



SugarCRM Scalability and Performance Benchmarks

TECHNICAL WHITE PAPER

EXECUTIVE SUMMARY

This white paper will outline some of the performance benchmarks and scalability testing SugarCRM has undergone with its product set. This report will cover the following test scenarios:

- Scalability and response for 100 concurrent users of Sugar Enterprise On-Site
- Scalability gained by adding Web servers

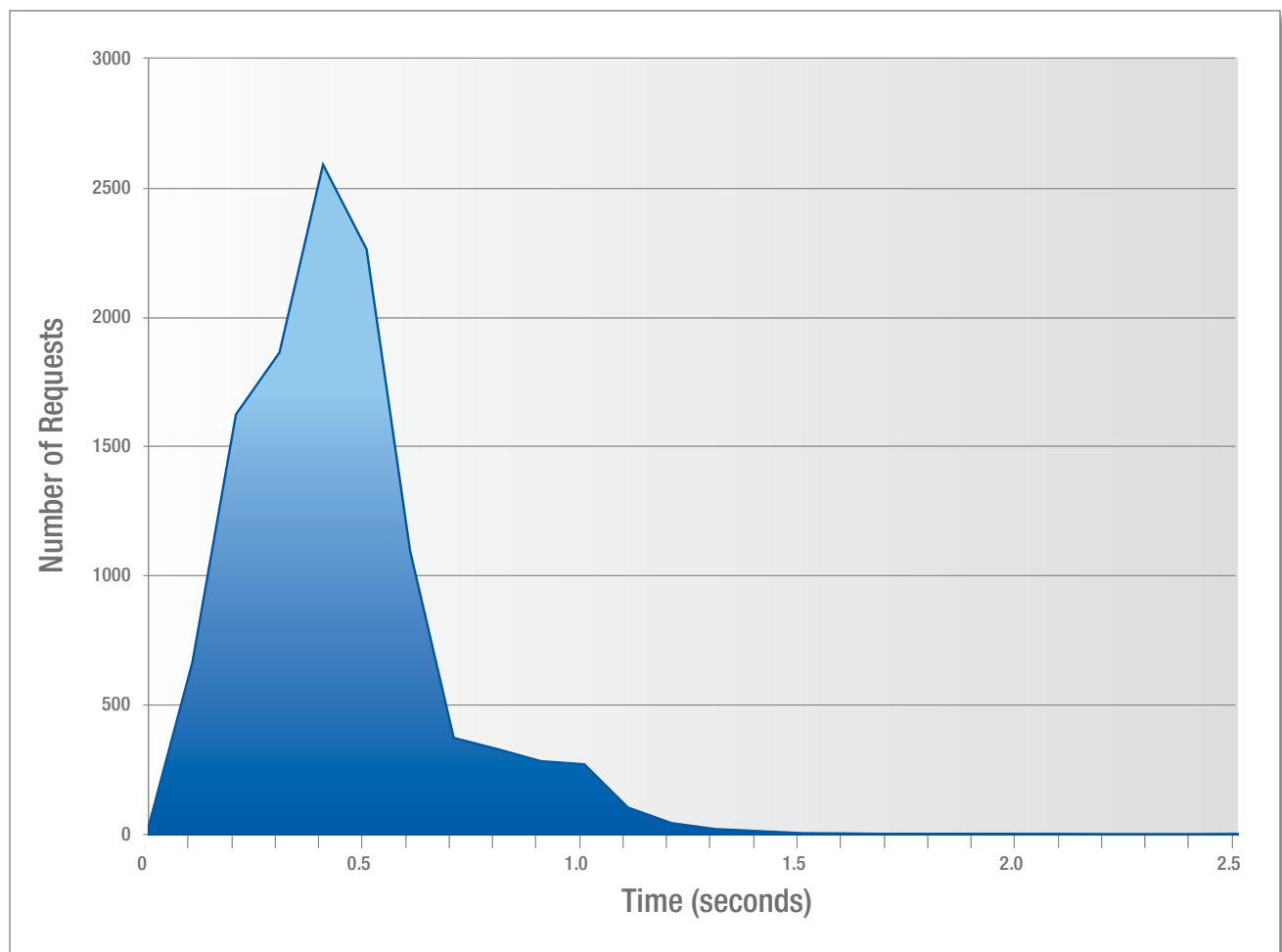
INTRODUCTION

Performance and scalability tests were performed to exhibit how SugarCRM can perform with many users attempting to access data at the same time. For this test and all others in this white paper, the product used was SugarCRM version 4.5.1 Enterprise edition. The database used in this test was MySQL, the default database for SugarCRM. The server configuration used in this series of tests was a dual processor, dual core Intel-based server with 4 gig of RAM. For more information regarding the data volume and server response time by action for these tests, please see the appendices at the end of this document.

