



CI/CD for front-end apps

Practical guide



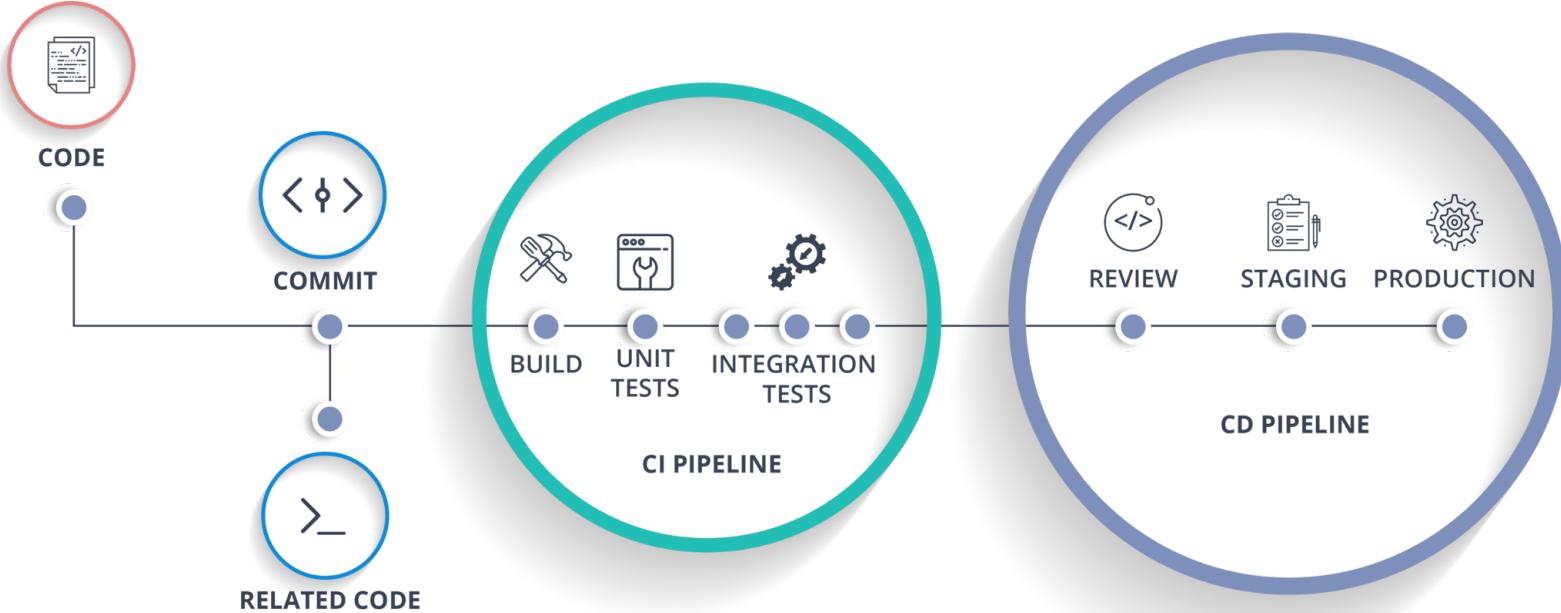
Agenda

- # RECAP CI/CD CONCEPTS
- # PRACTICE LOOK AT FRONT-END CI/CD PIPELINE
 - # SOURCE CODE
 - # EXPRESS DEPLOYMENT WITHOUT PIPELINE
 - # PRE-CHECKS
 - # TESTING
 - # CODE ANALYSIS TOOLS
 - # BUILD: CREATE AND STORE AN ARTIFACT
 - # DEPLOYMENT
- # SUMMARY

