

Project:

Give Your Application Auto-Deploy  
Superpowers

# Selling CI/CD to your Team/Organization

- Explain the fundamentals and benefits of CI/CD to achieve, build, and deploy automation for cloud-based software products.

The CI/CD benefits	
Technical Terms	translate to revenue and cost for the business
<b>Benefits of CI/CD in terms of cost, revenue, profit</b> <b>Catch Compile Errors After Merge</b>	<p>Cost: It reduces costs by detecting errors early, preventing complex and costly fixes.</p> <p>Revenue: It speeds up time-to-market, allowing businesses to deploy features faster and seize revenue opportunities. It also improves the user experience, leading to increased customer satisfaction and potential revenue growth.</p> <p>Profit: CI/CD streamlines development processes, saving time and resources. It enhances system stability, minimizing downtime and potential revenue loss. These factors contribute to maximizing profitability.</p>
<b>Benefits of CI/CD in terms of cost, revenue, profit</b> <b>Faster And More Frequent Production Deployments</b>	<p>Cost: CI/CD reduces rework and streamlines development processes, leading to cost savings.</p> <p>Revenue: Faster deployments enable quicker time-to-market, attracting more customers and generating revenue sooner.</p> <p>Profit: Continuous value delivery and adaptability maximize profitability through customer satisfaction and market responsiveness.</p>
<b>Benefits of CI/CD in terms of cost, revenue, profit</b> <b>Automate Infrastructure Cleanup</b>	<p>Cost: Automating infrastructure cleanup minimizes unnecessary resource costs and improves resource utilization.</p> <p>Revenue: Efficient resource management enhances system performance, attracting more users and potentially increasing revenue.</p> <p>Profit: Automated cleanup reduces costs, improves agility, and maximizes profitability through optimized resource allocation.</p>
<b>Benefits of CI/CD in terms of cost, revenue, profit</b> <b>Automate Smoke Tests</b>	<p>Cost: Automated smoke tests reduce manual effort and catch critical issues early, minimizing costly fixes.</p> <p>Revenue: Faster time-to-market and improved product quality through automated smoke tests can attract more customers and increase revenue.</p> <p>Profit: Increased customer confidence, optimized resource utilization, and improved productivity contribute to profit maximization.</p>

# Build Phase

[SCREENSHOT01]

Back-end build24s

```
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
43 Found 2 errors.
44
45 npm ERR! code ELIFECYCLE
46 npm ERR! errno 2
47 npm ERR! glee2@1.0.0 build: `tsc`
48 npm ERR! Exit status 2
49 npm ERR!
50 npm ERR! Failed at the glee2@1.0.0 build script.
51 npm ERR! This is probably not a problem with npm. There is likely additional logging output above.
52
53 npm ERR! A complete log of this run can be found in:
54 npm ERR! /home/circleci/.npm/_logs/2023-06-29T07_54_53_847Z-debug.log
55
56
57 Exited with code exit status 2
58 CircleCI received exit code 2
```

All Pipelines

## All Pipelines

Everyone's Pipelines

All Projects

All Branches

All days

Auto-expand

Pipeline	Status	Workflow	Branch / Commit	Start	Duration	Actions
udacity-project-039	Failed	default	main b20b5a1 push deploy	2m ago	40s	
Jobs	build-frontend	16			30s	
	build-backend	17			38s	

# Build Phase

- Fix

```
Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Learning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
$ git commit -m "fix backend"
[main 8b05744] fix backend
 2 files changed, 18 insertions(+), 53 deletions(-)

Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Learning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
$ git push origin main
Enumerating objects: 15, done.
Counting objects: 100% (14/14), done.
Delta compression using up to 16 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (8/8), 818 bytes | 818.00 KiB/s, done.
Total 8 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (6/6), completed with 6 local objects.
To https://github.com/phan-van-thuy/udacity-project-03.git
   4ce80c6..8b05744  main -> main

Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Learning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
$
```

All Pipelines						
<div>Everyone's Pipelines All Projects All Branches All days Auto-expand</div>						
Pipeline	Status	Workflow	Branch / Commit	Start	Duration	Actions
udacity-project-03 11	Success	default	main 8b05744 fix backend	3m ago	49s ↓ 2%	🔄 🔄 ✖ ⋮
Jobs	✓ build-frontend 20					32s
	✓ build-backend 21					42s
udacity-project-03 10	Failed	default	main 4ce80c6 fix backend	7m ago	35s	🔄 🔄 ✖ ⋮
Jobs	! build-frontend 18					23s

# Test Phase

## [SCREENSHOT02]

All Pipelines

All Pipelines

Everyone's Pipelines ▾All Projects ▾All Branches ▾All days ▾

AL

Pipeline	Status	Workflow	Branch / Commit	Start	Duration
udacity-project-03 12 ▾	Failed	default	main 8048921 push test	4m ago	1m 56s
Jobs					
build-frontend 22	✓				31s
test-frontend 24	✗				1m 20s
build-backend 23	✓				31s
test-backend 25	✗				1m 2s

Run frontend test

```
117 | index.tsx | 0 | 0 | 0 | 0 | ... 44,247,257,262 |
118 | containers/Employee/components/ViewEmployee | 0 | 0 | 0 | 0 | |
119 | index.tsx | 0 | 0 | 0 | 0 | ... 95,498,508,513 |
120 | containers/Employee/models | 0 | 0 | 0 | 0 | |
121 | EmployeeModel.ts | 0 | 0 | 0 | 0 | 1,2,3,6,7,8,66,67 |
122 | index.ts | 0 | 100 | 100 | 0 | 1 |
123 | containers/Employee/reducer | 38.89 | 33.33 | 37.5 | 38.89 | |
124 | employees.ts | 50 | 33.33 | 42.86 | 50 | ... 28,29,30,36,62 |
125 | sampleData.ts | 0 | 100 | 0 | 0 | 1,4,7,32 |
126 | containers/Employee/services | 30 | 0 | 10 | 30.77 | |
127 | employees.ts | 30 | 0 | 10 | 30.77 | ... 50,54,57,61,62 |
128 | -----|-----|-----|-----|
129 |
130 | Test Suites: 1 failed, 4 passed, 5 total
131 | Tests: 1 failed, 11 passed, 12 total
132 | Snapshots: 0 total
133 | Time: 49.31s
134 | Ran all test suites.
135 | npm ERR! code ELIFECYCLE
136 | npm ERR! errno 1
137 | npm ERR! typescript-react-redux-boilerplate@1.0.0 test: 'jest'
138 | npm ERR! Exit status 1
139 | npm ERR!
140 | npm ERR! Failed at the typescript-react-redux-boilerplate@1.0.0 test script.
141 | npm ERR! This is probably not a problem with npm. There is likely additional logging output above.
142 |
143 | npm ERR! A complete log of this run can be found in:
144 | npm ERR! /home/circleci/.npm/_logs/2023-06-29T08_09_01_044Z-debug.log
145 |
146 |
147 | Exited with code exit status 1
148 | CircleCI received exit code 1
```

