This screenshot shows the deployed ticketing system at the URL d16rls6uyd624v.cloudfront.net/#/home. The page title is 'SXR (eu-west-1)'. The main content area displays a welcome message: 'Welcome to Wild Rydes Trouble Ticket System.' It instructs users to enter a ticket into the system by navigating to the ticketing console. A blue button labeled 'Ticket Console »' is visible.

# 4. Route53

## 1. Configure Route53 Domain

### Purchasing a domain Name

The screenshot shows the AWS Route 53 Domain Search interface. On the left, a sidebar lists steps: 1: Domain Search, 2: Contact Details, and 3: Verify & Purchase. The main area is titled "Choose a domain name" and contains a search bar with "DataDivasDomain" and a dropdown for ".com - \$12.00". A "Check" button is next to the dropdown. Below the search bar, it says "Availability for 'datadivasdomain.com'" and shows a table:

Domain Name	Status	Price / 1 Year	Action
datadivasdomain.com	✓ Available - In Cart	\$12.00	Add to cart

On the right, a "Shopping cart" section shows "datadivasdomain.com" selected, "Register for 1 year", and a "SUBTOTAL" of "\$12.00". It also includes a note about "Monthly Fees for DNS Management" and a link to "View pricing details".

Below this, a "Related domain suggestions" section shows a table:

Domain Name	Status	Price / 1 Year	Action
bigdatadivasdomain.com	✓ Available	\$12.00	Add to cart
clouddivasdomain.com	✓ Available	\$12.00	Add to cart
clouddivasdomain.net	✓ Available	\$11.00	Add to cart
datadivasdomain.net	✓ Available	\$11.00	Add to cart

At the bottom, a "Registered domains" section shows a table:

Domain Name	Privacy Protection	Expiration Date	Auto Renew	Transfer Lock
datadivasdomain.com	All contacts	March 30, 2023	✓	X

The sidebar on the left includes links for Dashboard, Hosted zones, Health checks, Traffic flow, Traffic policies, Policy records, and Domains.

## 2. Configure ACM and Custom Domains in API Gateway

### 2.1 Configure a certificate in Certificate Manager in each region

#### Request public certificate

**Domain names**

Fully qualified domain name [Info](#)  
datadivasdomain.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.

**Select validation method [Info](#)**  
Select a method for validating domain ownership

DNS validation - recommended  
Choose this option if you are authorized to modify the DNS configuration for the domains in your certificate request.

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.

AWS Certificate Manager > Certificates > 07b6b0ec-1e95-4339-9b90-40f2191b6a44

### 07b6b0ec-1e95-4339-9b90-40f2191b6a44

Delete

**Certificate status**

Identifier	Status
07b6b0ec-1e95-4339-9b90-40f2191b6a44	Pending validation

ARN  
[arn:aws:acm:eu-west-1:461442691217:certificate/07b6b0ec-1e95-4339-9b90-40f2191b6a44](#)

Type  
Amazon Issued

Detailed status  
The status of this certificate request is "Pending validation". Further action is needed to validate and approve the certificate. [Info](#)

**Domains (2)**

Create records in Route 53 Export to CSV

Domain	Status	Renewal status	Type	CNAME name	CNAME value
datadivasdomain.com	Pending validation	-			
*.datadivasdomain.com	Pending validation	-			

AWS Certificate Manager > Certificates > 07b6b0ec-1e95-4339-9b90-40f2191b6a44 > Create DNS records in Amazon Route 53

Create DNS records in Amazon Route 53 (2/2)

<input checked="" type="checkbox"/> Domain	Validation status	Type	CNAME name	CNAME value	Is domain in Route 53?
datadivasdomain.com	Pending validation	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjqbvb.acm-validations.aws.	Yes
*.datadivasdomain.com	Pending validation	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjqbvb.acm-validations.aws.	Yes

[Cancel](#) [Create records](#)

ⓘ Successfully created DNS records

Successfully created DNS records in Amazon Route 53 for certificate with ID 07b6b0ec-1e95-4339-9b90-40f2191b6a44.

## Ireland

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AWS Certificate Manager > Certificates > 07b6b0ec-1e95-4339-9b90-40f2191b6a44

**Certificate status**

Identifier 07b6b0ec-1e95-4339-9b90-40f2191b6a44	Status <span style="color: green;">Issued</span>
ARN arn:aws:acm:eu-west-1:461442691217:certificate/07b6b0ec-1e95-4339-9b90-40f2191b6a44	Detailed status The certificate was issued at March 30, 2022, 21:50:52 (UTC-07:00).
Type Amazon Issued	

**Domains (2)** [Create records in Route 53](#) [Export to CSV](#)

Domain	Status	Renewal status	Type	CNAME name	CNAME value
datadivasdomain.com	<span style="color: green;">Success</span>	-	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjqbvb.acm-validations.aws.
*.datadivasdomain.com	<span style="color: green;">Success</span>	-	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjqbvb.acm-validations.aws.

## Singapore

The screenshot shows the AWS Certificate Manager interface for a certificate identified by the ARN: arn:aws:acm:ap-southeast-1:461442691217:certificate/452d4507-8f71-449f-863c-e954a477d199. The certificate is in the 'Issued' status and was issued on March 30, 2022, at 21:55:04 (UTC-07:00). Two domains are associated with this certificate:

Domain	Status	Renewal status	Type	CNAME name	CNAME value
datadivasdomain.com	Success	-	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjgbvbg.acm-validations.aws.
*.datadivasdomain.com	Success	-	CNAME	_89987a30725c4f1cc05fd7cb11258e.datadivasdomain.com.	_02f233e5591bdd33a4ae764b9a674478.qvwhjgbvbg.acm-validations.aws.

## 2.2 Configure custom domains on each API in each region

The screenshot shows the 'Create domain name' configuration page for an API Gateway. In the 'Domain details' section, the domain name is set to api.datadivasdomain.com. The 'Minimum TLS version' is set to 'TLS 1.2 (recommended)'. Under 'Mutual TLS authentication', the option 'Mutual TLS authentication' is selected. In the 'Endpoint configuration' section, the 'Endpoint type' is set to 'Regional', which is described as associating the custom domain name with a specific AWS Region to optimize intra-region latency.

