

# Project 3 Presentation

## Section 1: Selling CI/CD to your Team/Organization

**Continuous Integration (CI)** is the practice of merging all developers' working copies to a shared mainline several times a day while **Continuous Deployment (CD)** is a software engineering approach in which the value is delivered frequently through automated deployments.

### Benefits of the CI/CD to the team/Organization

- Helps Automate infrastructure creation reducing human errors and increases the speed of deployments reducing time to market.
- CI/CD pipelines helps catch compile errors after merge hence developers spend less time to debug.
- Automated smoke tests help to reduce downtime from a deploy-related crash or major bug. This prevents the company from losing money.
- Ability to catch unit tests failures hence less bugs in production and less time in testing.
- Continuous integration helps developers do frequent code commits leading to lesser merge conflicts due to the shorter commit cycles which ultimately save a lot of business hours which can be spent on creating more interesting new features.

## Section 2: Deploying Working, Trustworthy Software

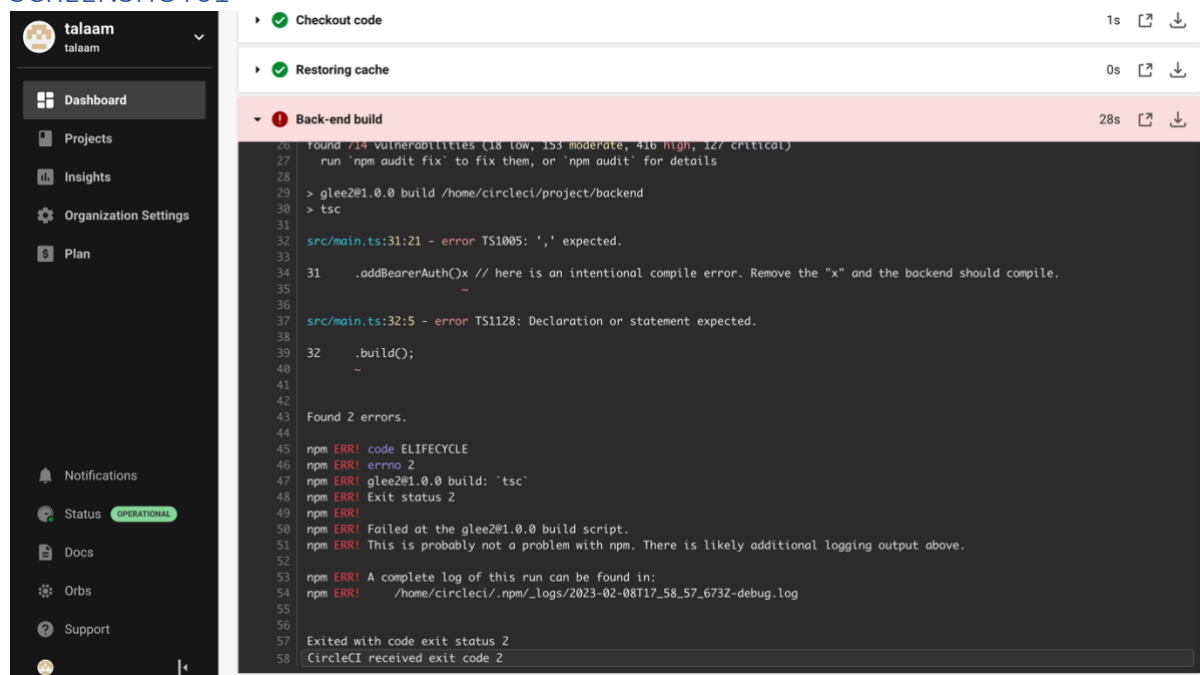
# A public git repository with your project code.

