

4,500 Concurrent User Siebel 7 Performance and Scalability Benchmark on IBM eServer xSeries and IBM DB2 UDB

Introduction

Siebel Systems is the world's leading provider of eBusiness applications software and is committed to delivering high performance solutions that meet our customers' requirements. The Siebel Smart Web Architecture is designed to meet demanding performance and scalability requirements in all deployment scenarios.

The purpose of this document is to provide the audience with the performance and scalability characteristics of the Siebel 7 eBusiness Application Suite on IBM eServer xSeries and IBM DB2 UDB. This information should be used as an aid for system planning and sizing to support business requirements.

Results† Summary: 4,500 Concurrent User Benchmark†

Workload	Number of Users	Avg Operation Response Time (sec)	Business Transactions Throughput/hour	Projected Daily Transactions (BTT/hour x 8)
Sales / Service Call Center	3,000	0.247	18,245	145,963
PRM	600	0.186	4,144	33,153
Esales	450	0.168	2,576	20,610
Eservice	450	0.082	6,093	48,742
Totals	4,500	N/A	31,059	248,468



Workload	Business Transactions Throughput/hour	Projected Transactions Per Day (BTT/hr x 8)
Assignment Manager	58,785	470,280
EAI - HTTP Adapter	1,084,680	8,677,440
EAI - MQ Series Adapter	591,372	4,730,976
Workflow Manager	73,677	589,416

Major Test Component	Version
Application	Siebel 7.0.3 Application Suite
Database	IBM DB2 UDB v7.2
Operating System	Microsoft Windows 2000 SP2
Hardware	IBM eServer xSeries 360, 370, 440 IBM Netfinity 7000, 7600 Servers

†This benchmark data is intended for general information purposes, and not for use as a substitute for implementation specific sizing or benchmarks.

‡Please note that actual results may vary, based on a broad range of implementation specific factors, such as transaction mix, hardware platform, network parameters, and database size. Siebel Systems does not warrant or guarantee that customers will obtain the same or similar results, even if they use the same or similar equipment and/or software applications. Siebel Systems does not warrant, endorse, or guarantee any performance of any products, any results desired or achieved, or any statements made within this document.

IBM Siebel Partnership

A recipient of five Siebel Systems Partner Excellence Awards, IBM is a global leader in the development and implementation of eBusiness solutions. IBM became Siebel Systems' first Global Strategic Partner in 1999. Since then, Siebel Systems and IBM have worked together closely on software and hardware development, establishing a worldwide network of solution partnership centers, conducting comprehensive co-marketing, and collaborating on more than \$1 billion in joint sales and hundreds of eBusiness implementations. IBM and Siebel Systems leverage each other's strengths to significantly improve their own business operations. IBM is currently rolling out the largest global deployment of CRM Applications in history. The deployment will provide more than 80,000 users with a single view of the customer across all channels and integrate more than 30,000 business partners into the IBM ecosystem via a Web-based partner portal. IBM brings a compelling value proposition to Siebel System's customers, offering a high-performance database, scalable and reliable hardware platforms, and an extensive IT services organization, with more than 700 Siebel Certified Consultants. IBM's extensive industry knowledge, hardware, software, and services dramatically reduce risk, accelerate deployment, and increase returns for our joint customers. Together, IBM and Siebel Systems have more than 500 joint customers.

Overview

The Siebel 7 Smart Web Architecture introduces a revolutionary approach for deploying web applications. It includes a web only solution with the interactivity customers have become accustomed to with client/server implementations. Yet, it does so by being highly scalable, very light on the network and web servers; thereby, allowing customers to leverage their existing network and web farm infrastructure.

The tests conducted under the Siebel Platform Sizing and Performance Program are designed to stress the Siebel 7 Architecture and to prove that large customers can be successful deploying many thousands of concurrent users. Among the Siebel 7 Architecture features exercised are:

- **Siebel 7 Smart Web Architecture** – Takes advantage of the latest web browser technology to deliver a high interactive experience to the most demanding users that have been accustomed to the interactivity of windows based applications. It also places a very light load on the web server, allowing customers to leverage their existing web farm infrastructure.
- **Siebel 7 Smart Network Architecture** – Allows Siebel 7 customers to leverage their existing network infrastructure by transmitting only the application data requested by the employee application in a compressed format between the browser and web servers, thus saving customers the expense of a certain network upgrade that would be necessary with competing products.
- **Siebel 7 Smart Database Connection Pooling and Multiplexing** – Allows customers to scale their databases without the introduction of expensive and complex transaction processing monitors.
- **Siebel 7 Server Request Broker** – Allows for the load balancing of work across multiple Siebel Servers without the expensive and complex administration or transaction processing monitors.
- **Siebel 7 Enterprise Application Integration** – Allows customers to integrate their existing systems with Siebel 7. With a relatively modest investment in equipment, customers can execute over 13,000,000 integrated transactions during a eight-hour business day.

