

UDACITY

Cloud Capstone Project

Serverless Application

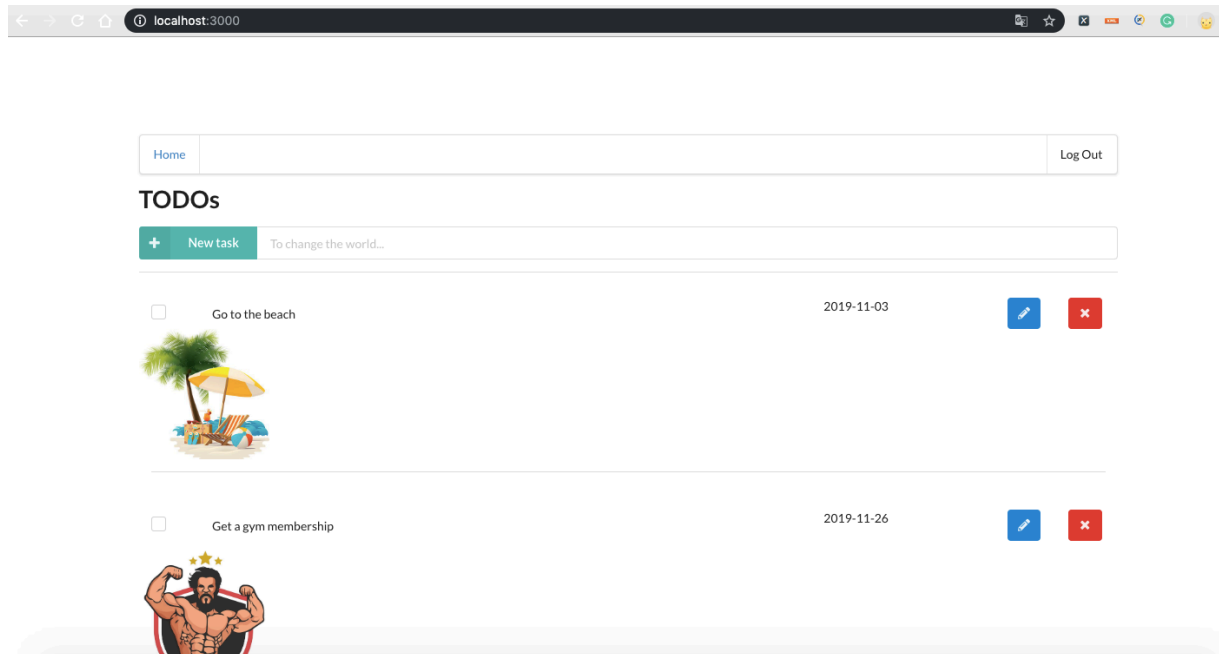
Prepared by:

Asrar Meshal Albeshri

Cloud Developer Nanodegree program

Project Screenshots

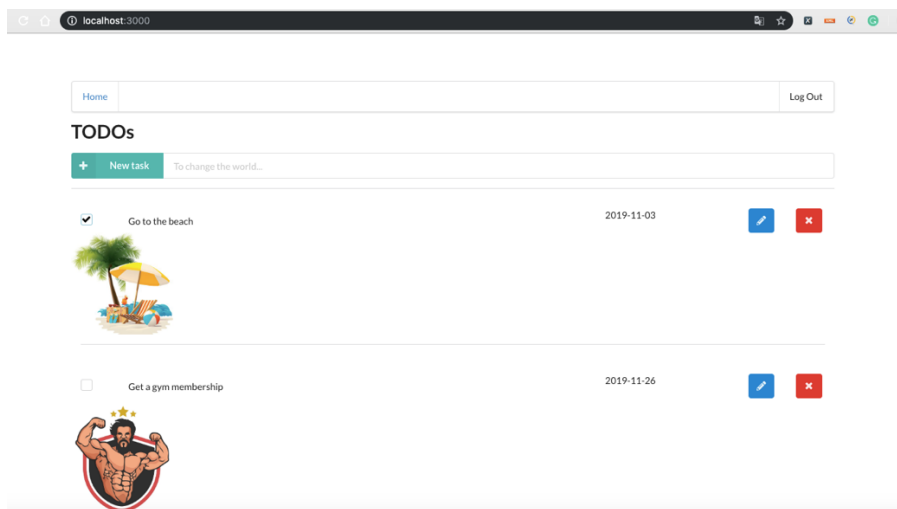
To Do web application



Some details about the project

User can do the following:

- Create a new to-do task,
- Upload Image (optionally),
- Update to do task status if done or not (as shown in the following picture),



- And, delete a to-do task.

