

## Scalability Results



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## Introduction

Organizations using Sage ACT! require high levels of performance, reliability, and scalability to match user, management, and IT expectations. They also need to balance infrastructure costs to deliver an acceptable Return on Investment (ROI). This white paper provides performance and scalability test results and hardware recommendations to deliver a cost effective and positive end-user experience.

Sage has conducted various tests to measure scalability across a wide variety of user counts and scenarios. The tests were conducted on previous versions of Sage ACT!, specifically ACT! Premium (now known as Sage ACT! Premium) and ACT! Premium for Web (now known as Sage ACT! Premium (access via web)), utilizing Microsoft® SQL Server® 2005. Although Sage ACT! 2011 uses the Microsoft SQL Server 2008 database engine, Sage ACT! uses a database-agnostic architecture. We expect both SQL Server 2005 and SQL Server 2008 to share the same hardware recommendations based on these test results:

- ACT! by Sage Premium for Web (ACT! Premium for Web is not available as a standalone product in North America) can effectively scale to more than 600 users
- ACT! Premium can effectively scale to more than 100 users
- ACT! Premium for Web scalability test results include CPU and RAM utilization at user counts of 50, 100, 200, 300, and 600 users. (ACT! Premium for Web is not available as a standalone product in North America.)
- ACT! Premium scalability test results include CPU and RAM utilization at user counts of 1 and 100.

While each individual company's needs differ, this white paper provides guidance to help an organization select a hardware configuration to optimize performance across a variety of deployment scenarios and user counts.

## Scalability

It's important to understand the impact of hardware on the overall ACT! experience regardless of deployment scenario. The following section examines scalability testing performed by Sage and covers the performed tests and test results. These results are provided to help guide hardware selection for the number of users an organization wishes to support.

### Definition

"Scalability" refers to the potential to increase data throughput by changing the hardware configuration. Sage regularly runs scalability tests to identify recommended hardware configurations based on the number of users in a workgroup that will access the system.

Several components are measured during scalability tests along with individual feature performance timing to give a complete picture of scalability and performance expectations.

### CPU and Memory Usage

The percentage of CPU and RAM consumed during usage while running ACT! is a major indicator of server health and software application efficiency. Sage measures these indicators closely during testing; test results provide a snapshot of how the server is performing and when resource consumption may result in a degraded user experience. During scalability tests, the Percent Processor Time (CPU) and the Percent Committed Bytes in Use (RAM) are measured.

## Testing Processes

To mirror real-world usage, Sage constructed tests that reflect typical scenarios of the tasks ACT! users execute most, and performed these tasks in an aggressive manner using simulated users. Figure 1 represents the deployment scenario used for the ACT! Premium scalability tests reported in this white paper.

These tests use two processes to measure scalability: (1) a simulated user load and (2) a single user called the “canary user,” whose individual tasks are timed. In testing, the simulated load process creates a system load composed of everyday user tasks performed with various user counts. Then, measurements are recorded for a single user (the canary user) against this load and are compared to understand the variance.

## ACT! Premium Scalability Tests

In a shared database workgroup environment, the ACT! Premium client can be installed on a user's PC and connected to a database hosted on a separate database server (Figure 1). In this configuration the workload is shared between the user's PC and a database server. Scalability tests were performed on 1 and 100-user environments with results shown in Figure 3.