Run backend test

```
283 |
284 | 33 |
285 | 34 | // Assert
286 | > 35 | expect(employeeRepository.findById).toBeCalledWith(100);
287 | |
288 | 36 | expect(employeeRepository.save).toBeCalled();
289 | 37 | });
290 | 38 | });
291 |
292 | at src/modules/domain/employees/commands/handlers/employee-activator.handler.spec.ts:35:43
293 | at fulfilled (src/modules/domain/employees/commands/handlers/employee-activator.handler.spec.ts:5:58)
294 |
295 |
296 | Test Suites: 1 failed, 50 passed, 51 total
297 | Tests: 1 failed, 78 passed, 79 total
298 | Snapshots: 0 total
299 | Time: 37.144s
300 | Ran all test suites.
301 | npm ERR! code ELIFECYCLE
302 | npm ERR! errno 1
303 | npm ERR! glee2@1.0.0 test: 'jest --runInBand'
304 | npm ERR! Exit status 1
305 | npm ERR!
306 | npm ERR! Failed at the glee2@1.0.0 test script.
307 | npm ERR! This is probably not a problem with npm. There is likely additional logging output above.
308 |
309 | npm ERR! A complete log of this run can be found in:
310 | npm ERR! /home/circleci/.npm/_logs/2023-06-29T08_08_44_764Z-debug.log
311 |
312 |
313 | Exited with code exit status 1
314 | CircleCI received exit code 1
```

# Test Phase

- FIX









```
Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Lerning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
$ git commit -m "fix test"
[main Odd9f1b] fix test
1 file changed, 1 insertion(+), 1 deletion(-)

Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Lerning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
$ git push origin main
Enumerating objects: 15, done.
Counting objects: 100% (15/15), done.
Delta compression using up to 16 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (8/8), 679 bytes | 679.00 KiB/s, done.
Total 8 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (6/6), completed with 6 local objects.
To https://github.com/phan-van-thuy/udacity-project-03.git
7a6e798..0dd9f1b  main -> main

Administrator@DESKTOP-2361KFI MINGW64 ~/Desktop/AWS-Lerning/UDACITY-Project-03/c
dond-c3-projectstarter (main)
```

## All Pipelines

Everyone's Pipelines All Projects All Branches All days Auto-expand

Pipeline	Status	Workflow	Branch / Commit	Start	Duration	Actions
udacity-project-03 14	Success	default	main Odd9f1b fix test	3m ago	1m 55s <span>↑ 130%</span>	   
Jobs	 build-frontend 29				29s	
	 test-frontend 31				1m 21s	
	 build-backend 30				33s	
	 test-backend 32				1m 11s	

# Analyze Phase

[SCREENSHOT03]

udacity-project-03

Add team members

Edit Config

Trigger Pipeline

Project Settings

Filters

Everyone's Pipelines

udacity-project-03

All Branches

All days

Auto-expand

Pipeline	Status	Workflow	Branch / Commit	Start	Duration	Actions
udacity-project-03	Failed	default	main 9954fe6 add scan	8m ago	1m 54s	
Jobs						
	✓ build-frontend	33			32s	
	! scan-frontend	35			29s	
	✓ test-frontend	36			1m 15s	
	✓ build-backend	34			33s	
	! scan-backend	38			29s	
	✓ test-backend	37			1m 0s	

## Parallel runs

0  
00:27

Use parallelism to run faster tests  
Parallelism speeds up tests by splitting them across multiple executors.

Go to Docs

✓ Spin up environment	1s
✓ Preparing environment variables	0s
✓ Checkout code	0s
✓ Restoring cache	0s
! Run backend scan	26s

## Parallel runs

0  
00:28

Use parallelism to run faster tests  
Parallelism speeds up tests by splitting them across multiple executors.

Go to Docs

✓ Spin up environment	1s
✓ Preparing environment variables	0s
✓ Checkout code	0s
✓ Restoring cache	0s
! Run frontend scan	26s

# Analyze Phase

## FIX

```
scan-frontend:
  docker:
    - image: circleci/node:13.8.0
  steps:
    - checkout
    - restore_cache:
        keys: [frontend-scan]
    - run:
        name: Run frontend scan
        command: |
          cd frontend
          npm install
          npm audit fix --audit-level=critical
          npm audit --audit-level=critical
scan-backend:
  docker:
    - image: circleci/node:13.8.0
  steps:
    - checkout
    - restore_cache:
        keys: [backend-scan]
    - run:
        name: Run backend scan
        command: |
          cd backend
          npm install
          npm audit fix --audit-level=critical
          npm audit --audit-level=critical
```

### All Pipelines

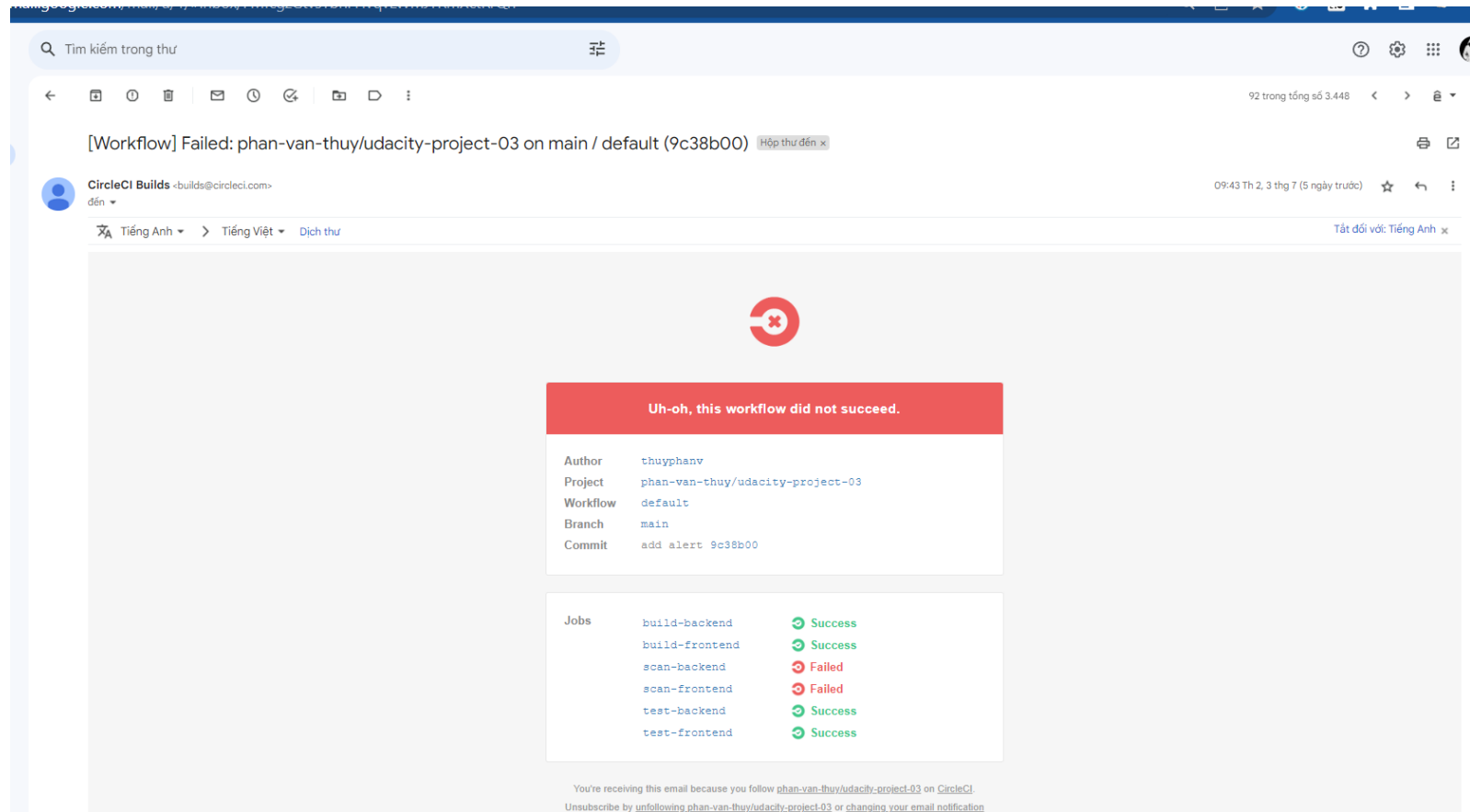
Everyone's Pipelines ▾ All Projects ▾ All Branches ▾ All days ▾ Filter ▾ Auto-expand ☒