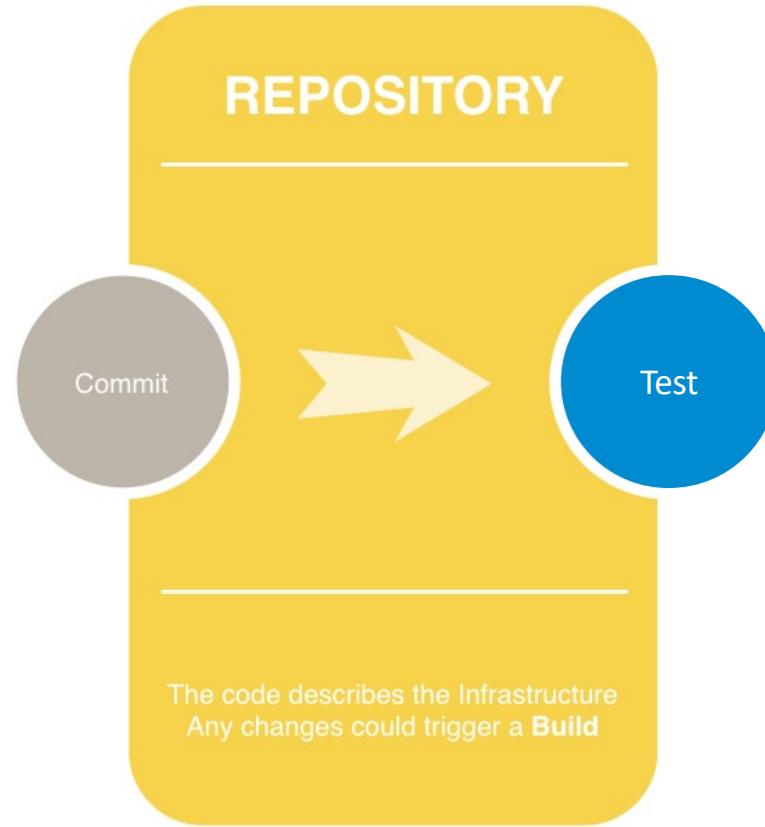


RECAP CI/CD CONCEPTS

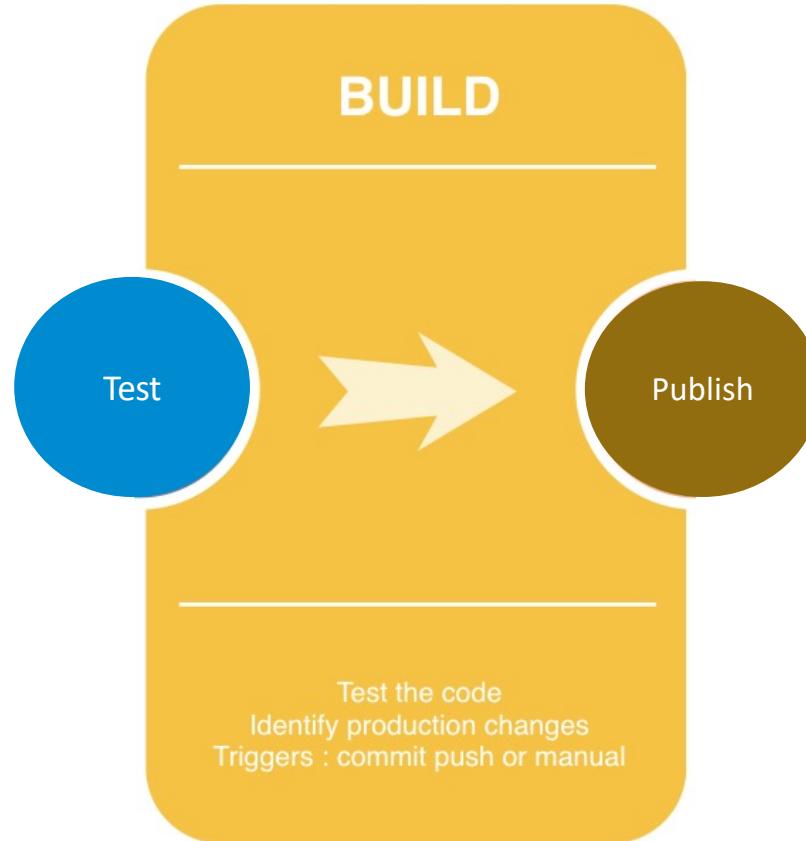
CI/CD Pipeline



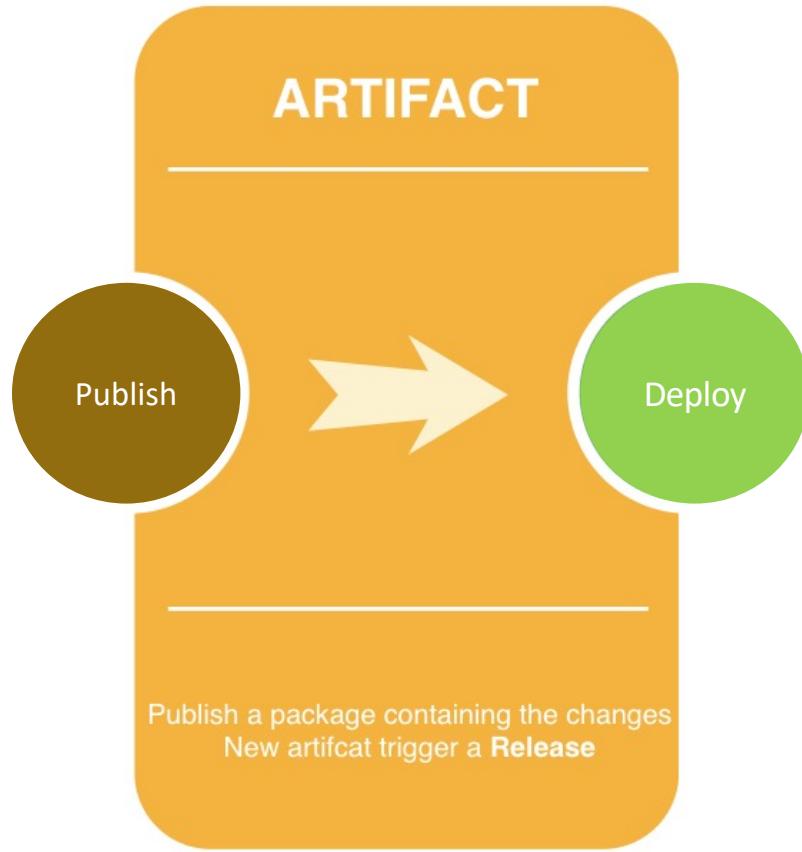
Code/Repository



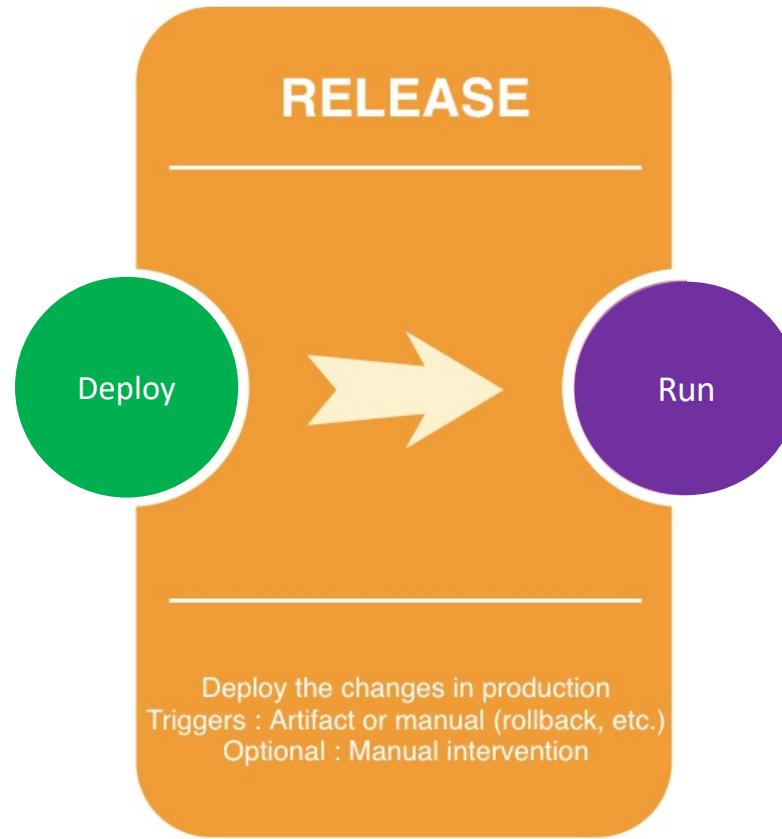
Build



Artifact



Deployment/Release



PRACTICE LOOK AT CI/CD PIPELINE



CODE

Repository

INGREDIENTS

- Application: **QuoteApp**
- Repository: <https://github.com/boale/ngQuote>
- Commands:
 - *Fork repository*
 - **git clone <https://github.com/{user}/ngQuote>**
 - **cd ngQuote**
 - **npm i**
 - **npm start**
 - *Open <http://localhost:4200> in browser*

“

©

The wise man does not lay up his own treasure. The more he gives to others, the more he has for his own.

©Lao Tzu

”

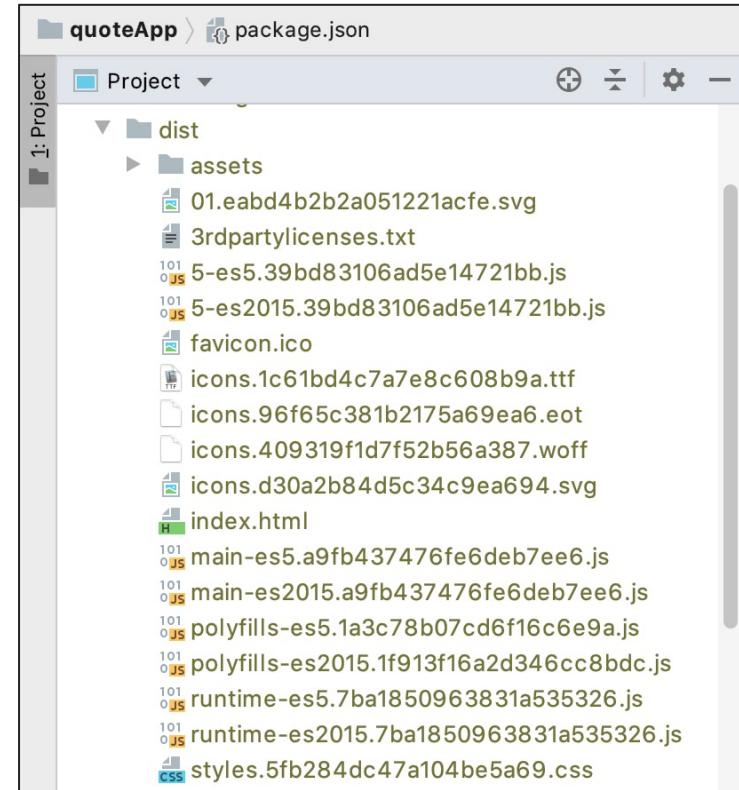
EXPRESS DEPLOYMENT WITHOUT PIPELINE

AWS S3 manual deployment (express version) - Warm up

INGREDIENTS

- Project Source Code
- Script: "build:prod": "npm run build -- --configuration production"
- Command: `npm run build:prod`
- Tool: AWS Simple Storage Service (S3)
- Config:

```
        "Version": "2012-10-17",
        "Id": "WebAppBucketPolicy",
        "Statement": [
            {
                "Sid": "PublicReadForGetBucketObjects",
                "Effect": "Allow",
                "Principal": "*",
                "Action": "s3:GetObject",
                "Resource": "arn:aws:s3:::quote-app-express/*"
            }
        ]
```



AWS S3: create a bucket

Amazon S3 > Create bucket

Create bucket Info

Buckets are containers for data stored in S3. [Learn more](#)

General configuration

Bucket name

quote-app-express

Bucket name must be unique and must not contain spaces or uppercase letters. [See rules for bucket](#)

AWS Region

US East (N. Virginia) us-east-1

Copy settings from existing bucket - optional

Only the bucket settings in the following configuration are copied.