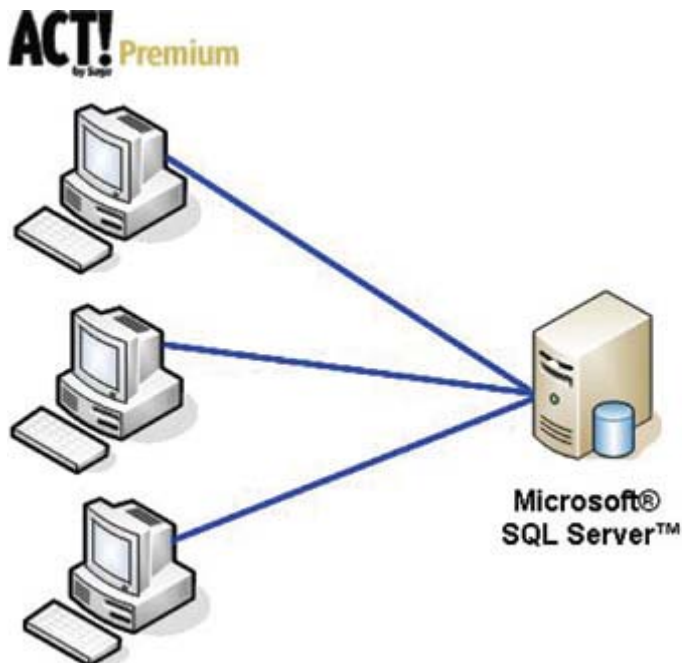


Figure 1: ACT! Premium in a Shared Workgroup Environment

### Test Environment

The Sage scalability tests used identical client hardware to ensure reliable results on the database server. For these tests, Sage used virtual machines (VMware®) set to the minimum client hardware system requirements for ACT! Premium using a Windows® operating system

ACT! Premium Client System Requirements

- Microsoft Windows XP Professional (SP2)
- 600 MHz Pentium® III processor
- 512 MB RAM

ACT! Premium was installed on these PCs and connected to a contact database (see specifics in Figure 2).

# of Concurrent Users	Database Size	Database Type	Database Server Hardware
1 and 100	100,000 contact database, each contact w/15 – 20 child records consisting of notes, history, and opportunities (100K)	Microsoft ®SQL Server® 2005 (ST edition)	Intel® Dual Xeon® 2.4 GHz Microsoft Server 4 GB RAM Microsoft Windows 2003 Server

Figure 2: ACT! Test Environment: Server Hardware and Database Size

### ACT! Premium Scalability Test Results

Test results are based on recorded timings for a single user on a PC with the minimum system requirements (listed on the previous page) connected to a SQL Server. Then, simulated users performed random, “everyday” ACT! tasks (see Appendix for list) at 1 – 120 second intervals to create the simulated user load. Under this load, timings are recorded for a single user performing these same tasks under the simulated load. The simulated single user and canary user timings are compared to understand the difference between the two timings. The CPU and RAM database findings of this test are shown in the following chart (Figure 3):

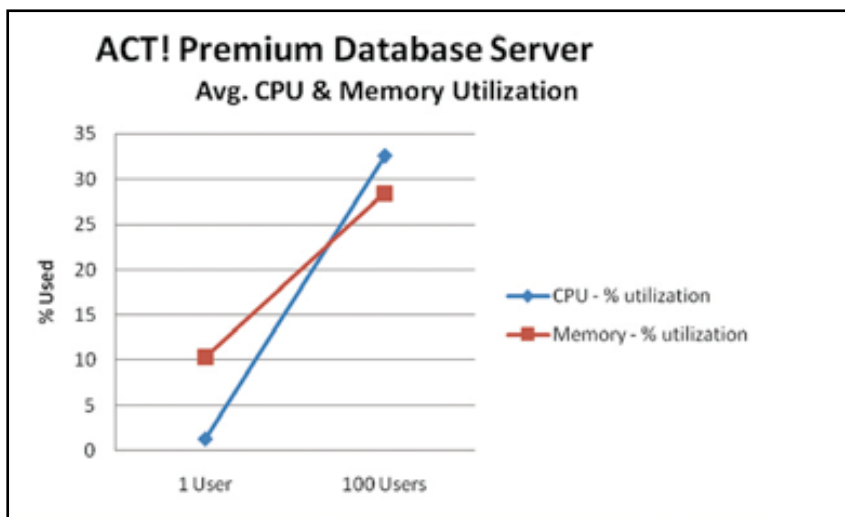


Figure 3: Average CPU and Memory Utilization, ACT! Premium

As shown in the chart (Figure 3), the SQL Server handled the user tests with relatively low stress to the hardware. The 100-user test averaged 33% for the CPU and also consumed an average of 28% of the available RAM (4 GB). Since ACT! uses a database-agnostic architecture, we expect both SQL Server 2005 and SQL Server 2008 to share the same hardware recommendations.

Based on these findings and additional tests performed, we recommend the following hardware specifications by user count (Figure 4):

Recommended Database Server Hardware, Product, and Database Type by User Count				
Number of Users	Recommended CPU Speed	Memory	Applicable Products	Database Tested
1 – 10	Intel Pentium® IV 1.8 GHz Server	1 GB RAM	ACT! ACT! Premium	SQL Server 2005 Express
11 – 30	Intel Pentium IV 2.0 GHz Server	1 GB RAM	ACT! Premium	SQL Server 2005 Express
31 – 50	Intel Pentium IV 3.2 GHz Server	1 GB RAM	ACT! Premium	SQL Server 2005 Standard
51 – 100	Dual Intel Xeon 2.4 Ghz Server	4 GB RAM	ACT! Premium	SQL Server 2005 Standard

Figure 4: Recommended Database Server Hardware, Product, and Database Type by User Count

## ACT! Premium for Web Scalability Tests

Please note ACT! Premium for Web is not available as a standalone product in North America.