Section 1: Performance Benchmarks for 100 Concurrent Users

This test was intended to demonstrate that a consistent sub-second response time could be maintained by simulating a load of 100 concurrent users performing a realistic mix of business functions in the application.

For this test, the average server response time for all pages was 490 milliseconds (ms). The percentage of response times below one second was 95 percent.



This chart shows the number of requests that fall into each response time window. For example, more than 2,500 requests saw a response time of between 0.4 and 0.5 seconds in this single server run with 100 concurrent users.

Section 2: Scalability Through Additional Web Servers

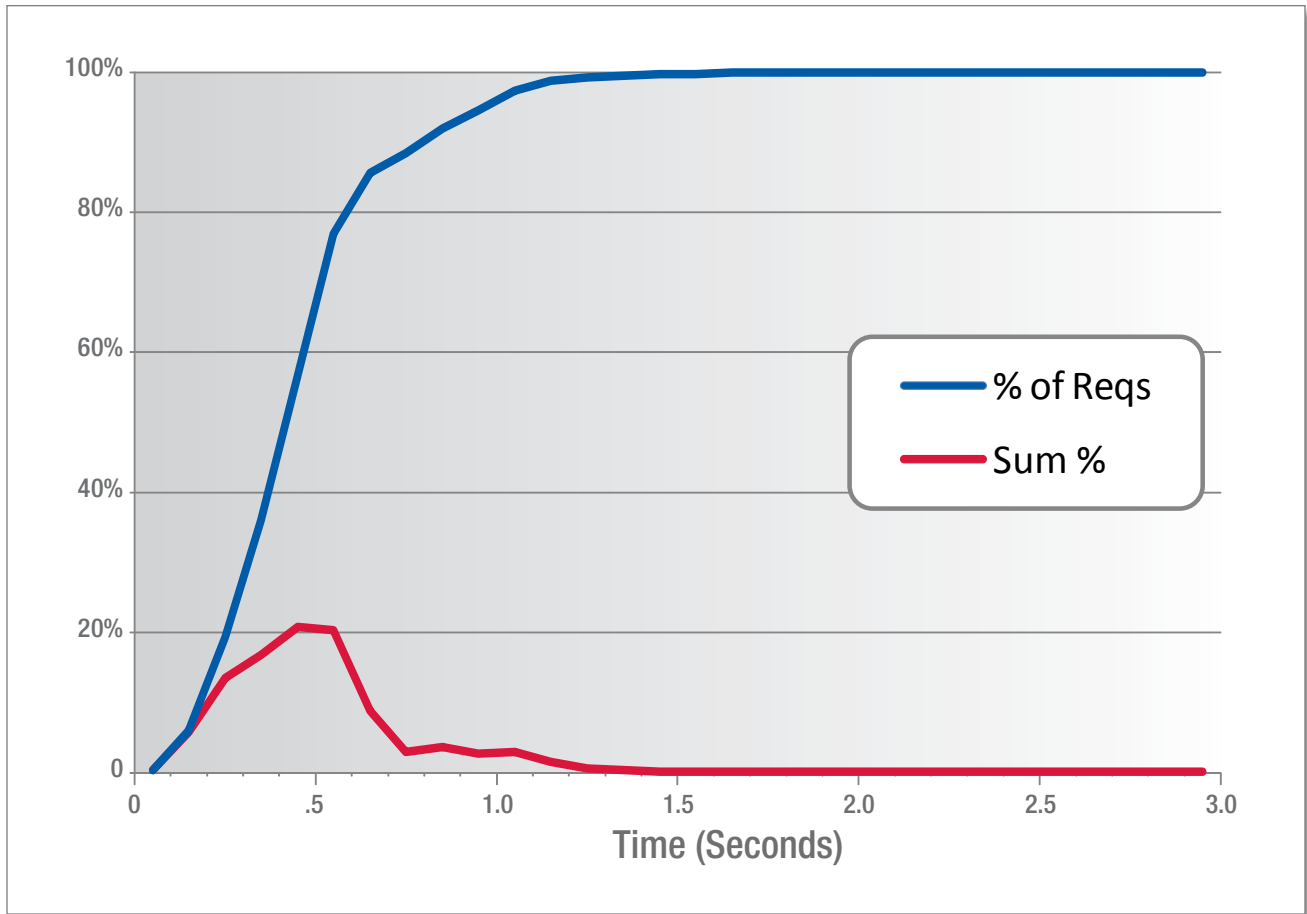
This benchmark was performed to test SugarCRM's scalability across multiple servers without degradation. The desired effect of this test was sub-second response time for high-volume business transactions inside the application by a high volume of concurrent users.

