Cloud Photo Sharing App

Cloud Computing course project - 2024

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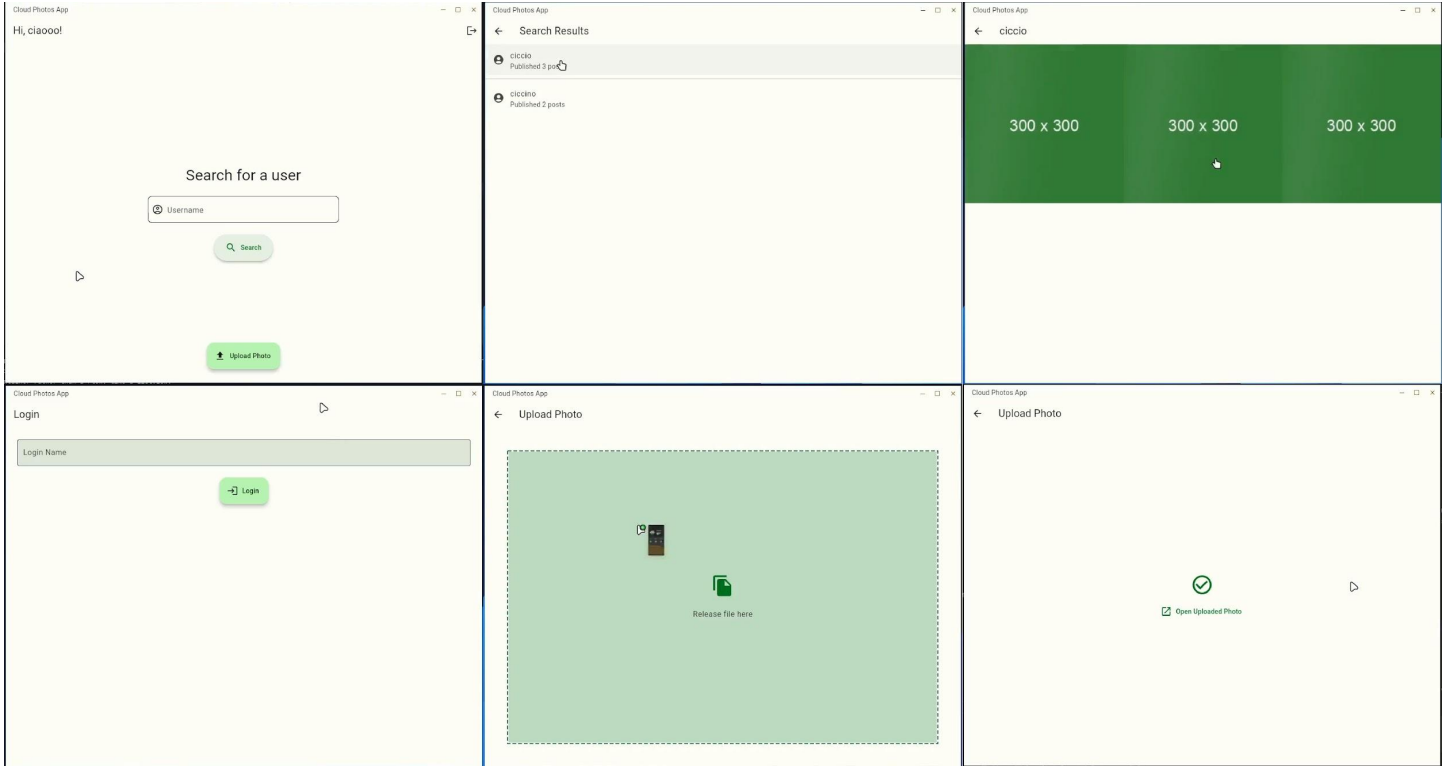
Idea