Pipeline	Status	Workflow	Branch / Commit	Start	Duration	Actions
udacity-project-03 25 ▾	Success	default	main 0a538f9 fix scan	8m ago	1m 56s ↓ 1%	🔄 🔄 🗑️ ⋮
<b>Jobs</b>						
build-frontend	93	38s				
scan-frontend	98	48s				
test-frontend	97	1m 13s				
build-backend	94	36s				
scan-backend	96	47s				
test-backend	95	1m 6s				



# Alerts

## SCREENSHOT04



# Create the Infrastructure

## Create Backend


### [SCREENSHOT05]

▶  Preparing Environment Variables


0s ↗ ↓

▶  Checkout code

2s ↗ ↓

▶  yum -y install tar gzip

6s ↗ ↓

▼  Ensure backend infrastructure exist

0s ↗ ↓

```
#!/bin/bash -eo pipefail
aws cloudformation deploy \
  --template-file .circleci/files/backend.yml \
  --stack-name "udapeople-backend-${CIRCLE_WORKFLOW_ID:0:7}" \
  --parameter-overrides ID="${CIRCLE_WORKFLOW_ID:0:7}" \
  --tags project=udapeople
```

An error occurred (ValidationError) when calling the CreateChangeSet operation: Template format error: Unrecognized resource types: [AWS::EC2::SecurityGroupss]

Exited with code exit status 254

# Configure Infrastructure

[URL01] <https://github.com/phan-van-thuy/udacity-project-03/blob/main/.circleci/config.yml>

The screenshot displays the CircleCI web interface for a user named 'phan-van-thuy'. The left sidebar contains navigation links: Dashboard, Projects, Insights, Self-Hosted Runners, Organization Settings, and Plan. Below these are Notifications, Status (OPERATIONAL), Docs, Orbs, and Support. The main content area shows a pipeline run for the workflow 'Run Playbook and Configure server' with a duration of 6m 37s. The run is successful, indicated by a green checkmark. The output log shows the following tasks and their results:

```
13 ok: [54.173.17.136]
14
15 TASK [configure-server : Import env] *****
16 changed: [54.173.17.136]
17
18 TASK [configure-server : upgrade packages] *****
19 changed: [54.173.17.136]
20
21 TASK [configure-server : Remove Old dependencies] *****
22 changed: [54.173.17.136]
23
24 TASK [configure-server : install dependencies] *****
25 changed: [54.173.17.136]
26
27 TASK [configure-server : Install pm2] *****
28 changed: [54.173.17.136]
29
30 TASK [configure-prometheus-node-exporter : install node exporter.] *****
31 changed: [54.173.17.136]
32
33 TASK [configure-prometheus-node-exporter : move binary to /usr/local/bin.] *****
34 changed: [54.173.17.136]
35
36 TASK [configure-prometheus-node-exporter : add node exporter configuration.] ***
37 changed: [54.173.17.136]
38
39 TASK [configure-prometheus-node-exporter : enable node_exporter service] *****
40 changed: [54.173.17.136]
41
42 PLAY RECAP *****
43 54.173.17.136 : ok=11 changed=9 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
44
45 CircleCI received exit code 0
```

# Deploy Phase

## • Database Migrations

```
run-migrations:
  docker:
    - image: circleci/node:13.8.0
  steps:
    - checkout
    - run:
        name: Run migrations
        command: |
          cd backend
          npm install
          npm run migrations > migrations_dump.txt
          cat migrations_dump.txt
    - run:
        name: Send migration status to kvdb.io
        command: |
          echo https://kvdb.io/9GE4jRtKznmVKRfvdBABBe/migration_${CIRCLE_WORKFLOW_ID:0:7}
          cd backend
          if grep -q "has been executed successfully." ~/project/backend/migrations_dump.txt
          then
            curl --insecure https://kvdb.io/9GE4jRtKznmVKRfvdBABBe/migration_${CIRCLE_WORKFLOW_ID:0:7} -d '1'
          fi
# Rollback if fail
- destroy-environment
- revert-migrations
```

app.circleci.com/pipelines/github/phan-van-thuy/udacity-project-03/161/workflows/b8eb8df9-72f8-4838-bc86-61be3c185e9a/jobs/1229

phan-van-thuy  
phan-van-thuy

Dashboard

- Projects
- Insights
- Self-Hosted Runners
- Organization Settings
- Plan

Notifications

Status **OPERATIONAL**

Docs

Orbs

Support

STEPS TESTS TIMING ARTIFACTS RESOURCES

⚠ You're using a deprecated Docker convenience image. Upgrade to a next-gen Docker convenience image.

