CSCI 5409

ADVANCE TOPICS IN CLOUD COMPUTING

TICKET BOOKING SYSTEM

Mechanical and Critical Analysis

GROUP – 8 ALPHA TEAM

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SERVICES:

In following table there are all the services listed which are proposed to implement the project.

FUNCTIONALITY	SERVICES
COMPUTE	• EC2 • Elastic BeanStalk • Docker
NETWORK	• Virtual Private Cloud • API Gateway
STORAGE	• AWS S3 • DynamoDB • AWS RDS (Provisional)
SECURITY	• AWS Secret Manager • AWS Cognito • Identity and Access Management (IAM)
SERVERLESS COMPUTING	• SNS • SQS • AWS Lambda • AWS Glue

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COMPUTE

SERVICE	ALTERNATIVES	REASON
EC2, AWS BEANSTALK	AWS LIGHTSAIL AWS BATCH AWS SNOWFAMILY AWS WAVELENGTH AWS VMWARE CLOUD	Compared to any other services combination of EC2 and AWS Beanstalk would be more suitable to project, as it would be easy to integrate them with the other tools which we are using in the project. Along with that we are familiar with these services compare to other one and the documentation is pretty good for these services.

DOCKER	HEROKU KUBERNETAS	For this project we are integrating EC2 and Beanstalk hence Docker is the one of the most viable option to move ahead. Other options do not integrate with the chosen services.

Usage: These services will allow users to book their tickets. The Docker would be hosted on Elastic Beanstalk and the application would be run via an EC2 compute engine.

NETWORK

SERVICES	ALTERNATIVES	RESON
VIRTUAL PRIVATE CLOUD	No other Alternatives by AWS, can look for GCP, Linode or Azure	For this use case we were not able to find any alternatives and this was the best service offered by AWS
AWS API GATEWAY	No other Alternatives by AWS, can look for GCP, Linode or Azure	This service would be used to open the ports for the project

Usage: These services will be used to create VMs and to deploy our Docker images and control network traffic and ports.

STORAGE

SERVICE	ALTERNATIVES	REASON
AWS S3	ELASTIC BLOCK STORE ELASTIC FILE SYSTEM S3 GLACIER	Aws S3 is preferred over all of the alternatives as we won't require to store large volume of data and S3 is scalable and could be used to store files and the folders too.
DYNAMO DB	No other Alternatives by AWS, can look for GCP, Linode or Azure	NoSQL database to handle non-relational data and could be used to save mediator information
AWS RDS	AWS AURORA	RDS would be used to store relational database in the

		form of SQL tables. AURORA is comparitivly expensive compared to AWS RDS and won't give any substantial benefits regarding the context of the project.

Usage: These services will be utilized to store the data that will be given by the user at sign up time. Also, it will store the allotted ticket number and events details per user as well

SECURITY

SERVICE	ALTERNATIVES	REASON
AWS SECRET MANAGEER	AWS SECURITY HUB AWS SINGLE SIGN ON	To securely save the password in an encrypted format. Single sign on does not allow direct integration with database to save the information. Security hub is complicated when used with RDS.
AWS COGNITO	AWS SINGLE SIGN ON AWS IDENTITY & ACCESS MANAGER	For login module and access management handling of the user. It will also conclude the identity management. IAM could be used but Cognito allows to integrate more features and IAM is heavier in loading compared to Cognito.

Usage: Secrets manager will manage the passwords fir the system and aws cognito would perform user handling.

SERVERLESS COMPUTING

SERVICE	ALTERNATIVES	REASON
SNS	AWS SES AMAZON PINPOINT	SNS would be used to either send notifications on the mobile device or send the email. Both could be done with the single service but with SES the only email could be done hence we choose SNS.

SQS	No other Alternatives by AWS, can look for GCP, Linode or Azure	SQS service would be used to queue the messages and there is no alternative which provides the service like this. Hence, we choose this service
AWS LAMBDA	AMAZON EVENTBRIDGE	Lamdba is a event based function which supports running python and node.js scripts. It also hast the capability to connect eith the different AWS services.

Usage: AWS SNS would be used to send email or text notifications and SQS for queuing. AWS Lamda which is triggered by an event would be used to call different services based on event triggers like calling S3 service to store the allotted ticket and RDS service to store user details.

PRICING

Service Name	Pricing	Does it affect our choice of service?
AWS Lambda	$ 0.2 per 1 M requests	No
EC2 instance	based on configuration ($ per hour)	Yes
AWS Elastic Beanstalk	No additional cost	No
Virtual Private Cloud	No additional cost	Yes
AWS S3	$ 0.0023 per GB	Yes
DynamoDB	$ 0.1 per GB/month	No
AWS Cognito	$ 0.0055 per MAU (after free 50,000 MAU)	No
Secret Manager	$ 0.05 for 10,000 API calls per month or $ 0.4 for 1 secret per month (also based on hourly rate)	Yes
AWS SQS	$ 0.40 for 1 million to 100 billion requests per month (first 1 million request are free)	No
AWS SNS	$ 0.5 per million mobile notification & $ 2.0 per lakh email notification	Yes

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