Website deployment CI/CD Pipeline Demo

https://github.com/maniaug81/checkk
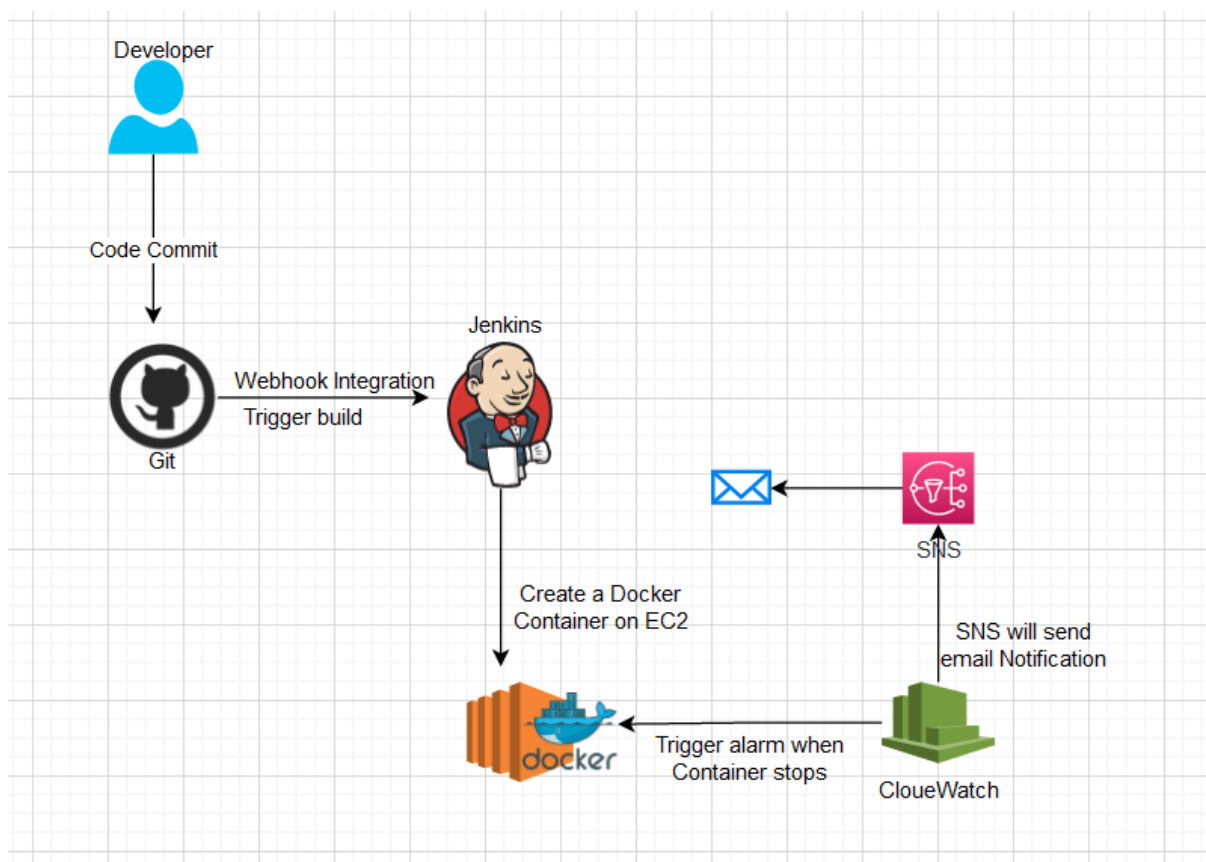
Prepared by:
Manish Kumar
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Perform below mentioned steps to fulfil pre requirements:

1. Create Amazon Linux machine on your AWS account
2. Install Jenkins, Docker and Git on EC2
3. Create a repository in your Github account
4. Download a sample TODO application from GitHub
   I have used this one - https://github.com/tusharnankani/ToDoList
5. Upload the initial code to the repository

Jenkins settings:

- Provide required details in Source Code Management option in your Jenkins project
  a. Create a freestyle item in Jenkins and do required configurations
     i. Source code management - Git
     ii. Provide repo, credentials and branch details.
     iii. Select option - GitHub hook trigger for GITScm polling
     iv. In build steps mention the shell script you want to execute with command line arguments
     v. Click on Apply and Save

Source Code Management

○ None

● Git ?