STEPS	TESTS	TIMING	ARTIFACTS	RESOURCES
▶ ✓ Spin up environment		1s	📄	📄
▶ ✓ Preparing environment variables		0s	📄	📄
▶ ✓ Checkout code		0s	📄	📄
▶ ✓ Run migrations		32s	📄	📄
▼ ✓ Send migration status to kvdb.io		0s	📄	📄

```
1 #!/bin/bash -eo pipefail
2 echo https://kvdb.io/9GE4jRtKznmVKRfvdBABBe/migration_${CIRCLE_WORKFLOW_ID:0:7}
3 cd backend
4 if grep -q "has been executed successfully." ~/project/backend/migrations_dump.txt
5 then
6     curl --insecure https://kvdb.io/9GE4jRtKznmVKRfvdBABBe/migration_${CIRCLE_WORKFLOW_ID:0:7} -d '1'
7 fi
8
9 https://kvdb.io/9GE4jRtKznmVKRfvdBABBe/migration_b8eb8df
10 CircleCI received exit code 0
```

# Deploy Frontend

- [URL02]

The screenshot shows the AWS S3 console interface. The top navigation bar includes the AWS logo, a search bar, and user information. The left sidebar contains navigation links for Amazon S3, Buckets, Access Points, Object Lambda Access Points, Multi-Region Access Points, Batch Operations, IAM Access Analyzer for S3, Storage Lens, Dashboards, AWS Organizations settings, Feature spotlight, and AWS Marketplace for S3.

The main content area displays the 'Amazon S3' dashboard. It includes an 'Account snapshot' section with a 'View Storage Lens dashboard' button. Below this is a table showing account metrics:

Total storage	Object count	Average object size	
11.6 MB	8	1.5 MB	You can enable advanced metrics in the "default-account-dashboard" configuration.

Below the metrics is a 'Buckets (1)' section with a 'Create bucket' button. A search bar for buckets is provided. A table lists the buckets:

Name	AWS Region	Access	Creation date
udapeople-b8eb8df	US East (N. Virginia) us-east-1	Public	July 9, 2023, 18:02:45 (UTC+07:00)

The bottom screenshot shows the 'udapeople-b8eb8df' bucket details page. It includes a 'Publicly accessible' badge and tabs for Objects, Properties, Permissions, Metrics, Management, and Access Points. The 'Objects' tab is active, showing a list of 8 objects:

Name	Type	Last modified	Size	Storage class
1ceff9123b66b50a7d3cb5b221160855.eot	eot	July 9, 2023, 18:11:36 (UTC+07:00)	65.5 KB	Standard
224b6d9d16679dab02826a2a7ea705eb.ttf	ttf	July 9, 2023, 18:11:36 (UTC+07:00)	65.4 KB	Standard
2fa692cd55bfc83c228c0ab271e4388c.woff	woff	July 9, 2023, 18:11:36 (UTC+07:00)	65.5 KB	Standard
6fba29d438ed8a3922b8.js	js	July 9, 2023, 18:11:36 (UTC+07:00)	1.4 MB	Standard
7d234e755f56c47d2c5a1c...	ic	July 9, 2023, 18:11:36	0.8 MB	Standard

# Deploy Backend

EXPLORER

UDACITY-PROJECT-03

project3

circleci

ansible

roles

configure-prometheus-node-exporter

files

node\_exporter.service

tasks

main.yml

configure-server/tasks

main.yml

deploy

configure-server.yml

deploy-backend.yml

inventory.txt

files

backend.yml

cloudfront.yml

frontend.yml

config.yml

backend

frontend

instructions

util

docker-compose.yml

CODEOWNERS

LICENSE.md

package-lock.json

README.md

OUTLINE

TIMELINE

GITLAB PIPELINES

! backend.yml

! config.yml 1 X

! # filters: Untitled-1

project3 > .circleci > ! config.yml > {} jobs > {} deploy-infrastructure > {} steps

268

269

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271

272

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302

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304

# Rollback if fail

- destroy-environment

- revert-migrations

deploy-backend:

docker:

- image: python:3.7-alpine3.11

steps:

- checkout

- add\_ssh\_keys:

fingerprints: ["5a:71:9b:3e:79:bb:94:65:69:ac:e4:6f:1b:c8:f0:e1"]

- run:

name: Install dependencies - Install Ansible

command: |

apk add --update ansible

apk add --no-cache tar

pip install --upgrade awscli

apk add --no-cache npm

apk add --no-cache curl

- attach\_workspace:

at: .circleci/ansible

- run:

name: Deploy backend

command: |

cat .circleci/ansible/ipec2.txt >> .circleci/ansible/inventory.txt

cd backend

npm i

npm run build

cd ..

echo ENVIRONMENT=production >> "backend/.env"

echo TYPEORM\_MIGRATIONS\_DIR=\${TYPEORM\_MIGRATIONS\_DIR} >> "backend/.env"

echo TYPEORM\_ENTITIES=\${TYPEORM\_ENTITIES} >> "backend/.env"

echo TYPEORM\_MIGRATIONS=\${TYPEORM\_MIGRATIONS} >> "backend/.env"

echo TYPEORM\_HOST=\${TYPEORM\_HOST} >> "backend/.env"

echo TYPEORM\_PORT=\${TYPEORM\_PORT} >> "backend/.env"

echo TYPEORM\_USERNAME=\${TYPEORM\_USERNAME} >> "backend/.env"

phan-van-thuy

phan-van-thuy

Dashboard

Projects

Insights

Self-Hosted Runners

Organization Settings

Plan

Notifications

Status OPERATIONAL

Docs

Orbs

Support

Download the full output as a file

6800 ./dist/migrations/

6801 ./dist/migrations/1549375960026-AddOrders.js.map

6802 ./dist/migrations/1549375960026-AddOrders.js

6803 ./dist/migrations/1549375960026-AddOrders.d.ts

6804 ./dist/migrations/1549398619849-FixProductIdTable.js.map

6805 ./dist/migrations/1549398619849-FixProductIdTable.js

6806 ./dist/migrations/1549398619849-FixProductIdTable.d.ts

6807 ./dist/migrations/1555722583168-AddEmployee.js.map

6808 ./dist/migrations/1555722583168-AddEmployee.js

6809 ./dist/migrations/1555722583168-AddEmployee.d.ts

6810 ./env

6811 Contents of the inventory.txt file is -----

6812 [web]

6813 54.173.17.136

6814

6815 PLAY [configuration play.] \*\*\*\*\*

6816

6817 TASK [deploy : Creates director] \*\*\*\*\*

6818 changed: [54.173.17.136]

6819

6820 TASK [deploy : Copy compressed backend folder] \*\*\*\*\*

6821 changed: [54.173.17.136]

6822

6823 TASK [deploy : Extract backend] \*\*\*\*\*

6824 changed: [54.173.17.136]

6825

6826 TASK [deploy : Run the web server] \*\*\*\*\*

6827 changed: [54.173.17.136]

6828

6829 PLAY RECAP \*\*\*\*\*

6830 54.173.17.136 : ok=4 changed=4 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