Also, the application applies the following features and services:

Sorting the items:

I have sorted a to-do list based on the due date in ascending order (as shown in the above picture).

Elasticsearch Service:

I have made an Elasticsearch cluster to allow full-text search (as shown in the following picture).

The screenshot shows the AWS Management Console for an Elasticsearch cluster named 'todos-search-dev'. The left sidebar contains navigation links for Dashboard, My domains, todos-search-dev, and Reserved instances. The main panel displays the cluster overview with tabs for Overview, Cluster health, Instance health, Indices, Logs, and Upgrade history. The Overview tab is active, showing the following details:

- Domain status: Active
- Elasticsearch version: 6.3
- Endpoint: <https://search-todos-search-dev-sgmpqjzvxskfnxx27kb4fid7je.us-east-1.es.amazonaws.com>
- Domain ARN: arn:aws:es:us-east-1:420095622374:domain/todos-search-dev
- Kibana: https://search-todos-search-dev-sgmpqjzvxskfnxx27kb4fid7je.us-east-1.es.amazonaws.com/_plugin/kibana/
- Availability zones: 1
- Instance type: t2.small.elasticsearch
- Number of instances: 1
- Storage type: EBS
- EBS volume type: General Purpose (SSD)
- EBS volume size: 10 GB
- Require HTTPS: Disabled
- Encryption at rest: Disabled
- Node-to-node encryption: Disabled

At the bottom of the console, there are links for Feedback, English (US), and a copyright notice for Amazon Web Services, Inc. or its affiliates.

Elasticsearch cluster overview

The screenshot shows the Kibana interface for the 'todos-index'. The left sidebar contains navigation links for Discover, Visualize, Dashboard, Timelion, Alerting, Dev Tools, and Management. The main panel displays a search for 'todos-index' with 7 hits. The search bar shows the query 'Search... (e.g. status:200 AND extension:PHP)'. The results are displayed in a table with columns for _source, _id, _type, _index, and _score. The table shows three search results for the 'todos-index'.

Time	_source
October 27th 2019, 04:25:13.522	<pre>{ "todoId": "6fcc76d4-0490-4235-895f-9d3487ae68b0", "userId": "google-oauth2 112173174920085927725", "name": "Be happy", "createdAt": "October 27th 2019, 04:25:13.522", "dueDate": "June 13th 2019, 03:00:00.000", "done": false, "attachmentUrl": "https://serverless-todo-imgs-dev.s3.amazonaws.com/6fcc76d4-0490-4235-895f-9d3487ae68b0", "id": "6fcc76d4-0490-4235-895f-9d3487ae68b0", "type": "images", "index": "todos-index", "score": - }</pre>
October 27th 2019, 03:53:50.563	<pre>{ "todoId": "b7fd9240-e568-414e-8a18-f3742018f946", "userId": "google-oauth2 112173174920085927725", "name": "Get a gym membership", "createdAt": "October 27th 2019, 03:53:50.563", "dueDate": "November 26th 2019, 03:00:00.000", "done": false, "attachmentUrl": "https://serverless-todo-imgs-dev.s3.amazonaws.com/b7fd9240-e568-414e-8a18-f3742018f946", "id": "b7fd9240-e568-414e-8a18-f3742018f946", "type": "images", "index": "todos-index", "score": - }</pre>
October 27th 2019, 03:53:07.848	<pre>{ "todoId": "475b0ad1-96b5-43e4-b1ff-cd7cd22d37c5", "userId": "google-oauth2 112173174920085927725", "name": "Learn something new", "createdAt": "October 27th 2019, 03:53:07.848", "dueDate": "November 26th 2019, 03:00:00.000", "done": false, "attachmentUrl": "https://serverless-todo-imgs-dev.s3.amazonaws.com/475b0ad1-96b5-43e4-b1ff-cd7cd22d37c5", "id": "475b0ad1-96b5-43e4-b1ff-cd7cd22d37c5", "type": "images", "index": "todos-index", "score": - }</pre>