Idea

Scalable and Highly-Available application for photo sharing

Users upload photos using their own username and can see each other's pictures

App features



App implementation

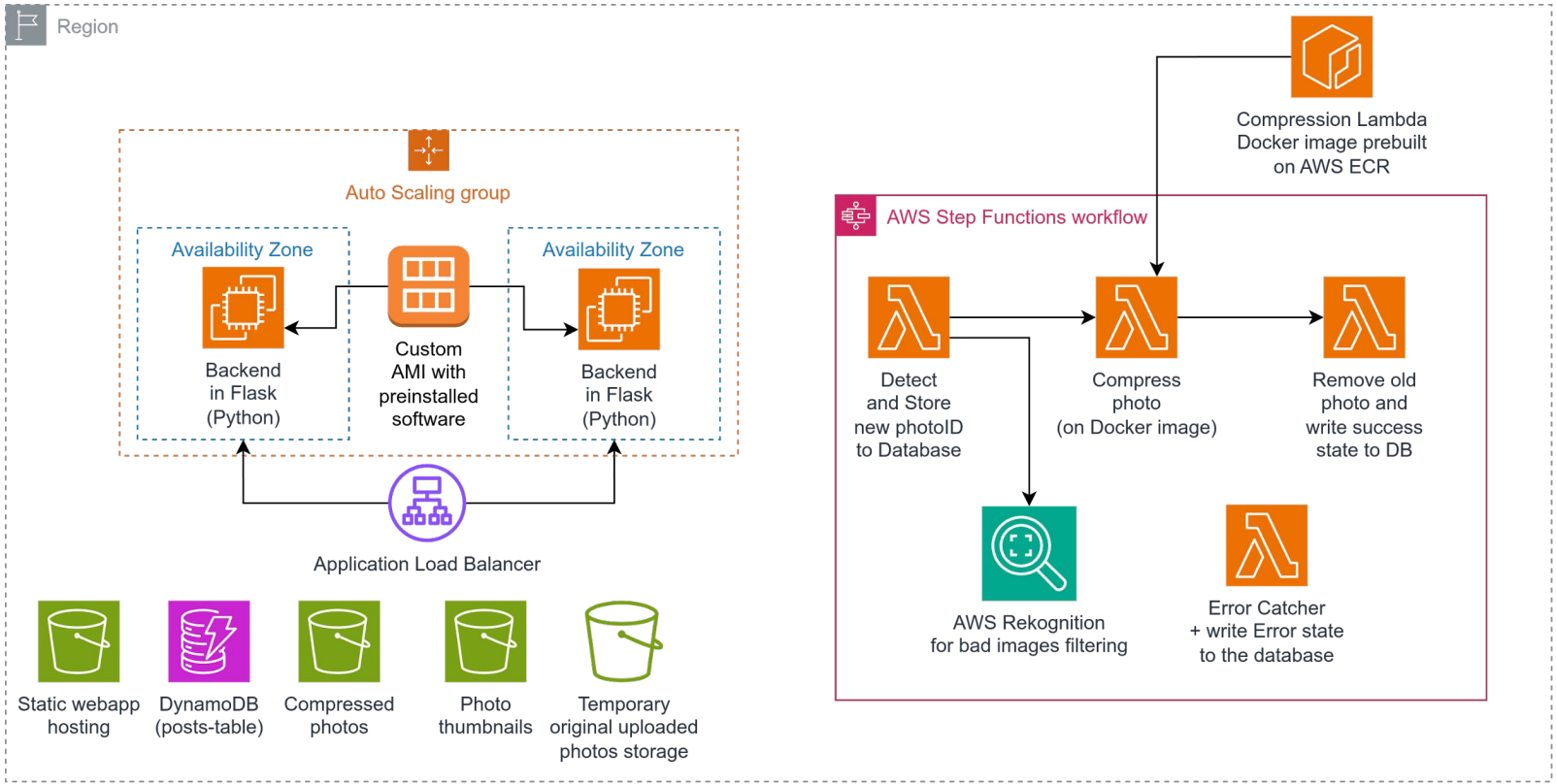
Flutter, making it a multiplatform application (Android, iOS, web and even desktop)

Flask, for the main backend

Python in Docker container, for the Lambda functions, integrating **imagemagick**