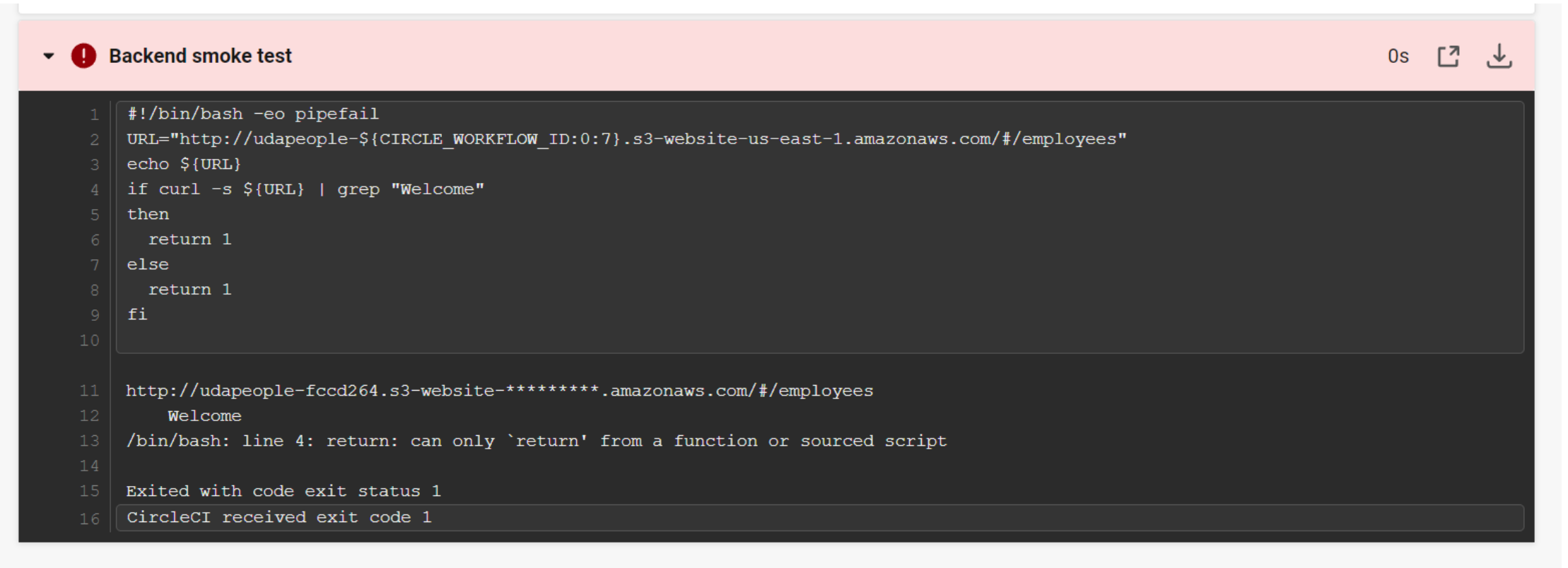
6831

6832 CircleCI received exit code 0

# smoke-test

- Alerts

## [SCREENSHOT06]






The screenshot shows a CircleCI job interface for a job named "Backend smoke test". The job status is failed, indicated by a red exclamation mark icon. The output of the job is displayed in a dark-themed terminal window. The script being executed is a bash script that sets a URL, echoes it, and attempts to curl the URL, checking for the word "Welcome". The script fails at line 4 with the error: "/bin/bash: line 4: return: can only `return' from a function or sourced script". The final output shows the job exited with code 1 and that CircleCI received exit code 1.

```
1  #!/bin/bash -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      return 1
7  else
8      return 1
9  fi
10
11  http://udapeople-fccd264.s3-website-*****.amazonaws.com/#/employees
12  Welcome
13  /bin/bash: line 4: return: can only `return' from a function or sourced script
14
15  Exited with code exit status 1
16  CircleCI received exit code 1
```

# smoke-test

## Fix smoke test


### Frontend

```
▼  Frontend smoke test. 0s  
```

```
1  #!/bin/bash -eo pipefail
2  export BACKEND_IP=$(aws ec2 describe-instances --query 'Reservations[*].Instances[*].PublicIpAddress' --filters "Name=tag:project,Value=frontend")
3  export API_URL="http://${BACKEND_IP}:3030"
4  echo "${API_URL}"
5  if curl "${API_URL}/api/status" | grep "ok"
6  then
7      echo "-----Frontend test passed-----"
8      exit 0
9  else
10     echo "-----Frontend test failed-----"
11     exit 1
12 fi
13
```

```
14 http://44.202.130.28:3030
15 % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
16          Dload  Upload  Total   Spent    Left     Speed
17 100    55    100    55    0    0    3414    0 --:--:-- --:--:-- --:--:-- 3437
18 {"status":"ok","version":"1.0.0","environment":"local"}
19 -----Frontend test passed-----
20 CircleCI received exit code 0
```

### Backend

```
▼  Backend smoke test
```

```
1  #!/bin/bash -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      echo "-----Backend test passed-----"
7  else
8      echo "-----Backend test failed-----"
9  fi
10
```

```
11 http://udapeople-ee0a448.s3-website-*****.amazonaws.com/#/employees
12 Welcome
13 -----Backend test passed-----
14 CircleCI received exit code 0
```



# Rollback Phase

- [SCREENSHOT07]

app.circleci.com/pipelines/github/phan-van-thuy/udacity-project-03/155/workflows/477accbd-b08f-48a9-abcd-c2cc626b8760/jobs/1129

phan-van-thuy

Dashboard

Projects

Insights

Self-Hosted Runners

Organization Settings

Plan

Notifications

Status OPERATIONAL

Docs

Orbs

Support

Install dependencies - Install Ansible 6s

Attaching workspace 0s

Frontend smoke test. 0s

```
#!/bin/bash -eo pipefail
export BACKEND_IP=$(aws ec2 describe-instances --query 'Reservations[*].Instances[*].PublicIpAddress' --filters "Name=tag:project,Values=udapeople" --output text)
export API_URL="http://${BACKEND_IP}:3030"
echo "${API_URL}"
if curl "${API_URL}/api/status" | grep "ok"
then
  return 1
else
  return 1
fi

http://54.163.48.127:3030
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload  Total   Spent    Left     Speed
100    55    100    55    0    0    3017    0 --:--:-- --:--:-- --:--:--   3055
{"status":"ok","version":"1.0.0","environment":"local"}
/bin/bash: line 5: return: can only 'return' from a function or sourced script

Exited with code exit status 1
CircleCI received exit code 1
```

Revert migrations 0s

Destroy environment 2s

```
#!/bin/bash -eo pipefail
echo "Distroy 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}

Distroy environment: 477accb
delete: s3://udapeople-477accb/1ceff9123b66b50a7d3cb5b221160855.eot
delete: s3://udapeople-477accb/index.html
delete: s3://udapeople-477accb/2fa692cd55bfc83c228c0ab271e4388c.woff
delete: s3://udapeople-477accb/bundle.js
delete: s3://udapeople-477accb/224b6d9d16679dab02826a2a7ea705eb.ttf
delete: s3://udapeople-477accb/images/6ab15f4239b7d187935cf6f4ec3313bf-kiwi.svg
delete: s3://udapeople-477accb/7d234c755f55c47d2c5a.js
delete: s3://udapeople-477accb/1ec36026efc604ac6f64.js

CircleCI received exit code 0
```