[Choose bucket](#)

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and granted using access policies. This determines who can specify access to objects.

ACLs disabled (recommended)

All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using access policies.

ACLs enabled

Objects in this bucket are owned by the account. Access to them is specified using ACLs.

Object Ownership

Bucket owner enforced

Block Public Access settings for this bucket

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to this bucket and its objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. [Learn more](#)

Block all public access

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent.

Block public access to buckets and objects granted through new access control lists (ACLs)

S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access using ACLs.

Block public access to buckets and objects granted through any access control lists (ACLs)

S3 will ignore all ACLs that grant public access to buckets and objects.

Block public access to buckets and objects granted through new public bucket or access point

S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting does not affect existing policies that allow public access to S3 resources.

Block public and cross-account access to buckets and objects through any public bucket or access point policies

S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to objects.



Turning off block all public access might result in this bucket and the objects within becoming public.

AWS recommends that you turn on block all public access, unless public access is required for specific use cases such as static website hosting.

I acknowledge that the current settings might result in this bucket and the objects within becoming public.

Default encryption

Automatically encrypt new objects stored in this bucket. [Learn more](#)

Server-side encryption

Disable

Enable

Advanced settings

Object Lock

Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. [Learn more](#)

Disable

Enable

Permanently allows objects in this bucket to be locked. Additional Object Lock configuration is required in bucket details after bucket creation to protect objects in this bucket from being deleted or overwritten.

Object Lock works only in versioned buckets. Enabling Object Lock automatically enables Bucket Versioning.

After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.

[Cancel](#)

[Create bucket](#)

AWS S3 bucket

Amazon S3 X

Buckets

- Access Points
- Object Lambda Access Points
- Multi-Region Access Points
- Batch Operations
- Access analyzer for S3

Block Public Access settings for this account

Storage Lens

- Dashboards
- AWS Organizations settings

Feature spotlight

AWS Marketplace for S3

Successfully created bucket "quote-app-express"
To upload files and folders, or to configure additional bucket settings choose [View details](#).

Amazon S3

Account snapshot [View Storage Lens dashboard](#)

Last updated: Dec 21, 2021 by Storage Lens. Metrics are generated every 24 hours. [Learn more](#)

Total storage 232.7 MB	Object count 489	Avg. object size 487.3 KB	You can enable advanced metrics in the "default-account-dashboard" configuration.
---------------------------	---------------------	------------------------------	---

Buckets (9) [Info](#) [C](#) [Copy ARN](#) [Empty](#) [Delete](#) [Create bucket](#)

Buckets are containers for data stored in S3. [Learn more](#)

Name	AWS Region	Access	Creation date
quote-app-express	US East (N. Virginia) us-east-1	Objects can be public	December 22, 2021, 15:15:28 (UTC+02:00)

AWS S3: configure public bucket – AWS Policy Generator

Bucket policy
The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts. [Learn more](#)

[Policy examples](#) [Policy generator](#)

Bucket ARN
 arn:aws:s3:::quote-app-express

Policy

```
1▼ {  
2    "Version": "2012-10-17",  
3    "Statement": [  
4        {  
5            "Sid": "Statement1",  
6            "Principal": "*",  
7            "Effect": "Allow",  
8            "Action": [  
9                "s3:GetObject"  
10            ],  
11            "Resource": [  
12                "arn:aws:s3:::quote-app-test/*"  
13            ]  
14        }  
15    ]  
16 }
```

Edit statement Statement1 [Remove](#)

1. Add actions
Choose a service [X](#)

Included
S3

Available
S3 Object Lambda
S3 Outposts

2. Add a resource [Add](#)

3. Add a condition (optional) [Add](#)

[+ Add new statement](#)

JSON Ln 11, Col 15

Security: 0 Errors: 0 Warnings: 0 Suggestions: 0 [Preview external access](#)

AWS S3: configure public bucket

Successfully edited bucket policy.

quote-app-express [Info](#)

Publicly accessible

Objects Properties Permissions Metrics Management Access Points

Permissions overview

Access [Public](#)

Block public access (bucket settings)

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without it.

[Edit](#)

Block all public access

[Off](#)
► Individual Block Public Access settings for this bucket

Bucket policy

The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other AWS accounts.

```
{ "Version": "2012-10-17", "Statement": [ { "Sid": "Statement1", "Effect": "Allow", "Principal": "*", "Action": "s3:GetObject", "Resource": "arn:aws:s3:::quote-app-express/*" } ] }
```

Access control list (ACL)

Grant basic read/write permissions to other AWS accounts. [Learn more](#)

This bucket has the bucket owner enforced setting applied for Object Ownership
When bucket owner enforced is applied, use bucket policies to control access. [Learn more](#)

The console displays combined access grants for duplicate grantees
To see the full list of ACLs, use the Amazon S3 REST API, AWS CLI, or AWS SDKs.

Grantee	Objects	Bucket ACL
Bucket owner (your AWS account) Canonical ID: decc1de5f40261fe6daaade96cb2679dd11caf75e43750e685bfe6583492484	List, Write	Read, Write
Everyone (public access) Group: http://acs.amazonaws.com/groups/global/AllUsers	-	-
Authenticated users group (anyone with an AWS account) Group: http://acs.amazonaws.com/groups/global/AuthenticatedUsers	-	-
S3 log delivery group Group: http://acs.amazonaws.com/groups/s3/LogDelivery	-	-

AWS S3: enable Static website hosting

Amazon S3 > quote-app-express

quote-app-express [Info](#)

Publicly accessible

Objects **Properties** Permissions Metrics Management Access Points

Bucket overview

AWS Region US East (N. Virginia) us-east-1	Amazon Resource Name (ARN) arn:aws:s3:::quote-app-express	Creation date December 22, 2021, 15:15:28 (UTC+02:00)
---	--	--

Static website hosting
Use this bucket to host a website or redirect requests. [Learn more](#)

Static website hosting
 Enable
 Disable

Hosting type
 Host a static website
Use the bucket endpoint as the web address. [Learn more](#)
 Redirect requests for an object
Redirect requests to another bucket or domain. [Learn more](#)

Edit

Amazon S3 > quote-app-express > Edit static website hosting

Edit static website hosting [Info](#)

Static website hosting
Use this bucket to host a website or redirect requests. [Learn more](#)

Static website hosting
 Enable
 Disable

Hosting type
 Host a static website
Use the bucket endpoint as the web address. [Learn more](#)
 Redirect requests for an object
Redirect requests to another bucket or domain. [Learn more](#)

For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see [Using Amazon S3 Block Public Access](#)

Index document
Specify the home or default page of the website.
index.html

Error document - optional
This is returned when an error occurs.
index.html

Redirection rules - optional
Redirection rules, written in JSON, automatically redirect webpage requests for specific content. [Learn more](#)

1

Cancel **Save changes**

AWS S3: upload files from dist folder (after build)

Amazon S3 > quote-app-express

quote-app-express [Info](#)

Publicly accessible

Objects Properties Metrics Management Access Points

Objects (0)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

[Copy S3 URI](#)

[Copy URL](#)

[Download](#)

[Open](#)

[Delete](#)

[Actions](#)

[Create folder](#)

[Upload](#)

[Find objects by prefix](#)

< 1 > ⌂

Name

Type

Last modified

Size

Storage class

No objects

Uploading

Total remaining: 104 files: 933.3 KB(99.41%)

Estimated time remaining: 27 minutes

Transfer rate: 599.4 B/s

Cancel

Upload: status

[Close](#)

The information below will no longer be available after you navigate away from this page.

Summary

Destination

s3://quote-app-express

Succeeded

8 files, 5.6 KB (0.59%)

Failed

0 files, 0 B (0%)

[Files and folders](#)

[Configuration](#)

Amazon S3 > quote-app-express > Upload

Upload [Info](#)

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose [Add files](#), or [Add folders](#).

