ETH zürich

Messaging System- Experiments

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Factors and Levels

Primary Factors

- Number of middleware
  - $x \in Z_+$
- Number of clients
  - $x \in Z_+$
- Operation performed by Client
  - 1…6;99 start conn.;7 end conn.
- Size of the messages
  - 200 and 2000 characters
- Workload
  - $x \in R_+$ | x request/second
- Max. # of connections in the Middleware
  - $x \in R_+$
- Max. # of connections in the Database
  - $x \in R_+$

Secondary Factors

- Hardware
  - Amazon EC2 instance
- Operating System
  - Ubuntu
- JVM heap
  - Default - change if needed
- Heap of Database
  - 128MB

System Stability

t.medium instances
ubuntu
20 GB ssd
4 GB memory
2 v-cpu

Fixed Factors

- Number of middleware
  - 2
- Number of clients
  - 30
- Running time
  - 30 minutes
- # of repetition of experiment
  - 5
- Workload
  - 120 requests/second
- Max. # of connections in the Middleware
  - 30
- Max. # of connections in the Database
  - 200

100 en la configuracion de postgres y todos estaban insertando mensajes
0.25 workload operation 5, 15 clientes maquina 1, 15 clientes maquina 2

Outcome

- Plot of avg. throughput per experiments
- Plot of avg. response per experiments

Goal

- Stability for long runs

System Throughput

Fixed Factors

- Number of middleware
  - 2
- Number of clients
  - 5,10,15,20 sending new messages,
  - 5,10,15,20 requesting messages
- Running time
  - 10 minutes
- # of repetition of experiment
  - 5
- Workload
  - 120 requests/second
- Max. # of connections in the Middleware
  - 30
- Max. # of connections in the Database
  - 200

Outcome

- Plot of avg. throughput per experiments

Goal

- Find configuration with highest throughput

fab -R local fullAmazon:experimentID=throughput_1_e20,dbServer=52.31.57.45,dbName=messaging,dbUser=postgres,dbPassword=squirrel,noOfConnections=100,listeningPort=5432,noConnDB=10,duration=600,serverPort=5433,serverAddress=52.31.56.239,serverAddress2=52.31.57.53,operationType=5,workload=0,noClients=20,messageType=2

System Scalability

Fixed Factors

- Number of middleware
  - 2
- Number of clients
  - 15 sending new messages,
  - 15 requesting messages
- Running time
  - 10 minutes
- # of repetition of experiment
  - 5
- Workload
  - 150,140,120,100,80 requests/second
- Max. # of connections in the Middleware
  - 30
- Max. # of connections in the Database
  - 200

Middleare time:10 min
Clients time: 3 min
DB con:5
Handlers:5
Mess:2
CL:15

Middleare time:10 min
Clients time: 3 min
DB con:10
Handlers:10
Mess:2
CL:30

Outcome

- Plot of avg. throughput per experiments
- Plot of avg. response per experiments

Goal

- Find best working configuration in response time and throughput with different workload

Response Time Variations

Fixed Factors

- Number of middleware
  - 2,1
- Number of clients
  - 30 sending new messages
- Message size
  - 200 and 200 characters
- Running time
  - 10 minutes
- # of repetition of experiment
  - 5
- Workload
  - 120 requests/second
- Max. # of connections in the Middleware
  - 30
- Max. # of connections in the Database
  - 200

Outcome

- Plot of avg. response per experiments

Goal

- Find variation in response time given the size of the messages.

fab -R local fullAmazon2:experimentDuration=resp_time_3_mid2_cl5_msg0,dbServer=52.30.174.216,dbNnDB=5,duration=300,serverPort=5433,serverAddress=52.30.110.167,serverAddress2=52.30.6.151,operationType=5,workload=0,noClients=15,messageType=0,essaging.dbUser=postgres,dbPassword=squirrel,noOfConnections=15,listeningPort=5433

no workload/with

2^k Experiment

fab -R local fullAmazonExperiment:experimentID=2k_1_m2_mid_2_ch10_cdb20,dbServer=52.31.45.239,dbName=messaging,dbUser=postgres,dbPassword=squirrel,noOfConnections=10,listeningPort=5432,noCDB=20,duration=600,serverPort=5433,serverAddress=52.31.32.223,serverAddress2=52.30.109,operationType=5,workload=0,noClients=15,messageType=2

K Factors

- Number of middleware
  - 2
- Number of clients **15 in each machine**
  - 30 sending new messages
- Running time
  - 10 minutes
- # of repetition of experiment
  - 5
- Workload
  - 120 requests/second
- **Max. # of connections in the Middleware**
  - **10, 20**
- **Max. # of connections in the Database**
  - **10, 20**

Outcome

- Plot of avg. throughput per experiments
- Plot of avg. response per experiments
- Solving 2^k model

Goal

- Find the impact of these parameters on the response variable “Throughput”