This test simulated a large corporation with 4,500 concurrent users across multiple functional requirements:

- **Siebel Call Center and Siebel Service** – Provides the most complete solution for enabling customer service and telesales representatives to provide world-class customer support, generate customer loyalty and to increase revenues through cross-selling and up-selling.
- **Siebel Partner Relationship Management** – Enables organizations to more effectively and strategically manage relationships with channel and alliance partners, distributors, resellers, agents, brokers and dealers.
- **Siebel Interactive Selling Suite** – a comprehensive platform for business-to-business and business-to-consumer selling over the Web. Siebel eSales includes a complete set of out-of-the-box features to allow customers to quickly and easily find the products and services that suit their needs and then order them.
- **Siebel eService** – a complete Web application allowing users to receive self-service and assisted-service over the Internet. Siebel eService provides customers with a secure, personalized experience to review service issues, order status and assets; resolve problems using a full suite of problem resolution tools.
- **Siebel Assignment Manager** – a rules based engine that assigns work, including sales opportunities, service requests and activities, based on employee skills, availability, territory and other user defined factors.
- **Siebel Workflow** – a business process management engine for automating user interaction, business processing, and integration workflows. It is designed for easy administration and rapid customization through its graphical drag-and-drop user interface. Administrators can add custom or pre-defined business services, branching, updates and inserts, and sub-processes to create a workflow process tailored to their unique business requirements.

Methodology

The test was executed independently by IBM under the auspices of the Siebel Platform Sizing and Performance Program. The tests conducted under this program are based on scenarios derived from Siebel customers, reflecting some of the most frequently used, and most critical components of the Siebel eBusiness Application Suite. The program requires that tests run in steady state for at least one hour and that certain key performance indicators be reached prior to certification.

The test simulated the real world requirements of a large organization of 4,500 concurrent users from the call center (Sales and Service Representatives), partner organizations (Partner Relationship Management), and customers (web sales and web service); and supporting application services such as work assignment (Siebel Assignment Manager) and business process management (Siebel Workflow). The application also simulated integration with legacy systems (Siebel EAI MQ Series Adapter) and web systems (Siebel EAI HTTP Adapter) with over 13,000,000 EAI transactions that can be executed between systems in a regular business day.

The end users were simulated using Mercury Interactive Load Runner version 7.5 with a think time in the range of 5 sec - 55 sec (or an average of 30 sec) between user operations. The Siebel 7 Assignment Manager processed assignment transactions for sales opportunities based on position and territories of employees. Siebel 7 Workflow Manager executed workflow steps based on inserted service requests. The Siebel 7 EAI MQ Series Adapter read from and placed transactions into IBM MQ Series queues. The Siebel 7 EAI HTTP Adapter executed requests between different web infrastructures.

The size of the database used was approximately 103 gigabytes. It was built to simulate customers with large transaction volumes and data distributions representing the most common customer data shapes. The DBMS used 300 megabytes of buffer space in order to emulate real customer environment and prevent the database from being cached. Below is a sampling of record volumes for key business entities of the standard Siebel volume database.

Business Entity	Number of Records
Accounts	1,897,161
Activities	8,744,305
Addresses	3,058,666
Contacts	3,366,764
Employees	21,000
Opportunities	3,237,794
Orders	355,297
Products	226,000
Quote Items	1,984,099
Quotes	253,614
Service Requests	5,581,538



Business Transactions

A total of 11 use cases of complex business transactions were executed simultaneously for 4,500 concurrent users. Between each user operation, the think time was in the range of 5 -55 sec (average of 30 sec).