Files and folders (112 Total, 938.9 KB)

All files and folders in this table will be uploaded.

[Find by name](#)

[Remove](#) [Add files](#) [Add folder](#)

1 2 3 4 5 6 7 ... 12 >

<input type="checkbox"/>	Name	Folder	Type	Size
<input type="checkbox"/>	app.controller.d.ts	app/	video/vnd.dlna.mpeg-tts	206.0 B
<input type="checkbox"/>	app.controller.js	app/	text/javascript	2.0 KB
<input type="checkbox"/>	app.controller.js.map	app/	-	665.0 B
<input type="checkbox"/>	app.module.d.ts	app/	video/vnd.dlna.mpeg-tts	37.0 B
<input type="checkbox"/>	app.module.js	app/	text/javascript	1.5 KB
<input type="checkbox"/>	app.module.js.map	app/	-	508.0 B
<input type="checkbox"/>	auth.guard.d.ts	app/auth/guards/	video/vnd.dlna.mpeg-tts	453.0 B
<input type="checkbox"/>	auth.guard.js	app/auth/guards/	text/javascript	1.7 KB
<input type="checkbox"/>	auth.guard.js.map	app/auth/guards/	-	667.0 B
<input type="checkbox"/>	auth.module.d.ts	app/auth/	video/vnd.dlna.mpeg-tts	38.0 B

Destination

Destination

s3://quote-app-express

► Destination details

Bucket settings that impact new objects stored in the specified destination.

► Permissions

Grant public access and access to other AWS accounts.

► Properties

Specify storage class, encryption settings, tags, and more.

[Cancel](#)

[Upload](#)

AWS S3 deployment complete!

Amazon S3 > quote-app-express > app/

app/

Copy S3 URI

Objects Properties

Objects (10)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3](#) to upload objects.

Copy S3 URI Copy URL Download

Find objects by prefix

<input type="checkbox"/>	Name	Type
<input type="checkbox"/>	app.controller.d.ts	ts
<input type="checkbox"/>	app.controller.js	js
<input type="checkbox"/>	app.controller.js.map	map
<input type="checkbox"/>	app.module.d.ts	ts
<input type="checkbox"/>	app.module.js	js
<input type="checkbox"/>	app.module.js.map	map
<input type="checkbox"/>	config/	Folder

“

The two most powerful warriors are
patience and time.

©Leo Tolstoy

”

PIPELINE PRE-CHECKS

Pre-checks

INGREDIENTS

- Packages:

- Husky
- ESLint
- CommitLint

- Commands:

- `npm install husky --save-dev`
- `npm install eslint --save-dev`
- `eslint --init` or `npm tslint typescript --save-dev`
- `npm install --save-dev @commitlint/{config-conventional,cli}`
 - `echo "module.exports = {extends: ['@commitlint/config-conventional']};" > commitlint.config.js`



Pre-checks

INGREDIENTS



- Scripts:
 - “lint”: “**ng lint**”
 - “**lint:fix**”: “**npm run lint -- --fix**”
- Configs:
 - **.eslintrc.json**
 - **commitlint.config.js**
 - for setting husky hooks:
 - enable hooks: **husky install && git config gitflow.path.hooks .husky**
 - create a hooks:
husky add .husky/pre-commit "npm run lint"
husky add .husky/pre-push "npm test"
husky add .husky/commit-msg 'npx --no-install commitlint --edit \$1'

Pre-checks

```
> ng lint

Linting "quoteApp"...
no-use-before-declare is deprecated. Since TypeScript 2.9. Please use the built-in compiler checks instead.
no-unused-variable is deprecated. Since TypeScript 2.9. Please use the built-in compiler checks instead.

Could not find implementations for the following rules specified in the configuration:
  import-sources-order
  use-input-property-decorator
  use-output-property-decorator
  use-host-property-decorator
Try upgrading TSLint and/or ensuring
If TSLint was recently upgraded, you
All files pass linting.

Process finished with exit code 0
```

```
> ng lint

Linting "quoteApp"...
no-use-before-declare is deprecated. Since TypeScript 2.9. Please use the built-in compiler checks instead.
no-unused-variable is deprecated. Since TypeScript 2.9. Please use the built-in compiler checks instead.

Could not find implementations for the following rules specified in the configuration:
  import-sources-order
  use-input-property-decorator
  use-output-property-decorator
  use-host-property-decorator
  use-life-cycle-interface
Try upgrading TSLint and/or ensuring that you have all necessary custom rules installed.
If TSLint was recently upgraded, you may have old rules configured which need to be cleaned up.

All files pass linting.
```

PIPELINE TESTING

Testing

INGREDIENTS

- Packages :
 - Karma/Jasmine/Jest
 - Istanbul/Nyc
 - CodeClimate
 - Codecov
- Commands:
 - `npm install --save-dev jasmine`
 - `jasmine init`
 - `npm install karma karma-jasmine karma-chrome-launcher jasmine-core --save-dev`
 - `karma init karma.conf.js`
 - `npm install --save-dev jest`
 - `jest --init`



Testing

INGREDIENTS



- Scripts:
 - “`test`”: “`ng test --noWatch`”
 - “`test:watch`”: “`ng test`”
 - “`test:coverage`”: “`npm test -- --codeCoverage`”
 - “`test:chrome`”: “`npm test -- --karmaConfig=karma-chrome.conf.js`”
 - “`test:chrome:watch`”: “`ng test -- --karmaConfig=karma-chrome.conf.js`”

Testing

INGREDIENTS

- Configs:

- karma-base.conf.js
- karma.conf.js
- karma-chrome.conf.js
- angular.json

```
{"test": {  
  "builder": "@angular-devkit/build-angular:karma",  
  "options": {  
    "main": "src/test.ts",  
    "polyfills": "src/polyfills.ts",  
    "tsConfig": "tsconfig.spec.json",  
    "karmaConfig": "karma.conf.js",  
    "assets": [  
      "src/favicon.ico",  
      "src/assets"  
    ],  
    "styles": [  
      "src/styles.scss"  
    ],  
    "scripts": []  
  }},
```

```
module.exports = {  
  basePath: '',  
  frameworks: ['jasmine', '@angular-devkit/build-angular'],  
  plugins: [  
    require('karma-jasmine'),  
    require('karma-chrome-launcher'),  
    require('karma-jasmine-html-reporter'),  
    require('karma-coverage-istanbul-reporter'),  
    require('@angular-devkit/build-angular/plugins/karma')  
  ],  
  client: {  
    clearContext: false // leave Jasmine Spec Runner output visible in browser  
  },  
  coverageIstanbulReporter: {  
    dir: require('path').join(__dirname, './coverage'),  
    reports: ['html', 'lcovonly', 'text-summary', 'json'],  
    fixWebpackSourcePaths: true,  
    thresholds: {  
      statements: 80,  
      lines: 80,  
      branches: 80,  
      functions: 80  
    }  
  },  
  reporters: ['progress', 'kjhtml'],  
  port: 9876,  
  colors: true,  
  autoWatch: true,  
  browsers: ['Chrome'],  
  singleRun: false,  
  restartOnFileChange: true,  
};
```

```
const baseConfig = require('./karma-base.conf');  
  
module.exports = function (config) {  
  config.set({  
    ...baseConfig,  
    logLevel: config.LOG_INFO,  
    browsers: ['ChromeHeadlessCI'],  
    customLaunchers: {  
      ChromeHeadlessCI: {  
        base: 'ChromeHeadless',  
        flags: ['--no-sandbox'],  
      }  
    }  
  });  
};  
  
const baseConfig = require('./karma-base.conf');  
  
module.exports = function (config) {  
  config.set({  
    ...baseConfig,  
    logLevel: config.LOG_INFO,  
  });  
};
```

Testing

INGREDIENTS



- Env variable:
 - CODECOV_TOKEN
- Command:
 - `curl -s https://codecov.io/bash | bash -s -t ${CODECOV_TOKEN} -f coverage/lcov.info`