URL01

<https://github.com/talaam/udaproject3>


Console output of various pre-deploy job failure scenarios:

SCREENSHOT01



```
26 found 714 vulnerabilities (18 low, 153 moderate, 416 high, 127 critical)
27 run 'npm audit fix' to fix them, or 'npm audit' for details
28
29 > glee2@1.0.0 build /home/circleci/project/backend
30 > tsc
31
32 src/main.ts:31:21 - error TS1005: ',' expected.
33
34 31   .addBearerAuth(x) // here is an intentional compile error. Remove the "x" and the backend should compile.
35   ~
36
37 src/main.ts:32:5 - error TS1128: Declaration or statement expected.
38
39 32   .build();
40   ~
41
42 Found 2 errors.
43
44 npm ERR! code ELIFECYCLE
45 npm ERR! errno 2
46 npm ERR! glee2@1.0.0 build: `tsc`
47 npm ERR! Exit status 2
48 npm ERR!
49 npm ERR! Failed at the glee2@1.0.0 build script.
50 npm ERR! This is probably not a problem with npm. There is likely additional logging output above.
51
52 npm ERR! A complete log of this run can be found in:
53 npm ERR! /home/circleci/.npm/_logs/2023-02-08T17_58_57_673Z-debug.log
54
55 Exited with code exit status 2
56
57 CircleCI received exit code 2
```

## SCREENSHOT2

 talaam

Dashboard

Projects

Insights

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Notifications

Status OPERATIONAL

Docs

Orbs

Support

Spin up environment

Preparing environment variables


Checkout code

Restoring cache

Run frontend test

```
276 • Employee Remover > when a user activates an employee > should activate the employee from the repository
277
278 expect(jest.fn()).toBeCalledWith(...expected)
279
280 Expected: 100
281 Received: 101
282
283 Number of calls: 1
284
285   33 |
286   34 | // Assert
287 > 35 | expect(employeeRepository.findById).toBeCalledWith(100);
288     |                                     ^
289   36 | expect(employeeRepository.save).toBeCalled();
290   37 | });
291   38 | });
292
293 at src/modules/domain/employees/commands/handlers/employee-activator.handler.spec.ts:35:43
294 at fulfilled (src/modules/domain/employees/commands/handlers/employee-activator.handler.spec.ts:5:58)
295
296 Test Suites: 1 failed, 50 passed, 51 total
297 Tests: 1 failed, 78 passed, 79 total
298 Snapshots: 0 total
299 Time: 40.304s
300 Ran all test suites.
301 npm ERR! code ELIFECYCLE
302
```

## SCREENSHOT3

 talaam

Dashboard

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Status OPERATIONAL

Docs

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Support

Checkout code

Restoring cache

Scan frontend

Your output is too large to display in the browser.  
Only the last 400000 characters are displayed.