Of course, **boto3** library

Cloud implementation



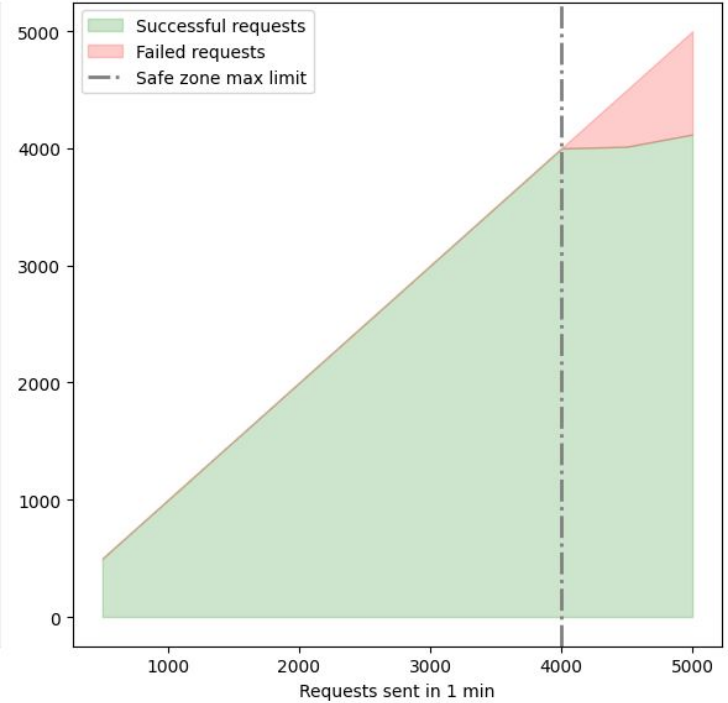
EC2 Testing

Backend tests

We tested the backend for load balancing and availability

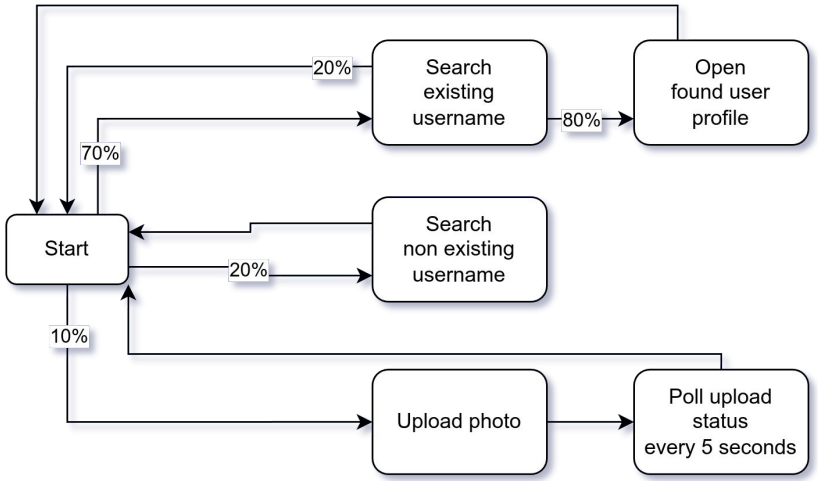
The load balancing is implemented using the AWS EC2 Autoscaling

Availability tests involve simulating instances failures



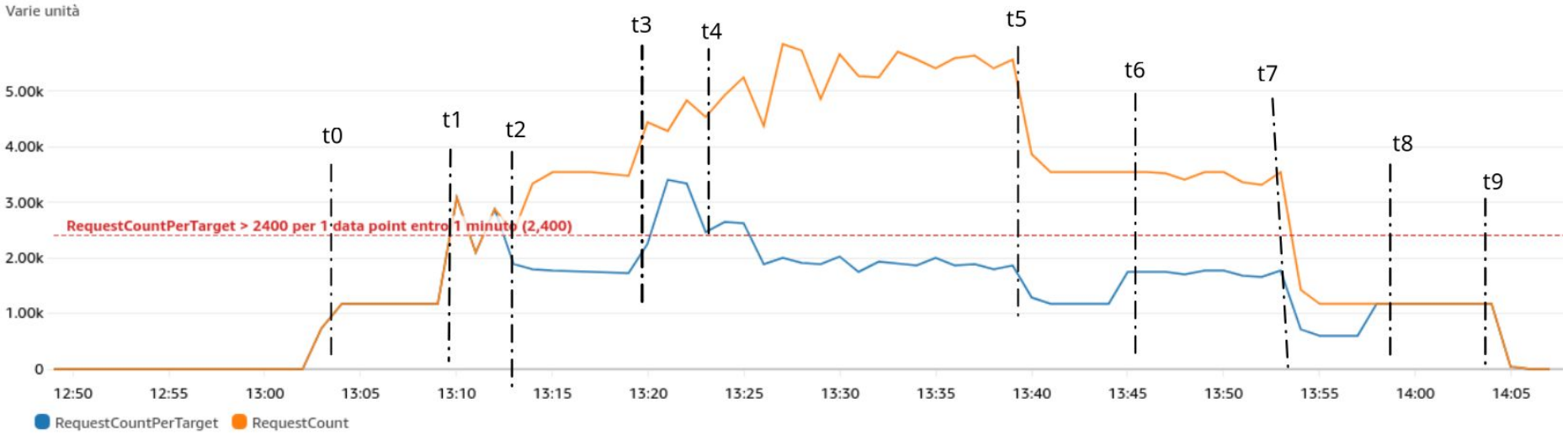
We had to identify the maximum theoretical load for this backend