Repositories ?

Repository URL ?   ✕

https://github.com/maniaug81/checkk

Credentials ?

maniaug81/****** (github username and password)   ⌄

[+ Add]

[Advanced...]

[Add Repository]

Branches to build ?

Branch Specifier (blank for 'any') ?   ✕

*/main

[Save] [Apply]

Build Triggers

☐ Trigger builds remotely (e.g., from scripts) ?

☐ Build after other projects are built ?

☐ Build periodically ?

☑ GitHub hook trigger for GITScm polling ?

☐ Poll SCM ?

Build Steps

≡ **Execute shell** ?

Command

See the list of available environment variables

```
chmod +x build.sh
./build.sh $BUILD_NUMBER
```

Advanced...

Add build step ▾

GitHub settings:

- In your Github repository click on Settings and then Webhook
    a. Payload URL will have Jenkins URL in format
       http://<ip address>/github-webhook/

    b. Content-type should be selected as application/json
- Select on which events you want to trigger the Jenkins Job
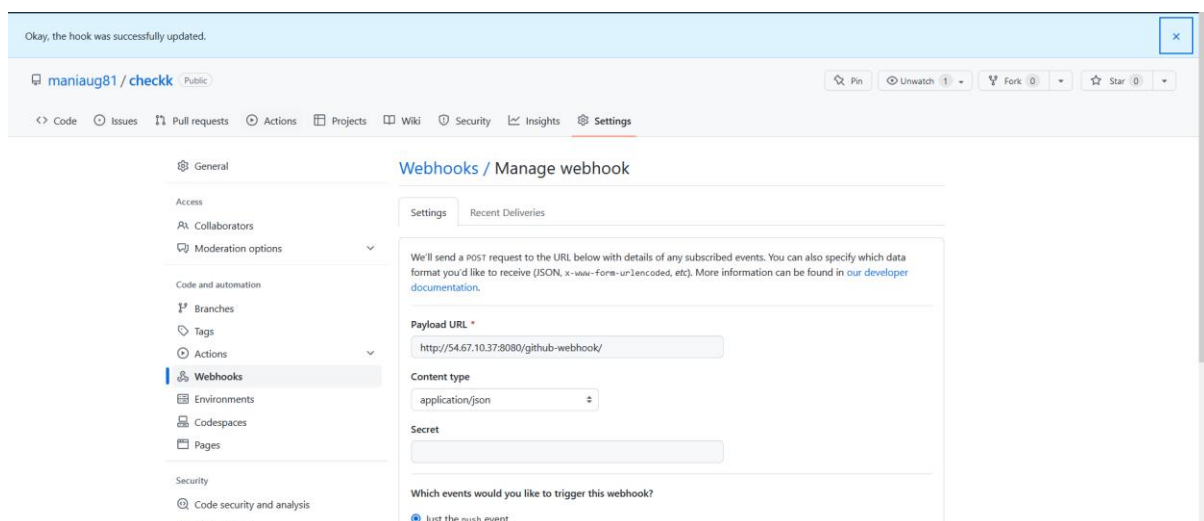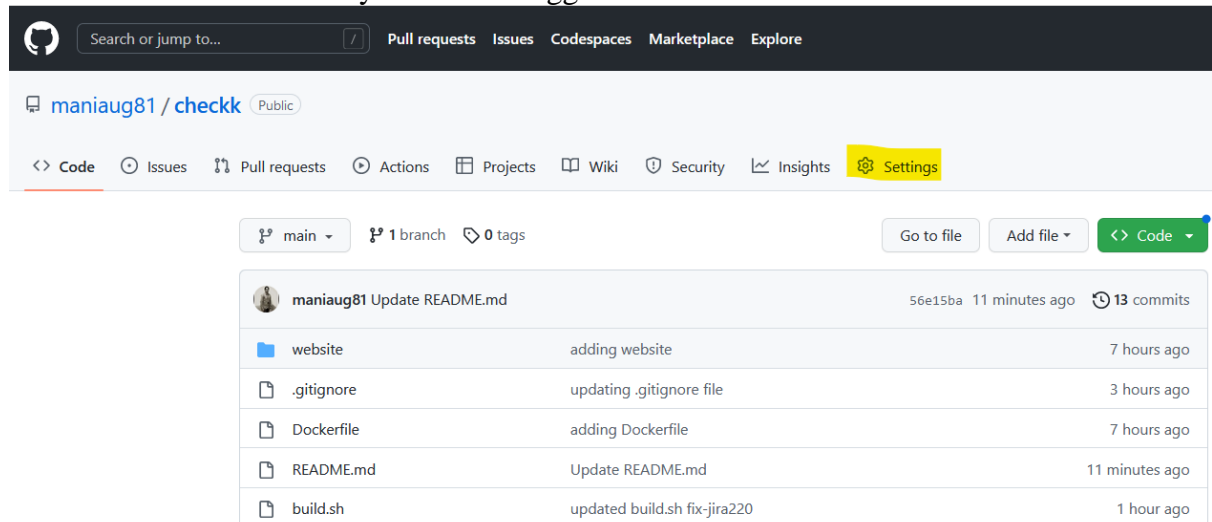
- Once a code commit is done, it will trigger the Jenkins job. It can be seen in below image that it is mentioned the job is triggered by GitHub Push

