act!™

Scalability Results

Select the right hardware configuration for your organization to optimize performance

sw!ftpage™

Table of Contents

Introduction

Organizations using 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.

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

- Act! Premium (access via web) can effectively scale to more than 600 users. (Act! Premium for Web is not available as a standalone product in North America).

- Act! Premium can effectively scale to more than 100 users.

- Act! Premium (access via web) scalability test results include CPU and RAM utilization at user counts of 50, 100, 200, 300, and 600 users. (Act! Premium (access via 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 refers to the potential to increase data throughput by changing the hardware configuration.

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 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. 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. These indicators are measured 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, tests are constructed to reflect typical scenarios of the tasks Act! users execute most. These tasks are performed in an aggressive manner using simulated users. Figure 1 represents the deployment scenario used for the 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 scalability tests used identical client hardware to ensure reliable results on the database server. For these tests, we 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 the following specifics).

# of Concurrent Users	Database Size	Database Type	Database Server Hardware
1 and 100	100,000 contact database, each contact with 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: The test environment used the server hardware and database sizes shown

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.
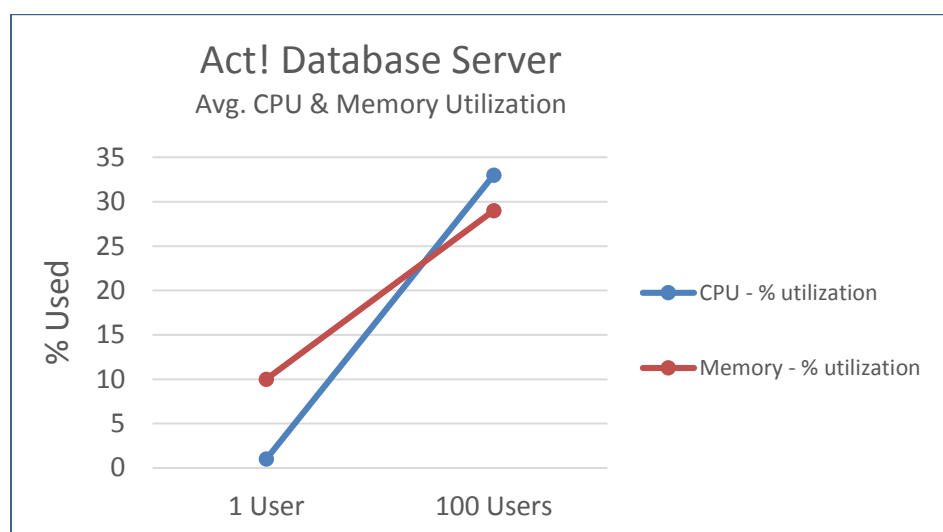

Figure 3: The average CPU and Memory Utilization results for Act! Premium

As shown in 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.

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: Recommendations based on scalability test results

Act! Premium for Web Scalability Tests

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

To extend Act! Premium (access via 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 figure shows an architectural overview of this approach.
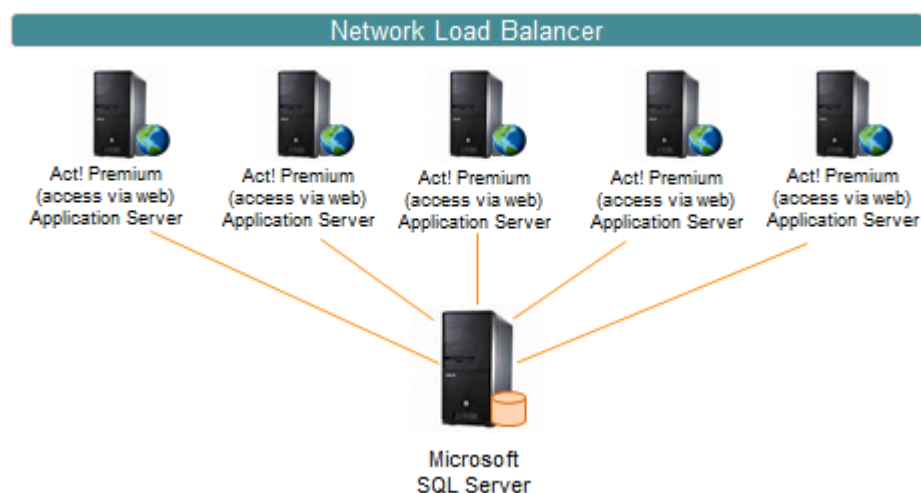
Figure 5: An architectural overview for Act! Premium (access via web) scalability tests

Users' requests pass through a network load balancer, which distributes users to an appropriate application server. These application servers in turn access the SQL Server, which houses the Act! Premium (access via 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 (access via web) application. With these individual virtual directories, the Windows® operating system can take advantage of more RAM memory and extend the server's scalability. We recommend creating a virtual pool for every 50 concurrent users that will access the software.