# Promotion Phase

## [SCREENSHOT08]

The screenshot displays the CircleCI interface for a user named 'phan-van-thuy'. The left sidebar contains navigation links: Dashboard, Projects, Insights, Self-Hosted Runners, Organization Settings, Plan, Getting Started, Notifications, Status (OPERATIONAL), Docs, Orbs, and Support. The main area shows a list of workflow steps, all of which are completed with green checkmarks:

- Preparing environment variables
- Checkout code
- Install dependencies
- Update cloudfront distribution

The 'Update cloudfront distribution' step is expanded, showing a terminal output with the following commands and results:

```
1  #!/bin/bash -eo pipefail
2  export OldWorkflowID=$(aws cloudformation list-exports \
3  --query "Exports[?Name=='WorkflowID'].Value" \
4  --no-paginate --output text)
5  echo $OldWorkflowID >> ~/OldWorkflowID.txt
6  cat ~/OldWorkflowID.txt
7  aws cloudformation deploy \
8  --template-file .circleci/files/cloudfront.yml \
9  --stack-name "InitialStack-${OldWorkflowID}" \
10 --parameter-overrides WorkflowID="udapeople-${CIRCLE_WORKFLOW_ID:0:7}" --tags project=udapeople
11 echo OldWorkflowID: "${OldWorkflowID}"
12 echo current Workflow Id: "${CIRCLE_WORKFLOW_ID:0:7}"
13
14
15
16 Waiting for changeset to be created..
17 Waiting for stack create/update to complete
18 Successfully created/updated stack - InitialStack-
19 OldWorkflowID:
20 current Workflow Id: 049f797
21 CircleCI received exit code 0
```

# Promotion Phase

## [URL03\_SCREENSHOT]

The image shows two overlapping screenshots. The top screenshot is of the AWS CloudFront console, displaying a list of distributions. The bottom screenshot is of an application interface for managing employees.

**AWS CloudFront Console:**

- URL: `us-east-1.console.aws.amazon.com/cloudfront/v3/home?region=us-east-1#/distributions`
- Page Title: CloudFront > Distributions
- Buttons: Enable, Disable, Delete, Create distribution
- Search: Search all distributions
- Table Headers: ID, Description, Type, Domain name, Alternat..., Origins, Status, Last m
- Table Data:

ID	Description	Type	Domain name	Alternat...	Origins	Status	Last m
EZYT5NIBELCYA	-	Production	da1soreee1hgh.cloudfront.net	-	udapeople-c4ac411.s3-website-us-east-1.amazonaws.com	Enabled	De

**Application Interface:**

- URL: `da1soreee1hgh.cloudfront.net/#/employees`
- Page Title: View & Manage Employees
- Buttons: Add New Employee
- Notification: All changes have been saved successfully!
- Table Headers: Display Name, Last Name, Email, Tags, Birthdate, Start Date, Action
- Table Data:

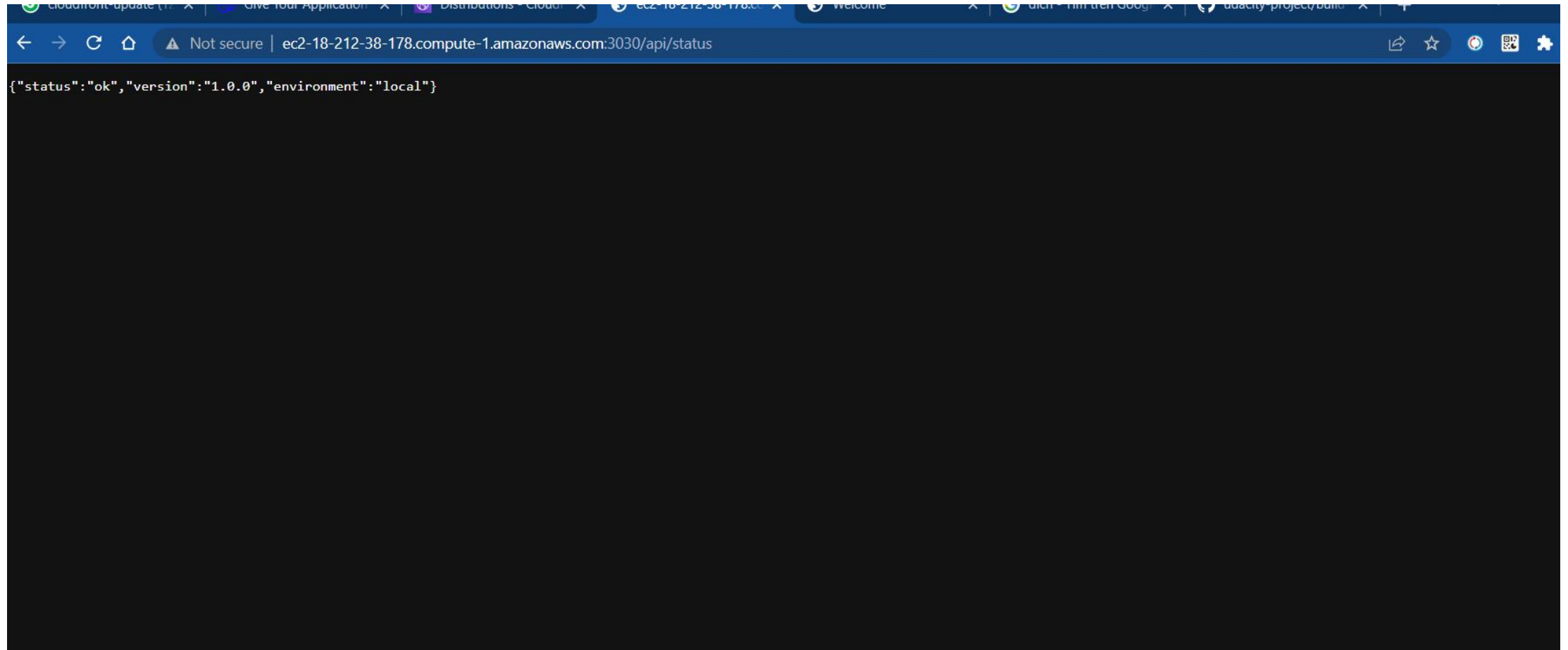
Display Name	Last Name	Email	Tags	Birthdate	Start Date	Action
fsdfs	sfsf	fsdfs@gmail.com		7/10/2023	7/10/2023	
Thuy	Thuy	thuyphanv@gmail.com		7/7/2023	7/7/2023	
thuy2	thuy2	thuyphanv2@gmail.com		7/7/2023	7/7/2023	
thuy3	thuy3	thuyphanv3@gmail.com		7/7/2023	7/7/2023	
thuy4	thuy4	thuy4@gmail.com		7/10/2023	7/10/2023	
thuytest10	thuytest10	thuytest10@gmail.com		7/10/2023	7/10/2023	