**ACM certificate**

Select an AWS Certificate Manager certificate for your custom domain name. [Learn more](#)

datadivasdomain.com

[Create a new ACM certificate](#)

**Tags**

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

No tags associated with the resource.

[Add tag](#)

[Cancel](#) [Create domain name](#)

## Configuring API Mapping

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**API Gateway** Successfully created domain name api.datadivasdomain.com

Successfully updated API mappings

API Gateway > Custom domain names

**Custom domain names**

Domain names	Create
<input type="text"/>	
api.datadivasdomain.com	

Domain details		
Domain name	TLS version	Status
api.datadivasdomain.com	TLS 1.2	Available

Configurations API mappings Tags

**API mappings**

Map paths from your domain name to your API stages

API	Stage	Path	Default endpoint
wild-rydes-api	prod	(none)	Enabled

[Configure API mappings](#)

## Ireland

The screenshot shows the AWS API Gateway interface for managing custom domain names. The left sidebar lists 'APIs', 'Custom domain names', and 'VPC links'. The main content area displays a success message: 'Successfully created domain name ireland.datadivasdomain.com' and 'Successfully updated API mappings'. Below this, the 'Custom domain names' section is shown. On the left, under 'Domain names', there is a search bar and a list with two items: 'api.datadivasdomain.com' (unchecked) and 'ireland.datadivasdomain.com' (checked). On the right, the 'Domain details' section shows the domain name 'ireland.datadivasdomain.com', TLS version 'TLS 1.2', and status 'Available'. The 'API mappings' tab is selected, showing a table with one entry: 'wild-rydes-api' mapped to 'prod' stage with '(none)' path and 'Enabled' status. Buttons for 'Delete' and 'Edit' are also present.

## Singapore

The screenshot shows the AWS API Gateway interface for managing custom domain names. The left sidebar lists 'APIs', 'Custom domain names', and 'VPC links'. The main content area displays a success message: 'Successfully created domain name api.datadivasdomain.com' and 'Successfully updated API mappings'. Below this, the 'Custom domain names' section is shown. On the left, under 'Domain names', there is a search bar and a list with two items: 'api.datadivasdomain.com' (checked) and 'singapore.datadivasdomain.com' (unchecked). On the right, the 'Domain details' section shows the domain name 'api.datadivasdomain.com', TLS version 'TLS 1.2', and status 'Available'. The 'API mappings' tab is selected, showing a table with one entry: 'wild-rydes-api' mapped to 'prod' stage with '(none)' path and 'Enabled' status. Buttons for 'Delete' and 'Edit' are also present.

### 3. Configure Route53 DNS records

#### 3.1 Configure DNS records

## Ireland

Quick create record [Info](#) [Switch to wizard](#)

▼ Record 1 [Delete](#)

Record name [Info](#) ireland .datadivasdomain.com  
Valid characters: a-z, 0-9, ! " # \$ % & ' ( ) \* + , - / ; < = > ? @ [ \ ] ^ \_ ` { } . ~

Value [Info](#)  Alias  
d-xsl8z3fh2.execute-api.eu-west-1.amazonaws.com|  
Enter multiple values on separate lines.

Record type [Info](#) CNAME – Routes traffic to another domain name and to some AWS reso... ▾

TTL (seconds) [Info](#) 60  
1m 1h 1d  
Recommended values: 60 to 172800 (two days)

Routing policy [Info](#) Simple routing  
Add another record

[Cancel](#) [Create records](#)

## Singapore

Route 53 > Hosted zones > datadivasdomain.com > Create record

Quick create record [Info](#) [Switch to wizard](#)

▼ Record 1 [Delete](#)

Record name [Info](#) singapore .datadivasdomain.com  
Valid characters: a-z, 0-9, ! " # \$ % & ' ( ) \* + , - / ; < = > ? @ [ \ ] ^ \_ ` { } . ~

Value [Info](#)  Alias  
d-fu05i87x1b.execute-api.ap-southeast-1.amazonaws.com|  
Enter multiple values on separate lines.

Record type [Info](#) CNAME – Routes traffic to another domain name and to some AWS reso... ▾

TTL (seconds) [Info](#) 60  
1m 1h 1d  
Recommended values: 60 to 172800 (two days)

Routing policy [Info](#) Simple routing  
Add another record

[Cancel](#) [Create records](#)

Records (5)						DNSSEC signing	Hosted zone tags (0)			
						<input type="button" value="Delete record"/>	<input type="button" value="Import zone file"/>	<input type="button" value="Create record"/>		
<input type="text"/> Filter records by property or value						Type ▾	Routing policy ▾	Alias ▾	< 1 >	
<input type="checkbox"/> Record name ▾						Type ▾	Routin... ▾	Differ... ▾	Value/Route traffic to	
<input type="checkbox"/> datadivasdomain.com						NS	Simple	-	ns-1065.awsdns-05.org. ns-982.awsdns-58.net. ns-1884.awsdns-43.co.uk. ns-390.awsdns-48.com.	
<input type="checkbox"/> datadivasdomain.com						SOA	Simple	-	ns-1065.awsdns-05.org. awsdns-hostmaster.amazon.com. 1 7200 900 1209600 86400	
<input type="checkbox"/> _89987a30725c4f1cc05fd7cb1125...						CNAME	Simple	-	_02f233e5591bdd33a4ae764b9a674478.qvwhjqvbvg.acm-validations.aws.	
<input type="checkbox"/> ireland.datadivasdomain.com						CNAME	Simple	-	d-xssl8z3fh2.execute-api.eu-west-1.amazonaws.com	
<input type="checkbox"/> singapore.datadivasdomain.com						CNAME	Simple	-	d-fu05i87x1b.execute-api.ap-southeast-1.amazonaws.com	

Checking endpoint on API :<https://ireland.datadivasdomain.com/health>

```
← → C 🔒 https://ireland.datadivasdomain.com/health
{
  "region": "eu-west-1",
  "message": "Successful response reading from DynamoDB table."
}
```

Checking endpoint on API :<https://singapore.datadivasdomain.com/health>

```
← → C 🔒 singapore.datadivasdomain.com/health
{
  "region": "ap-southeast-1",
  "message": "Successful response reading from DynamoDB table."
}
```

## 3.2 Configure a health check for both regions

### Ireland

Create health check

**Step 1: Configure health check**

Step 2: Get notified when health check fails

**Configure health check**

Route 53 health checks let you track the health status of your resources, such as web servers or mail servers, and take action when an outage occurs.