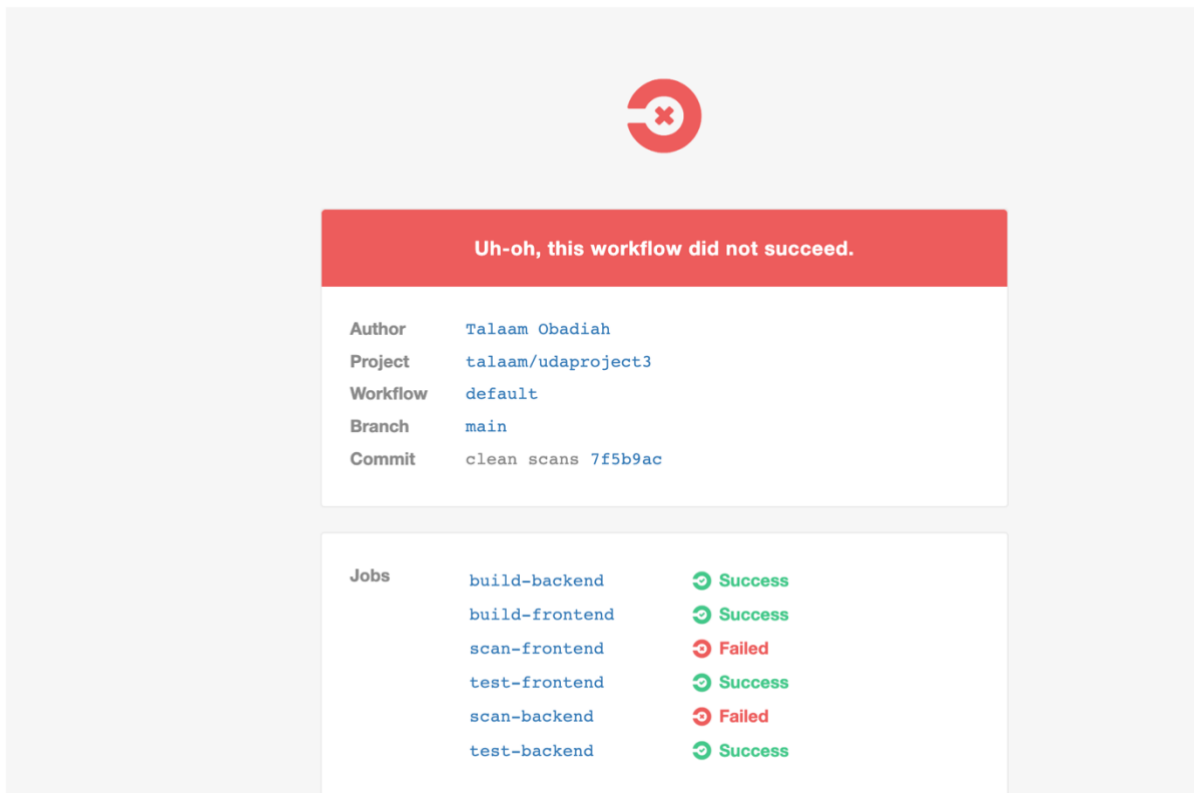
[Download the full output as a file](#)

```
5576 | High | qs vulnerable to Prototype Pollution
5577 |
5578 | Package | qs
5579 |
5580 | Patched in | >=6.5.3
5581 |
5582 | Dependency of | glee-jwks-rsa
5583 |
5584 | Path | glee-jwks-rsa > request > qs
5585 |
5586 | More info | https://github.com/advisories/GHSA-hrpp-h998-j3pp
5587 |
5588 | High | qs vulnerable to Prototype Pollution
5589 |
5590 | Package | qs
5591 |
5592 | Patched in | >=6.5.3
5593 |
5594 | Dependency of | winston-loggly-bulk
5595 |
5596 | Path | winston-loggly-bulk > node-loggly-bulk > request > qs
5597 |
5598 | More info | https://github.com/advisories/GHSA-hrpp-h998-j3pp
5599 |
5600 |
5601 |
5602 |
```

## SCREENSHOT04

CircleCI Builds <builds@circleci.com>  
to ▾

10:30 PM (1 hour ago)



A screenshot of a CircleCI workflow failure summary. At the top is a red circle with a white 'X' icon. Below it is a red banner with the text "Uh-oh, this workflow did not succeed." Underneath the banner is a white box containing metadata: Author (Talaam Obadiah), Project (talaam/udaproject3), Workflow (default), Branch (main), and Commit (clean scans 7f5b9ac). Below this is another white box titled "Jobs" containing a list of jobs and their status: build-backend (Success), build-frontend (Success), scan-frontend (Failed), test-frontend (Success), scan-backend (Failed), and test-backend (Success). Each job has a corresponding icon (green checkmark for Success, red X for Failed).