Status

</> Changes

▷_ Console Output

☑ Edit Build Information

🗑 Delete build '#23'

📋 Polling Log

◆ Git Build Data

← Previous Build

✓ **Build #23 (Mar 22, 2023, 1:56:03 AM)**

Keep this build forever

Started 1 min 23 sec ago

✏ Add description   Took **9.7 sec**

</> Changes

1. Update README.md (**details** / **githubweb**)
2. Update README.md (**details** / **githubweb**)
3. changed docker container port to 80 (**details** / **githubweb**)
4. changed docker container port to 80 (**details** / **githubweb**)
5. changed docker container port to 80 (**details** / **githubweb**)
6. changed docker container port to 80 (**details** / **githubweb**)
7. changed docker container port to 80 (**details** / **githubweb**)
8. added code to delete old image (**details** / **githubweb**)
9. added code to delete old image (**details** / **githubweb**)
10. added code to delete old image (**details** / **githubweb**)

🕐 **Started by GitHub push by maniaug81**

◆ git   **Revision**: 8078d481b59900e93d2933d2aae1e580479521dd
Repository: https://github.com/maniaug81/checkk

  • refs/remotes/origin/main

- Once the job is executed successfully, the image and container can be verified by logging into the EC2

```
[root@ip-192-168-2-71 ~]# docker images
REPOSITORY              TAG      IMAGE ID       CREATED            SIZE
maniaug81/my-custom-todo  23       62053c30dfda   About a minute ago  146MB
httpd                   2.4      daab1fa13f86   2 weeks ago        145MB
[root@ip-192-168-2-71 ~]# docker ps -a
CONTAINER ID   IMAGE                      COMMAND             CREATED            STATUS            PORTS                            NAMES
62762cafa1b1   maniaug81/my-custom-todo:23  "httpd-foreground"  About a minute ago  Up About a minute  0.0.0.0:80->80/tcp, :::80->80/tcp  mycustomtodo
[root@ip-192-168-2-71 ~]#
```

- Go to your EC2 and find the public IP

EC2 > Instances > i-081b176013e55f9fc > Connect to instance

Connect to instance Info

Connect to your instance i-081b176013e55f9fc (ManishASG-tf-pub) using any of these options

EC2 Instance Connect	**Session Manager**	**SSH client**	**EC2 serial console**

Instance ID

shASG-tf-pub)

