

Software Design and Architecture

Assignment 4

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The Result of Performance Testing

Test Environment

CPU: 2.3 GHz Intel Core i5
Memory: 8GB 1333MHz DDR3
Architecture: x86_64
JVM Version: 1.6.0_35
O/S: OS X Version 10.8.2
Web Application Server: Tomcat 6.0.35.0
Database: MySQL Community Server Version 5.5.25a

Test case

Initial access to the website
Login the website with id and password
Search an item with database access
Generate a PDF report file
Query users with an admin authority
Check orders a buyer placed

Iteration Times

10times

The Variation of the Number of Threads(Users)

Four variations including 1, 10, 100, and 1000.

When I tried to test with over 1000 thread I encountered the halt of JMeter.

I think that it is because of the lack of my test hardware specification.

The Tables of Test Result

Initial access to the website

URL = /bigsale/welcome.html

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	4	0
10 Threads	10	0
100 Threads	186	0
1000 Threads	2703	14.28

Login the website with id and password

URL = /bigsale/login.jsp

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	2	0
10 Threads	9	0
100 Threads	147	0
1000 Threads	1135	16.34

Search an item with database access

URL = /bigsale/searchItem.html? itemName=aa

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	8	0
10 Threads	29	0
100 Threads	359	0
1000 Threads	2016	11.15

Generate a PDF report file

URL = /bigsale/admin/makeReportForm.jsp

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	7	0
10 Threads	20	0
100 Threads	284	0
1000 Threads	1936	12.31

Query users with an admin authority

URL = /bigsale/admin/querySellerForm.html

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	8	0
10 Threads	23	0
100 Threads	272	0
1000 Threads	1935	13.42