- Env variable:
 - CODE_CLIMATE_REPORTER_ID
- Commands:
 - `export GIT_COMMIT_SHA="$(echo $CODEBUILD_RESOLVED_SOURCE_VERSION)"`
 - `export GIT_COMMITED_AT="$(date +%s)"`
 - `curl -L https://codeclimate.com/downloads/test-reporter/test-reporter-latest-linux-amd64 > ./cc-test-reporter`
 - `chmod +x ./cc-test-reporter`
 - `./cc-test-reporter before-build`
 - `./cc-test-reporter after-build -t lcov -r ${CODE_CLIMATE_REPORTER_ID} --exit-code $?`

Testing

```
> npm test -- --codeCoverage

> quote-app@0.0.0 test /Users/oleksandr_bondarenko/Projects/NG_stores/quoteApp
> ng test --noWatch "--codeCoverage"

10% building 2/2 modules 0 active0 04 2020 19:54:07.009:INFO0 [karma-server]: Karma v4.4.1 server started at http://0.0.0.0:9876/
07 04 2020 19:54:07.011:INFO0 [launcher]: Launching browsers ChromeHeadlessCI with concurrency unlimited
07 04 2020 19:54:07.015:INFO0 [launcher]: 02 04 2020 12:41:40.233:INFO0 [karma-server]: Karma v4.4.1 server started at http://0.0.0.0:9876/
07 04 2020 19:54:12.170:INFO0 [HeadlessChr] 02 04 2020 12:41:40.236:INFO0 [launcher]: Launching browsers ChromeHeadlessCI with concurrency unlimited
HeadlessChrome 80.0.3987 (Mac OS X 10.15.4) 02 04 2020 12:41:40.241:INFO0 [launcher]: Starting browser ChromeHeadless
TOTAL: 18 SUCCESS 02 04 2020 12:41:47.207:INFO0 [HeadlessChrome 80.0.3987 (Linux 0.0.0)]: Connected on socket wiXYKhYrzK3jxt63AAAA with id 73664342
TOTAL: 18 SUCCESS
TOTAL: 18 SUCCESS
TOTAL: 18 SUCCESS

===== Coverage =====
Statements : 97.87% ( 46/47 )
Branches   : 100% ( 2/2 )
Functions   : 93.75% ( 15/16 )
Lines      : 97.62% ( 41/42 )

===== Coverage =====
Statements : 97.87% ( 46/47 )
Branches   : 100% ( 2/2 )
Functions   : 93.75% ( 15/16 )
Lines      : 97.62% ( 41/42 )

[Container] 2020/04/02 12:42:55 Running command curl -s https://codecov.io/bash | bash -s - -t ${CODECOV_TOKEN} -f ${CODECOV_COVERAGE_REPORT_PATH}
[Container] 2020/04/02 12:42:55 Running command curl -s https://codecov.io/bash | bash -s - -t ${CODECOV_TOKEN} -f ${CODECOV_COVERAGE_REPORT_PATH}

===== Coverage =====
Statements : 97.87% ( 46/47 )
Branches   : 100% ( 2/2 )
Functions   : 93.75% ( 15/16 )
Lines      : 97.62% ( 41/42 )

Bash-tbd

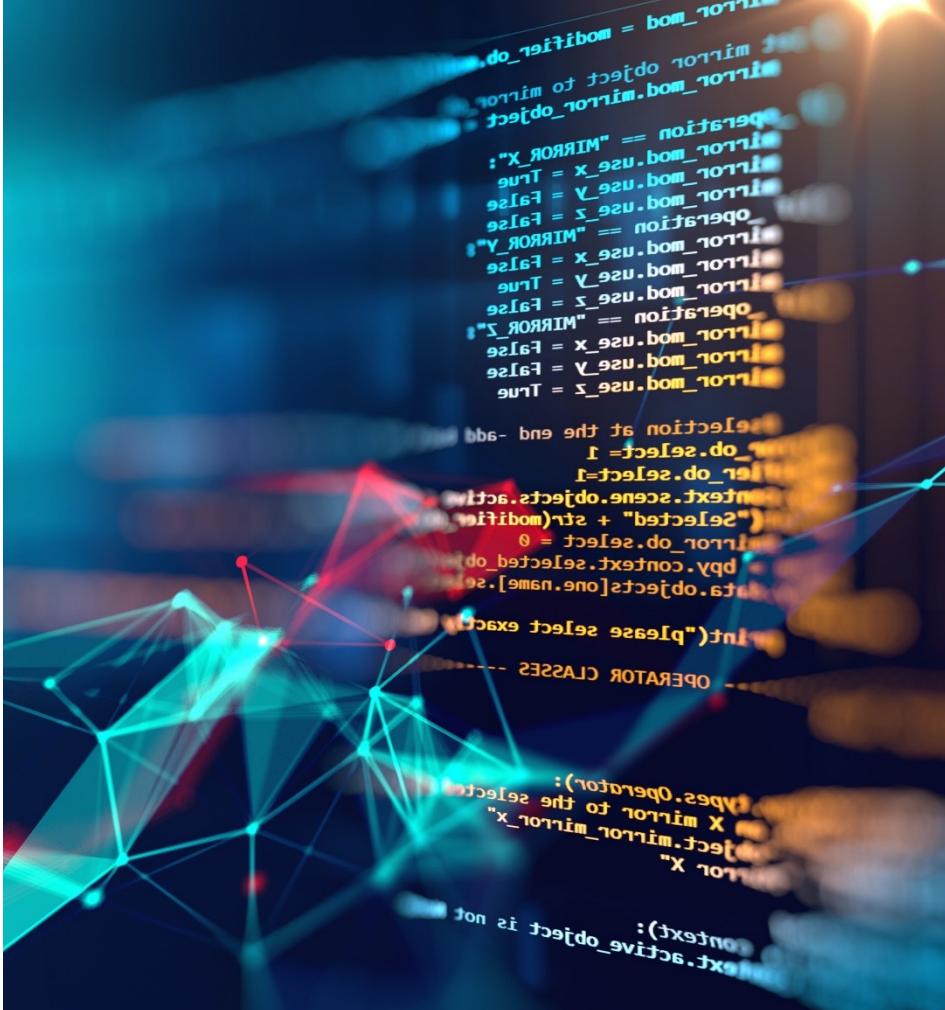
[Container] 2020/04/02 12:42:58 Running command ./cc-test-reporter after-build -t lcov -r ${CODE_CLIMATE_REPORTER_ID} --exit-code $?
Test report uploaded successfully to Code Climate
```

PIPELINE CODE ANALYSIS

Code Analysis

OTHER INGREDIENTS (INTEGRATIONS)

- Tools:
 - DeepCode
 - DeepScan
 - CodeClimate
 - Snyk
 - SonarQube?



PIPELINE BUILD: CREATE AND STORE AN ARTIFACT

Build

INGREDIENTS:

- Tools:
 - AWS Simple Storage Service (S3)
 - AWS CloudFront
 - AWS CodeBuild
 - AWS Identity and Access Management (IAM)
 - AWS CodePipeline
- Configs:
 - `buildspec/buildspec.{env}.yml`
 - or:
 - `cloudformation/cloudformation.{env}.yml`

Build: Create S3 Bucket

INGREDIENTS:

... you know what to do ...



AGAIN

Build: Create CloudFront Distribution

CloudFront > Distributions > create

Create distribution

Origin

Origin domain
Choose an AWS origin, or enter your origin's domain name.

Origin path - *optional* [Info](#)
Enter a URL path to append to the origin domain name for origin requests.

Name
Enter a name for this origin.

S3 bucket access [Info](#)
Use a CloudFront origin access identity (OAI) to access the S3 bucket.

Don't use OAI (bucket must allow public access)
 Yes use OAI (bucket can restrict access to only CloudFront)

Add custom header - *optional*
CloudFront includes this header in all requests that it sends to your origin.