⊘ Public IP address copied

🗗 54.67.10.37

User name

Enter the user name defined in the AMI used to launch the instance. If you didn't define a custom user name, use the default user name, root.
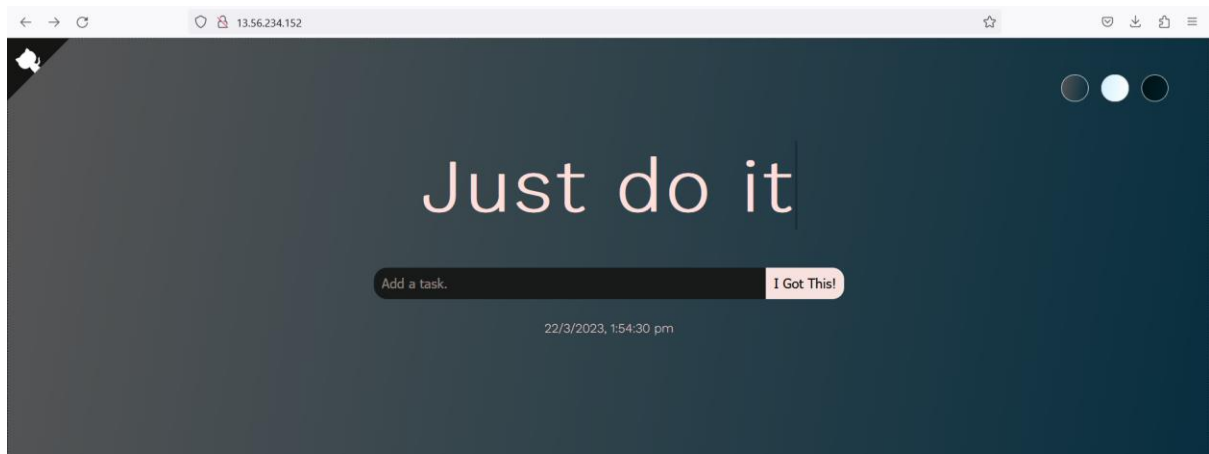
root

ⓘ **Note:** In most cases, the default user name, root, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.
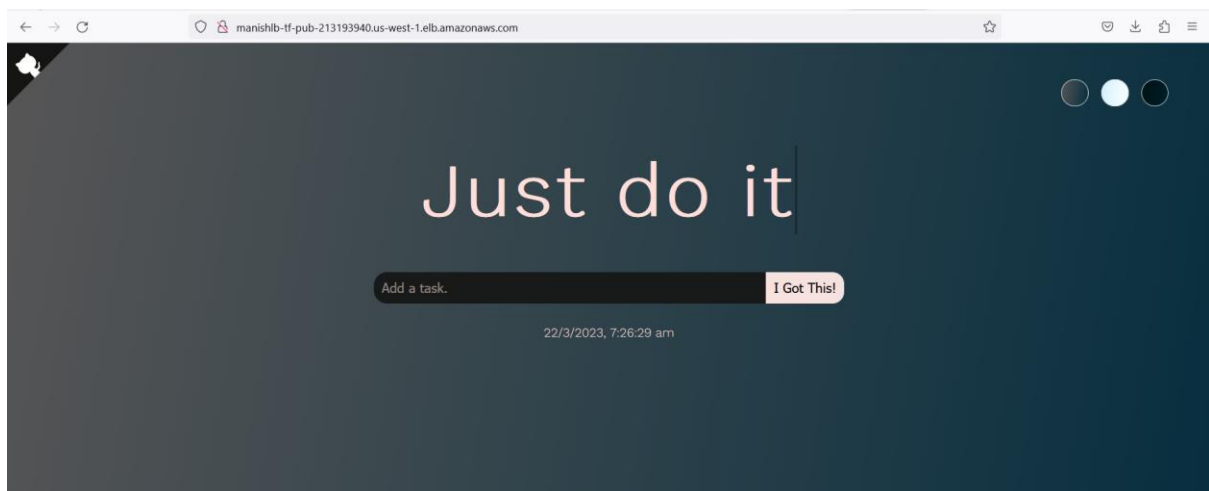
Cancel   **Connect**

