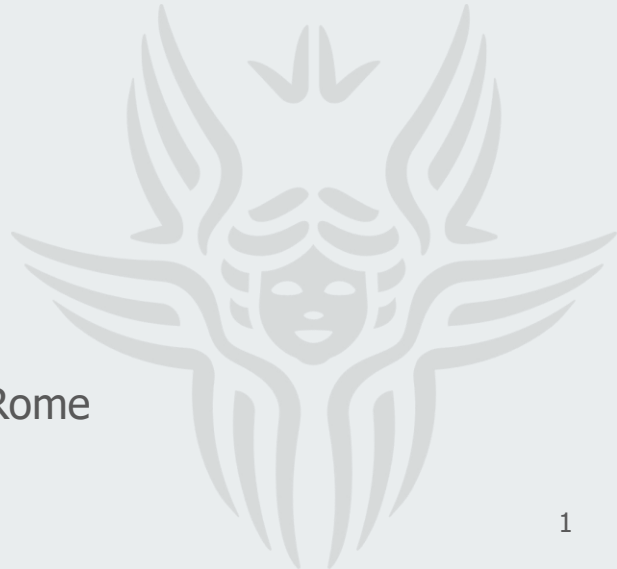
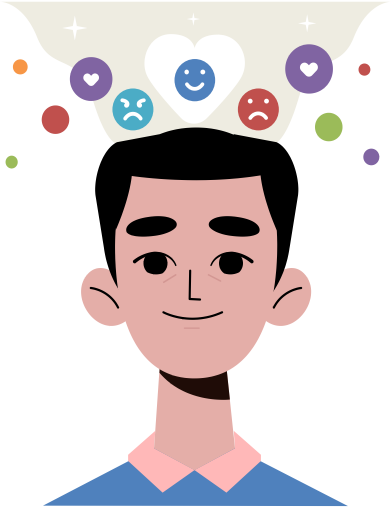
Cloud Computing Project

Barreca Federico – 1736423
Bevilacqua Paolo Pio – 2002288
De Sio Ilaria – 2064970

Cloud Computing – A.Y. 2022-2023 Sapienza University of Rome



Description of the problem addressed



The user expresses emotions through a phrase.

SOUNDFLOW

It’s a recommendation system designed to understand user’s emotion and suggest Spotify songs.

Emotions - Songs

The connection between emotions and songs will be determined throught the examination of these three fields:

Valence

Degree of similarity and positivity of a song

Energy

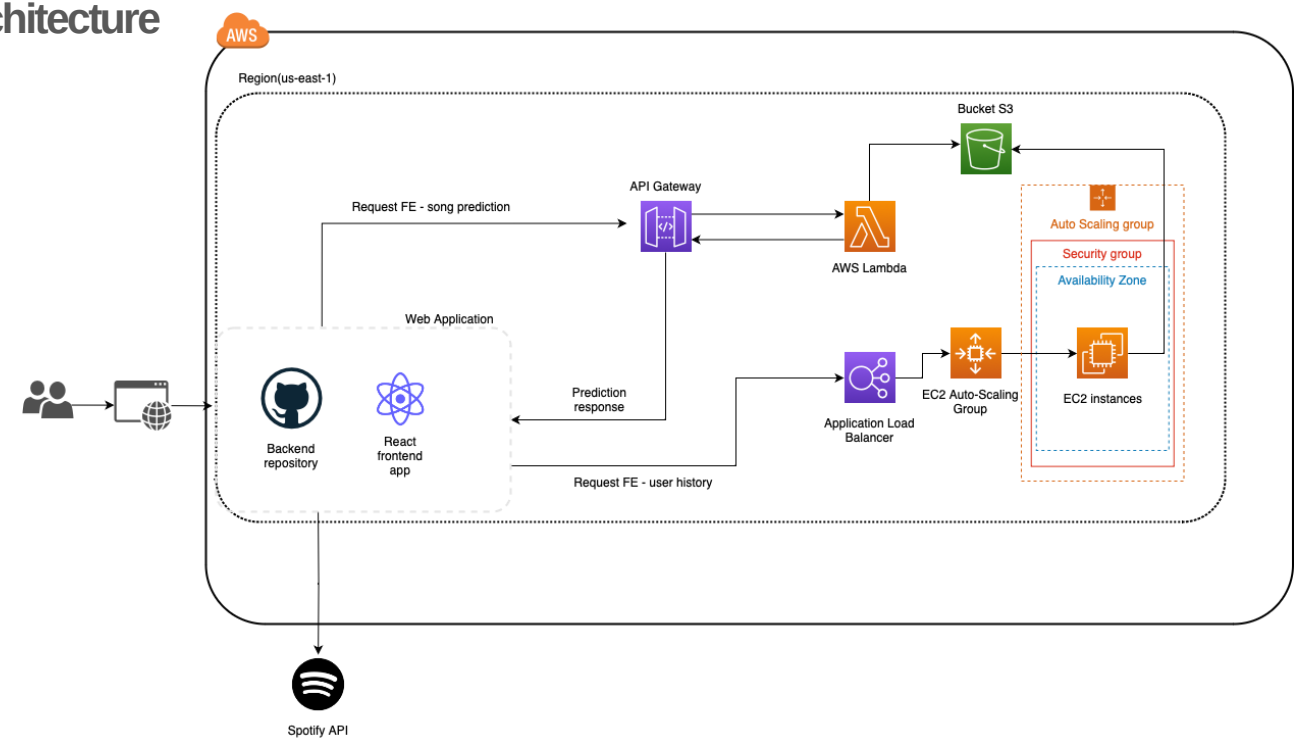
Perceptual measure of intensity and activity