Enable Origin Shield [Info](#)
Origin Shield is an additional caching layer that can help reduce the load on your origin and help protect its availability.

No
 Yes

► Additional settings

Default cache behavior

Path pattern [Info](#)
Default (*)

Compress objects automatically [Info](#)
 No
 Yes

Viewer

Viewer protocol policy

HTTP and HTTPS
 Redirect HTTP to HTTPS
 HTTPS only

Allowed HTTP methods

GET, HEAD
 GET, HEAD, OPTIONS
 GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE

Cache HTTP methods

GET and HEAD methods are cached by default.
 OPTIONS

Restrict viewer access

If you restrict viewer access, viewers must use CloudFront signed URLs or signed cookies to access your content.

No
 Yes

Build: Create CloudFront Distribution

Cache key and origin requests

We recommend using a cache policy and origin request policy to control the cache key and origin requests.

Cache policy and origin request policy (recommended)

Legacy cache settings

Cache policy

Choose an existing cache policy or create a new one.

CachingOptimized Required

Default policy when CF compression is enabled

[Create policy](#) [View policy](#)

Origin request policy - optional

Choose an existing origin request policy or create a new one.

AllViewer

Policy with forward all parameters in viewer requests

[Create policy](#) [View policy](#)

Response headers policy - optional

Choose an existing response headers policy or create a new one.

[Select response headers](#)

[Create policy](#)

► Additional settings

Function associations - optional Info

Choose an edge function to associate with this cache behavior, and the CloudFront event that triggers the function.

	Function type	Function ARN / Name
Viewer request	No association	
Viewer response	No association	
Origin request	No association	
Origin response	No association	

Settings

Price class Info

Choose the price class associated with the maximum price that you want to pay.

Use all edge locations (best performance)

Use only North America and Europe

Use North America, Europe, Asia, Middle East, and Africa

AWS WAF web ACL - optional

Choose the web ACL in AWS WAF to associate with this distribution.

[Choose web ACL](#)

Alternate domain name (CNAME) - optional

Add the custom domain names that you use in URLs for the files served by this distribution.

[Add item](#)

① To add a list of alternative domain names, use the [bulk editor](#).

Custom SSL certificate - optional

Associate a certificate from AWS Certificate Manager. The certificate must be in the US East (N. Virginia) Region (us-east-1).

[Choose certificate](#)



[Request certificate](#)

Supported HTTP versions

Add support for additional HTTP versions. HTTP/1.0 and HTTP/1.1 are supported by default.

HTTP/2

Default root object - optional

The object (file name) to return when a viewer requests the root URL (/) instead of a specific object.

Standard logging

Get logs of viewer requests delivered to an Amazon S3 bucket.

Off

On

IPv6

Off

On

Description - optional

[Cancel](#)

[Create distribution](#)

Build: Create CodeBuild Project

Continue to CodePipeline
Create a new CodeBuild build project and return to CodePipeline
your pipeline.

Create build project

Project configuration

Project name

A project name must be 2 to 255 characters. It can include the letters A-Z and a-z, the special characters - and _.

Description - optional

► Additional configuration
tags

Environment

Environment image

Managed image
Use an image managed by AWS CodeBuild

Custom image
Specify a Docker image

Operating system

Runtime(s)

Image

Image version

Environment type

Privileged
 Enable this flag if you want to build Docker images or want your builds to get elevated privileges

Service role

New service role
Create a service role in your account

Existing service role
Choose an existing service role from your account

Role name

Type your service role name

► Additional configuration
Timeout, certificate, VPC, compute type, environment variables, file systems

Build: Create CodeBuild Project

Buildspec

Build specifications

Use a buildspec file
Store build commands in a YAML-formatted buildspec file

Insert build commands
Store build commands as build project configuration

Buildspec name - optional
By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your file uses a different name or location, enter its path from the source root here (for example, buildspecs/buildspec.test.yml).

buildspecs/buildspec.test.yml

Logs

CloudWatch

CloudWatch logs - *optional*
Checking this option will upload build output logs to CloudWatch.

Group name

Stream name

S3

S3 logs - *optional*
Checking this option will upload build output logs to S3.

[Cancel](#) [Continue to CodePipeline](#)

Build: Grant CodeBuild Project an Access to S3 and CloudFront

Environment				Edit
Image	Environment type	Compute	Privileged	
aws/codebuild/standard:4.0	Linux	3 GB memory, 2 vCPUs	True	
Service role	Timeout	Queued timeout	Certificate	
arn:aws:iam::724443507988:role/service-role/codebuild-quote-app-build-service-role	1 hour 0 minutes	8 hours 0 minutes	-	
Registry credential	-	-	-	-
► VPC	-	-	-	-
► Environment variables	-	-	-	-
► File systems	-	-	-	-

Build: Grant CodeBuild Project an Access to S3 and CloudFront

Identity and Access Management (IAM)

Roles > codebuild-quote-app-build-service-role

Summary

Role ARN arn:aws:iam::724443507988:role/service-role/codebuild-quote-app-build-service-role [Edit](#)

Role description [Edit](#)

Instance Profile ARNs [Edit](#)

Path /service-role/

Creation time 2020-03-25 13:34 UTC+0300

Last activity 2020-04-02 15:43 UTC+0300 (5 days ago)

Maximum CLI/API session duration 1 hour [Edit](#)

Permissions **Trust relationships** **Tags** **Access Advisor** **Revoke sessions**

▼ Permissions policies (3 policies applied)

Attach policies [Add inline policy](#)

Policy name	Policy type	Actions
CodeBuildBasePolicy-quote-app-test-build-us-east-1	Managed policy	X
AmazonS3FullAccess	AWS managed policy	X
CloudFrontFullAccess	AWS managed policy	X

▶ Permissions boundary (not set)

Delete role

Search IAM

Build: Add Environment Variables

Environment				Edit
Image	Environment type	Compute	Privileged	
aws/codebuild/standard:4.0	Linux	3 GB memory, 2 vCPUs	True	
Service role	Timeout	Queued timeout	Certificate	
arn:aws:iam::724443507988:role/service-role/codebuild-quote-app-build-service-role	1 hour 0 minutes	8 hours 0 minutes	-	
Registry credential				
-				
► VPC				
► Environment variables				
► File systems				

Build: Create CodePipeline

Step 1 Step 2 Step 3 Step 4 Step 5

Developer Tools > CodePipeline > Pipelines > Create new pipeline

Choose pipeline settings

Pipeline settings

Pipeline name
Enter the pipeline name. You cannot edit the pipeline name after it is created.
 No more than 100 characters

Service role

New service role
Create a service role in your account

Existing service role
Choose an existing service role from your account

Role name

Type your service role name

Allow AWS CodePipeline to create a service role so it can be used with this new pipeline

► Advanced settings

Cancel **Next**

Build: Create CodePipeline

Add source stage

Step 3
Add build stage
Step 4
Add deploy stage
Step 5
Review

Source

Source provider
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.

GitHub

Grant AWS CodePipeline access to your GitHub repository. This allows AWS CodePipeline to upload commits from GitHub to your pipeline.

Connected

You have successfully configured the action with the provider. X

Repository

Branch

Change detection options
Choose a detection mode to automatically start your pipeline when a change occurs in the source code.

GitHub webhooks (recommended)
Use webhooks in GitHub to automatically start my pipeline when a change occurs

AWS CodePipeline
Use AWS CodePipeline to check periodically for changes

Cancel **Previous** **Next**

Build: Create CodePipeline

Step 1 Developer Tools > CodePipeline > Pipelines > Create new pipeline

Step 2 Choose pipeline settings

Step 3 Add source stage

Step 4 Add build stage

Step 5 Add deploy stage

Review

Add build stage

Build - optional

Build provider
This is the tool of your build project. Provide build artifact details like operating system, build spec file, and output file names.