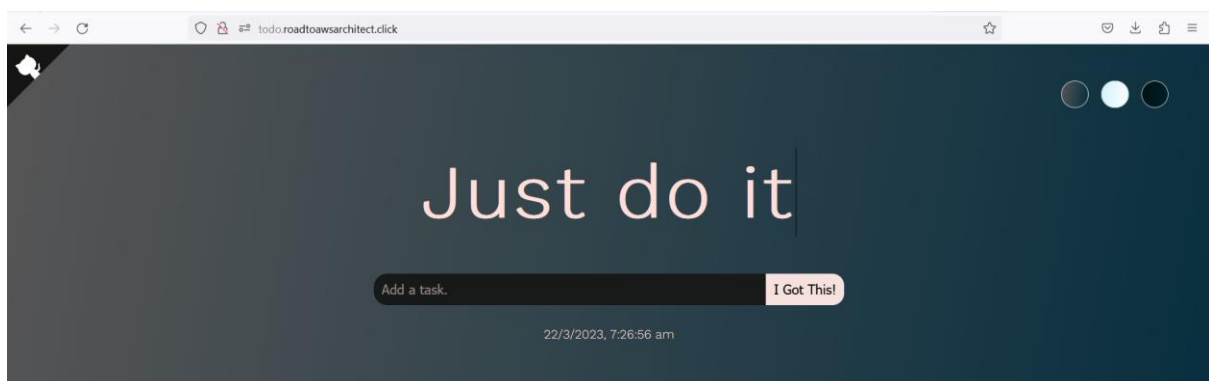- Enter the URL in browser to see the web app running as a docker container
  http://13.56.234.152/

- **Accessing the website from Load balancer**

- **Accessing the website using Route53 DNS name**

Create Cloudwatch alarm when the container is stopped

- Create an IAM role as follows

- Attach this role to your EC2 where the container is running

- Create a log group in Cloudwatch

- Perform some operations on your container, the container logs will start going to Cloudwatch log group

Log events

You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns ☑

[C] [Actions ▼] [Create metric filter]

🔍 Filter events

[Clear] [1m] [30m] [1h] [12h] [Custom ⊞] [Display ▼] ⚙

▶	Timestamp	Message
		No older events at this moment. *Retry*
▶	2023-03-22T12:40:04.931+05:30	AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.3. Set the 'ServerName' directive glo...
▶	2023-03-22T12:40:04.934+05:30	AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.3. Set the 'ServerName' directive glo...
▶	2023-03-22T12:40:04.936+05:30	[Wed Mar 22 07:10:04.936511 2023] [mpm_event:notice] [pid 1:tid 140567289126208] AH00489: Apache/2.4.56 (Unix) configured -- resuming norma...
▶	2023-03-22T12:40:04.936+05:30	[Wed Mar 22 07:10:04.936764 2023] [core:notice] [pid 1:tid 140567289126208] AH00094: Command line: 'httpd -D FOREGROUND'
▶	2023-03-22T12:40:41.987+05:30	49.206.123.157 - - [22/Mar/2023:07:10:41 +0000] "GET / HTTP/1.1" 200 3497
▶	2023-03-22T12:40:42.348+05:30	49.206.123.157 - - [22/Mar/2023:07:10:42 +0000] "GET /CSS/main.css HTTP/1.1" 200 7068
▶	2023-03-22T12:40:42.360+05:30	49.206.123.157 - - [22/Mar/2023:07:10:42 +0000] "GET /CSS/corner.css HTTP/1.1" 200 604
▶	2023-03-22T12:40:42.656+05:30	49.206.123.157 - - [22/Mar/2023:07:10:42 +0000] "GET /JS/main.js HTTP/1.1" 200 6235
▶	2023-03-22T12:40:42.661+05:30	49.206.123.157 - - [22/Mar/2023:07:10:42 +0000] "GET /JS/time.js HTTP/1.1" 200 89
▶	2023-03-22T12:40:42.984+05:30	49.206.123.157 - - [22/Mar/2023:07:10:42 +0000] "GET /assets/favicon.png HTTP/1.1" 200 848
▶	2023-03-22T12:41:19.412+05:30	container-stop
▶	2023-03-22T12:45:05.859+05:30	[Wed Mar 22 07:15:05.857164 2023] [mpm_event:notice] [pid 1:tid 140567289126208] AH00492: caught SIGWINCH, shutting down gracefully
		No newer events at this moment. *Auto retry paused.* **Resume**

- Create a "Metric Filter" in your Cloudwatch log group

Step 1
Define pattern

Step 2
Assign metric

Step 3
Review and confirm

Define pattern

Create filter pattern

You can use metric filters to monitor events in a log group as they are sent to CloudWatch Logs. You can monitor and count specific terms or extract values from log events and associate the results with a metric. **Learn more about pattern syntax.** ☑

Filter pattern
Specify the terms or pattern to match in your log events to create metrics.