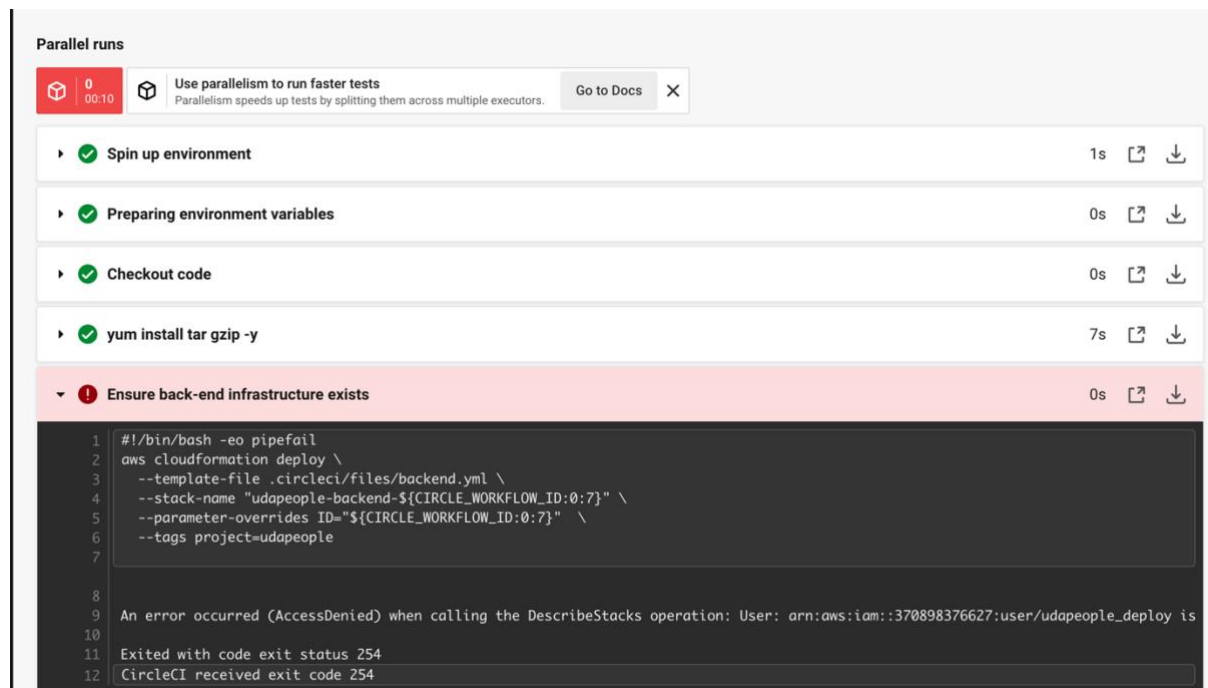
Author	Talaam Obadiah
Project	talaam/udaproject3
Workflow	default
Branch	main
Commit	clean scans 7f5b9ac

Jobs	build-backend	build-frontend	scan-frontend	test-frontend	scan-backend	test-backend
	Success	Success	Failed	Success	Failed	Success

Console output of appropriate failure for infrastructure creation job  
(using CloudFormation)

## SCREENSHOT05



A screenshot of a CircleCI console output for an infrastructure creation job. The output is divided into two sections: "Parallel runs" and "Console output". The "Parallel runs" section shows a list of steps: Spin up environment (1s), Preparing environment variables (0s), Checkout code (0s), yum install tar gzip -y (7s), and Ensure back-end infrastructure exists (0s). The "Ensure back-end infrastructure exists" step is highlighted in red and shows a failure. The "Console output" section shows the command used to deploy the infrastructure using AWS CloudFormation, followed by an error message: "An error occurred (AccessDenied) when calling the DescribeStacks operation: User: arn:aws:iam::370898376627:user/udapeople\_deploy is not authorized to perform: iam:DescribeStacks on resource: arn:aws:cloudformation:us-east-1:370898376627:stack/udapeople-backend-7f5b9ac". The output ends with "Exited with code exit status 254" and "CircleCI received exit code 254".