Test Environment

In the Act! Premium (access via 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.

# 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 (access via web) Scalability Tests: Application Servers and Virtual Pools

Act! Premium (access via web) Scalability Test Results

The Act! Premium (access via 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.

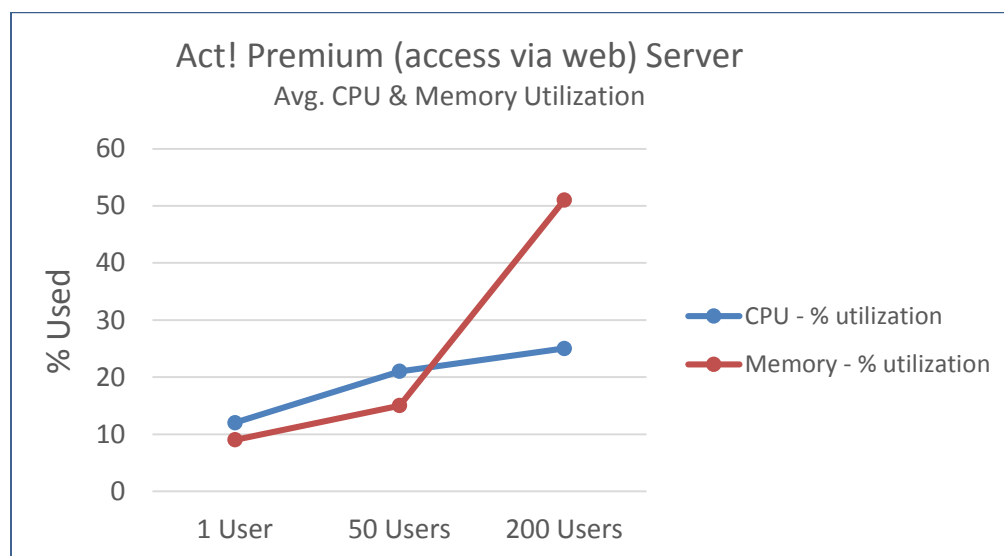Each application server experienced a similar result.

Figure 7: Maximum, minimum, and average percentages of CPU and memory use during the Act! Premium (access via web) tests for 1, 50, and 200 users

As shown in Figure 7, CPU usage maintained an average of 25% and memory averaged 51% for 200 users.
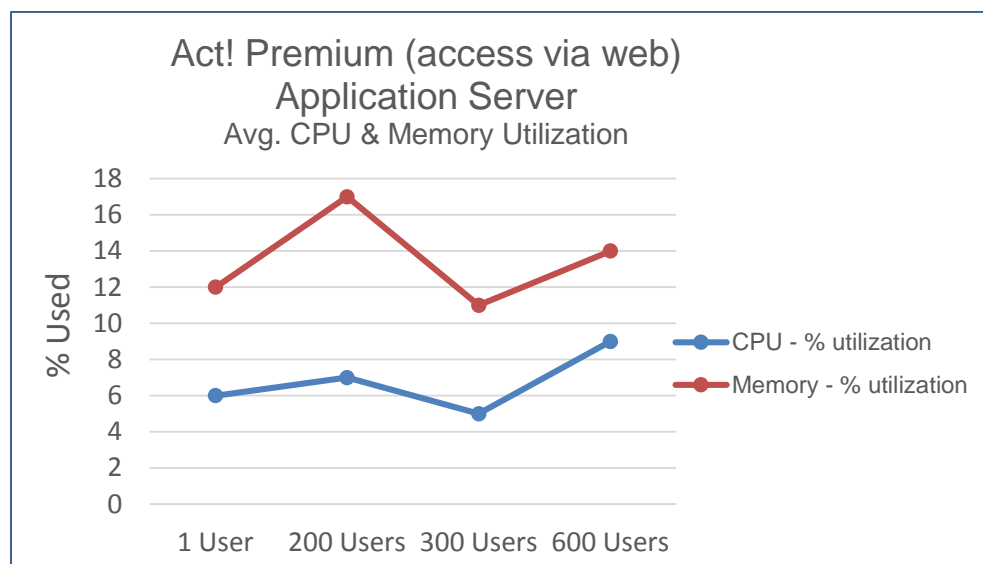

Figure 8: Percentages of CPU and memory usage for the single SQL Server used in the test for Act! Premium (access via web)

In the Act! Premium (access via 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.