[shutting down gracefully   ✕]

Test pattern

Select log data to test

[1dcfbca3dd7b55b697099adeea373a15f8f57082831212b4dadf03b45d574... ▼]

Log event messages
Type log data to test with your Filter Pattern. Please use line breaks to separate log events.

```
s HTTP/1.1" 200 6235
s HTTP/1.1" 200 89
vicon.png HTTP/1.1" 200 848

d 140567289126208] AH00492: caught SIGWINCH, shutting down gracefully
```

[**Test pattern**]

- Create a new CloudWatch alarm based on this Metric and select SNS notification where you want to send the notification
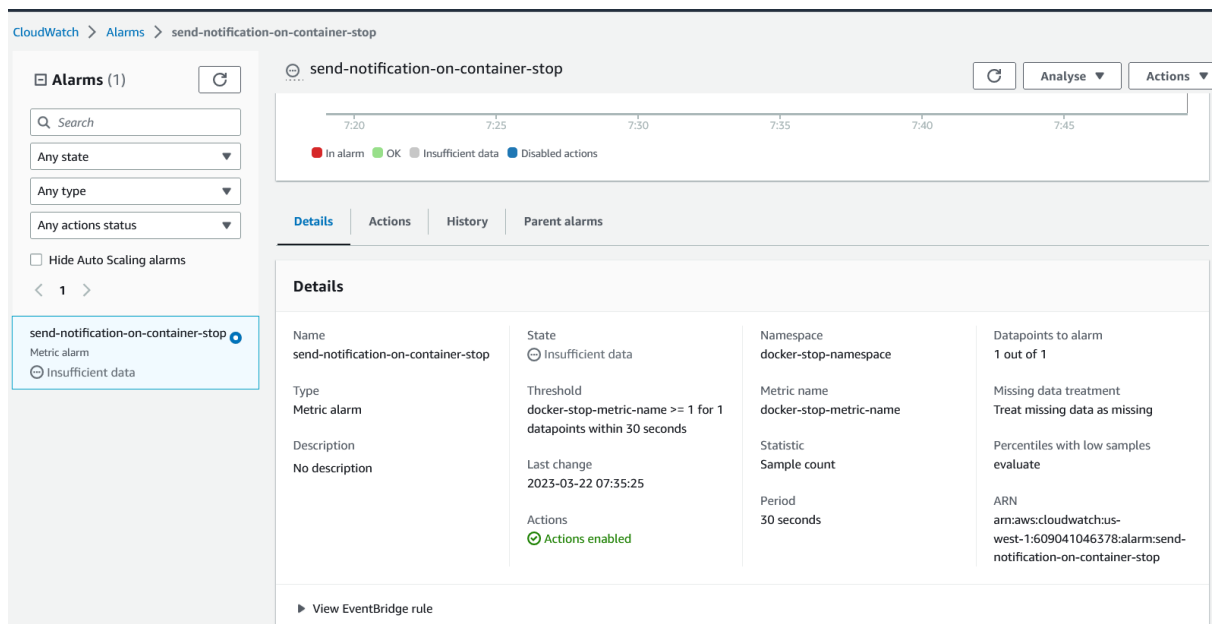
- When the container is stopped, it triggered the alarm

- Email notification received on the email ID specified while creating Topic

ALARM: "send-notification-on-container-stop" in US West (N. California) ⅀ Inbox ×

AWS Notifications <no-reply@sns.amazonaws.com>   1:25 PM (5 minutes ago)   ☆   ↩   ⋮
to me ▾