Parallel runs

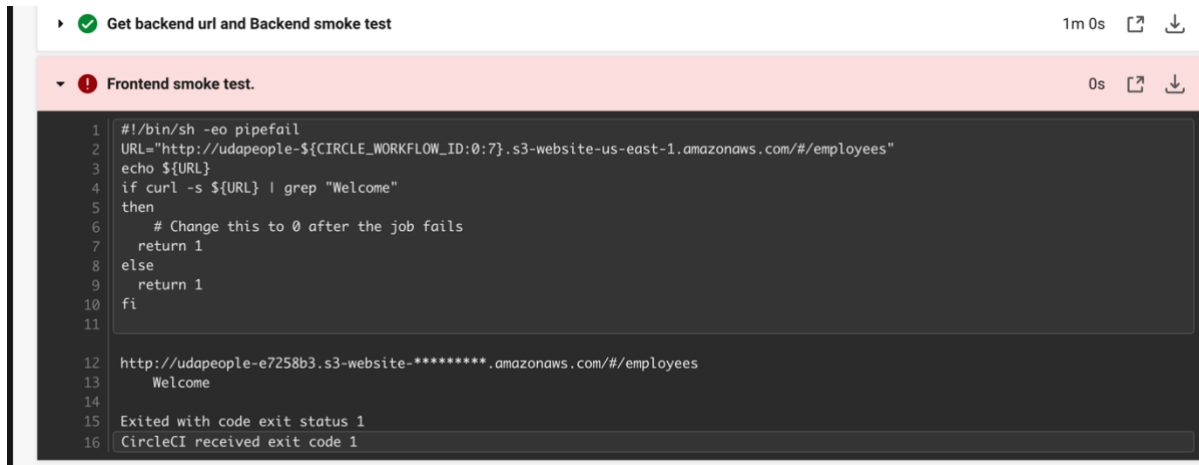
0 00:10 Use parallelism to run faster tests  
Parallelism speeds up tests by splitting them across multiple executors. Go to Docs X

- Spin up environment 1s
- Preparing environment variables 0s
- Checkout code 0s
- yum install tar gzip -y 7s
- Ensure back-end infrastructure exists 0s

```
1 #!/bin/bash -eo pipefail
2 aws cloudformation deploy \
3   --template-file .circleci/files/backend.yml \
4   --stack-name "udapeople-backend-${CIRCLE_WORKFLOW_ID:0:7}" \
5   --parameter-overrides ID="${CIRCLE_WORKFLOW_ID:0:7}" \
6   --tags project=udapeople
7
8
9 An error occurred (AccessDenied) when calling the DescribeStacks operation: User: arn:aws:iam::370898376627:user/udapeople_deploy is
10
11 Exited with code exit status 254
12 CircleCI received exit code 254
```

Console output of a smoke test job that is failing appropriately.

#### SCREENSHOT06



The screenshot displays the CircleCI console output for a job. It shows two steps: 'Get backend url and Backend smoke test' which passed, and 'Frontend smoke test.' which failed. The failed step's output shows a shell script that attempts to curl a URL and check for 'Welcome'. The script returns an exit status of 1, indicating failure. The console output is as follows:

```
1  #!/bin/sh -eo pipefail
2  URL="http://udapeople-${CIRCLE_WORKFLOW_ID:0:7}.s3-website-us-east-1.amazonaws.com/#/employees"
3  echo ${URL}
4  if curl -s ${URL} | grep "Welcome"
5  then
6      # Change this to 0 after the job fails
7      return 1
8  else
9      return 1
10 fi
11
12 http://udapeople-e7258b3.s3-website-*****.amazonaws.com/#/employees
13 Welcome
14
15 Exited with code exit status 1
16 CircleCI received exit code 1
```

Console output of a successful rollback after a failed smoke test.

## SCREENSHOT07

### Frontend smoke test.

```
#!/bin/sh -eo pipefail
URL="http://udapeople-${CIRCLE_WORKFLOW_ID:0:7}.s3-website-us-east-1.amazonaws.com/#/employees"
if curl -s ${URL} | grep "Welcome"
then
  return 1
else
  return 1
fi
```

Exited with code exit status 1  
CircleCI received exit code 1

### Destroy environment \${CIRCLE\_WORKFLOW\_ID:0:7}

Your output is too large to display in the browser.

Only the last 400000 characters are displayed.