Tempo

Overall estimated tempo of a track in BPM

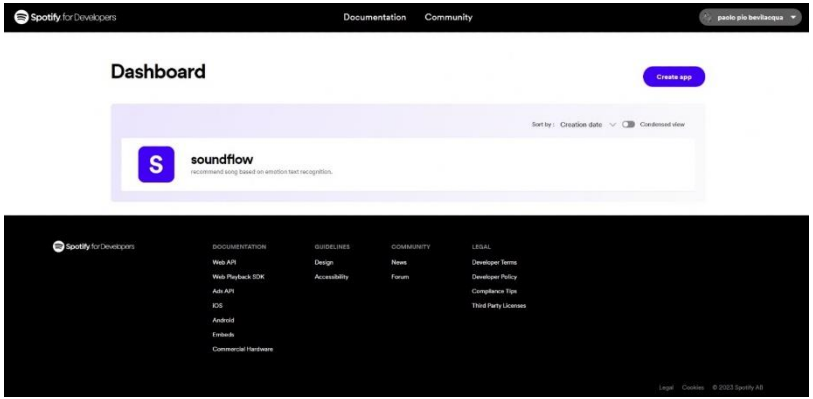
Design of the solution

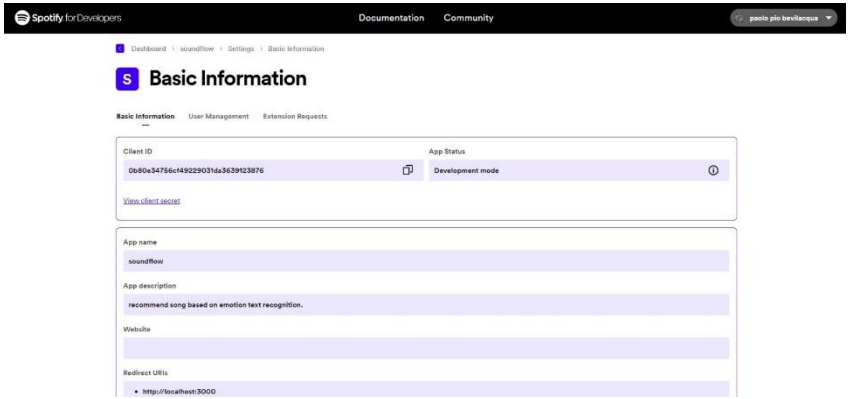
Cloud Architecture



Description of the deployment of the solution

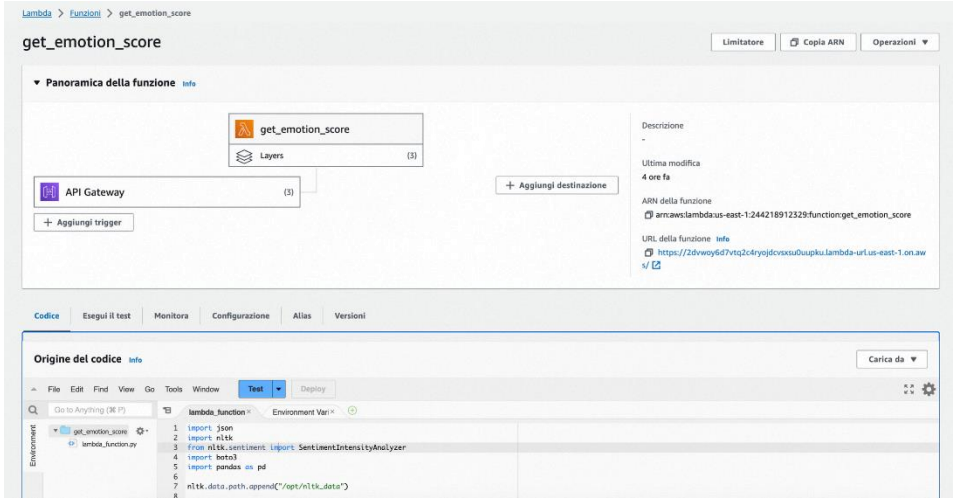
Step 1 – Integration with Spotify API





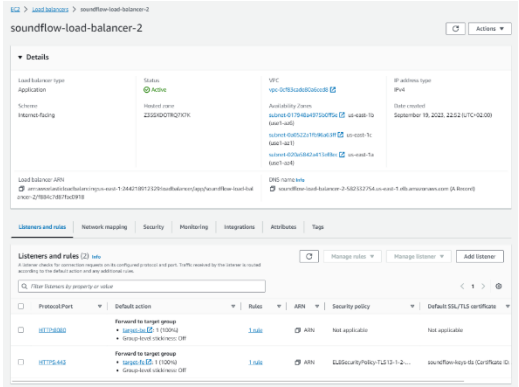
Description of the deployment of the solution

Step 2 – Lambda function



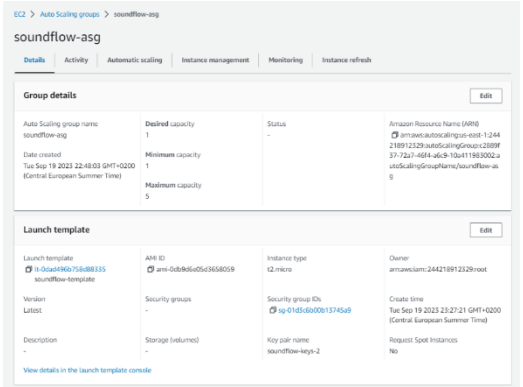
Description of the deployment of the solution