ACT! Premium for Web is a browser-based application. Users access a centralized Web application server. In ACT! Premium for Web, most of the processing work occurs on the Web application server or the SQL Server (database server).

To extend ACT! Premium for Web scalability for testing, organizations can use multiple virtual pools on the application server and multiple Web application servers with a single Microsoft SQL Server. In this setup, a load balancer is often employed to spread users evenly over the application servers. The following diagram shows an architectural overview of this approach (Figure 5).

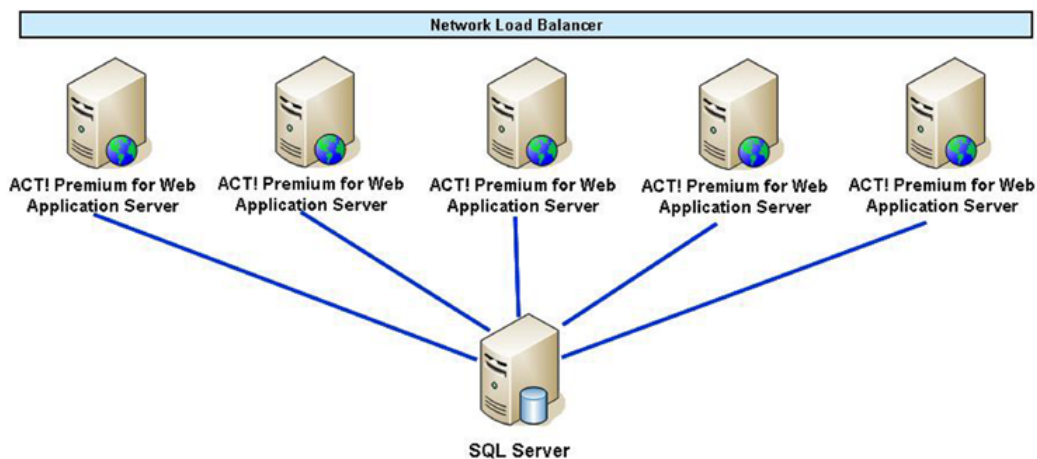


Figure 5: Architecture for ACT! Premium for Web Scalability Tests

Users' requests pass through a network load balancer (Figure 5), which distributes users to an appropriate application server. These application servers in turn access the SQL Server, which houses the ACT! Premium for Web database(s).

**Note:** This requires configuration of the preference setting so that user preference settings are available from any application server.

#### Virtual Directories and Pools

In Microsoft IIS 6.0 – 7.0 you can create multiple virtual directories, each with their own virtual pool, to increase a server's ability to serve more concurrent users accessing the ACT! Premium for Web application. With these individual virtual directories, the Windows® operating system can take advantage of more RAM memory and extend the server's scalability. **Sage recommends creating a virtual pool for every 50 concurrent users that will access the software.**

#### Test Environment

In the ACT! Premium for Web scalability tests, all user traffic was created using simulated users interacting through Internet Explorer® (which generates a load of HTTP requests) from multiple virtual machines.

A different number of application servers and virtual pools were used in these tests, along with a 100K contact database (Figure 6).

# of Concurrent Users	Database Size	Database Type	Web Application Server Hardware	Database Server Hardware
200 and 600	100,000 contact database, each contact with 15 – 20 child records consisting of notes, history, and opportunities (100K)	Microsoft SQL Server 2005	Dual Xeon 2.4 GHz 4 GB RAM Microsoft Windows 32bit Server Operating System 4 Application Pools per Server	Intel Quad Xeon 3.16 GHz Processor 4 GB RAM Microsoft Windows 32bit Server Operating System

Figure 6: ACT! Premium for Web Scalability Tests: Application Servers and Virtual Pools

#### ACT! Premium for Web Scalability Test Results

The ACT! Premium for Web scalability tests performed placed a simulated user load of 200 users per application server to a single SQL Server. These tests reached a maximum of 600 users, spread over three application servers.