Promotion Phase

- **URL03\_SCREENSHOT**

Promotion Phase

**[URL04\_SCREENSHOT]**



# Cleanup Phase

## [SCREENSHOT09]

The screenshot shows a CircleCI pipeline job for user 'phan-van-thuy'. The job is titled 'Spin up environment' and is currently in the 'Get old stack workflow id' step, which has a duration of 1s. The previous steps, 'Preparing environment variables' and 'Checkout code', are also shown with a duration of 0s each. The 'Get old stack workflow id' step contains a bash script that uses AWS CLI to list exports and stacks, and then deletes the old stack. The output of the script shows the old workflow ID as 'udapeople-049f797' and the stack names as 'InitialStack- udapeople-frontend-049f797' and 'udapeople-backend-049f797'. The job status is 'OPERATIONAL'.

app.circeci.com/pipelines/github/phan-van-thuy/udacity-project-03/161/workflows/049f797a-66e9-4809-9dec-cf4182a40307/jobs/1206

phan-van-thuy  
phan-van-thuy

Dashboard  
Projects  
Insights  
Self-Hosted Runners  
Organization Settings  
Plan

Getting Started  
Notifications  
Status **OPERATIONAL**  
Docs  
Orbs  
Support

Spin up environment

Preparing environment variables 0s

Checkout code 0s

Get old stack workflow id 1s

```
1 #!/bin/bash -eo pipefail
2 export OldWorkflowID=$(aws cloudformation list-exports --query "Exports[?Name=='WorkflowID'].Value" --no-paginate --output text)
3 echo OldWorkflowID: "${OldWorkflowID}"
4 echo CIRCLE_WORKFLOW_ID "${CIRCLE_WORKFLOW_ID:0:7}"
5 export STACKS=$(aws cloudformation list-stacks \
6   --query "StackSummaries[*].StackName" \
7   --stack-status-filter CREATE_COMPLETE --no-paginate --output text))
8 echo Stack names: "${STACKS[@]}"
9 if [[ "${STACKS[@]}" =~ "${OldWorkflowID}" ]]
10 then
11   echo "-----your stack to delete-----"
12   aws s3 rm "s3://udapeople-${OldWorkflowID}" --recursive
13   aws cloudformation delete-stack --stack-name "udapeople-backend-${OldWorkflowID}"
14   aws cloudformation delete-stack --stack-name "udapeople-frontend-${OldWorkflowID}"
15 else
16   echo "-----not found stack delete-----"
17 fi
18
19 OldWorkflowID: udapeople-049f797
20 CIRCLE_WORKFLOW_ID 049f797
21 Stack names: InitialStack- udapeople-frontend-049f797 udapeople-backend-049f797
22 -----not found stack delete-----
23 CircleCI received exit code 0
```

## Other Considerations

- **[SCREENSHOT10]**

The screenshot displays the GitHub Actions interface for a workflow named 'default'. The workflow is in a 'Success' state, indicated by a green checkmark and the word 'Success' in a green box. The breadcrumb navigation shows the path: Dashboard > Project > udacity-project-03 > Branch > main > Workflow > default. The workflow details section shows it was triggered by a commit to the 'main' branch with commit ID '247608d' by user 'phan-van-thuy'. The workflow steps are organized into two columns: build and test steps for both frontend and backend. Each step is marked with a green checkmark and its duration.

Step Name	Duration
build-frontend	29s
scan-frontend	59s
test-frontend	1m 19s
build-backend	36s
scan-backend	1m 20s
test-backend	1m 9s

# Run the application

*URL02*

ACKLEN

Employees

View & Manage

Add New

Search in the app

Employees / View & Manage

View & Manage Employees

Add New Employee

Active Archived

Type to filter...

Display Name	Last Name	Email	Tags	Birthdate	Start Date	Action
Thuy	Thuy	thuyphanv@gmail.com		7/7/2023	7/7/2023	
thuy2	thuy2	thuyphanv2@gmail.com		7/7/2023	7/7/2023	
thuy3	thuy3	thuyphanv3@gmail.com		7/7/2023	7/7/2023	
thuy4	thuy4	thuy4@gmail.com		7/10/2023	7/10/2023	