Application Server

Number of Users	Number of Servers	Recommended CPU Speed – Application Server	Memory	Applicable Product	Database
1-10	1		1 GB RAM	Act! Premium (access via web)	SQL Server 2005 Express
11-30	1		1 GB RAM	Act! Premium (access via web)	SQL Server 2005 Express

31-50	1		2 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
51-200	1		4 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
201-400	2		4 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
401-600	3		4 GB RAM	Act! Premium (access via 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

Number of Users	Recommended CPU Speed – Database Server	Memory	Applicable Product	Database
1-30	See the Application Server specifications in the previous table. The database and application server can exist on the same server for up to 30 users.			
31-100	Intel Dual Xeon 2.4 GHz server	4 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
101-200	Intel Quad Xeon 3.16 GHz server	8 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
201-400	Intel Quad Xeon 3.16 GHz server	8 GB RAM	Act! Premium (access via web)	SQL Server 2005 Standard
401-600	Intel Quad Xeon 3.16 GHz server	8 GB RAM	Act! Premium (access via 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 displays different scenarios by user count and recommended Act! product, along with general hardware recommendations.
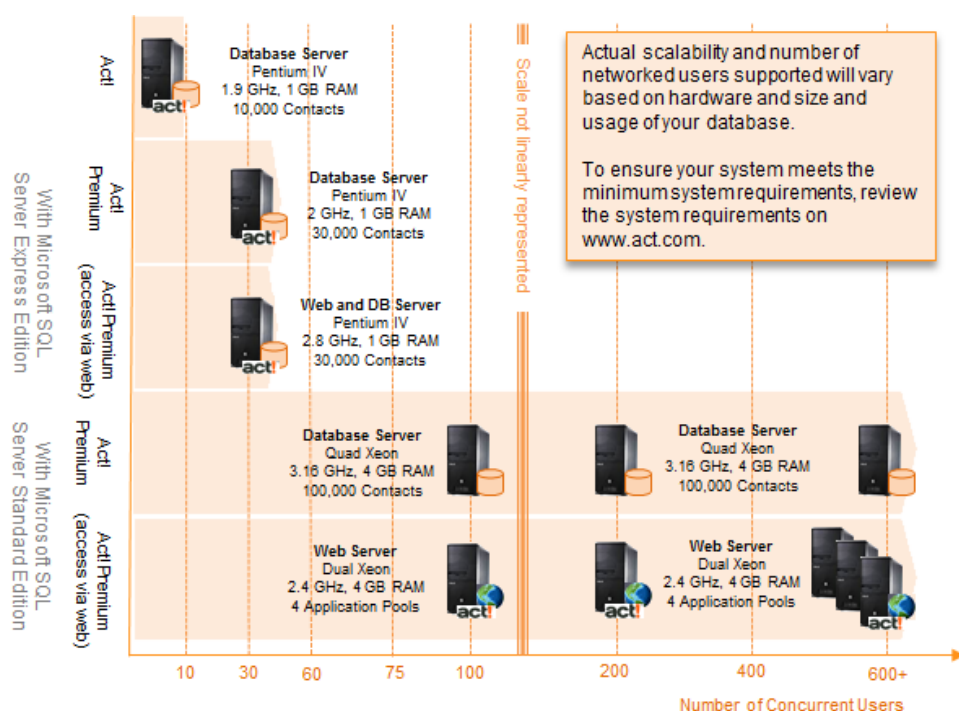

Figure 11: Act! scalability comparison

Organizations using Act! must balance hardware investment, application performance, and user expectations to deliver an acceptable Return on Investment.

Conclusion

This white paper is intended to be a guide to scalability and hardware selection when planning Act! Premium and Act! Premium (access via web) implementations. When properly configured, test results confirm Act! Premium scalability of 100 users or more, and 600 users or more when using Act! Premium (access via web). While the tests measured scalability at specific user counts, scalability limits are determined by the hardware configuration and user load.

Organizations using Act! 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! delivers satisfactory and cost-effective performance when deployed on appropriate platforms.

Appendix

List of Act! Tasks Tested

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

Top Tasks Act! Users Perform Most

Task	View/Feature/Dialog Boxes Accessed
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

Number of Users	1	100
	AVG	
CPU - % utilization	1.371	32.545
Memory - % utilization	10.333	28.441

Act! Premium (access via web) Results Detail

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

Database Server Average Results

Number of Users	1	200	300	600
			AVG	
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
		AVG	
CPU - % utilization	12.80	21.25	24.81
Memory - % utilization	8.263	15.28	51.15

sw!ftpage™

About Swiftpage

8800 N. Gainey Center Dr., Suite 200 | Scottsdale, AZ 85258 | www.swiftpage.com