Name  ⓘ

What to monitor  Endpoint  Status of other health checks (calculated health check)  State of CloudWatch alarm

Monitor an endpoint

Multiple Route 53 health checkers will try to establish a TCP connection with the following resource to determine whether it's healthy. [Learn more](#)

Specify endpoint by  IP address  Domain name

Protocol  ⓘ

Domain name \*  ⓘ

Port \*  ⓘ

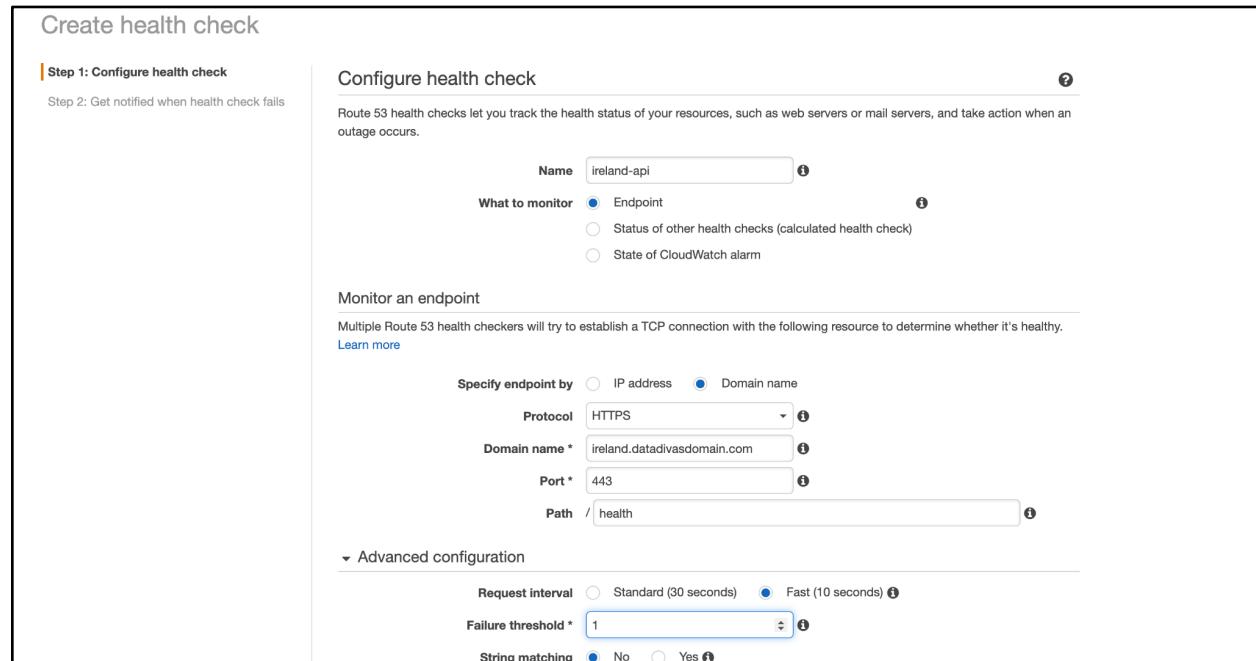
Path  ⓘ

Advanced configuration

Request interval  Standard (30 seconds)  Fast (10 seconds) ⓘ

Failure threshold \*  ⓘ

String matching  No  Yes ⓘ



### Singapore

Create health check

**Step 1: Configure health check**

Step 2: Get notified when health check fails

**Configure health check**

Route 53 health checks let you track the health status of your resources, such as web servers or mail servers, and take action when an outage occurs.

Name  ⓘ

What to monitor  Endpoint  Status of other health checks (calculated health check)  State of CloudWatch alarm

Monitor an endpoint

Multiple Route 53 health checkers will try to establish a TCP connection with the following resource to determine whether it's healthy. [Learn more](#)