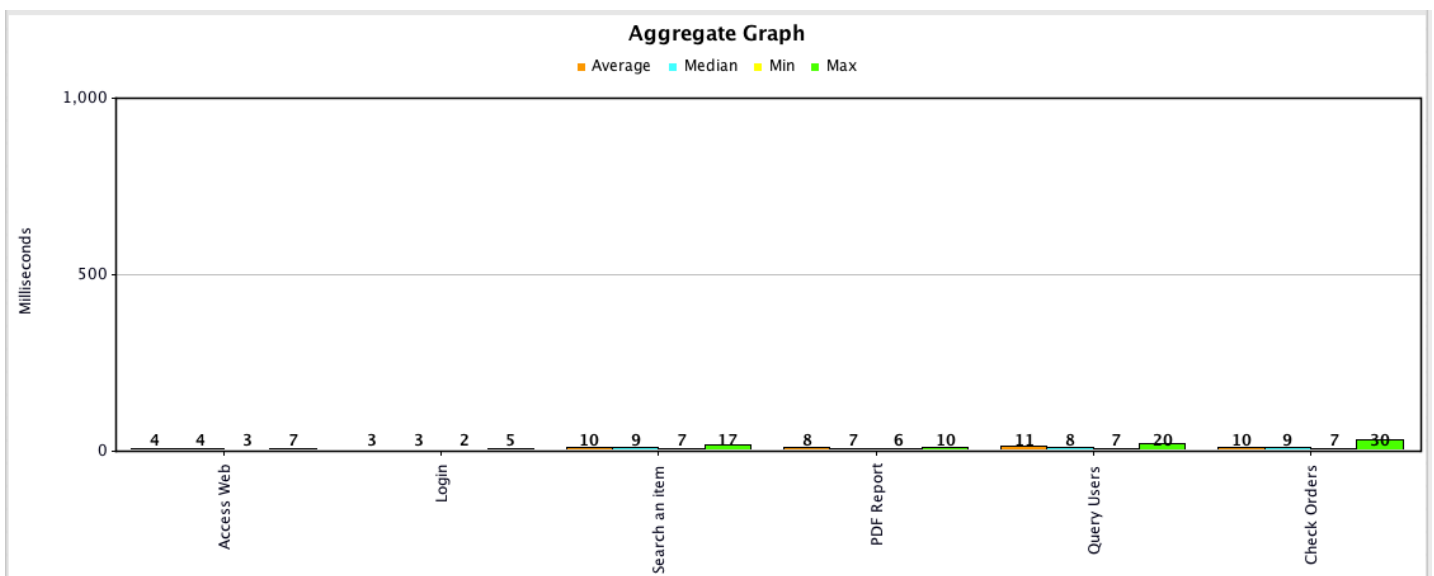
Check orders a buyer placed

URL = /bigsale/seller/checkOrder.html

Test Criteria	Average Response Time(ms)	Error Rate (%)
1 Threads	8	0
10 Threads	22	0
100 Threads	273	0
1000 Threads	1746	13.54