Model the user as a random process

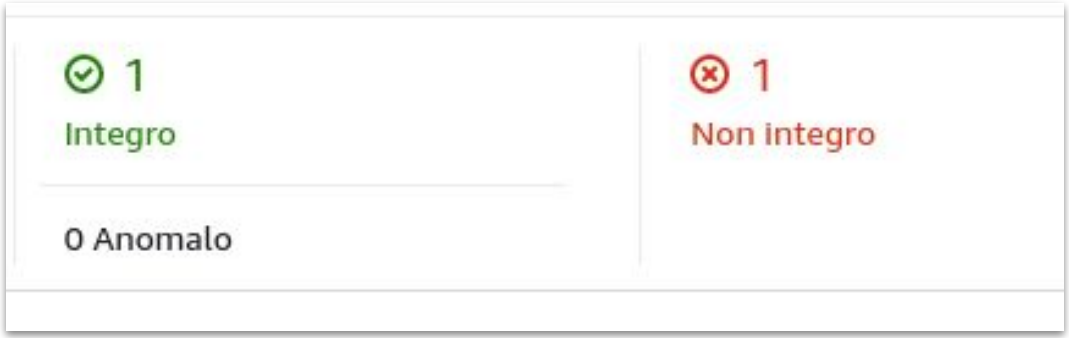


Effectively simulating the user is crucial for the fidelity of the experiment

Load Test results



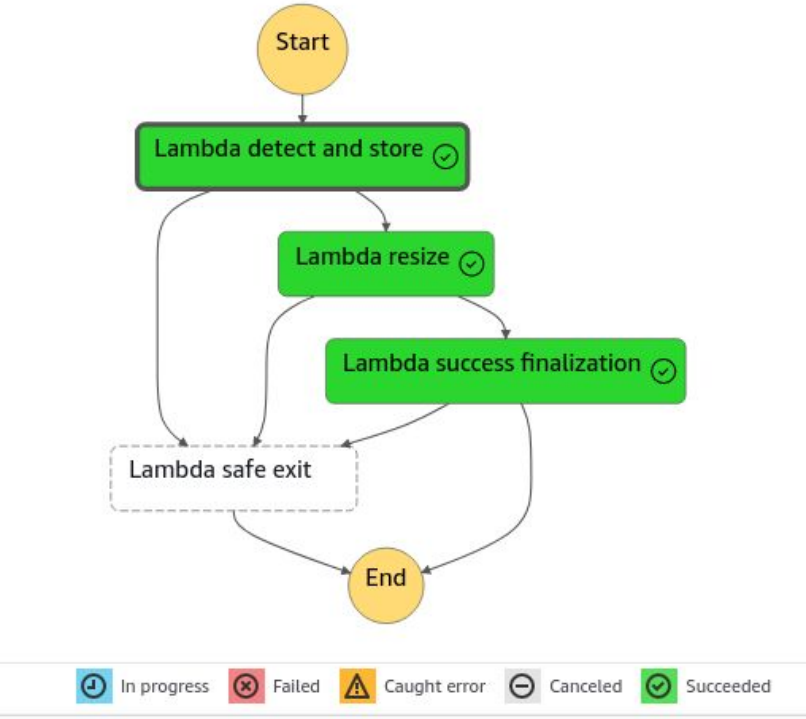
Availability test - simulating instances failures