The test was performed in several phases. One phase emulated a 100 concurrent user scenario, running on a single web server. This revealed a solid sub-second average response, with average times coming in at .490 seconds. Benchmarks for 200 concurrent users over two web servers were slightly slower, at .501 seconds on average. When a 300 concurrent user scenario was tested using three web servers, with triple the amount of operations, the average response time was .503 seconds.

Number of Concurrent Users	Avg. Response (seconds)	Business Ops / hr	Business Ops / 8 hr day	# of Web Servers
100	0.490	11,584	92,672	1
200	0.501	23,141	185,128	2
300	0.503	34,702	277,616	3

This chart shows the average response times of SugarCRM based on the amount of users and servers. SugarCRM's performance can be scaled out to more servers with minimal performance degradation.

This scalability test includes some basic assumptions. The test included a "think time" of 30 seconds between activities. For most sales force automation and customer support tools, this is an acceptable time between activities.



The chart above shows two distinct results of the load test using three web servers. The “Sum %” line graph shows the percentage of user actions in the test that were executed in a certain amount of time or less. The “% of Requests” line shows what percentage of the user activities took a certain amount of time to complete. As the chart indicates, 100% of the user activities were completed in less than 2.6 seconds. Also, the chart indicates that a high percentage of requests, nearly 56%, were executed in .5 seconds or less. Again, the average response time for this test was .503 seconds.

CONCLUSIONS

Based on these tests, SugarCRM recommends a maximum of 250 concurrent users on a single web server with this configuration in order to achieve sub-second responses 80 percent of the time. For a typical CRM deployment, that usually equates to a total user breakdown of 2,500 sales representatives or 500 contact center agents running on the same instance.

APPENDIX A – DATA VOLUME

For these runs, all runs were using generated seed data with 1,000 accounts. The details of the seed data are below. The total includes the main objects and the relationship rows that link the data together.

Business Object	Number of Records
Users	400
Teams	80
Accounts	1,000
Quotes	1,000
Product Bundles	2,000
Products	4,000
Calls	24,000
Emails	16,000
Contacts	4,000
Leads	4,000
Opportunities	2,000
Cases	4,000
Bugs	3,000
Meetings	8,000
Tasks	4,000
Notes	4,000
Total Records	351,800

APPENDIX B – TESTS RESULTS FOR A 100 USER SINGLE SERVER LOAD

This test took one hour with each action being executed at least once by each user. More common actions, such as the various List and Detail Views, were executed with a higher frequency to simulate a more realistic use case. The resulting test executions put minimal loads on the database and web servers.

Below is a breakdown of the server response time by action. The Action at left is a typical task performed by a user or the system. The average response time is how long that request took in terms of a server round trip in milliseconds. The Minimum Response Time was the shortest timed round trip. The Maximum Response Time represents the longest round trip time.

