

Dynamic Bookings: Auto-Scaling Solutions on AWS

Final Project



Course: Introduction to Cloud Computing - DV1566

by: Seyed Mohammad Hossein Tabatabaei Ashkezari

Department of Computer Science, BTH

Architecture Overview: Seamless Booking Experience

- **Interactive Booking Portal:** User-friendly interface for effortless table reservations.
- **AWS-Integrated Architecture:** Robust and scalable with a frontend application, serverless backend, and managed database services.
- **Performance Validation:** Utilizing Apache JMeter for rigorous stress testing and validation of autoscaling capabilities.
- **Monitoring the Autoscaling Test:** Leveraging AWS CloudWatch and Amplify's built-in monitoring for in-depth performance insights of the autoscaling capabilities"

Project Website

Booking a Table

Please fill in the form below to book a table at our restaurant. Ensure that you select a date within the next 5 days and choose an available table number from 1 to 15.

Name	Email	Table No.	dd/mm/yyyy	<input type="button" value="Book Table"/>
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Number of bookings for table on : 0



<https://dev7373.d2f3jrw6p8oqa0.amplifyapp.com/>





Lambda

Chosen for serverless execution: Automatic scaling and no infrastructure management

- Event-driven and cost-effective: Pay only for the compute time used
- Integrates seamlessly with other AWS services like DynamoDB and API Gateway
- Facilitates rapid development and deployment of backend functions



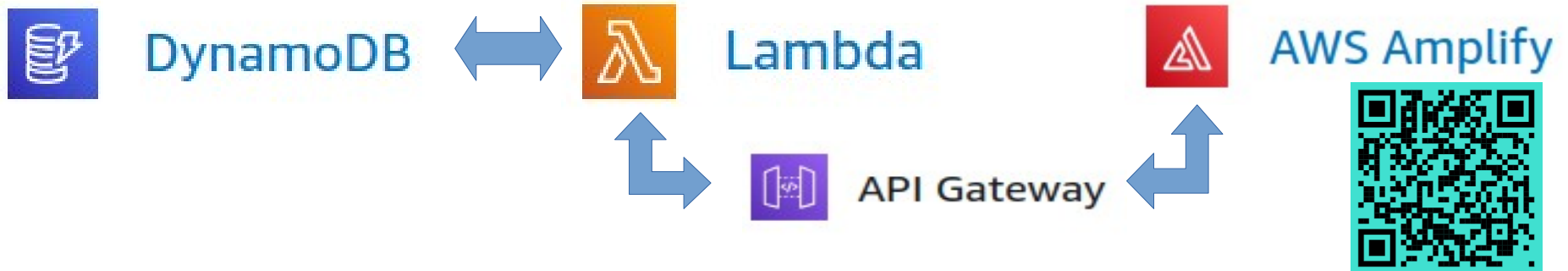
- Simplifies deployment and hosting of web applications
- Offers seamless integration with backend services
- Provides easy-to-use interface for managing backend functionalities
- Enhances development workflow with continuous integration and delivery (CI/CD)