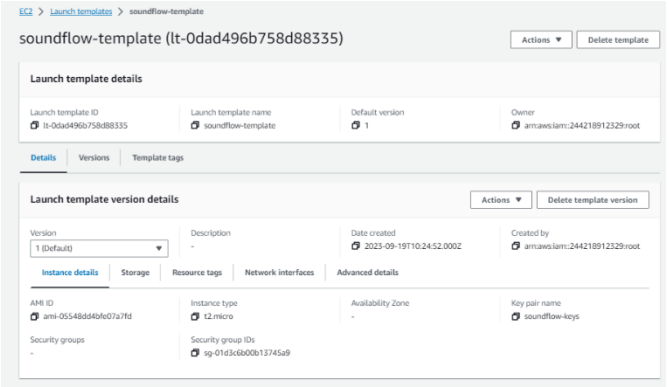
Step 3 – Setting EC2 service



Application Load Balancer

Auto-Scaling Group



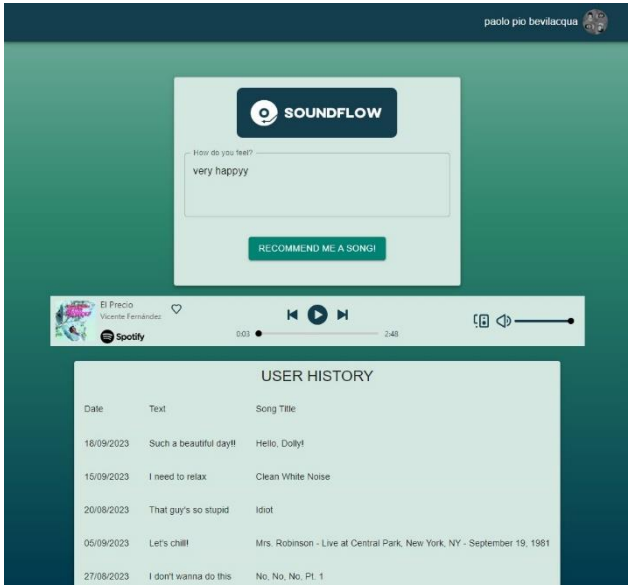


Launch template ASG

Interface of the application

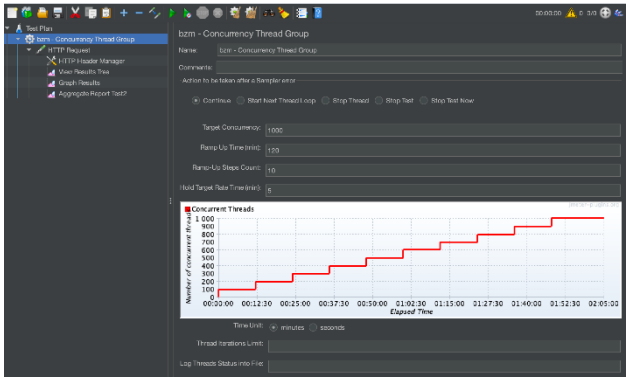
Two main functionalities

- ❑ Spotify Real-Time player
- ❑ User’s history

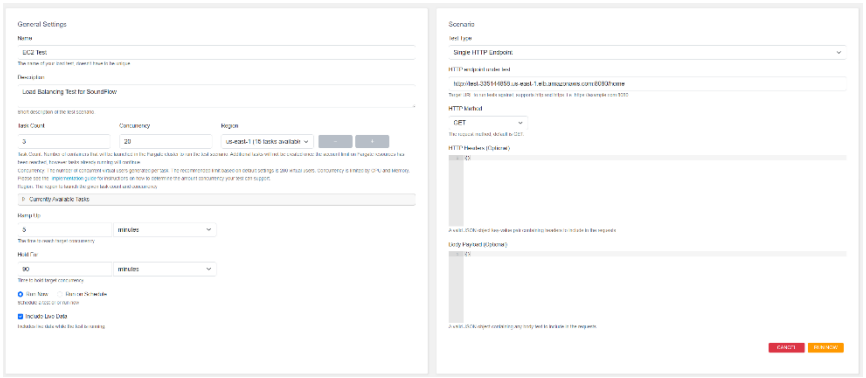


Experimental Design

Configuration details of the tools for testing



❑ JMeter

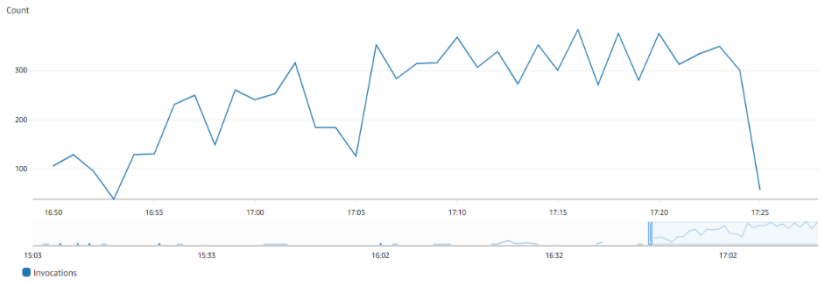


❑ Distributed Load Testing

Experimental Results

Chosen Metrics and graph results on AWS Lambda

Invocations