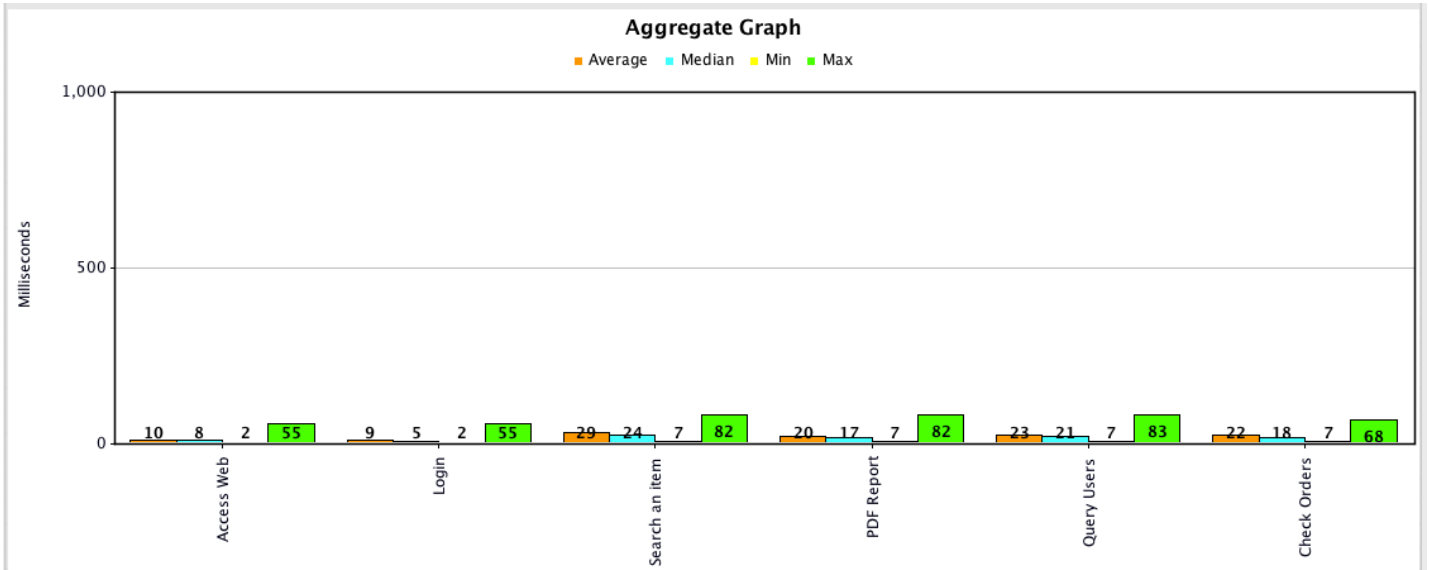
Test Evidences with JMeter

One Thread



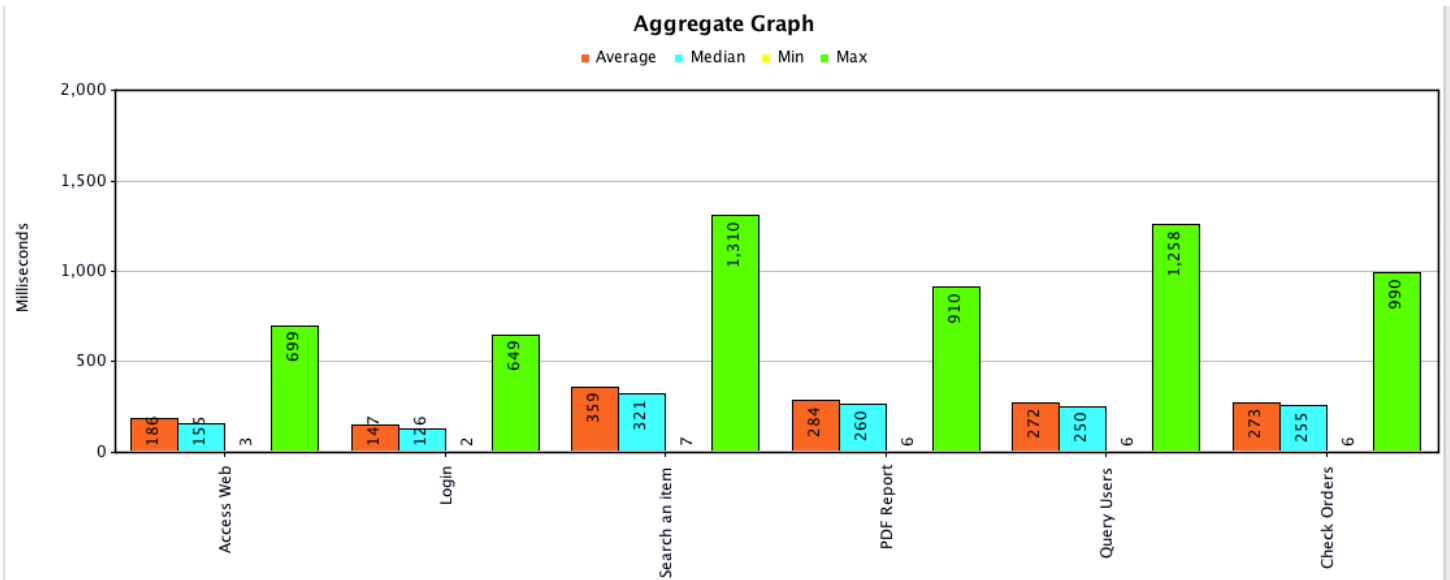
Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Access Web	21	4	2	12	2.08	0.00%	16.7/min	0.62	2281.0
Login	21	2	2	5	0.81	0.00%	16.7/min	0.28	1022.0
Search an item	21	8	7	17	2.11	0.00%	16.7/min	0.70	2566.0
PDF Report	21	7	6	10	1.29	0.00%	16.7/min	0.68	2496.0
Query Users	21	8	6	20	3.82	0.00%	16.7/min	0.68	2496.0
Check Orders	21	8	6	30	4.97	0.00%	16.7/min	0.68	2496.0
TOTAL	126	6	2	30	3.70	0.00%	1.7/sec	3.63	2226.2