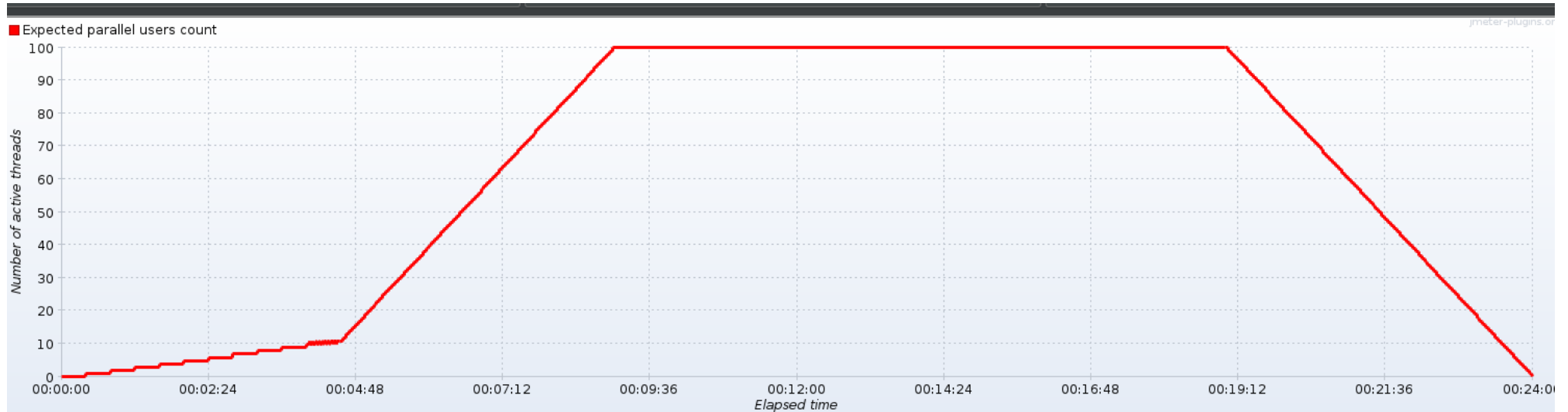
DynamoDB

- **Scalability:** Seamless scalability is offered by DynamoDB, handling varying loads without the need for manual intervention.
- **Performance:** Consistent, fast performance is maintained, with single-digit millisecond response times during scaling operations.
- **Fully Managed Service:** The operational burden is reduced due to DynamoDB being a fully managed service.
- **Provisioned Capacity:** Efficient cost management is enabled through the specification of capacity.

Architecture on AWS



Performance Validation



WU

RU

S

RD

Monitoring the Autoscaling Test



CloudWatch



Lambda



DynamoDB



AWS Amplify

App settings: Monitoring

Monitoring the Autoscaling Test :

Requests



AWS Amplify

App settings: Monitoring

Requests (sum)

Reset zoom

1 minute

Sum

1h

3h

12h

1d

3d

1w

Custom



Local timezone



4.00k

3.00k

2.00k

1.00k

0

19:20

19:25

19:30

19:35

19:40

19:45



Requests

Monitoring the Autoscaling Test :

Bytes Uploaded/Dowloaded



AWS Amplify

App settings: Monitoring

Data transfer (sum)

Reset zoom

1 minute

Sum

1h

3h

12h

1d

3d

1w

Custom

Local timezone



Bytes

5.00M

4.00M

3.00M

2.00M

1.00M

0

19:22

19:23

19:24

19:25

19:26

19:27

19:28

19:29

19:30

19:31

19:32

19:33

19:34

19:35

19:36

19:37

19:38

19:39

19:40

19:41

19:42

19:43

19:44

19:45

19:46



BytesDownloaded



BytesUploaded

Monitoring the Autoscaling Test:

ConcurrentExecution



CloudWatch



Lambda

ConcurrentExecutions, Duration, Invocations, Throttles

Refresh

5 minutes

Average

1h

3h

12h

1d

3d

1w

Custom

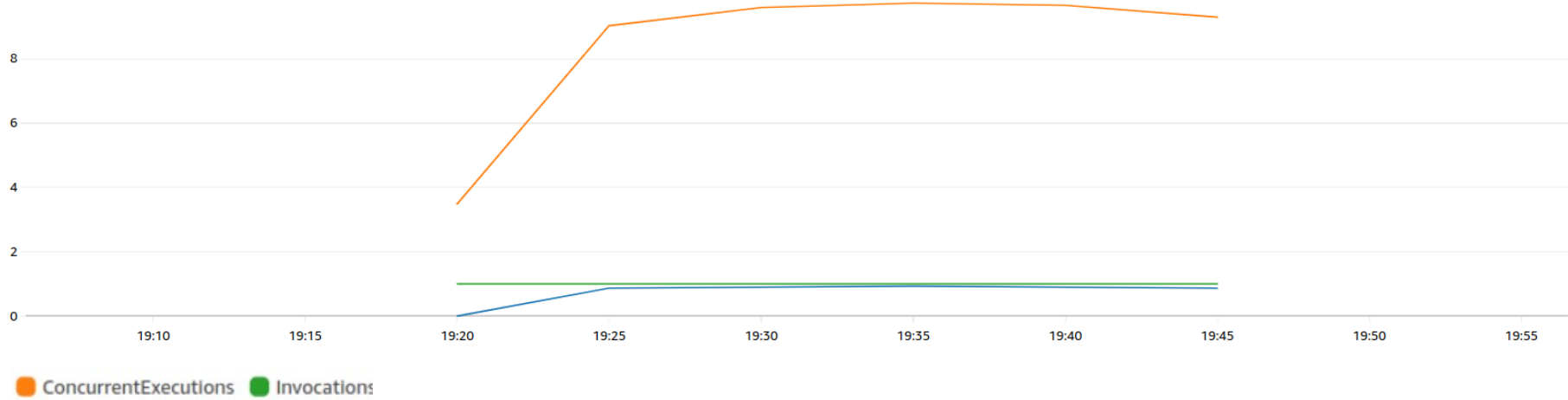
Local timezone



5 minutes



Various units



Monitoring the Autoscaling Test:

Duration



CloudWatch



Lambda

ConcurrentExecutions, Duration, Invocations, Throttles

Best view

5 minutes

Average

1h

3h

12h

1d

3d

1w

Custom

Local timezone



5 minutes



Various units

1.20k

1.00k

800

600

400

200

0

19:20 19:21 19:22 19:23 19:24 19:25 19:26 19:27 19:28 19:29 19:30 19:31 19:32 19:33 19:34 19:35 19:36 19:37 19:38 19:39 19:40 19:41 19:42 19:43 19:44 19:45



Throttles



ConcurrentExecutions



Invocations



Duration

Monitoring the Autoscaling Test:

Read Capacity



CloudWatch



DynamoDB

ConsumedReadCapacityUnits, ConsumedWriteCapacityUnits, ProvisionedReadCapacityUnits

5 minutes

Average

1h

3h

12h

1d

3d

1w

Custom

Local timezone



5 minutes



Count

10

8

6

4

2

0

19:15 19:20 19:25 19:30 19:35 19:40 19:45 19:50 19:55 20:00 20:05 20:10 20:15 20:20 20:25 20:30 20:35 20:40 20:45 20:50 20:55 21:00 21:05



ConsumedReadCapacityUnits



ProvisionedReadCapacityUnits

Monitoring the Autoscaling Test:

Write Capacity



CloudWatch



DynamoDB

ConsumedReadCapacityUnits, ConsumedWriteCapacityUnits, ProvisionedReadCapacityUnits, ProvisionedWriteCapacityUnits

5 minutes

Average

1h

3h

12h

1d

3d

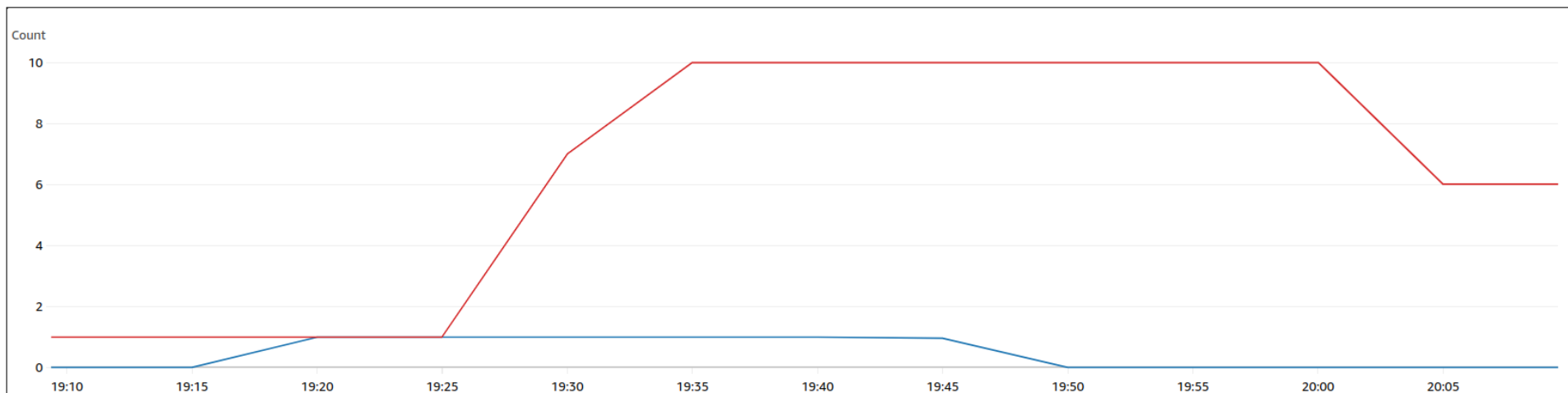
1w

Custom

Local timezone



5 minutes



ConsumedWriteCapacityUnits



ProvisionedWriteCapacityUnits

Thank You for Your Attention

Improving Handwritten Digit Recognition Using CNN with SE Blocks

I welcome any questions you may have

Seyed Mohammad Hosseinn Tabatabaei Ashkezari

seta23@student.bth.se