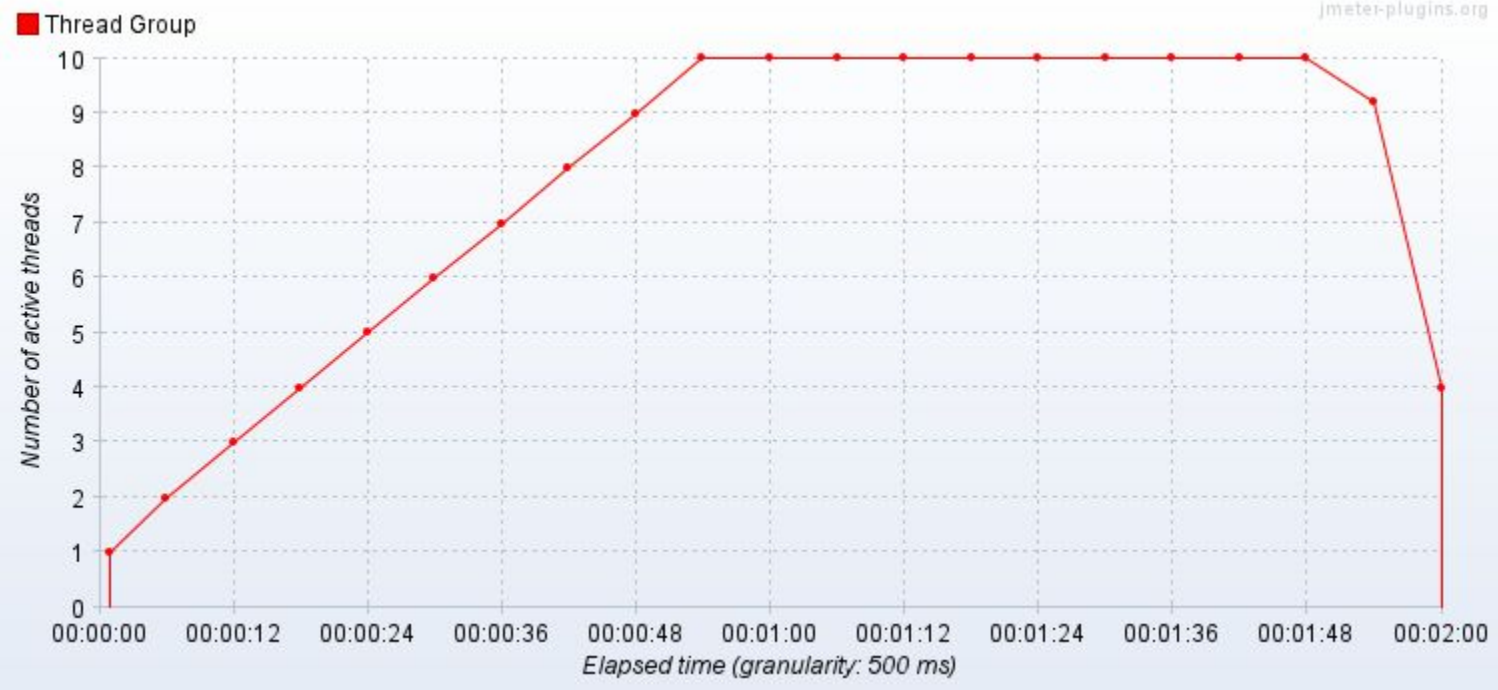
Availability test - simulating instances failures