Siebel Call Center

- Incoming call creates sales opportunity, quote and order
- Incoming call creates service request, customer profile and activity plan
- Service agent investigates and solves service request

Siebel Partner Relationship Management

- Partner creates account, contact, service request, and partner profile
- Partner creates opportunity, activities and assigns sales team
- Partner searches for service requests, and enters new action for service request

Siebel Interactive Selling Suite

- User browses product catalog for several items
- User browses product catalog, places item in shopping cart, reviews account profile
- User browses product catalog, execute complex search, purchases product

Siebel eService

- User logs new service request and reviews open service requests
- User searches for service centers, sends e-mail

The use cases for the different applications are typically considered heavy transactions; For example, the high level description of the “Incoming call creates opportunity, quote and order” use case is as follows:

Incoming call creates sales opportunity, quote and order

- Using prebuilt Siebel computer telephony integration (CTI) functionality, “retrieve” an incoming call
- Enable Siebel Search Center
- Search for a non-existing Contact
- After no records are found, navigate to the “My Contacts” page
- Create a new contact, entering all of the fields on the list view
- Navigate to the “Contact’s Opportunity” detail page
- Create a new opportunity for the contact, including: opportunity name, description, projected revenue and channel
- Associate the opportunity to an account
- Enter new products for the opportunity
- Using the Siebel Auto Quote function, automatically generate a quote for the opportunity
- Re-price the quote after changing the price list and discount level
- Communicate net price from the quote to customer
- Update the opportunity when re-pricing is completed
- Using Siebel Auto Order, generate an order for the quote
- Summarize quote and order with the customer
- Using Siebel CTI functionality, release the call

Topology

The section below shows the hardware topology of the systems used for the test as well as the hardware and software combinations used.

Web Servers:

- 5 x IBM eServer xSeries Model 360
 - 4 x 1.6 GHz Xeon MP
 - 8 GB RAM
- MS IIS 5.0
- Siebel version 7.0.3 SWSE
- Windows 2000 SP2

Gateway Server / LDAP:

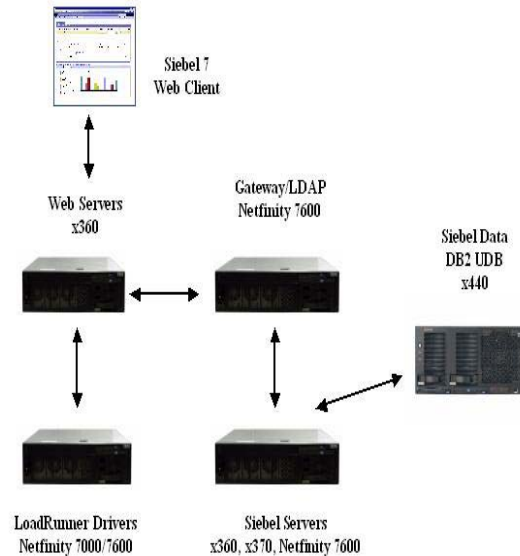
- 1 x IBM Netfinity 7600
 - 4 x 700 MHz Pentium III Xeon
 - 4 GB RAM
- Siebel version 7.0.3 gateway
- Resonate version 3.2.2
- Netscape Console 4.2
- Windows 2000 SP2

Application Servers:

- 6 x IBM eServer xSeries Model 360
 - 4 x 1.6 GHz Xeon MP
 - 8 GB RAM
- 2 x IBM eServer xSeries Model 370
 - 4 x 900 MHz Pentium III Xeon
 - 8 GB RAM
- 1 x IBM Netfinity 7600
 - 4 x 700MHz Pentium III Xeon
 - 4GB RAM
- Siebel version 7.0.3
- Windows 2000 SP2

Database Server:

- IBM eServer xSeries Model 440
 - 4 x 1.6 GHz Xeon MP
 - 8 GB RAM
- DB2 UDB for Windows v7.2
- Fixpak 5S with the following APARs:
IY30544 + IY29294 + IY29792
- Windows 2000 SP2



Load Runner Drivers:

- 2 x IBM Netfinity 7000
 - 4 x 500 MHz Pentium III Xeon
 - 4 GB RAM
- 1 x IBM Netfinity 7600
 - 4 x 700 MHz Pentium III Xeon
 - 4 GB RAM
- Mercury Interactive LR version 7.5
- Windows 2000 SP2



Results*

The test system demonstrated that Siebel 7 Architecture on IBM eServer xSeries and DB2 UDB easily scales to 4,500 concurrent users.