Figure 7 shows maximum, minimum, and average percentages of CPU and memory use during the tests for 1, 50, and 200 users. Each application server experienced a similar result.

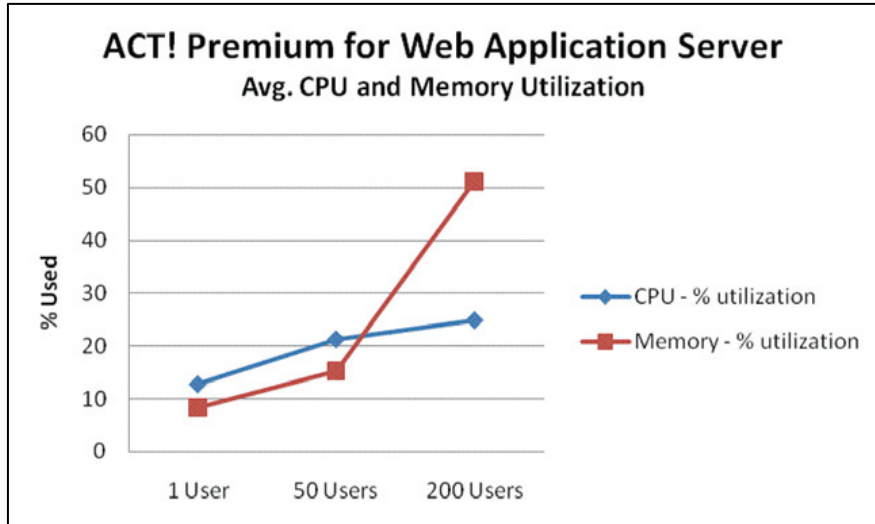


Figure 7: Application CPU and Memory Utilization, ACT! Premium for Web

As shown in the chart, CPU usage maintained an average of 25% and memory averaged 51% for 200 users.

The second chart (Figure 8) shows percentages of CPU and memory usage for the single SQL Server used in the test.

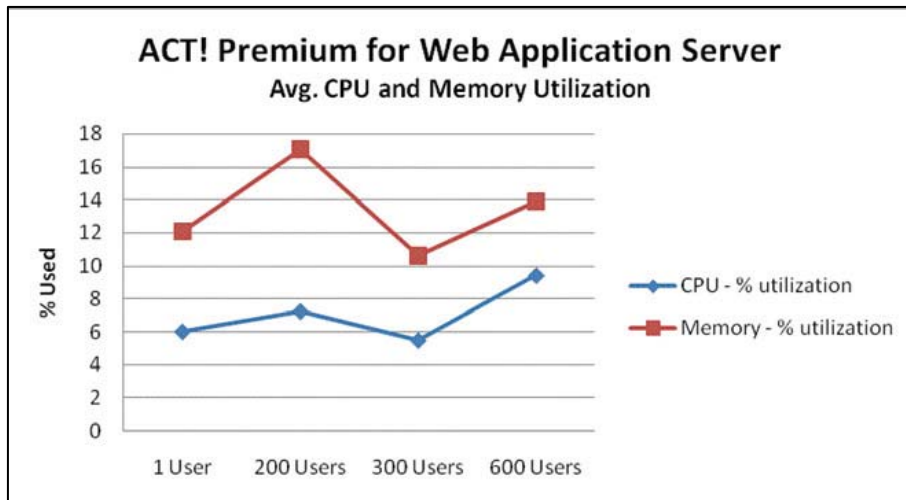


Figure 8: Database CPU and Memory Utilization, ACT! Premium for Web

In the ACT! Premium for Web database, CPU and memory measurements remained low throughout the test, reaching an average of 9% for the CPU and 14% for memory for 600 users.

Based on these findings and additional tests performed, we recommend the following hardware specifications by user count (Figures 9 and 10). These recommendations balance hardware investment, application performance, and user expectations regarding application performance.

