Assignment 3 report

github repo:

https://github.com/yty20/CS6650-project

Database Designs

I uses DynamoDB and there is only one table named "skierActivities" with the following attributes:

- skierID (String): partition key
- date (String): sort key
- lifts (Map of String(liftID) and Integer(number of lifts))
- resortID (String)
- verticalTotals (integer): all liftID in lifts times 10.

And I also add a GSI with resortID as partition key and date as sort key to help query by resortID and date.

Deployment Topology

The deployment topology is as follows:
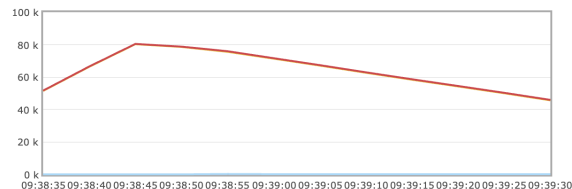client -> EC2 with Servlet -> RMQ -> consumer * 4 -> DynamoDB.

the client use 100 threads to simulate the skiers' activities. Servlet collects the data from the skiers and send it to RMQ. There are 4 instances of consumer to process the data from RMQ and store it in DynamoDB, so that the consumer rate can keep up with the incoming data and keep the queue in healthy status.

Metric Results:
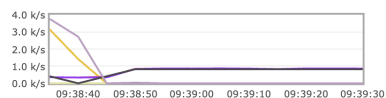
1. RabbitMQ console log with only one consumer:

RabbitMQ™ RabbitMQ 3.9.13 Erlang 24.2.1

Cluster **rabbit@i**

Overview | Connections | Channels | Exchanges | Queues | Admin

Overview

Totals

Queued messages [last minute] [?]

Ready		41,388
Unacked		298
Total		41,686

Message rates [last minute] [?]

Publish	0.00/s	Deliver (auto ack)	0.00/s	Get (manual ack)	0.00/s	Unroutable (return)	0.00/s
Publisher confirm	0.00/s	Consumer ack	858/s	Get (auto ack)	0.00/s	Unroutable (drop)	0.00/s
Deliver (manual ack)	858/s	Redelivered	0.00/s	Get (empty)	0.00/s	Disk read	819/s
						Disk write	0.00/s

Global counts [?]

Connections: 401 | Channels: 498 | Exchanges: 7 | Queues: 1 | Consumers: 298

Nodes

Name	File descriptors [?]	Socket descriptors [?]	Erlang processes	Memory [?]	Disk space	Uptime	Info	Reset stats	+/-
rabbit@ip-172-31-19-197	439 (65536 available)	401 (58893 available)	5156 (1048576 available)	252 MiB (380 MiB high watermark)	3.8 GiB (48 MiB low watermark)	2m 39s	basic disc 1 rss	This node All nodes	

Churn statistics

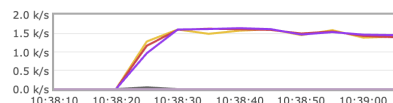2. RabbitMQ console log with 4 consumers:

RabbitMQ™ RabbitMQ 3.9.13 Erlang 24.2.1

Overview | Connections | Channels | Exchanges | Queues | Admin

Overview

Totals

Queued messages [last minute] [?]
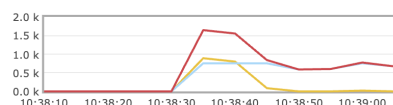
Ready		0
Unacked		516
Total		516

Message rates [last minute] [?]

Publish	1,409/s	Deliver (auto ack)	0.00/s	Get (manual ack)	0.00/s	Unroutable (return)	0.00/s
Publisher confirm	0.00/s	Consumer ack	1,450/s	Get (auto ack)	0.00/s	Unroutable (drop)	0.00/s
Deliver (manual ack)	1,395/s	Redelivered	0.00/s	Get (empty)	0.00/s	Disk read	0.00/s
						Disk write	0.00/s

Global counts [?]

Connections: 1001 | Channels: 954 | Exchanges: 7 | Queues: 1 | Consumers: 754

Nodes

Name	File descriptors [?]	Socket descriptors [?]	Erlang processes	Memory [?]	Disk space	Uptime	Info	Reset stats	+/-
rabbit@ip-172-31-19-197	1039 (65536 available)	1001 (58893 available)	11180 (1048576 available)	360 MiB (380 MiB high watermark)	3.8 GiB (48 MiB low watermark)	1m 24s	basic disc 1 rss	This node All nodes	

3. client output:

```
Total Successful Requests: 200000
Total Failed Requests: 0
Total Time: 169.603 s
Total throughput: 1179.2244240962718 requests/s
Latency Statistics:
Mean Latency: 84.39164 ms
Median Latency: 59 ms
Min Latency: 31 ms
Max Latency: 4203 ms
99th Percentile Latency: 250 ms


Process finished with exit code 0
```