Specify endpoint by  IP address  Domain name

Protocol  ⓘ

Domain name \*  ⓘ

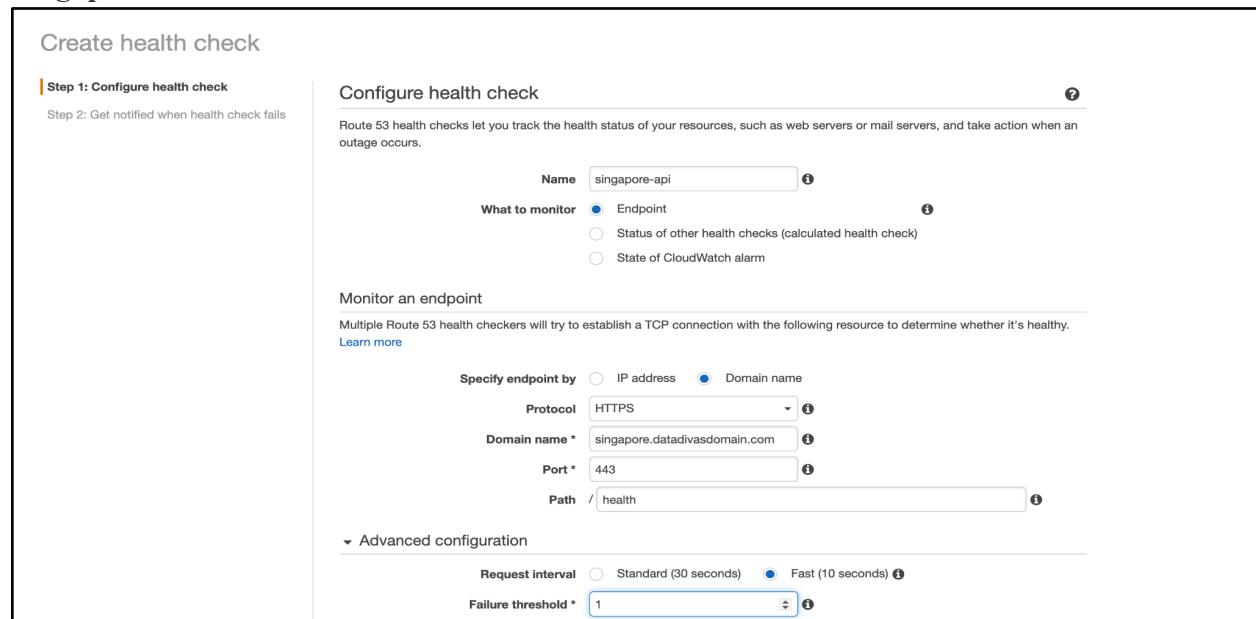
Port \*  ⓘ

Path  ⓘ

Advanced configuration

Request interval  Standard (30 seconds)  Fast (10 seconds) ⓘ

Failure threshold \*  ⓘ



## Health Check

Health Check Overview					
Actions		Health Status		Description	Alarms
Name	Status	Timestamp	Last Check	Description	ID
ireland-api	Healthy	15 minutes ago	now	https://ireland.datadivasdomain.com:44... Status: 200 OK	No alarms configured.
singapore-api	Healthy	15 minutes ago	now	https://singapore.datadivasdomain.com:44... Status: 200 OK	No alarms configured.

## 3.3 Configure DNS Routing Policy

### Ireland

Route 53 > Hosted zones > datadivasdomain.com > Create record

**Quick create record** [Info](#) [Switch to wizard](#)

**Record 1**

**Record name** [Info](#): api.datadivasdomain.com

**Record type** [Info](#): CNAME – Routes traffic to another domain name and to some AWS reso...

**Route traffic to** [Info](#):  Alias

**Alias to another record in this hosted zone**: US East (N. Virginia)

An alias to a CloudFront distribution and another record in the same hosted zone are global and available only in US East (N. Virginia).

**Routing policy** [Info](#): Simple routing

**Evaluate target health**: Yes

**Add another record**

**Create records**

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datadivasdomain.com [Info](#) Delete zone Test record Configure query logging

**Hosted zone details** [Edit hosted zone](#)

**Records (6)** DNSSEC signing Hosted zone tags (0)

**Records (1/6) Info** Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.

**Create record**

**Record type** [Info](#): CNAME – Routes traffic to another domain name and to some AWS reso...

**Route traffic to** [Info](#):  Alias

**Alias to another record in this hosted zone**: US East (N. Virginia) [us-east-1]

An alias to a CloudFront distribution and another record in the same hosted zone are global and available only in US East (N. Virginia) [us-east-1].

**Routing policy** [Info](#): Weighted

**Weight**: 50

The weight can be a number between 0 and 255. If you specify 0, Route 53 stops responding to DNS queries using this record.

**Health check - optional** [Info](#): ireland-api

**Evaluate target health**: Yes

**Record ID** [Info](#): ireland api gateway

**Save**

## Singapore

Route 53 > Hosted zones > datadivasdomain.com > Create record

**Quick create record** [Info](#) [Switch to wizard](#)

**Record 1**

**Record name** [Info](#) **.datadivasdomain.com**  
 .datadivasdomain.com  
 Valid characters: a-z, 0-9, !"#\$%&'()\*+,-/:;<=>?@[\]^\_`{|}~,

**Record type** [Info](#) **CNAME – Routes traffic to another domain name and to some AWS resources**

**Route traffic to** [Info](#)  Alias  
 Alias to another record in this hosted zone  
 US East (N. Virginia)  
 An alias to a CloudFront distribution and another record in the same hosted zone are global and available only in US East (N. Virginia).  
 [X](#)

**Evaluate target health**  Yes

**Routing policy** [Info](#) **Simple routing**

[Add another record](#)

[Cancel](#) [Create records](#)

**Hosted zone details** [Edit hosted zone](#)

[Records \(7\)](#) [DNSSEC signing](#) [Hosted zone tags \(0\)](#)

**Records (7) [Info](#)**  
 Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

[C](#) [Delete record](#) [Import zone file](#) [Create record](#)

<input type="checkbox"/>	Record name	Type	Routing policy	Differences	Value/Route traffic to
<input type="checkbox"/>	datadivasdomai...	NS	Simple	-	ns-1065.awsdns-05.org. ns-982.awsdns-58.net. ns-1884.awsdns-43.co.uk. ns-390.awsdns-48.com.
<input type="checkbox"/>	datadivasdomai...	SOA	Simple	-	ns-1065.awsdns-05.org. awsdns-hostmaster.amazon.com. 1 7200 900 1209600 86400
<input type="checkbox"/>	_89987a30725c...	CNAME	Simple	-	_02f233e5591bdd33a4ae764b9a674478.qvwhjqbvbg.acm-validations.aws.
<input type="checkbox"/>	api.datadivasdo...	CNAME	Weighted	50	ireland.datadivasdomain.com.
<input type="checkbox"/>	api.datadivasdo...	CNAME	Weighted	50	singapore.datadivasdomain.com.
<input type="checkbox"/>	ireland.datadiva...	CNAME	Simple	-	d-xsl18z3fh2.execute-api.eu-west-1.amazonaws.com
<input type="checkbox"/>	singapore.datadi...	CNAME	Simple	-	d-fu05i87x1b.execute-api.ap-southeast-1.amazonaws.com

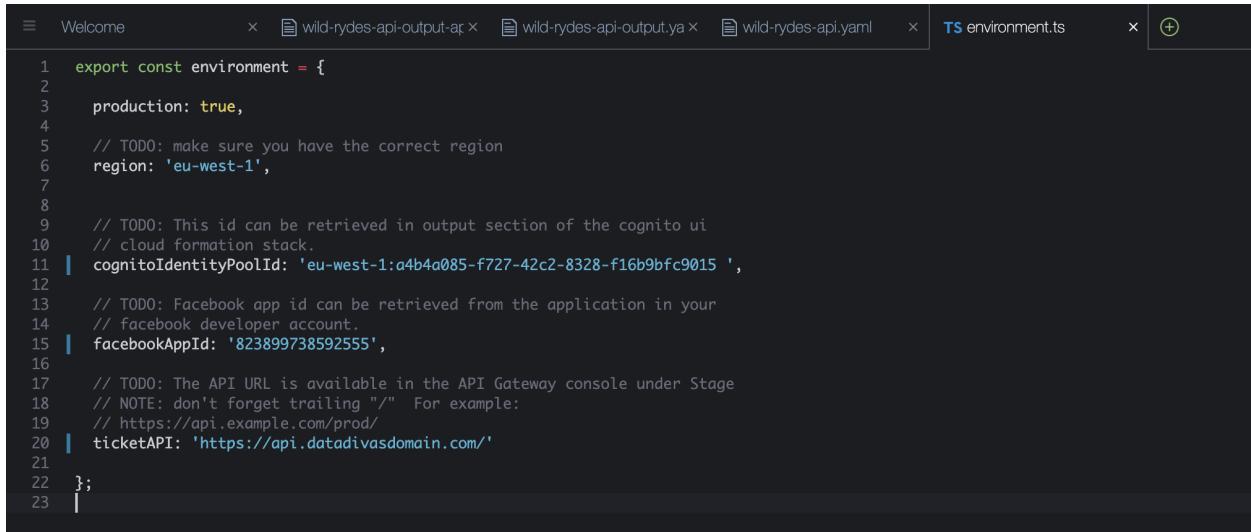
Checking endpoint on API :<https://api.datadivasdomain.com/health>