Action	Average (ms)	Minimum (ms)	Maximum (ms)
Login Screen	209.4	178	294
Login	698.0	634	1046
Leads List View	424.2	391	1581
Opportunities List View	447.1	414	1312
Case List View	415.6	377	1314
Contacts List View	465.0	426	1191
Task List View	452.2	400	1419
Lead Detail View	464.4	283	1081
Opportunity Detail View	540.9	489	1799
Accounts List View	391.4	361	956
Case Detail View	554.9	388	1647
Quick Create Opportunity	753.6	690	1417
Task Detail View	318.3	201	813
Notes List View	442.0	352	1295
Account Detail View	677.3	209	1728
Note Detail View	303.4	200	1342
Quick Create Account	837.9	757	1467
Quick Create Note	342.3	304	869
Quick Create Case	425.0	382	903
Delete Account	955.2	824	3010
Quick Create Lead	684.6	621	1491
Quick Create Contact	832.1	761	1311
Quick Create Task	341.0	304	958
Delete Note	877.0	750	1635
Delete Contact	982.7	875	1783
Delete Case	874.4	787	1292
Delete Lead	881.0	782	1540
Delete Task	868.2	751	1294
Delete Opportunity	144.2	130	245

Load Composition

The chart below represents how many times each activity was performed during the load test. The Action at left describes the type of user activity. On the right is the amount of times that activity was performed as a server request during the testing process.

Action	Total
Login Screen	100
Login	100
Leads List View	755
Opportunities List View	754
Case List View	751
Contacts List View	730
Task List View	744
Lead Detail View	748
Opportunity Detail View	747
Accounts List View	755
Case Detail View	742
Quick Create Opportunity	375
Task Detail View	736
Notes List View	754
Account Detail View	749
Note Detail View	746
Quick Create Account	100
Quick Create Note	100
Quick Create Case	100
Delete Account	100
Quick Create Lead	100
Quick Create Contact	100
Quick Create Task	100
Delete Note	100
Delete Contact	100
Delete Case	100
Delete Lead	100
Delete Task	100
Delete Opportunity	100

Response Time Spread

This table shows response times broken down in buckets of 0.1 second. Each bucket has the number of requests that fell in that time interval, the percentage of all requests that fell into that time interval, and the cumulative sum of all responses that have come in within the upper bound of the interval.

As an example, our goal was 80% of all responses in less than 1 second. The cumulative sum of the 0.9-1.0 second bucket is 95.94%. This means that 95% of all requests returned in less than one second. 99% of all requests returned in less than 1.2 seconds.

Response Time (seconds)	Requests (total in Bucket)	% Responses (in bucket)	Cumulative Sum %
< 0.1	34	0.294	0.294
0.1 – 0.2	665	5.741	6.034
0.2 – 0.3	1623	14.011	20.045
0.3 – 0.4	1862	16.074	36.119
0.4 – 0.5	2588	22.341	58.460
0.5 – 0.6	2261	19.518	77.978
0.6 – 0.7	1095	9.453	87.431
0.7 – 0.8	373	3.220	90.651
0.8 – 0.9	330	2.849	93.500
0.9 – 1.0	283	2.443	95.943
1.0 – 1.1	271	2.339	98.282
1.1 – 1.2	104	0.898	99.180
1.2 – 1.3	44	0.380	99.560
1.3 – 1.4	21	0.181	99.741
1.4 – 1.5	13	0.112	99.853
1.5 – 1.6	5	0.043	99.896
1.6 – 1.7	4	0.035	99.931
1.7 – 1.8	2	0.017	99.948
1.8 – 1.9	1	0.009	99.957
1.9 – 2.0	2	0.017	99.974
2.0 – 2.1	1	0.009	99.983
2.1 – 2.2	1	0.009	99.991
2.2 – 2.3	0	0.000	99.991
2.3 – 2.4	0	0.000	99.991
2.4 – 2.5	0	0.000	99.991
2.5 – 2.6	1	0.009	100.000

- Total round trips: 11,584
- Average response time for all pages: 490.5 ms
- Responses in under 1 second: 95%

SugarCRM, Inc.
10050 North Wolfe Road
SW2-130
Cupertino, CA 95014
T: 408.454.6900
F: 408.873.2872

www.sugarcrm.com



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