Indicates the number of times a Lambda function is activated or invoked in response to an event or request

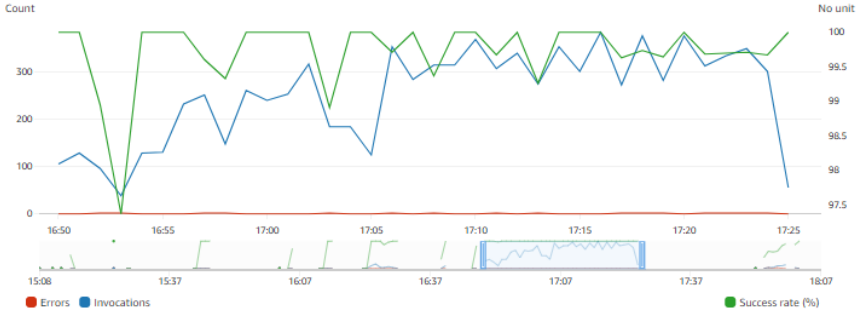
Duration

Determines the duration, measured in milliseconds, of a Lambda function's code execution in response to an invocation

Experimental Results

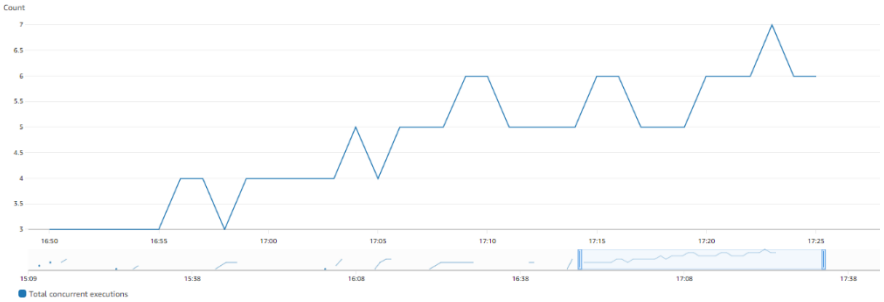
Chosen Metrics and graph results on AWS Lambda

Error count and success rate



These metrics provide an indicator of the stability and reliability of the function

Concurrent executions

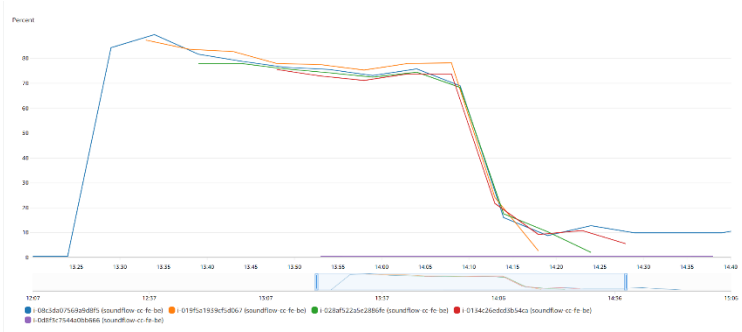


The maximum number of instances of a function that are active simultaneously at a given moment