[Download the full output as a file](#)

```
#!/bin/sh -eo pipefail
echo "Destroying environment: ${CIRCLE_WORKFLOW_ID:0:7} "
aws s3 rm s3://udapeople-${CIRCLE_WORKFLOW_ID:0:7} --recursive
aws cloudformation delete-stack --stack-name udapeople-backend-${CIRCLE_WORKFLOW_ID:0:7}
aws cloudformation delete-stack --stack-name udapeople-frontend-${CIRCLE_WORKFLOW_ID:0:7}

ople-d02e68a/node_modules/renderkid/node_modules/domutils/LICENSE
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domhandler/test/cases/18-enforce_empty_tags.json
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/package.json
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domhandler/test/cases/07-unescaped_in_style.json
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/readme.md
delete: s3://udapeople-d02e68a/node_modules/regenerator-runtime/path.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/DomUtils/04-outer_html.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domhandler/test/cases/22-lowercase_tags.json
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domhandler/test/cases/10-singular_attribute.json
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/DomUtils/01-by_id.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domhandler/test/tests.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/DomUtils/05-inner_html.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/.travis.yml
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/.npmignore
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/DomUtils/03-by_type.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/index.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/README.md
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/lib/CollectingHandler.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/LICENSE
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/00-runttests.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/lib/FeedHandler.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/domutils/tests/DomUtils/02-by_tagname.js
delete: s3://udapeople-d02e68a/node_modules/renderkid/node_modules/htmlparser2/lib/Parser.js
```

### Revert migrations

```
#!/bin/sh -eo pipefail
if grep -q "has been executed successfully." ~/project/backend/migrations_dump.txt
then
```

Console output of successful promotion of new version to production in CloudFront.

## SCREENSHOT08

```
Update cloudfront distribution 3m 37s

1 #!/bin/bash -eo pipefail
2 # your code here
3 aws cloudformation deploy \
4   --template-file .circleci/files/cloudfront.yml \
5   --stack-name InitialStack \
6   --parameter-overrides WorkflowID="udapeople-${CIRCLE_WORKFLOW_ID:0:7}" \
7   --tags project=udapeople
8 echo OldWorkflowID: $(cat ~/project/OldWorkflowID.txt)
9 echo CurrentWorkflowID: "${CIRCLE_WORKFLOW_ID:0:7}"
10
11
12 Waiting for changeset to be created..
13 Waiting for stack create/update to complete
14 Successfully created/updated stack - InitialStack
15 OldWorkflowID: 
16 CurrentWorkflowID: 38eed73
17 CircleCI received exit code 0
```

Console output of successful cleanup job that removes old S3 bucket and EC2 instance.

## SCREENSHOT09

```
Get old stack workflow id 0s

1 #!/bin/bash -eo pipefail
2 # your code here
3 export STACKS=$(aws cloudformation list-stacks --query "StackSummaries[*].StackName" \
4   --stack-status-filter CREATE_COMPLETE --no-paginate --output text))
5 echo Stack names: "${STACKS[@]}"
6 cat ~/project/OldWorkflowID.txt
7 export OldWorkflowID=$(cat ~/project/OldWorkflowID.txt)
8 echo OldWorkflowID: "${OldWorkflowID}"
9
10 Stack names: None
11 [ "udapeople-88e156a" ]
12 OldWorkflowID: [ "udapeople-88e156a" ]
13 CircleCI received exit code 0
```

Evidence that the deploy jobs only happen on the **main** branch.

## SCREENSHOT10

All Pipelines > udaproject3 > dev-branch > default

default Success Insights Rerun ...