Recommended Web Application Server Hardware, Product, and Database Type by User Count					
Number of Users	# of Servers	Recommended CPU Speed – Application Server	Memory	Applicable Product	Database
1 – 10	1	Intel Pentium IV 1.8 GHz Server	1 GB RAM	ACT! Premium for Web	SQL Server 2005 Express
11 - 30	1	Intel Pentium IV 2.8 GHz Server	1 GB RAM	ACT! Premium for Web	SQL Server 2005 Express
31 – 50	1	Intel Pentium IV 2.8 GHz Server	2 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
51 – 200	1	Intel Dual Xeon 2.4 GHz server	4 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
201 – 400	2	Intel Dual Xeon 2.4 GHz servers	4 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
401 – 600	3	Intel Dual Xeon 2.4 GHz servers	4 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard

Figure 9: Recommended Web Application Server Hardware, Product, and Database Type by User Count

**Note:** When the number of users per application server approaches the recommended maximum, administrators may want to consider adding an additional application server to ensure acceptable end user performance.

#### Database Server

Recommended Web Application Server Hardware, Product, and Database Type by User Count				
Number of Users	Recommended CPU Speed – Database Server	Memory	Applicable Product	Database
1 – 30	(See preceding application server specifications. Database and application server can exist on same server for up to 30 users.)			
31 – 100	Intel Dual Xeon 2.4 GHz server	4 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
101 - 200	Intel Quad Xeon 3.16 GHz server	8 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
201 – 400	Intel Quad Xeon 3.16 GHz server	8 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard
401 – 600	Intel Quad Xeon 3.16 GHz server	8 GB RAM	ACT! Premium for Web	SQL Server 2005 Standard

Figure 10: Recommended Web Application Server Hardware, Product, and Database Type by User Count

## ACT! Scalability, a Side-by-Side Comparison

We've developed a side-by-side comparison of different ACT! Premium Solutions and hardware choices based on the total number of users to be served, with results derived from the scalability tests performed. The following diagram (Figure 11) displays different scenarios by user count and recommended ACT! product, along with general hardware recommendations.

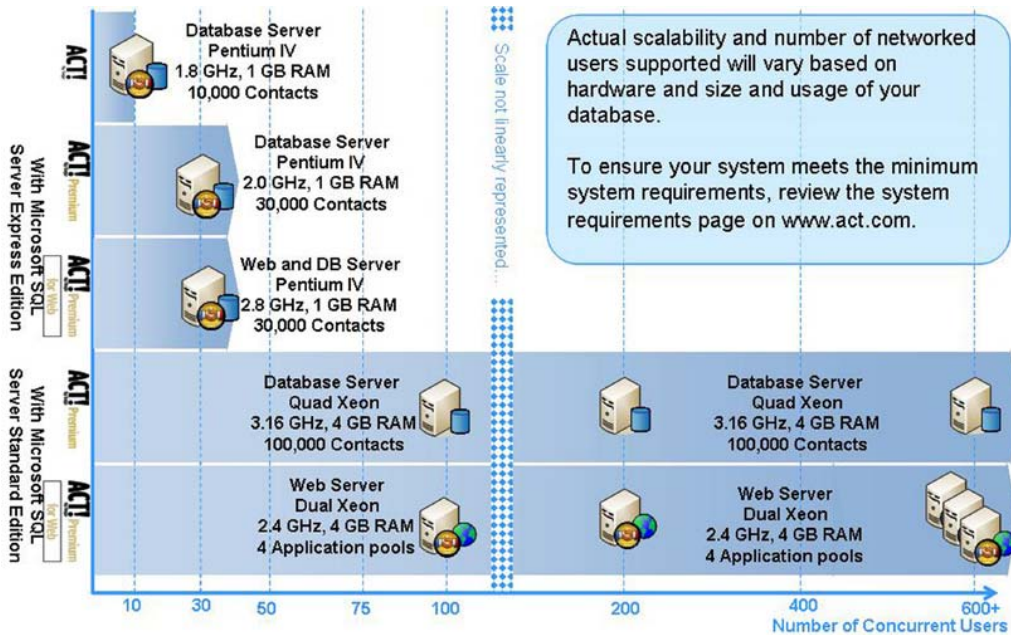


Figure 11: ACT! Scalability Comparisons

## Conclusion

This white paper is intended to be a guide to scalability and hardware selection when planning ACT! Premium Solutions' implementations. When properly configured, Sage test results confirm ACT! Premium scalability of 100 users or more, and 600 users or more when using ACT! Premium for Web. While the tests reported in this white paper measured scalability at specific user counts, scalability limits are determined by the hardware configuration and user load.

Organizations using ACT! Premium Solutions must balance hardware investment, application performance, and user expectations to deliver an acceptable Return on Investment. Organizations' scalability results will vary based on the number of records, intensity of use, and network realities. However, as these test results demonstrate, ACT! Premium Solutions deliver satisfactory and cost-effective performance when deployed on appropriate platforms.