[←](#) [→](#) [C](#) <https://api.datadivasdomain.com/health>

```
{"region": "eu-west-1", "message": "Successful response reading from DynamoDB table."}
```

## 4. Update your UI with new API Gateway Endpoint

### Changing the environment file

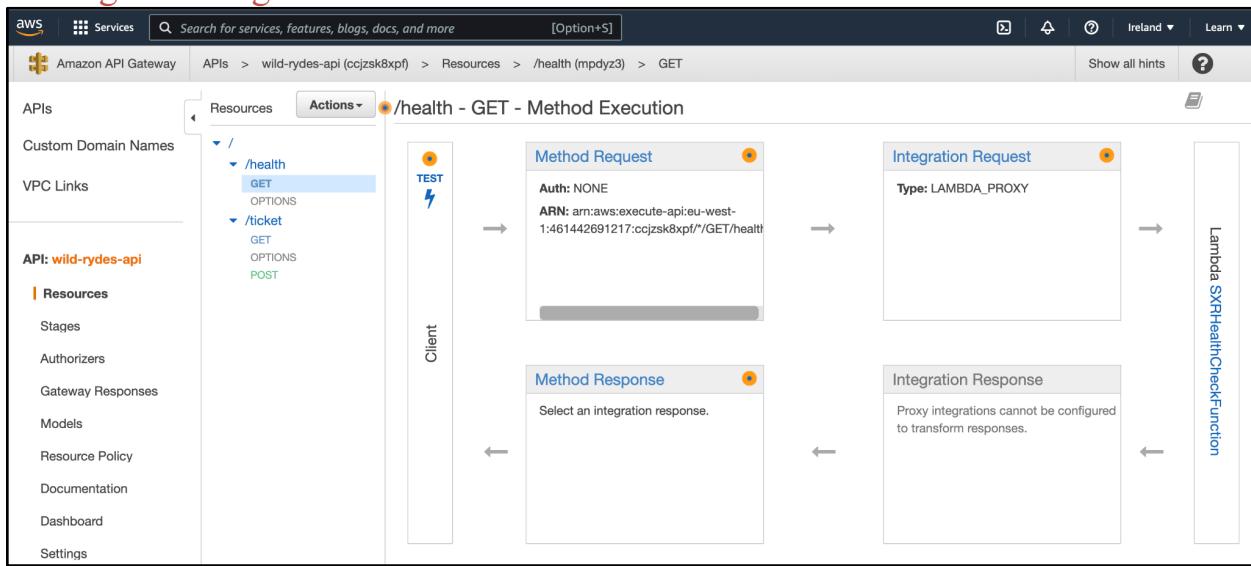


The screenshot shows a code editor interface with multiple tabs. The active tab is 'environment.ts', which contains the following code:

```
1  export const environment = {
2
3    production: true,
4
5    // TODO: make sure you have the correct region
6    region: 'eu-west-1',
7
8
9    // TODO: This id can be retrieved in output section of the cognito ui
10   // cloud formation stack.
11   cognitoIdentityPoolId: 'eu-west-1:a4b4a085-f727-42c2-8328-f16b9bfc9015 ',
12
13   // TODO: Facebook app id can be retrieved from the application in your
14   // facebook developer account.
15   facebookAppId: '823899738592555',
16
17   // TODO: The API URL is available in the API Gateway console under Stage
18   // NOTE: don't forget trailing "/" For example:
19   // https://api.example.com/prod/
20   ticketAPI: 'https://api.datadivasdomain.com/'
21
22 };
23
```

## 5. Test failover

### Testing Multi-region Active-active



### Breaking the primary region

The screenshot shows the AWS API Gateway Method Execution configuration page for the /health resource. The left sidebar lists various API resources. The main panel shows the configuration for the /health resource's GET method. Under 'Integration type', 'Lambda Function' is selected. Under 'Use Lambda Proxy integration', the 'Lambda Region' is set to 'eu-west-1' and the 'Lambda Function' is set to 'TicketPostFunction'. There are also options for 'Execution role', 'Invoke with caller credentials', 'Credentials cache', and 'Use Default Timeout'.

## Deploying the API to prod stage

Deploy API 

Choose a stage where your API will be deployed. For example, a test version of your API could be deployed to a stage named beta.

**Deployment stage**  

**Deployment description**

**Cancel** **Deploy**

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Ireland Learn ▾

APIs Stages Create prod Stage Editor Delete Stage Configure Tags

Custom Domain Names

VPC Links

API: wild-rydes-api

Resources

**Stages** 

Authorizers

Gateway Responses

Models

Resource Policy

Documentation

Dashboard

Settings

Usage Plans

API Keys

Client Certificates

Settings

Invoke URL: <https://ccjzsk8xpf.execute-api.eu-west-1.amazonaws.com/prod>

**Settings** Logs/Tracing Stage Variables SDK Generation Export Deployment History Documentation History Canary

**Cache Settings**

Enable API cache

**Default Method Throttling**

Choose the default throttling level for the methods in this stage. Each method in this stage will respect these rate and burst settings. Your current account level throttling rate is 10000 requests per second with a burst of 5000 requests. [Read more about API Gateway throttling](#)

Enable throttling  

Rate 10000 requests per second

Burst 5000 requests

**Web Application Firewall (WAF)** [Learn more](#).

Select the Web ACL to be applied to this stage.