Ten Threads



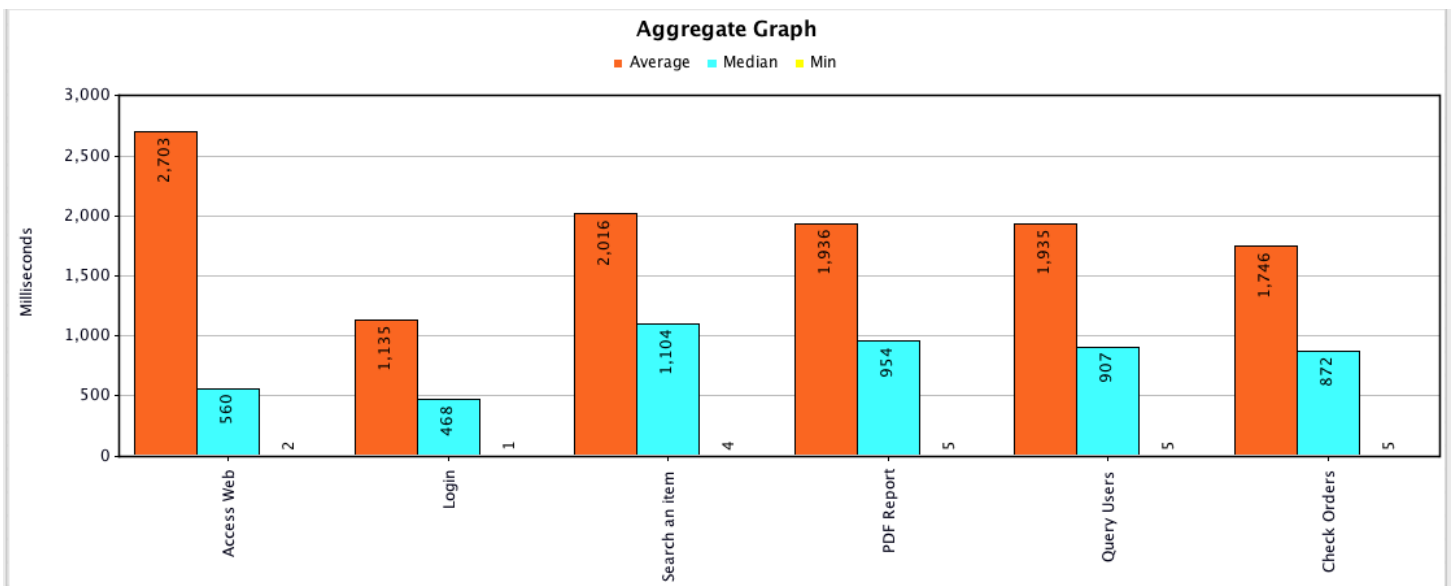
Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Access Web	100	10	2	55	9.02	0.00%	49.9/sec	111.10	2281.0
Login	100	9	2	55	8.53	0.00%	51.4/sec	51.34	1022.0
Search an item	100	29	7	82	17.06	0.00%	50.9/sec	127.65	2566.0
PDF Report	100	20	7	82	12.43	0.00%	50.8/sec	123.79	2496.0
Query Users	100	23	7	83	14.05	0.00%	50.7/sec	123.54	2496.0
Check Orders	100	22	7	68	12.53	0.00%	50.7/sec	123.48	2496.0
TOTAL	600	19	2	83	14.48	0.00%	289.4/sec	629.23	2226.2

One Hundred Threads



Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Access Web	1000	186	3	699	139.30	0.00%	57.8/sec	128.71	2281.0
Login	1000	147	2	649	120.81	0.00%	59.6/sec	59.53	1022.0
Search an item	1000	359	7	1310	224.19	0.00%	60.6/sec	151.83	2566.0
PDF Report	1000	284	6	910	172.48	0.00%	60.9/sec	148.55	2496.0
Query Users	1000	272	6	1258	175.92	0.00%	63.3/sec	154.33	2496.0
Check Orders	1000	273	6	990	168.20	0.00%	63.7/sec	155.25	2496.0
TOTAL	6000	254	2	1310	183.50	0.00%	345.7/sec	751.55	2226.2