## Appendix

### List of ACT! Tasks Tested on an Ongoing Basis

1. Launch ACT!
2. Database Open
3. Open Task List View
4. Open Activity Dialog from Contact Detail View
5. Add an Activity from Contact Detail View
6. Open History Dialog Box from Contact Detail View
7. Open Notes Dialog Box from Contact Detail View
8. Add Note from Contact Detail View
9. Open Lookup Dialog Box from Contact Detail View
10. Open Group Detail View from Contact Detail View
11. Open Company Detail View from Contact Detail View
12. Create New Database
13. Update Database
14. Open Clear Activity Dialog Box from Contact Detail View
15. Open preferences Dialog Box (local)
16. Open Opportunity Dialog Box from Contact Detail View
17. Open Monthly Calendar from Contact Detail View
18. Open Weekly Calendar View from Contact Detail View
19. Open Daily Calendar View from Contact Detail View
20. Open Existing Activity from Contact Detail View
21. Open Define fields Dialog Box (local)
22. Lookup Last Name - Contact Detail View
23. Lookup Last Name - Contact List View
24. Open Opportunity List View from Contact Detail View
25. Open Group List View from Contact Detail View
26. Open Company List View from Contact Detail View
27. Open Contact Detail view From Daily Calendar View
28. Open Contact List View from Contact Detail View
29. Open Write E-mail Dialog Box from Contact Detail View (client closed)
30. Open Write E-mail Dialog Box from Contact Detail View (client open)
31. Save Copy As
32. Mail Merge E-mail Closed - 100 contacts
33. Mail Merge E-mail Open - 100 contacts
34. Mail Merge ACT! Word - 100 contacts
35. Mail Merge MS Word - 100 contacts
36. Contact Report
37. Import Database

**Table 1 - Top Tasks ACT! Users Perform Most**

<b>Task</b>	<b>View/Feature/Dialog Boxes Accessed</b>
Start Working with ACT!	
	Open Application
	Open Database
See Everything About the Contact in One Place	
	View Contact Detail
	View Group/Company detail
	View Group/Company list view
Schedule/Clear an Activity	
	View Task List
	View Daily Calendar
	View Weekly Calendar
	View Monthly Calendar
	Schedule Activity dialog box – open
	Schedule Activity dialog box - save
	Clear Activity dialog box – open
Look up a Contact	
	Lookup dialog box
	Lookup results – Contact detail
	Lookup results – Contact list
Insert Piece of Data	
	Insert note dialog box – open
	Insert note dialog box – save
Send E-mail	
	ACT! E-mail form – Client closed
	ACT! E-mail form – Client open
Record a Sale	
	Opportunity detail view – open
Track a Sale(s)	
	Load Opportunity list – 50 items
	Change Opportunity filter to only show open Opportunities

**ACT! Premium Results Detail**

The following table displays average results recorded during the scalability tests.

**Database Server Average Results**

<b>Number of Users ---&gt;</b>	<b>1</b>	<b>100</b>
	<b>AVG</b>	
CPU - % utilization	1.371	32.545
Memory - % utilization	10.333	28.441

**ACT! Premium for Web Results Detail**

The following tables displays average results recorded during the scalability tests.

**Database Server Average Results**

Number of Users --->	1	200	300	600
	<b>AVG</b>			
CPU - % utilization	6.02	7.25	5.49	9.44
Memory - % utilization	12.08	17.06	10.59	13.89

**Application Server Average Results**

Number of Users --->	1	50	200
	<b>AVG</b>		
Memory (% Committed Bytes In Use )	12.80	21.25	24.81
Processor (% Processor Time)	8.263	15.28	51.15

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#### About Sage ACT!

Sage ACT! makes it easy for you to have meaningful conversations with customers by giving you an organized view of the people you do business with. Like the millions of small businesses and sales teams who use Sage ACT!, you'll always be prepared with recent emails, meeting notes, task reminders, and social media profiles, because all of these details live in one place.

**Important Note:** Review Sage ACT! system requirements at [www.act.com/2011systreq](http://www.act.com/2011systreq). You must purchase one license of Sage ACT! per user. Scalability varies based on hardware, size, and usage of your database. **Compatibility:** Visit [www.actolutions.com](http://www.actolutions.com) or contact your add-on product provider to help determine compatibility.