Web ACL None [Create Web ACL](#)

**Client Certificate**

Select the client certificate that API Gateway will use to call your integration endpoints in this stage.

Certificate None

## Verifying the failure for Ireland

Create health check Delete health check Edit health check

Filter by keyword

1 to 2 of 2 health checks

Name	Status	Description	Alarms	ID
ireland-api	 30 minutes ago now  Unhealthy	<a href="https://ireland.datadivasdomain.com:44...">https://ireland.datadivasdomain.com:44...</a>	No alarms configured.	73d4108d-b168-4

### Checking endpoint on API :<https://api.datadivasdomain.com/health>

The end point is displaying ap-southeast-1(singapore) as a region when the ireland is unhealthy



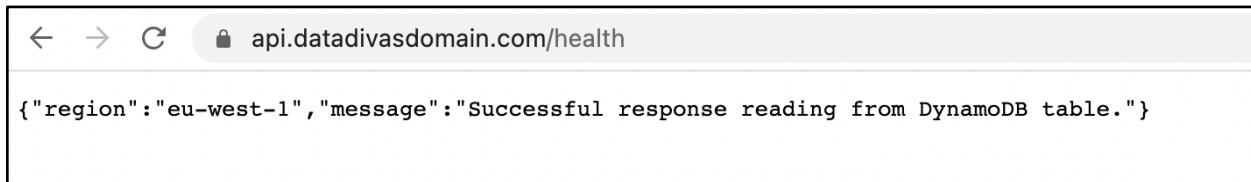
A screenshot of a web browser window. The address bar shows the URL <https://api.datadivasdomain.com/health>. The page content displays a JSON response:

```
{"region": "ap-southeast-1", "message": "Successful response reading from DynamoDB table."}
```

### Verifying the failure for Singapore

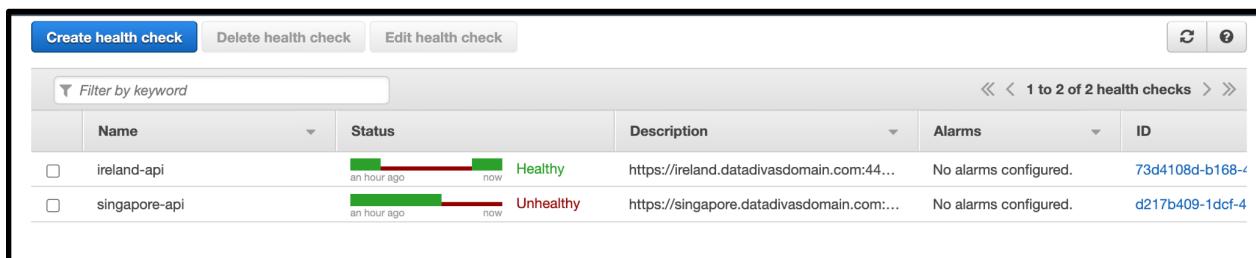
Now Ireland became healthy, and Singapore became unhealthy and the end point is displaying eu-west-1(Ireland) as a region.

### Checking endpoint on API :<https://api.datadivasdomain.com/health>



A screenshot of a web browser window. The address bar shows the URL <https://api.datadivasdomain.com/health>. The page content displays a JSON response:

```
{"region": "eu-west-1", "message": "Successful response reading from DynamoDB table."}
```



A screenshot of the AWS CloudWatch Metrics Health Checks interface. The table lists two health checks:

Name	Status	Description	Alarms	ID
ireland-api	Healthy	https://ireland.datadivasdomain.com:44...	No alarms configured.	73d4108d-b168-4
singapore-api	Unhealthy	https://singapore.datadivasdomain.com:...	No alarms configured.	d217b409-1dcf-4

## Creating First Ticket for the Singapore being unhealthy and assigning to EngHwa

SXR (eu-west-1)

saranya\_july4@yahoo.co.in Log Out

Main  
Home  
Ticket

Create Ticket:

\* Description (min 10 characters):  
Creating ticket test1

\* Assigned:  
EngHwa

\* Priority:  
Medium

\* Status:  
Open

\* = required field

Create

All Tickets: Refresh

assigned	priority	status	createdOn	createdBy
No data to display				

0 total

All Tickets: Refresh

assigned	priority	status	createdOn	createdBy
enghwa	medium	open	2022-03-31 06:45:42	saranya_july4@yahoo.co.in

1 total

## Verifying the failure for Ireland Again

Now Ireland became unhealthy, and Singapore became Healthy, and the end point is displaying ap-southeast-1(Singapore) as a region.

Create health check Delete health check Edit health check

Filter by keyword

1 to 2 of 2 health checks

Name	Status	Description	Alarms	ID
ireland-api	Unhealthy	https://ireland.datadivasdomain.com:44...	No alarms configured.	73d4108d-b168-4
singapore-api	Healthy	https://singapore.datadivasdomain.com:...	No alarms configured.	d217b409-1dcf-4

Checking endpoint on API :<https://api.datadivasdomain.com/health>

← → C https://api.datadivasdomain.com/health

```
{"region": "ap-southeast-1", "message": "Successful response reading from DynamoDB table."}
```

## Creating Second Ticket for the Ireland being unhealthy and assigning to Jay

SXR (ap-southeast-1)

saranya\_july4@yahoo.co.in Log Out

Main  
Home  
Ticket

**Create Ticket:**

- \* Description (min 10 characters):  
Creating ticket test2
- \* Assigned:  
Jay
- \* Priority:  
Medium
- \* Status:  
Open

\* = required field

**Create**

All Tickets: Refresh

assigned	priority	status	createdOn	createdBy
enghwa	medium	open	2022-03-31 06:45:42	saranya_july4@yahoo.co.in
1 total				

All Tickets: Refresh

assigned	priority	status	createdOn	createdBy
enghwa	medium	open	2022-03-31 06:45:42	saranya_july4@yahoo.co.in
jay	medium	open	2022-03-31 07:03:32	saranya_july4@yahoo.co.in

## DynamoDB tables Information in Ireland

warn Services Search for services, features, blogs, docs, and more [Option+S]

Ireland Lean

**DynamoDB**

- Dashboard
- Tables
  - Update settings
  - Explore items**
- PartQL editor New
- Backups
- Exports to S3
- Reserved capacity

**DAX**

- Clusters
- Subnet groups
- Parameter groups
- Events

Tell us what you think

Return to the previous console experience

Density settings

**Tables (1)**

Any table tag

Find tables by table name

SXRTickets

**SXRTickets**

Autopreview Actions Create item Update table settings

Scan/Query items

Scan Query

Table or index SXRTickets

Filters

Run Reset

Completed Read capacity units consumed: 0.5

Items returned (2)

	id	assigned	aws:rep:...	aws:rep:...	aws:rep:...
2022-03-5...	jay	false	ap-southea...	164871021...	
2022-03-5...	enghwa	false	eu-west-1	164870914...	