Step Function testing

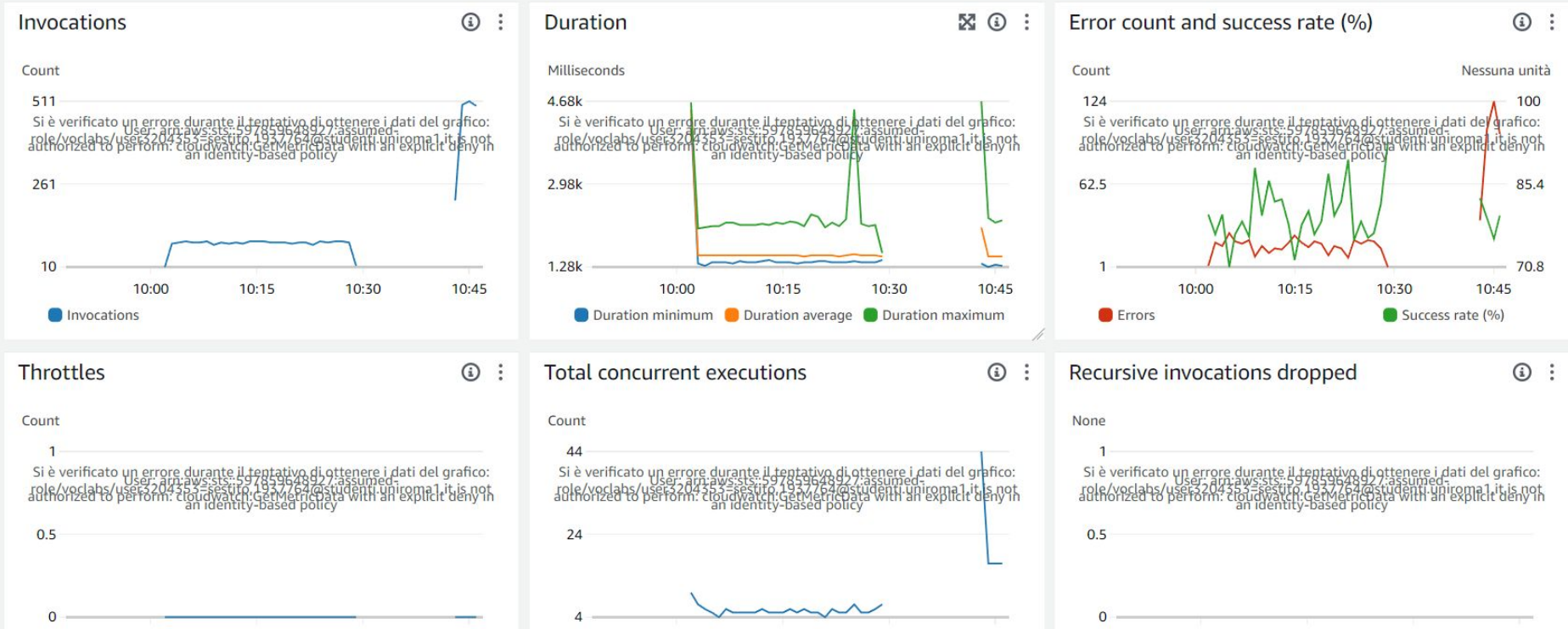
Successful workflow



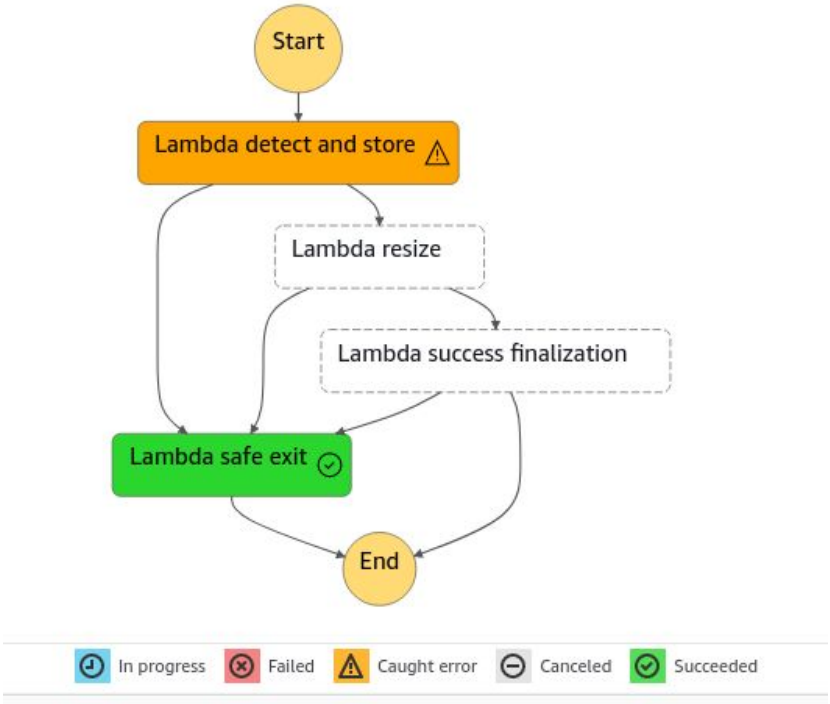
Other stress tests were made on the step function to get metrics associated with the lambda function