Kibana Interface for to do Elasticsearch cluster

Distributed tracing: x-ray tracing:

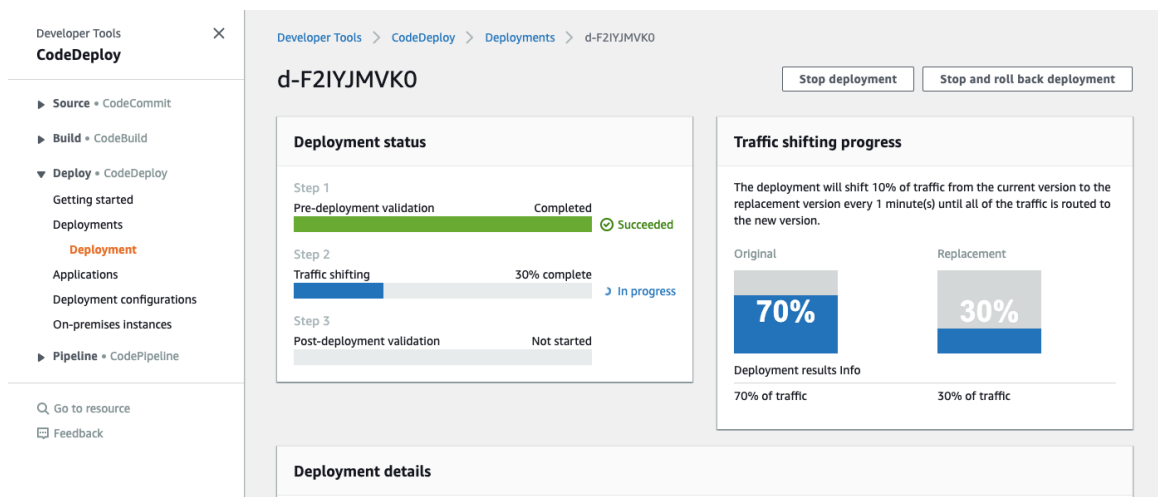
I have created an AWS X-ray to implement distributed tracing and send information about executed requests.



For example, when the user creates a to-do task, the APIGateway will verify the user through the auth lambda function. If the user is validated, the data will be saved in dynamodb table.

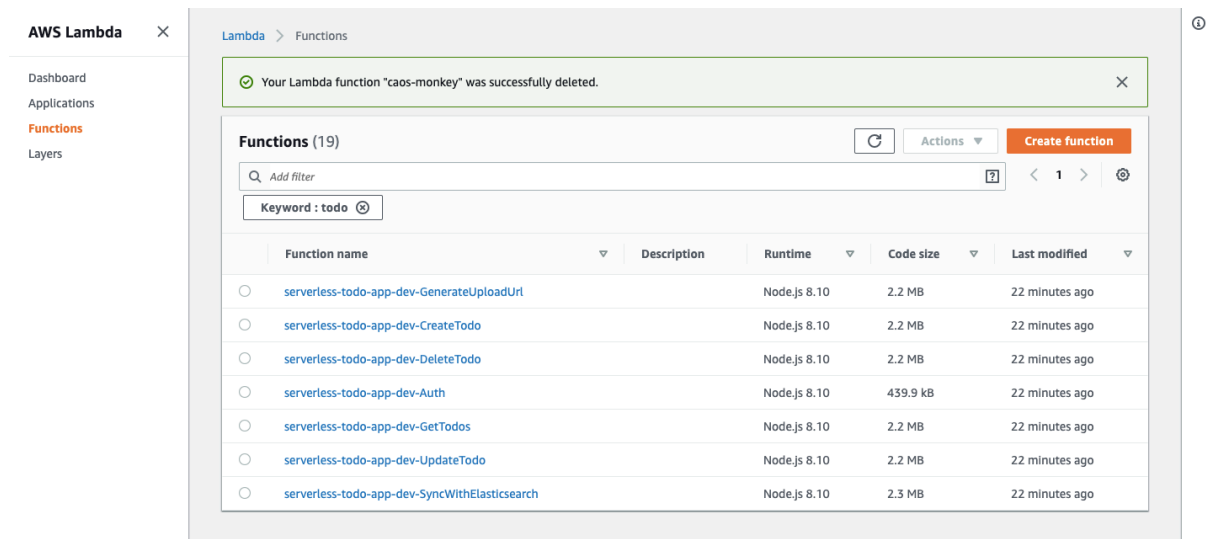
Canary deployment:

I have made canary deployment to deploy and test the new version of the application. I will explain this deployment by creating a to-do task as an example.



Optimize functions size:

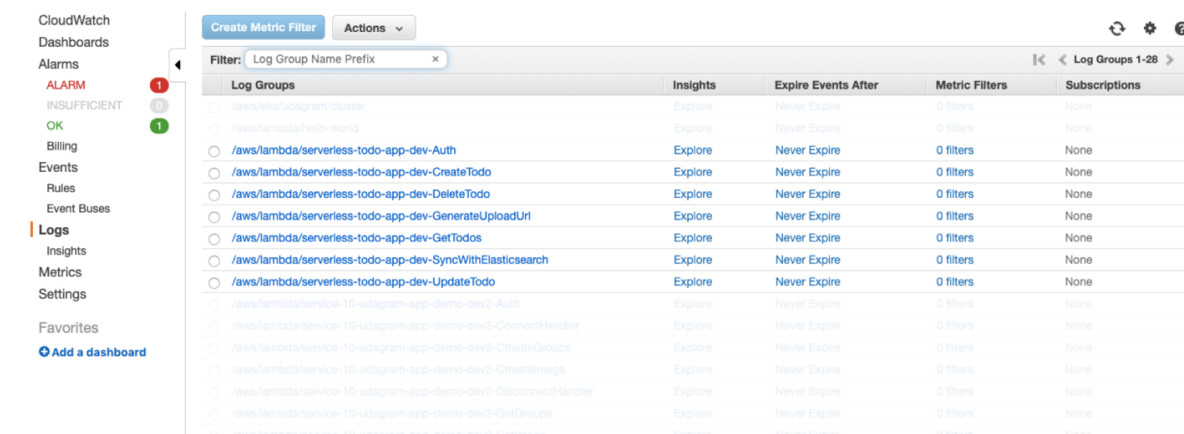
- I have packaged functions individually to optimize function size.



The screenshot shows the AWS Lambda console interface. A notification at the top states: "Your Lambda function 'caos-monkey' was successfully deleted." Below this, the 'Functions (19)' section is visible. It includes a search bar with the text 'Add filter' and a 'Keyword: todo' filter applied. A table lists the functions with columns for Function name, Description, Runtime, Code size, and Last modified. The functions listed are:

Function name	Description	Runtime	Code size	Last modified
serverless-todo-app-dev-GenerateUploadUrl		Node.js 8.10	2.2 MB	22 minutes ago
serverless-todo-app-dev-CreateTodo		Node.js 8.10	2.2 MB	22 minutes ago
serverless-todo-app-dev-DeleteTodo		Node.js 8.10	2.2 MB	22 minutes ago
serverless-todo-app-dev-Auth		Node.js 8.10	439.9 kB	22 minutes ago
serverless-todo-app-dev-GetTodos		Node.js 8.10	2.2 MB	22 minutes ago
serverless-todo-app-dev-UpdateTodo		Node.js 8.10	2.2 MB	22 minutes ago
serverless-todo-app-dev-SyncWithElasticsearch		Node.js 8.10	2.3 MB	22 minutes ago