## DynamoDB tables Information in Singapore

The screenshot shows the AWS DynamoDB console interface. On the left, the navigation pane is open with the 'DynamoDB' tab selected. Under 'Tables', the 'Explore items' option is highlighted. The main area displays the 'SXRTickets' table details. The table has one item, which is being scanned. The table structure includes columns: id, assigned, aws:rep..., aws:rep..., and aws:rep.... The data returned shows two items:

	id	assigned	aws:rep...	aws:rep...	aws:rep...
1	2022-03-3...	jay	false	ap-southea...	164871021...
2	2022-03-3...	enghwa	false	eu-west-1	164870914...

# 7. S3 Replication and CloudFront with Multi-Region S3 Origins

## S3 Cross-Region Replication (CRR)

### 1. Enable versioning on your source bucket in Ireland region

```
aws s3api put-bucket-versioning \
--bucket ticket-service-ui-websitebucket-1v6h833bd5d1y \
--versioning-configuration Status=Enabled
```

### 2. Create a destination bucket and enable versioning on it

```
aws s3api create-bucket \
--bucket ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y \
--region ap-southeast-1 \
--create-bucket-configuration LocationConstraint=ap-southeast-1
```

Name	AWS Region	Access	Creation date
ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y	Asia Pacific (Singapore) ap-southeast-1	Objects can be public	March 31, 2022, 00:13:15 (UTC-07:00)
ticket-service-ui-websitebucket-1v6h833bd5d1y	EU (Ireland) eu-west-1	Objects can be public	March 30, 2022, 20:24:23 (UTC-07:00)

## Enabling Version

```
aws s3api put-bucket-versioning \
--bucket ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y \
--versioning-configuration Status=Enabled
```

### 3.Create an IAM role

IAM > Roles > Create role

Step 1  
Select trusted entity

Step 2  
Add permissions

Step 3  
Name, review, and create

#### Name, review, and create

##### Role details

Role name  
Enter a meaningful name to identify this role.  
**crrDataDivas**

Description  
Add a short explanation for this policy.  
Allows S3 to call AWS services on your behalf.

Step 1: Select trusted entities Edit

```
1- [
2-   "Version": "2012-10-17",
3-   "Statement": [
4-     {
5-       "Effect": "Allow",
6-       "Principal": {
7-         "Service": "s3.amazonaws.com"
8-       },
9-       "Action": "sts:AssumeRole"
10-    }
11-  ]
]
```

Step 2: Add permissions Edit

Permissions policy summary

Policy name	Type	Attached as
<a href="#">crrRolePolicy</a>	Customer managed	Permissions policy

Tags

**Add tags (Optional)**  
Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

No tags associated with the resource.

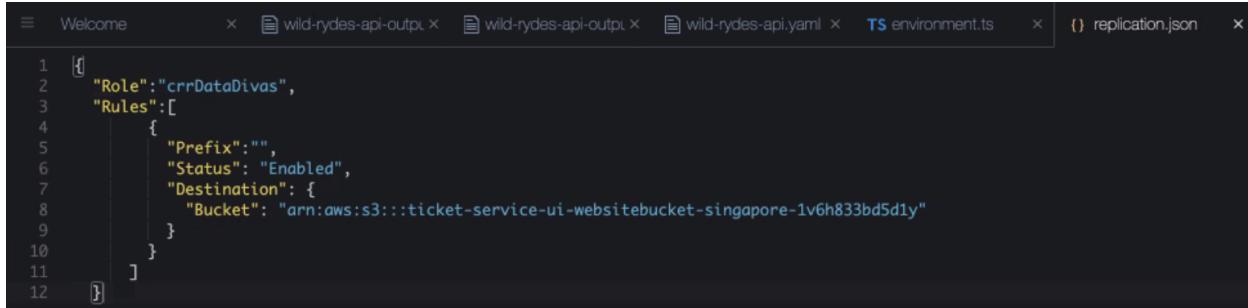
[Add tag](#)  
You can add up to 50 more tags

[Cancel](#) [Previous](#) [Create role](#)



Role **crrDataDivas** created

## Replication.json



```
1  [ {  
2      "Role": "crrDataDivas",  
3      "Rules": [  
4          {  
5              "Prefix": "",  
6              "Status": "Enabled",  
7              "Destination": {  
8                  "Bucket": "arn:aws:s3:::ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y"  
9              }  
10         }  
11     ]  
12 } ]
```

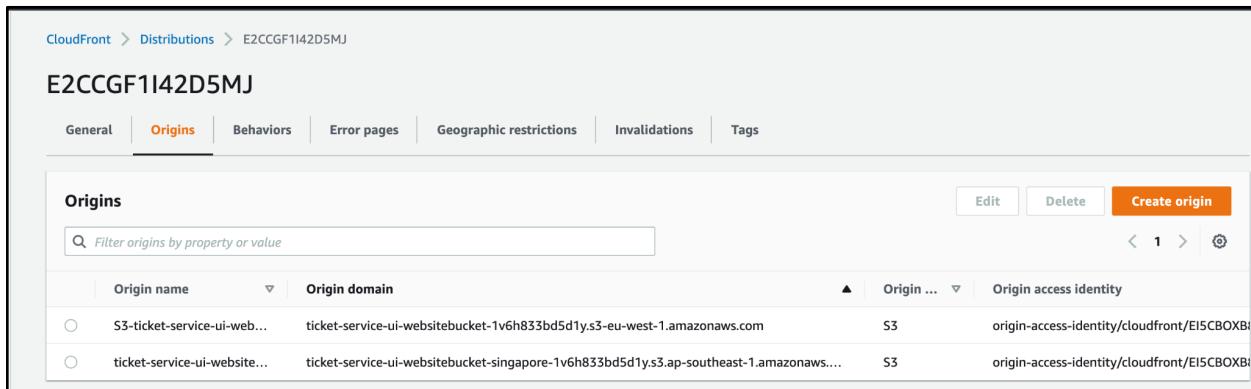
Running the following command to add the replication configuration to your source bucket.

```
aws s3api put-bucket-replication \  
--replication-configuration file://replication.json \  
--bucket ticket-service-ui-websitebucket-1v6h833bd5d1y
```