Experimental Results

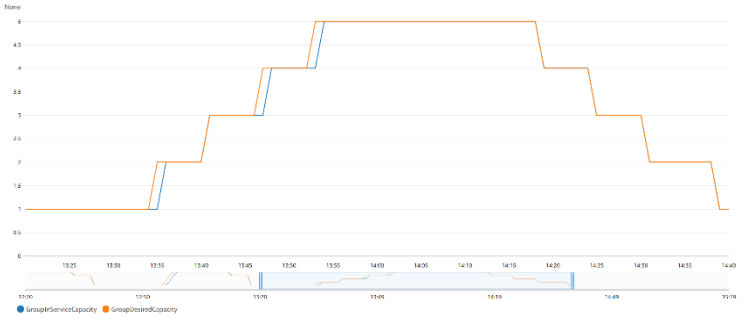
Chosen Metrics and graph results on AWS EC2

CPU Usage (per instance)



CPU usage for each instance created in the test

Auto-Scaling Group

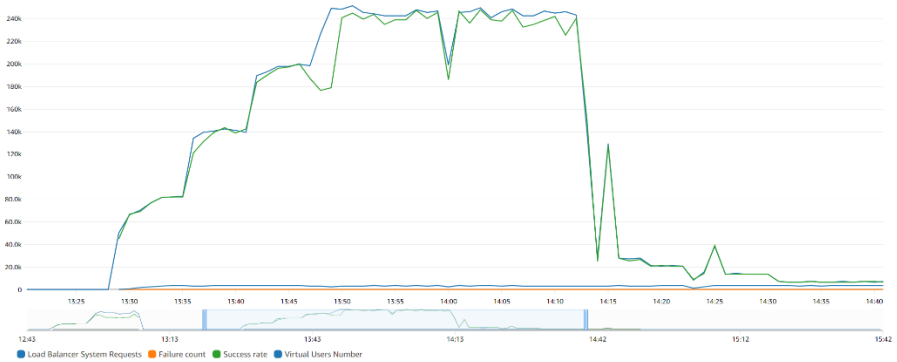


This graph compare Group Desired capacity and Group in Service capacity

Experimental Results

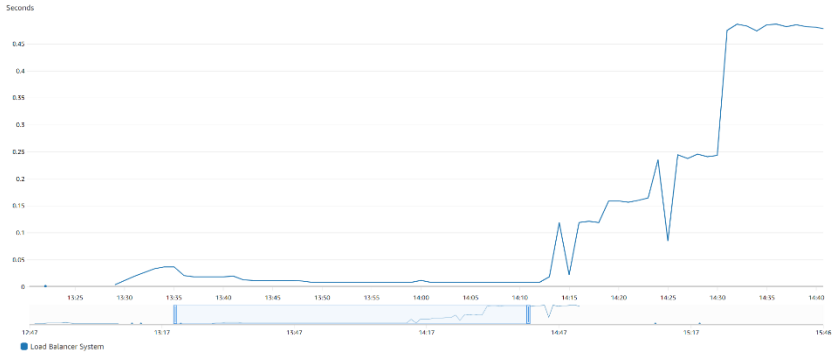
Chosen Metrics and graph results on AWS EC2

