

15-319 / 15-619

Cloud Computing

Overview 11

April 4th, 2022

TEAM PROJECT

Twitter Data Analytics



Top Microservice 1 Teams

Submitter	Effective RPS
ccgroupjk	216224.5
CloudComputingTeam	145189.18
MainframeComputing	142264

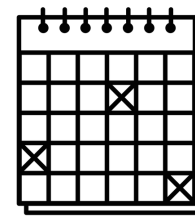
Top Microservice 2 Teams



Submitter	Effective RPS
ccgroupjk	56709.8
ThreeCobblers	56241.94
ElasticPyjama	55634.11

Top Microservice 3 Teams

Submitter	Effective RPS
cctooheavy	26779.56
ccgroupjk	22631.08
ThreeCobblers	21167.8

Team Project Time Table



Task	Timeline
Phase 2 Report	<ul style="list-style-type: none">● Due: Tuesday 04/05/2022 23:59:59 ET 
Phase 3 Phase 3 Live Test Phase 3 Report	<ul style="list-style-type: none">● Submissions due: Sunday 04/17/2022 3:59 pmET ● DNS Submission open: Sunday 04/17/2022 3:00 pmET● DNS Submission due: Sunday 04/17/2022 3:59 pmET● Due: Tuesday 04/19/2022 11:59pm ET

Live Test Schedule

Submit DNS for Live Test

Information		
Time	Task	Description
4:00 pm	DNS Submission	Submit your DNS for the Live Test before 4pm
5:30 pm - 5:35 pm	DNS Validation	Validate your DNS. This is the last chance to update your DNS for the Live Test

Live Test

Information			
Time	Value	Target	Weight
6:00 pm - 7:00 pm	Warm-up (M1 only)	0	0%
7:00 pm - 7:30 pm	M1	40000	15%
7:30 pm - 8:00 pm	M2	25000	25%
8:00 pm - 8:30 pm	M3	10000	25%
8:30 pm - 9:00 pm	Mixed (M1,M2,M3)	15000/10000/2000	5+5+5 = 15%

Team Project Phase 3

- Use only AWS managed services
- Web-tier
 - ECS with Fargate
 - EKS with Fargate
 - EKS with managed node group
- Storage-tier
 - Amazon RDS
 - Amazon DynamoDB
 - Amazon ElastiCache
 - Others, check writeup for whitelist
- Teams should explore the managed services provided by AWS to come up with a solution

Task Reminder

- Throughput targets:
 - M1: 65,000 RPS
 - M2: 25,000 RPS
 - M3: 10,000 RPS
 - Mixed queries M1/M2/M3: 15,000/10,000/2,000 RPS
- Bonuses
 - Top 5 teams with highest performance/cost ratio
→ 4% Bonus
 - Raking 1st/2nd/3rd/4th/5th in the live test
→ 5%/4%/3%/2%/1% Bonus
 - Achieve target throughput for all tests
→ 2% Bonus

Total Budget Reminder

- Budget limit \$120, double budget \$150

	No Penalty	-10% Penalty	-100% Penalty
Total cost	< \$120	\$120-\$150	\$150+
Development cost	< \$90	\$90 - \$120	\$120+
Live Test cost	~ \$30	~ \$30	~ \$30

- Use GCP and Azure for ETL
- Use Spot instances wisely

Hourly Budget Reminder

- Your web service should not cost more than **\$1.28/hour**
- This includes:
 - EKS / ECS cost
 - Database cost
 - ELB cost - excluding LCU-hour cost

 - See writeup for details

Resource Constraint Reminder

- No self-managed EC2 instances and EBS volumes during the Live Test!
- Rule of thumb: See resources in the EC2 dashboard besides managed node groups? NOT ALLOWED
 - <https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances>
 - <https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Volumes>
 - If you are installing MySQL as Kubernetes Deployment, StatefulSet, Helm chart → **STOP**
- T-family instances are not allowed, as their performance are not consistent

Hints for loading ETL results

- Perform ETL on Azure or GCP
 - Save results as TSV/CSV to cloud storage (e.g. Azure Blob Storage, GCP Cloud Storage)
 - Refer to [Spark docs](#)
- Launch your database
 - Use Terraform to reduce risk of human error (e.g. inconsistent configuration, forgot tagging...)
- Use a temporary EC2 instance to import
 - Use azcopy or gsutil to download ETL result
 - Make a backup on an S3 bucket
- Make a snapshot of the database

Hints

- Not all fully managed services for web-tier are suitable for Live Test. Some might not provide enough flexibility and result in higher total cost
- Consider the characteristics of the query before deciding on which managed database service to use
- High performance/cost ratio is preferred. Read the pricing of each service carefully and try your best to achieve the highest possible ratio
- Make sure you understand the concept of VPC and Security Group. Don't open your database to the world!

Best Wishes!!!



IDENTIFY
THE
BOTTLENECK
AND
OPTIMIZE