## Building the App

```
aws s3 sync --delete dist/ s3://ticket-service-ui-websitebucket-1v6h833bd5d1y
```

## CloudFront Origin Failover



The screenshot shows the AWS CloudFront Origins page for distribution E2CCGF1I42D5MJ. The page has a navigation bar at the top with 'CloudFront > Distributions > E2CCGF1I42D5MJ'. Below the navigation is a title 'E2CCGF1I42D5MJ'. A tab bar below the title includes 'General', 'Origins' (which is highlighted in orange), 'Behaviors', 'Error pages', 'Geographic restrictions', 'Invalidations', and 'Tags'. The main content area is titled 'Origins' and contains a table with two rows of data. The columns in the table are 'Origin name', 'Origin domain', 'Origin ...', and 'Origin access identity'. The first row shows 'S3-ticket-service-ui-web...' with 'ticket-service-ui-websitebucket-1v6h833bd5d1y.s3-eu-west-1.amazonaws.com' as the origin domain, 'S3' as the protocol, and 'origin-access-identity/cloudfront/E15CBOXB1' as the origin access identity. The second row shows 'ticket-service-ui-website...' with 'ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y.s3.ap-southeast-1.amazonaws.com' as the origin domain, 'S3' as the protocol, and 'origin-access-identity/cloudfront/E15CBOXB1' as the origin access identity. There are buttons for 'Edit', 'Delete', and 'Create origin' at the top right of the table.

Origin name	Origin domain	Origin ...	Origin access identity
S3-ticket-service-ui-web...	ticket-service-ui-websitebucket-1v6h833bd5d1y.s3-eu-west-1.amazonaws.com	S3	origin-access-identity/cloudfront/E15CBOXB1
ticket-service-ui-website...	ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y.s3.ap-southeast-1.amazonaws.com	S3	origin-access-identity/cloudfront/E15CBOXB1

## Create Origin

### Create origin group

#### Settings

**Origins**  
Choose the origins for this group, then put them in priority order.

**1: S3-ticket-service-ui-websitebucket-1v6h833bd5d1y (primary)**  
X

**2: ticket-service-ui-websitebucket-singapore-1v6h833bd5d1y.s3.ap-southeast-1.amazonaws.com**  
X

**Name**  
Enter a name for this origin group.

**Failover criteria**  
Select the origin errors to use as failover criteria.

400 Bad Request  
 403 Forbidden  
 404 Not found  
 416 Range Not Satisfiable  
 500 Internal server error  
 502 Bad gateway  
 503 Service unavailable  
 504 Gateway timeout

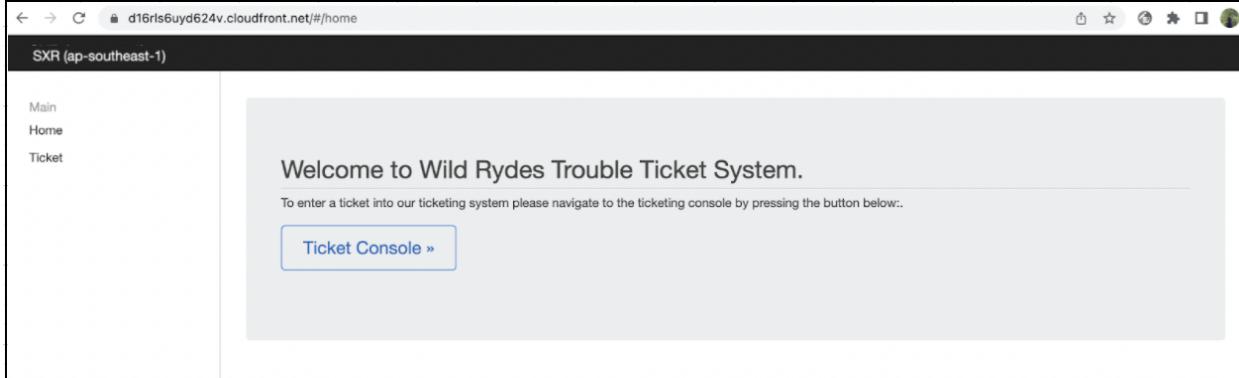
```
aws cloudfront create invalidation --distribution-id E2CCGF1I42D5MJ --paths "/images/app-screenshot.png" "/images/app-screenshot2.png"
```

```
ec2-user:~/environment/MultiRegion-Serverless-Workshop/2_UI (master) $ aws cloudfront create invalidation --distribution-id E2CCGF1I42D5M  
J --paths "/images/app-screenshot.png" "/images/app-screenshot2.png"  
{  
    "Invalidation": {  
        "Status": "InProgress",  
        "InvalidationBatch": {  
            "Paths": {  
                "Items": [  
                    "/images/app-screenshot2.png",  
                    "/images/app-screenshot.png"  
                ],  
                "Quantity": 2  
            },  
            "CallerReference": "cli-1648714098-32824"  
        },  
        "Id": "I18M6H0DOY46BG",  
        "CreateTime": "2022-03-31T08:08:19.392Z"  
    },  
    "Location": "https://cloudfront.amazonaws.com/2020-05-31/distribution/E2CCGF1I42D5MJ/invalidation/I18M6H0DOY46BG"  
}
```

# Test CloudFront Failover

---

Checking the multi-region active-active ticketing system working perfectly though the primary region (Ireland) has an issue in S3 (Deleted the S3 bucket in the source region)



## References

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- GitHub - enghwa/MultiRegion-Serverless-Workshop: Build an Active/Active Multi-Region Serverless Application for Resilience and High Availability. GitHub. (2022). Retrieved 31 March 2022, from <https://github.com/enghwa/MultiRegion-Serverless-Workshop>.