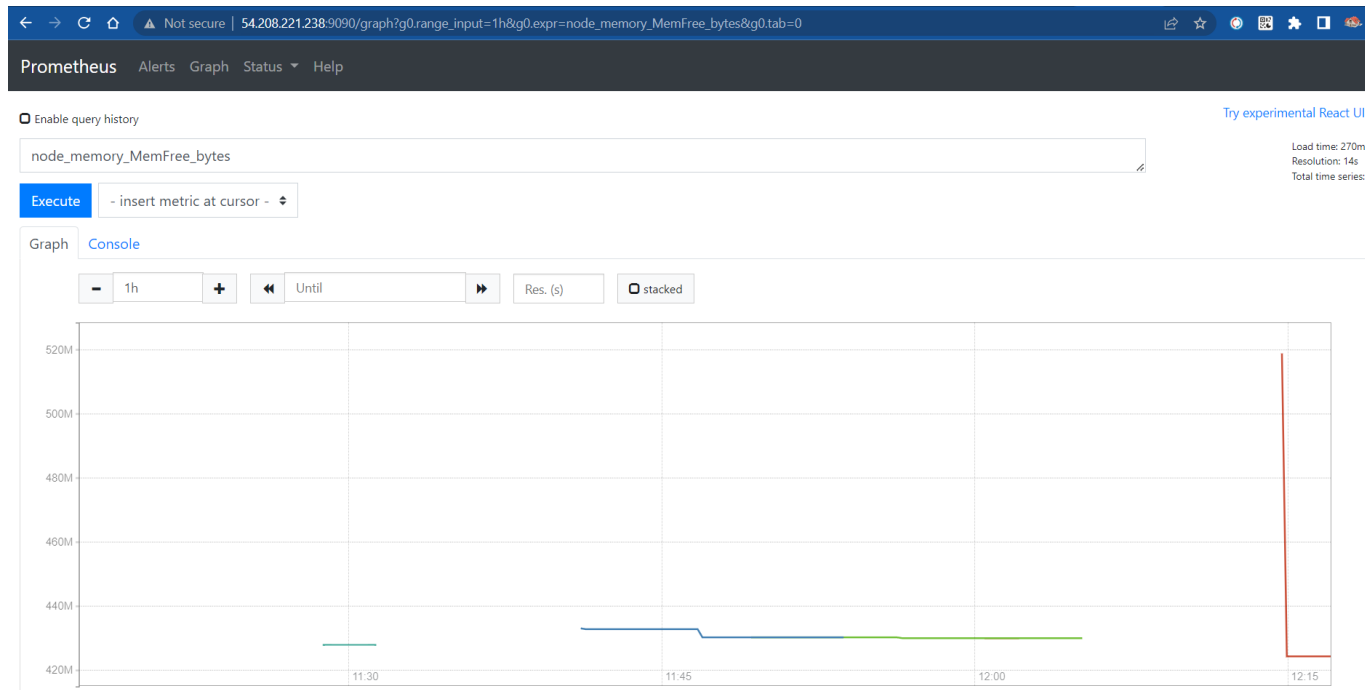


# Setup Back-End Monitoring

- Setup Back-End Monitoring

**[SCREENSHOT11]**

**MEMORY**

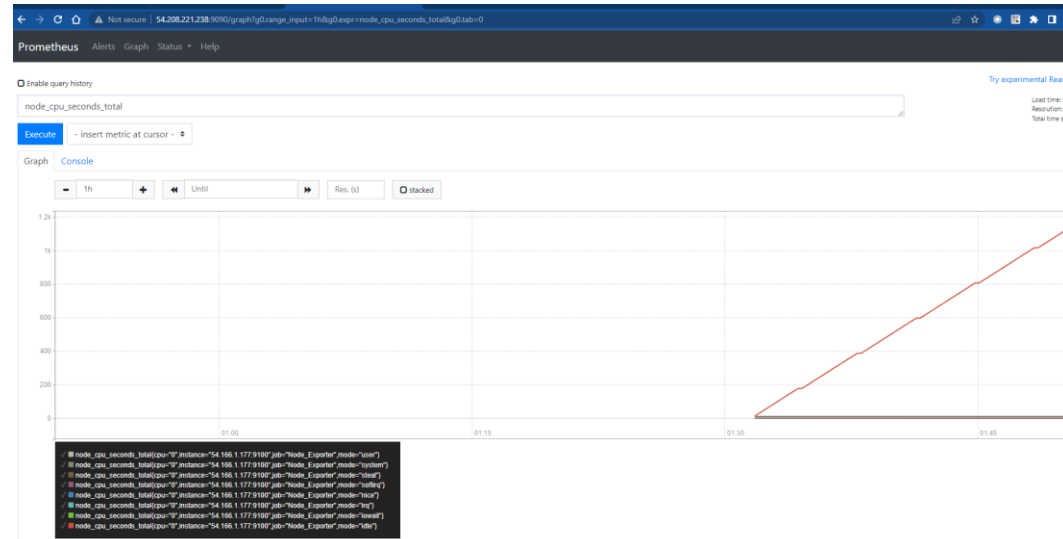


## Setup Back-End Monitoring

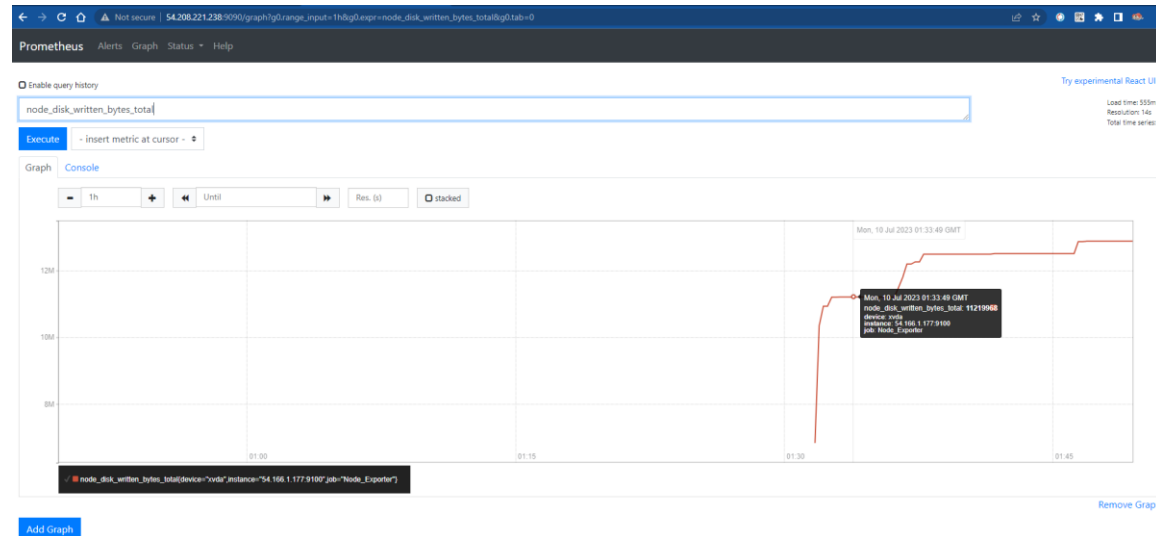
- Setup Back-End Monitoring

[SCREENSHOT11]

CPU



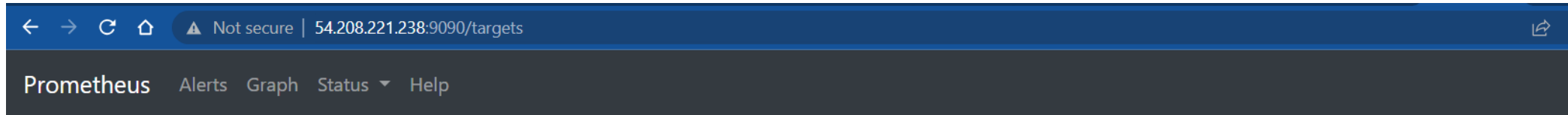
DISK



## Setup Back-End Monitoring

- **[URL05\_SCREENSHOT]**

http://54.208.221.238:9090/targets



## Targets

All Unhealthy

Node\_Exporter (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
<a href="http://54.166.1.177:9100/metrics">http://54.166.1.177:9100/metrics</a>	UP	instance="54.166.1.177:9100" job="Node_Exporter"	342ms ago	12.64ms	

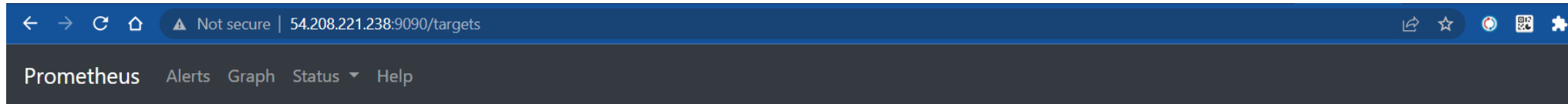
prometheus (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
<a href="http://localhost:9090/metrics">http://localhost:9090/metrics</a>	UP	instance="localhost:9090" job="prometheus"	1.05s ago	5.912ms	

## Setup Back-End Monitoring

- Setup Back-End Monitoring

### [URL05\_SCREENSHOT]



## Targets

All Unhealthy

### Node\_Exporter (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
<a href="http://54.166.1.177:9100/metrics">http://54.166.1.177:9100/metrics</a>	UP	instance="54.166.1.177:9100" job="Node_Exporter"	8.233s ago	13.45ms	

### 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	instance="localhost:9090" job="prometheus"	8.94s ago	5.882ms	

# Setup Alerts

## • [SCREENSHOT12]