# Samples	Avg	Min	Max	Error %	Throughput	Received Kb/s	Sent Kb/s	Avg. bytes
16	12,8	4,9	91,4	0.00%	0.135	0.59	0.65	448.9

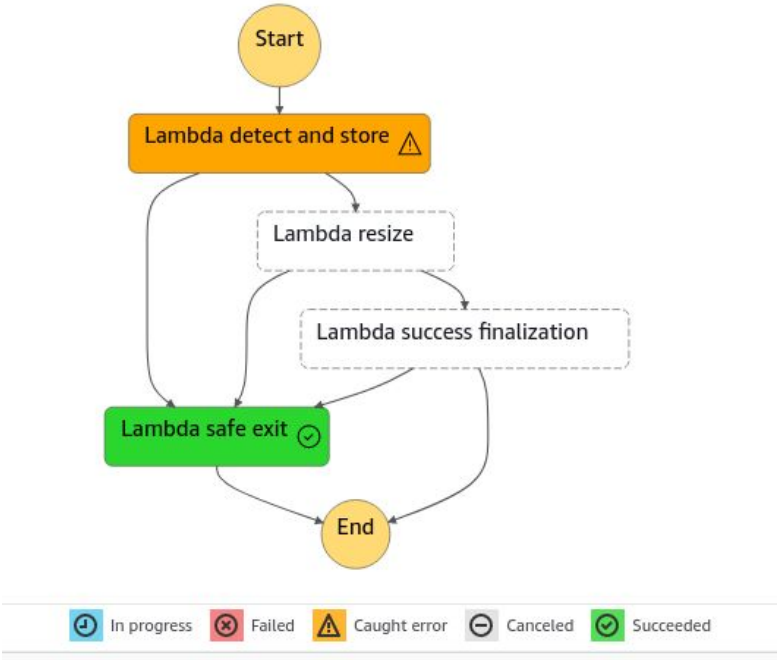

Invocations
Count
511
261
10
10:00
10:15
10:30
10:45
Invocations
Duration
Milliseconds
4.68k
2.98k
1.28k
10:00
10:15
10:30
10:45
Duration minimum
Duration average
Duration maximum
Error count and success rate (%)
Count
Nessuna unità
124
62.5
1
100
85.4
70.8
10:00
10:15
10:30
10:45
Errors
Success rate (%)
Si è verificato un errore durante il tentativo di ottenere i dati del grafico: User: arn:aws:sts::597859648927:assumed-role/voclabs/user3204353=sestito.1937764@studenti.uniroma1.it.is not authorized to perform: cloudwatch:GetMetricData with an explicit deny in an identity-based policy
Throttles
Count
1
0.5
0
Total concurrent executions
Count
44
24
4
Recursive invocations dropped
None
1
0.5
0

Errored workflow

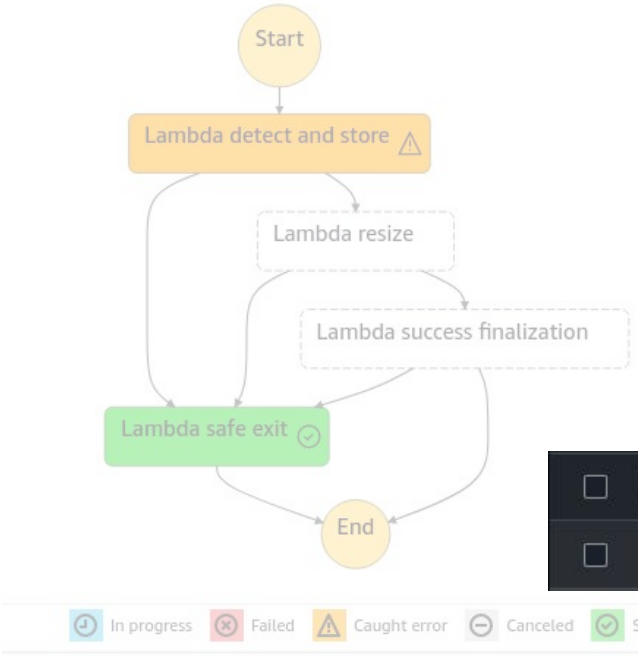


How to improve availability from the step function itself.

Availability test - simulating step function failure



Availability test - simulating step function failure



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Thanks for the attention