Duration / Finished	Branch	Commit	Author
🕒 1m 56s / 4m ago	🌿 dev-branch	🔗 8422c17	👤 talaam

build-frontend 36s

scan-frontend 58s

test-frontend 1m 15s

build-backend 30s

scan-backend 44s

test-backend 1m 14s

Evidence of deployed and functioning front-end application in an S3 bucket  
# s3 url

URL02

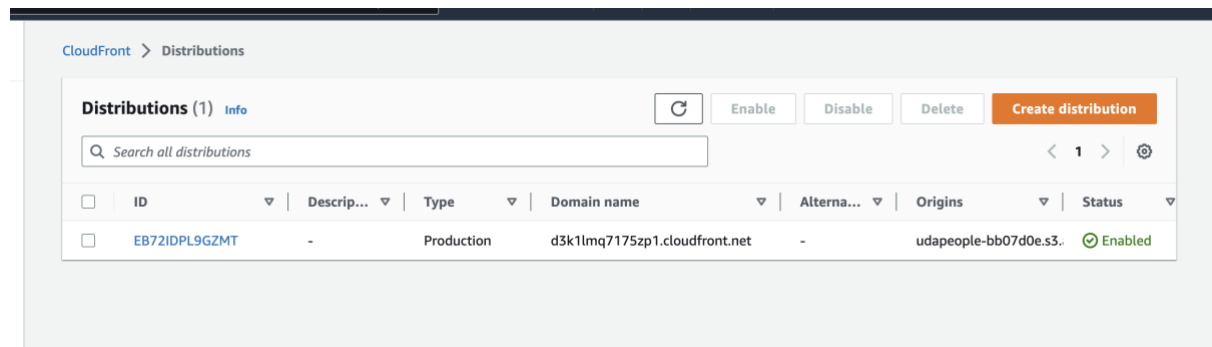
<http://udapeople-bb07d0e.s3-website-us-east-1.amazonaws.com>

**Evidence of deployed and functioning front-end application in CloudFront.**

# CloudFront Distribution URL

URL03\_SCREENSHOT

<https://d3k1lmq7175zp1.cloudfront.net>

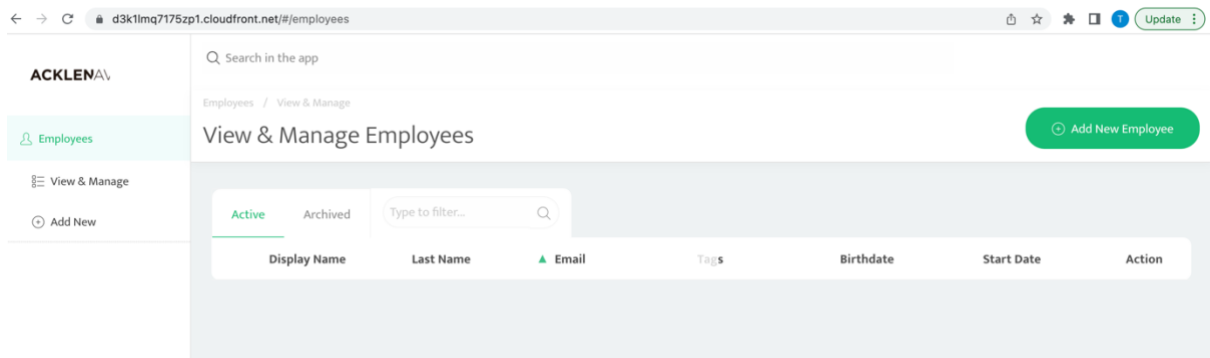


Evidence of deployed and functioning front-end application in CloudFront.