AWS CodeBuild ▾

Region
US East (N. Virginia) ▾

Project name
Choose a build project that you have already created in the AWS CodeBuild console. Or create a build project in the AWS CodeBuild console and then return to this task.

quote-app-test-build X or Create project

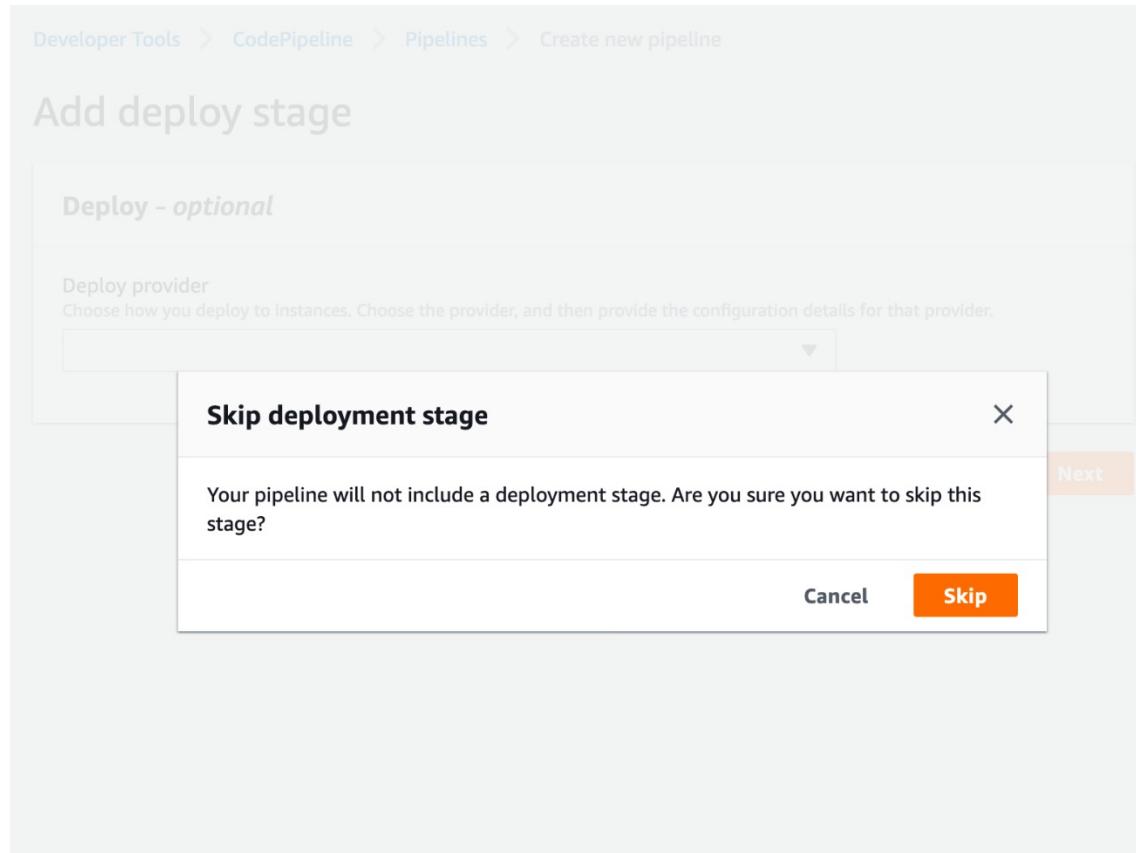
✓ Successfully created quote-app-test-build in CodeBuild. X

Environment variables - optional
Choose the key, value, and type for your CodeBuild environment variables. In the value field, you can reference variables generated by CodePipeline. [Learn more](#)

Add environment variable

Cancel Previous Skip build stage Next

Build: Create CodePipeline



Build: Create CodePipeline

- Step 1 Choose pipeline settings
- Step 2 Add source stage
- Step 3 Add build stage
- Step 4 Add deploy stage
- Step 5 Review

Developer Tools > CodePipeline > Pipelines > Create new pipeline

Review

Step 1: Choose pipeline settings

Pipeline settings

Pipeline name

quote-app-pipeline

Artifact location

A new Amazon S3 bucket will be created as the default artifact store for your pipeline

Service role name

AWSCodePipelineServiceRole-us-east-1-quote-app-pipeline

Step 2: Add source stage

Source action provider

Source action provider

ThirdParty GitHub

PollForSourceChanges

false

Repo

ngQuote

Owner

boale

Branch

develop

Step 4: Add deploy stage

Deploy action provider

Deployment stage

No deploy

Step 3: Add build stage

Build action provider

Build action provider

AWS CodeBuild

ProjectName

quote-app-test-build

Cancel

Previous

Create pipeline

Build: Create CodePipeline

Developer Tools

CodePipeline

- ▶ Source • CodeCommit
- ▶ Build • CodeBuild
- ▶ Deploy • CodeDeploy
- ▼ Pipeline • CodePipeline
 - Getting started
 - Pipelines**
 - ▶ Settings

Q Go to resource

Feedback

Developer Tools > CodePipeline > Pipelines

Pipelines [Info](#)

C Notify View pipeline View history Delete pipeline [Create pipeline](#)

Name	Most recent execution	Latest source revisions	Last executed
quote-app-pipeline	Succeeded	Source – 8125abde style: buildspecs	5 days ago

Build: Create CodePipeline

Developer Tools X

CodePipeline

- ▶ Source • CodeCommit
- ▶ Build • CodeBuild
- ▶ Deploy • CodeDeploy
- ▼ Pipeline • CodePipeline
 - Getting started
 - Pipelines
 - Pipeline**
 - History
 - Settings
- ▶ Settings

Go to resource

Feedback

quote-app-pipeline

Notify ▾ Edit Stop execution Clone pipeline Release change

Source Succeeded
Pipeline execution ID: 572efc1c-f907-46c9-819d-606bf00dcbb8

Source GitHub ⓘ
Succeeded - 5 days ago 8125abde ⓘ

8125abde ⓘ Source: style: buildspecs ⓘ

Disable transition

Build Succeeded
Pipeline execution ID: 572efc1c-f907-46c9-819d-606bf00dcbb8

Build AWS CodeBuild ⓘ
Succeeded - 5 days ago Details

8125abde ⓘ Source: style: buildspecs ⓘ

```
graph TD; Source[Source GitHub] --> Build[Build AWS CodeBuild]
```

PIPELINE DEPLOYMENT

Deployment is Done (during the build stage)

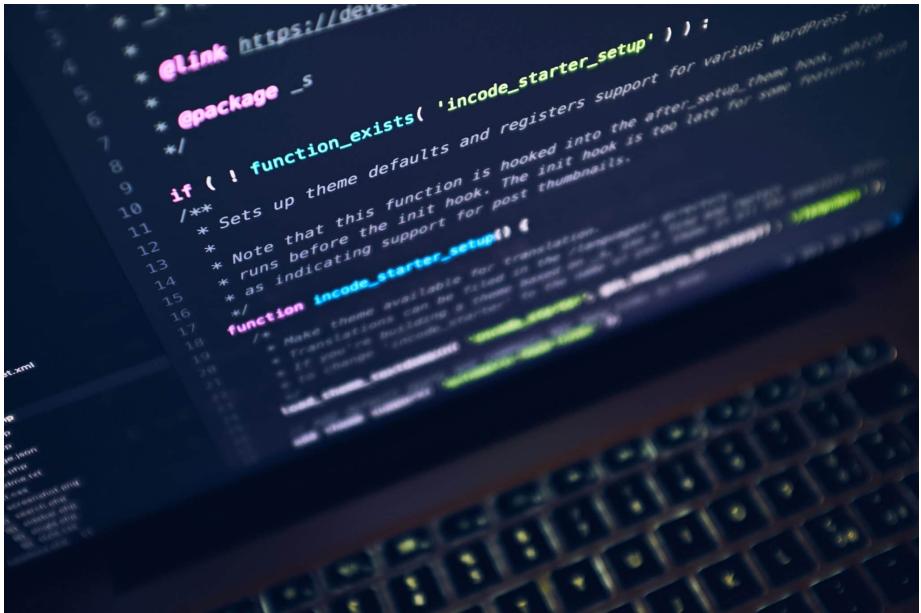
```
# Clear S3 bucket.  
- aws s3 rm s3://${S3_BUCKET} --recursive  
- echo S3 bucket is cleared.  
# Copy dist folder to S3 bucket.  
- aws s3 cp dist s3://${S3_BUCKET} --recursive  
  
# Clear CloudFront cache.  
- aws configure set preview.cloudfront true  
# Create CloudFront invalidation.  
- aws cloudfront create-invalidation --distribution-id ${CLOUDFRONT_ID} --paths "/"
```