One Thousand Threads



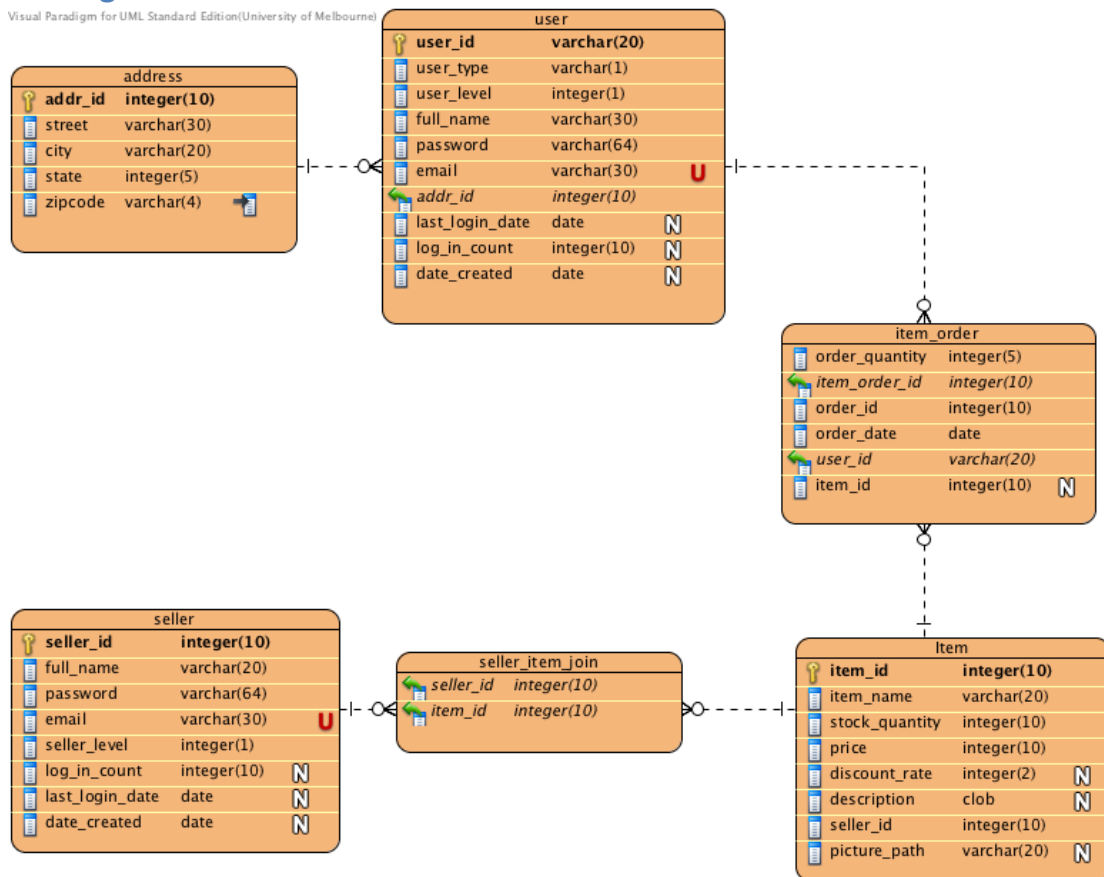
Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Access Web	10000	2703	2	101881	9466.18	14.28%	56.5/sec	124.73	2262
Login	10000	1135	1	66500	4578.44	16.34%	56.5/sec	67.23	1218
Search an item	10000	2016	4	95534	4941.64	11.15%	56.5/sec	138.92	2518
PDF Report	10000	1936	5	95238	4776.86	12.31%	56.6/sec	137.49	2488
Query Users	10000	1935	5	95822	4663.05	13.42%	56.6/sec	137.22	2483
Check Orders	10000	1746	5	96320	3737.44	13.54%	57.0/sec	138.19	2482
TOTAL	60000	1912	1	101881	5697.80	13.51%	338.7/sec	741.64	2242

The Change of Software Design Documentation

During implementation, the database structure was inappropriate so that the design has been changed. On top of that, a security module has been added and the module is working with the chain of responsibility. Except these two aspects the others is as same as the previous design.

ER Diagram

Visual Paradigm for UML Standard Edition (University of Melbourne)



Security Module Class Diagram

Visual Paradigm for UML Standard Edition (University of Melbourne)