URL04\_SCREENSHOT

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## Section 3

# Prometheus URL

URL05\_SCREENSHOT

<http://ec2-44-201-111-159.compute-1.amazonaws.com:9090/targets>

Not Secure | ec2-44-201-111-159.compute-1.amazonaws.com:9090/targets

Prometheus Alerts Graph Status Help

### Targets

All Unhealthy

prometheus (1/1 up) show less

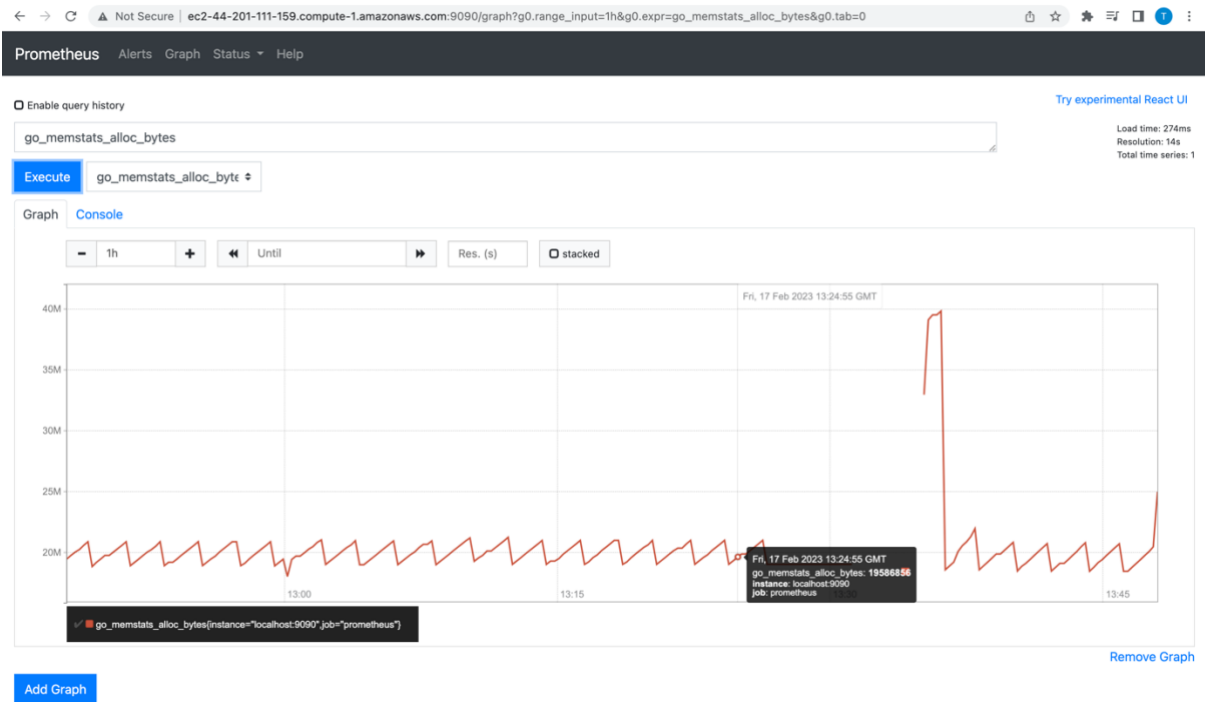
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
<a href="http://localhost:9090/metrics">http://localhost:9090/metrics</a>	UP	instances="localhost:9090" jobs="prometheus"	11.866s ago	6.131ms	

udapeople (0/1 up) show less

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
<a href="http://ip-172-31-92-15.ec2.internal:9100/metrics">http://ip-172-31-92-15.ec2.internal:9100/metrics</a>	DOWN	instances="ip-172-31-92-15.ec2.internal:9100" jobs="udapeople"	3.025s ago	1.835ms	Get "http://ip-172-31-92-15.ec2.internal:9100/metrics": dial tcp 172.31.92.15:9100: connect: connection refused



# SCREENSHOT11



# SCREENSHOT12

## Alerts

Inactive (0) Pending (0) Firing (1)

Show annotations

/etc/prometheus/rules.yml > Down

InstanceDown (1 active)

```
alert: InstanceDown
expr: up == 0
for: 2m
labels:
  description: (instance {{ $labels.instance }}) has been down for the last 2 minutes
  severity: critical
  summary: Instance (instance {{ $labels.instance }}) is Down
```

Labels	State	Active Since	Value
alertname="InstanceDown" descriptions="(instance ip-172-31-92-15.ec2.internal:9100) has been down for the last 2 minutes" instance="ip-172-31-92-15.ec2.internal:9100"	FIRING	2023-02-17	0
jobs="udapeople" severity="critical" summary="Instance (instance ip-172-31-92-15.ec2.internal:9100) is Down"		13:35:29.214668377 +0000 UTC	