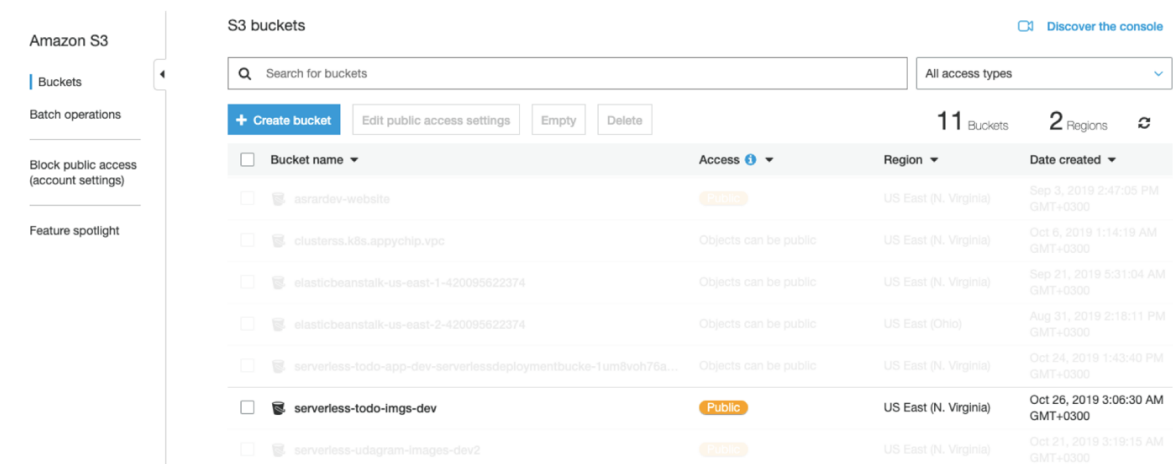
CloudWatch logs for lambda functions:



The screenshot shows the AWS CloudWatch console. The left sidebar has a red '1' next to the 'Logs' section. The main area displays a table of log groups. The table has columns for Log Groups, Insights, Expire Events After, Metric Filters, and Subscriptions. The log groups listed are:

Log Groups	Insights	Expire Events After	Metric Filters	Subscriptions
/aws/eks/udagram/cluster	Explore	Never Expire	0 filters	None
/aws/lambda/hello-world	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-Auth	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-CreateTodo	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-DeleteTodo	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-GenerateUploadUrl	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-GetTodos	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-SyncWithElasticsearch	Explore	Never Expire	0 filters	None
/aws/lambda/serverless-todo-app-dev-UpdateTodo	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-Auth	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-ConnectHandler	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-CreateGroups	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-CreateImage	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-DisconnectHandler	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-GetGroups	Explore	Never Expire	0 filters	None
/aws/lambda/service-10-udagram-app-demo-dev2-GetImage	Explore	Never Expire	0 filters	None

S3 bucket to store application attachments:



The screenshot shows the Amazon S3 console. The left sidebar has a red '1' next to the 'Buckets' section. The main area displays a table of S3 buckets. The table has columns for Bucket name, Access, Region, and Date created. The buckets listed are:

Bucket name	Access	Region	Date created
asrarddev-website	Public	US East (N. Virginia)	Sep 3, 2019 2:47:05 PM GMT+0300
clusters.k8s.appychip.vpc	Objects can be public	US East (N. Virginia)	Oct 6, 2019 1:14:19 AM GMT+0300
elasticbeanstalk-us-east-1-420095622374	Objects can be public	US East (N. Virginia)	Sep 21, 2019 5:31:04 AM GMT+0300
elasticbeanstalk-us-east-2-420095622374	Objects can be public	US East (Ohio)	Aug 31, 2019 2:18:11 PM GMT+0300
serverless-todo-app-dev-serverlessdeploymentbucket-1um8voh76a...	Objects can be public	US East (N. Virginia)	Oct 24, 2019 1:43:40 PM GMT+0300
serverless-todo-imgs-dev	Public	US East (N. Virginia)	Oct 26, 2019 3:06:30 AM GMT+0300
serverless-udagram-images-dev2	Public	US East (N. Virginia)	Oct 21, 2019 3:19:15 AM GMT+0300