Distributed Load Testing



Number of the Request, Failure count, Success rate and Virtual Users number

Target Response Time



Response time of Load Balancer System

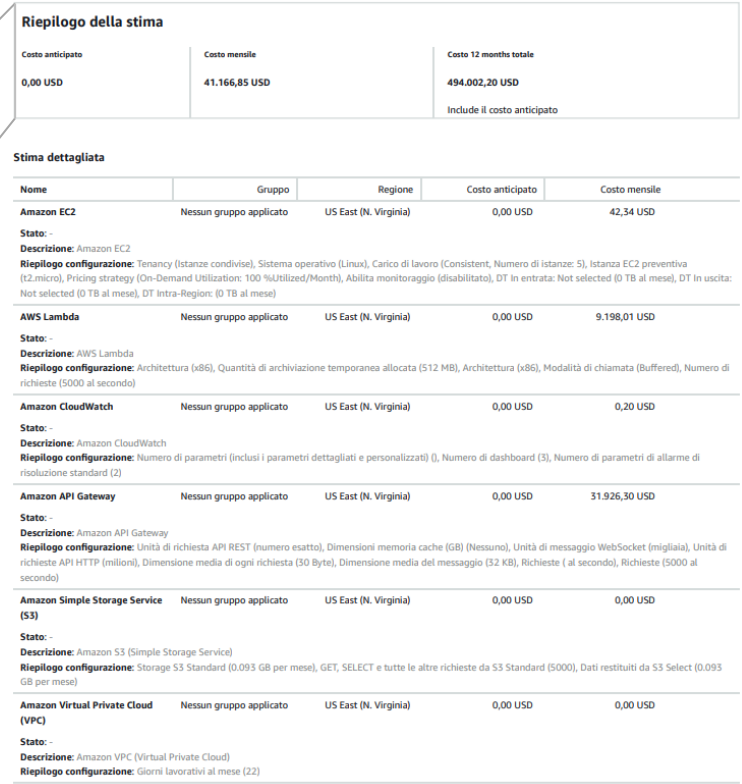
Cloud Cost Report

Estimated costs of SoundFlow

Riepilogo della stima

Costo anticipato	Costo mensile	Costo 12 months totale
0,00 USD	41.166,85 USD	494.002,20 USD Include il costo anticipato

- Expected Traffic : 5000 req/sec
- EC2 instance type : t2.micro
- Auto-Scaling group : capacity [1,5]



Riepilogo della stima

Costo anticipato	Costo mensile	Costo 12 months totale
0,00 USD	41.166,85 USD	494.002,20 USD Include il costo anticipato

Stima dettagliata

Nome	Gruppo	Regione	Costo anticipato	Costo mensile
Amazon EC2	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	42,34 USD
Stato: - **Descrizione:** Amazon EC2 **Riepilogo configurazione:** Tenancy (Istanze condivise), Sistema operativo (Linux), Carico di lavoro (Consistent, Numero di istanze: 5), Istanza EC2 preventiva (t2.micro), Pricing strategy (On-Demand Utilization: 100 %Utilized/Month), Abilita monitoraggio (disabilitato), DT In entrata: Not selected (0 TB al mese), DT In uscita: Not selected (0 TB al mese), DT Intra-Region: (0 TB al mese)				
AWS Lambda	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	9.198,01 USD
Stato: - **Descrizione:** AWS Lambda **Riepilogo configurazione:** Architettura (x86), Quantità di archiviazione temporanea allocata (512 MB), Architettura (x86), Modalità di chiamata (Buffered), Numero di richieste (5000 al secondo)				
Amazon CloudWatch	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	0,20 USD
Stato: - **Descrizione:** Amazon CloudWatch **Riepilogo configurazione:** Numero di parametri (inclusi i parametri dettagliati e personalizzati) (), Numero di dashboard (3), Numero di parametri di allarme di risoluzione standard (2)				
Amazon API Gateway	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	31.926,30 USD
Stato: - **Descrizione:** Amazon API Gateway **Riepilogo configurazione:** Unità di richiesta API REST (numero esatto), Dimensioni memoria cache (GB) (Nessuno), Unità di messaggio WebSocket (migliaia), Unità di richieste API HTTP (milioni), Dimensione media di ogni richiesta (30 Byte), Dimensione media del messaggio (32 KB), Richieste (al secondo), Richieste (5000 al secondo)				
Amazon Simple Storage Service (S3)	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	0,00 USD
Stato: - **Descrizione:** Amazon S3 (Simple Storage Service) **Riepilogo configurazione:** Storage S3 Standard (0.093 GB per mese), GET, SELECT e tutte le altre richieste da S3 Standard (5000), Dati restituiti da S3 Select (0.093 GB per mese)				
Amazon Virtual Private Cloud (VPC)	Nessun gruppo applicato	US East (N. Virginia)	0,00 USD	0,00 USD
Stato: - **Descrizione:** Amazon VPC (Virtual Private Cloud) **Riepilogo configurazione:** Giorni lavorativi al mese (22)				

Thank you for the attention!