- **Vertical scalability** – The Siebel 7 Server showed excellent scalability within an application server.
- **Horizontal scalability** – The benchmark demonstrates scalability across multiple servers without degradation.
- **Low network utilization** – The Siebel 7 Smart Web Architecture and Smart Network Architecture efficiently managed the network consuming only 5.8 kilobits per second per user.
- **Efficient use of the database server** – The Siebel 7 Smart Database Connection Pooling and Multiplexing allowed the database to service 4,500 concurrent users and the supporting Siebel 7 Server application services with 330 database connections.

During the test the database grew by about one (1) gigabytes indicating significant amount of transaction load.

The Business Transaction Throughput provides a measure of efficiency for a full sequence or iteration of Siebel operations that constitute a business transaction, the 11 types of transactions shown above.

Response Times and Transaction Throughput

Workload	Number of Users	Avg. Operation Response Time (sec)	Business Transactions Throughput/hour
Call Center – Sales and Service	3,000	0.247	18,245
Partner Relationship Management	600	0.186	4,144
Interactive Selling Suite	450	0.168	2,576
EService	450	0.082	6,093
Totals	4,500	N/A	31,059

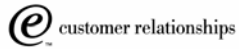
Workload	Business Transactions Throughput/hour
Assignment Manager	58,785
EAI - HTTP Adapter	1,084,680
EAI - MQ Series Adapter	591,372
Workflow Manager	73677.0

Server Resource Utilization

Node	Functional Use	% CPU Utilization	Memory Utilization (MB)
IBM eServer xSeries Model 360	Web Server – Application Requests	5	210
IBM eServer xSeries Model 360	Web Server – Application Requests	19	198
IBM eServer xSeries Model 360	Web Server – Application Requests	20	229
IBM eServer xSeries Model 360	Web Server – Application Requests	21	229
IBM eServer xSeries Model 360	Web Server – Application Requests	20	158
IBM Netfinity 7600	Siebel Gateway Server / LDAP	4	193
IBM eServer xSeries Model 360	Siebel Application Server – End Users	28	2,719
IBM eServer xSeries Model 360	Siebel Application Server – End Users	29	2,739
IBM eServer xSeries Model 360	Siebel Application Server – End Users	28	2,756
IBM eServer xSeries Model 360	Siebel Application Server – End Users	27	3,098
IBM eServer xSeries Model 360	Siebel Application Server – End Users	27	3,005
IBM Netfinity 7600	Siebel Application Server – Workflow Manager, Assignment Manager	55	1,669
IBM eServer xSeries Model 370	Siebel Application Server – EAI MQ Series Adapter	47	569
IBM eServer xSeries Model 360	Siebel Application Server – EAI HTTP Adapter	26	275
IBM eServer xSeries Model 370	Siebel Application Server – EAI HTTP Adapter	27	284
IBM eServer xSeries 440	IBM DB2 UDB v7.2	37	2,868

Note: Response times are measured at the web server and not the end user, which would depend on the network latency and bandwidth between web server and browser, and the time for browser rendering.

Please note that actual results may vary, based on a broad range of implementation specific factors, such as transaction mix, hardware platform, network parameters, and database size. Siebel Systems does not warrant or guarantee that customers will obtain the same or similar results, even if they use the same or similar equipment and/or software applications. Siebel Systems does not warrant, endorse, or guarantee any performance of any products, any results desired or achieved, or any statements made within this document.



Network Utilization

For 4,500 concurrent users, the network utilization measured was 3.2 megabytes per second for the browser traffic, an average of 5.8 kbps per user. These measurements did not incorporate compression for web server to browser traffic.

Summary

Siebel Systems is the world's leading provider of eBusiness applications software and is committed to delivering high performance solutions that meet our customers' requirements. Over 4,000 organizations have standardized on Siebel eBusiness Applications as their CRM standard including industry leaders like AXA, British Telecom, Deutsche Telekom, General Electric, General Motors, The Hartford, IBM, JP Morgan Chase, and Yahoo! The Siebel Smart Web Architecture is designed to meet demanding performance and scalability requirements for even the most demanding global deployment scenarios.

For Further Information

For further metrics on scalability and performance, or information on any Siebel 7 products, please contact:

Siebel Systems, Inc.

2207 Bridgepointe Parkway

San Mateo, CA 94404

Phone: (650) 477-5000

<http://www.siebel.com>

E-Mail: info@siebel.com