VERSIONING

Versioning

INGREDIENTS:

- Tools:
 - Standard Version
- Scripts:
 - “release”: “standard-version”
- Commands:
 - npm i --save-dev standard-version
 - npm run release -- --first-release



PIPELINE E2E TESTING

E2E

INGREDIENTS:

- Tools:
 - Protractor
 - Jasmine
- Configs:
 - protractor.conf.js
 - angular.json
- Scripts:
 - “e2e”: “ng e2e”
- Commands:
 - `npm run e2e --configuration=production --base-url=${CLOUDFRONT_APP_URL}`

```
"e2e": {  
  "builder": "@angular-devkit/build-angular:protractor",  
  "options": {  
    "protractorConfig": "e2e/protractor.conf.js",  
    "devServerTarget": "quoteApp:serve"  
  },  
  "configurations": {  
    "production": {  
      "devServerTarget": ""  
    }  
  }  
}
```

E2E

```
[Container] 2020/04/02 12:43:08 Running command npm run e2e -- --configuration=production --base-url=${CLOUDFRONT_APP_URL}
> quote-app@0.0.0 e2e /codebuild/output/src029893904/src
> ng e2e "--configuration=production" "--base-url=https://d17588deywjxij.cloudfront.net"

[12:43:09] I/file_manager - creating folder /codebuild/output/src029893904/src/node_modules/protractor/node_modules
/webdriver-manager/selenium
[12:43:09] I/config_source - curl -o/codebuild/output/src029893904/src/node_modules/protractor/node_modules/webdriver-
manager/selenium/chrome-response.xml https://chromedriver.storage.googleapis.com/
[12:43:10] I/downloader - curl -o/codebuild/output/src029893904/src/node_modules/protractor/node_modules/webdriver-manager
/selenium/chromedriver_80.0.3987.106.zip https://chromedriver.storage.googleapis.com/80.0.3987.16/chromedriver_linux64.zip
[12:43:10] I/update - chromedriver: unzipping chromedriver_80.0.3987.106.zip
[12:43:10] I/update - chromedriver: setting permissions to 0755 for /codebuild/output/src029893904/src/node_modules
/protractor/node_modules/webdriver-manager/selenium/chromedriver_80.0.3987.106
[12:43:10] I/launcher - Running 1 instances of WebDriver
[12:43:10] I/direct - Using ChromeDriver directly...
Jasmine started

Quote App

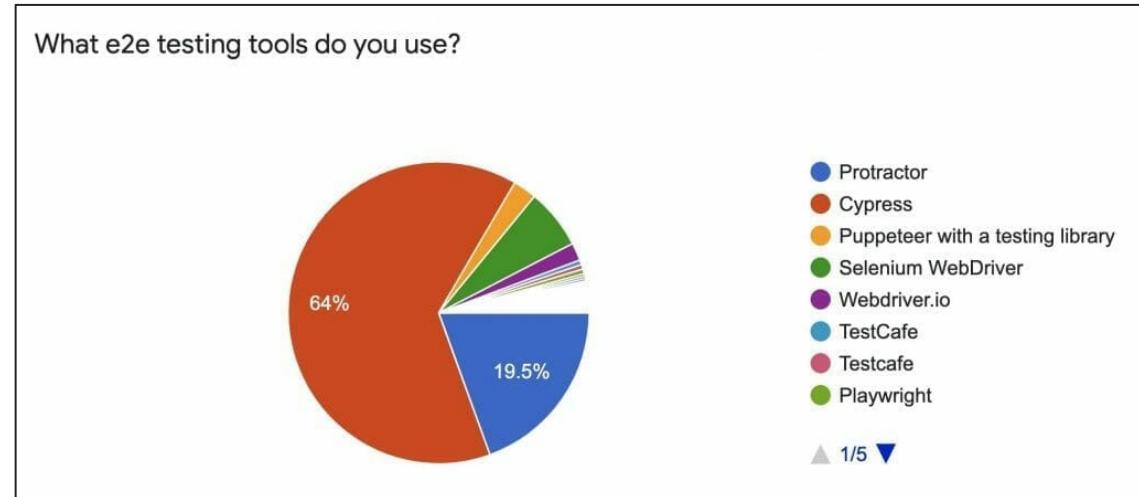
Quote
  .[32m✓ should display a quote text.[39m
  .[32m✓ should display an author of quote.[39m
  .[32m✓ should display a refresh btn.[39m

Executed 3 of 3 specs.[32m SUCCESS.[39m in 1 sec.
[12:43:14] I/launcher - 0 instance(s) of WebDriver still running
[12:43:14] I/launcher - chrome #01 passed
```

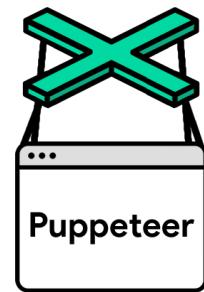
Protractor Deprecated

Deprecation timeline is as follows:

- Angular version 12 (May 2021)
 - Announcement of deprecation
 - Angular CLI will not include Protractor for new projects
 - Show warning when `@angular-devkit/build-angular:protractor` is used
 - Only PRs that address security issues and fixes for browser releases that break Protractor tests will be merged
- Angular version 15 (end of 2022)
 - End of development on Protractor



Alternatives to Protractor



FINALLY



→

C



https://d17588deywixij.cloudfront.net

...



“

”

If A is success in life, then A equals x plus y plus z. Work is x; y is play; and z is keeping your mouth shut.

©Albert Einstein

”

STATIC CODE ANALYSIS TOOLS

GitHub marketplace

Categories

298 results filtered by **Code quality**

Category	App Name	Description
API management	Codecov	Group, merge and compare coverage reports
Chat	Codacy	Automated code reviews to help developers ship better software, faster
Code quality	codebeat	Code review expert on demand. Automated for mobile and web
Code review	Better Code Hub	A Benchmarked Definition of Done for Code Quality with BetterCodeHub
Continuous integration	Code Climate	Automated code review for technical debt and test coverage
Dependency management	Coveralls	Ensure that new code is fully covered, and see coverage trends emerge. Works with any CI service
Deployment	Sider	Automatically analyze pull request against custom per-project rulesets and best practices
IDEs	Imgbot	A GitHub app that optimizes your images
Learning	CodeScene	The analysis tool to identify and prioritize technical debt and evaluate your organizational efficiency
Localization	CodeFactor	Automated code review for GitHub
Mobile	TestQuality	Modern, powerful, test plan management
Monitoring	Restyled.io	Restyle Pull Requests as they're opened
Project management	DeepScan	Advanced static analysis for automatically finding runtime errors in JavaScript code
Publishing	LGTM	Find and prevent zero-days and other critical bugs, with customizable alerts and automated code review
Recently added	Datree	Policy enforcement solution for confident and compliant code
Security	Lucidchart Connector	Insert a public link to a Lucidchart diagram so team members can quickly understand an issue or pull request
Support	DeepSource	Discover bug risks, anti-patterns and security vulnerabilities before they end up in production. For Python and Go
Testing	Code Inspector	Code Quality, Code Reviews and Technical Debt evaluation made easy
Utilities		
Filters		
Verification		

THANK YOU