You are receiving this email because your Amazon CloudWatch Alarm "send-notification-on-container-stop" in the US West (N. California) region has entered the ALARM state, because "Threshold Crossed: 1 out of the last 1 datapoints [1.0 (22/03/23 07:54:00)] was greater than or equal to the threshold (1.0) (minimum 1 datapoint for OK -> ALARM transition)." at "Wednesday 22 March, 2023 07:55:07 UTC".
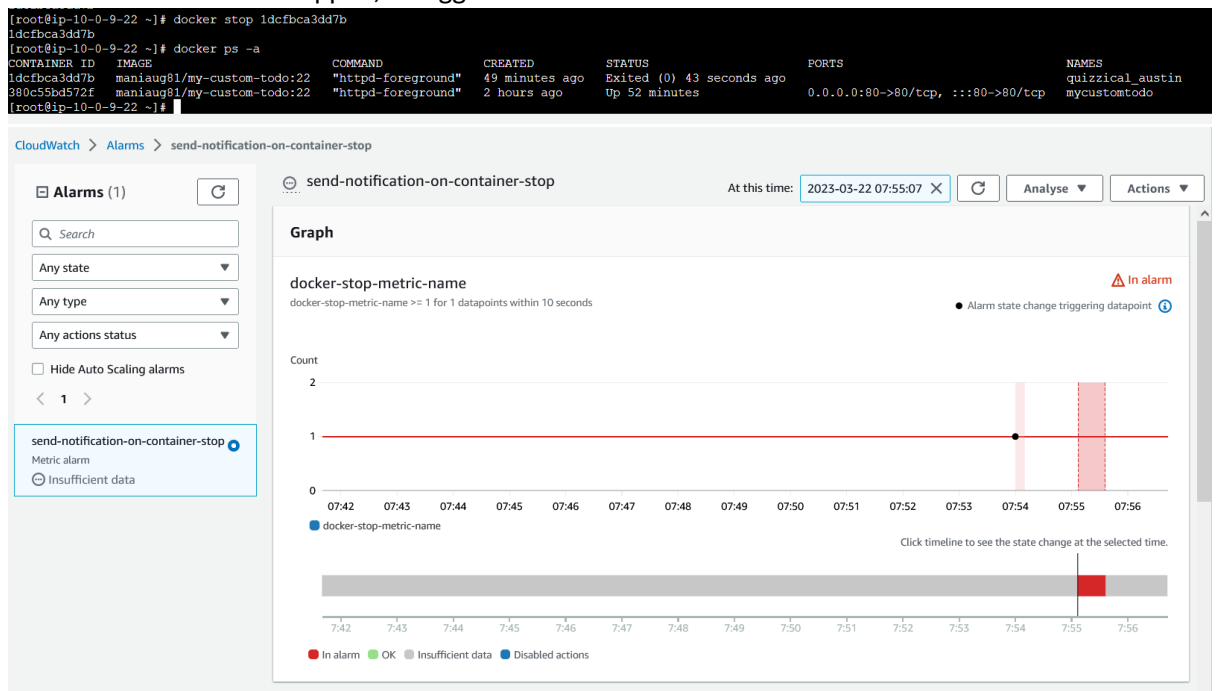
View this alarm in the AWS Management Console:
https://us-west-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=us-west-1#alarmsV2:alarm/send-notification-on-container-stop

Alarm Details:
- Name: send-notification-on-container-stop
- Description:
- State Change: INSUFFICIENT_DATA -> ALARM
- Reason for State Change: Threshold Crossed: 1 out of the last 1 datapoints [1.0 (22/03/23 07:54:00)] was greater than or equal to the threshold (1.0) (minimum 1 datapoint for OK -> ALARM transition).
- Timestamp: Wednesday 22 March, 2023 07:55:07 UTC
- AWS Account:
- Alarm Arn: arn:aws:cloudwatch:us-west-1:   alarm:send-notification-on-container-stop

Threshold:
- The alarm is in the ALARM state when the metric is GreaterThanOrEqualToThreshold 1.0 for at least 1 of the last 1 period(s) of 10 seconds.

Monitored Metric:
- MetricNamespace: docker-stop-namespace
- MetricName: docker-stop-metric-name
- Dimensions:
- Period: 10 seconds