

Performance and Scalability Benchmark: Siebel CRM Release 7 on IBM eServer p650 and IBM DB2 UDB

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INTRODUCTION

This white paper describes the performance and scalability capabilities of Oracle's Siebel Customer Relationship Management (CRM) Applications Release 7. The benchmark comprised 2,500 concurrent users running Siebel CRM Release 7 on IBM eServer p650 and IBM DB2 UDB. This information should be used as an aid for system planning and sizing to support business requirements.

Results Summary: 2,500-Active-Concurrent-User Benchmark ^{1 2}

Workload	Number of Users	Avg Operation Response Time (sec)	Business Transactions Throughput/hour	Projected Daily Transactions (BTT/hr x 8)
Sales / Service Call Center	1,750	0.121	9,108	72,867
PRM	250	0.109	3,363	26,904
eSales	250	0.207	1,697	13,578
eService	250	0.134	3,225	25,797
Totals	2,500	N/A	17,393	139,146

Workload	Business Transactions Throughput/hour	Projected Transactions Per Day (BTT/hr x 8)
Assignment Manager	43,020	344,157
EAI - HTTP Adapter	154,296	1,234,368
EAI - MQ Series Adapter	116,285	930,280
Workflow Manager	16,108	128,860

¹ This benchmark data is intended for general information purposes and not for use as a substitute for implementation-specific sizing or benchmarks.

² Actual results may vary, based on a broad range of implementation-specific factors, such as transaction mix, hardware platform, network parameters, and database size. Oracle 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. Oracle does not warrant, endorse, or guarantee any performance of any products, any results desired or achieved, or any statements made within this document.

Major Test Component	Version
Application	Siebel 7.5.2.211 Application Suite
Database	IBM DB2® Universal Database™ v7.1 FP 3SA
Operating System	AIX 5L™
Hardware	IBM eServer pSeries 650 Server

OVERVIEW

The Siebel CRM Release 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. It does so by being highly scalable and very light on the network and Web servers, thereby allowing customers to leverage their existing network and Web-farm infrastructure.

The tests conducted in Oracle's Siebel Platform Sizing and Performance Program are designed to stress the Siebel CRM Release 7 architecture and to demonstrate that large customers can successfully deploy many thousands of concurrent users. The Siebel CRM Release 7 architecture features tested in this benchmark include

- **Siebel Smart Web Architecture**—Takes advantage of the latest Web browser technology to deliver a highly interactive experience. The interactive model which is similar to Windows-based applications also improves productivity. Utilization rates on the Web server are low, allowing customers to retain existing Web server infrastructure.
- **Siebel Smart Network Architecture**—Allows Siebel CRM Release 7 customers to leverage their existing network infrastructure by compressing and caching user interface components, so that browser/Web server interaction occurs only when the application requests data. This allows customers to avoid expensive network upgrades that can be necessary with competing products.
- **Siebel Smart Database Connection Pooling and Multiplexing**—Allows customers to scale their databases without introducing expensive and complex transaction processing monitors.
- **Siebel Request Broker**—Provides for component-level load balancing of work across multiple Siebel servers without the expensive and complex administration of transaction-processing monitors.
- **Enterprise Application Integration (EAI)**—Allows customers to integrate their existing systems with Siebel CRM applications. With a relatively modest investment in equipment, customers can execute more than 2,100,000 integrated transactions during an eight-hour business day.

This test simulated a large corporation with 2,500 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 superior world-class customer support, generate customer loyalty, and 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**—Provides a comprehensive platform for business-to-business and business-to-consumer sales over the Web. Siebel eSales includes a complete set of out-of-the-box features to allow customers to quickly and easily find, and then order, products and services that suit their needs.
- **Siebel eService**—Allows users to receive self-service and assisted service over the internet. Siebel eService provides customers with a secure, personalized experience for reviewing service issues, order status, and assets and resolving problems by using a full suite of problem-resolution tools.
- **Siebel Assignment Manager**—Offers 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**—Automates user interaction, business processing, and integration workflows through use of a business-process-management engine. It is designed for easy administration and rapid customization through its graphical drag-and-drop user interface. Administrators can add custom or predefined business services, branching, updates and inserts, and subprocesses to create a workflow process tailored to their unique business requirements.
- **Siebel Enterprise Application Integration**—Allows customers to integrate their existing systems with Siebel CRM. Siebel EAI supports several adapters. The Siebel EAI HTTP and MQ Series adapters were used in this benchmark.

METHODOLOGY

This benchmark was executed independently by IBM under Oracle's Siebel Platform Sizing and Performance Program guidelines, with test cases based on Siebel customer requirements. These test cases reflect some of the most critical and frequently used components, must run in steady state for at least one hour, and certification is dependent on the achievement of certain key performance indicators.

The test simulated the real-world requirements of a large organization of 2,500 concurrent users from the call center (sales and service representatives), partner

organizations (partner relationship management), 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 more than 2,100,000 EAI transactions that can be executed between systems in a regular business day.

The end users were simulated by use of Mercury Interactive LoadRunner version 7.51, with a think time in the range of 5 to 55 seconds (or an average of 30 seconds) between user operations. The Siebel CRM Release 7 Assignment Manager processed assignment transactions for sales opportunities based on position and territories of employees. Siebel CRM Release 7 Workflow Manager executed workflow steps based on inserted service requests. The Siebel CRM Release 7 EAI MQ Series Adapter read from and placed transactions into IBM MQ Series queues. The Siebel CRM Release 7 EAI HTTP Adapter executed requests between different Web infrastructures.

Database Setup

Prior to benchmark execution, the database size was approximately 140GB. It was built to simulate customers with large transaction volumes and data distributions representing the most-common customer data shapes. Below is a sampling of record volumes for key business entities of the standard Siebel volume database.

Business Entity	Number of Records
Accounts	2,309,277
Activities	8,924,305
Addresses	3,492,831
Contacts	3,366,764
Employees	21,000
Opportunities	3,448,952
Orders	438,100
Products	226,000
Quote Items	1,410,433
Quotes	253,614
Service Requests	5,602,538

Business Transactions

A total of 10 use cases of complex business transactions was executed simultaneously for 2,500 concurrent users. Between each user operation and the next one, the think time was in the range of 5 to 55 seconds (average of 30 seconds). The 10 use cases are listed below.

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 resolves service request.
- Simulation of users doing random searches on several objects, such as contact last name and account name.

Siebel Partner Relationship Management

- Partner queries on product and categories, reviews partner profile.
- Partner reviews, creates, or updates opportunity and activities.

Siebel Interactive Selling Suite

- User browses product catalog for several items.
- User browses product catalog, places item in shopping cart, reviews account profile.

Siebel eService

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

Siebel Enterprise Application Integration—Integrate Third-Party Application

- EAI requests are made using a customized account-integration object. The requests consist of 80 percent selects, 10 percent updates, and 10 percent inserts.

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

- Enable Siebel Search Center.
- Search for a nonexistent contact.
- After no records are found, navigate to the My Contacts page.
- Create a new contact, entering information into all of the fields in 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 with an account.
- Enter new products for the opportunity.
- Using the Siebel Auto Quote function, automatically generate a quote for the opportunity.
- Reprice the quote after changing the price list and discount level.

- Communicate the net price from the quote to the customer.
- Update the opportunity when repricing is completed.
- Using Siebel Auto Order, generate an order for the quote.
- Summarize the quote and order with the customer.

TOPOLOGY

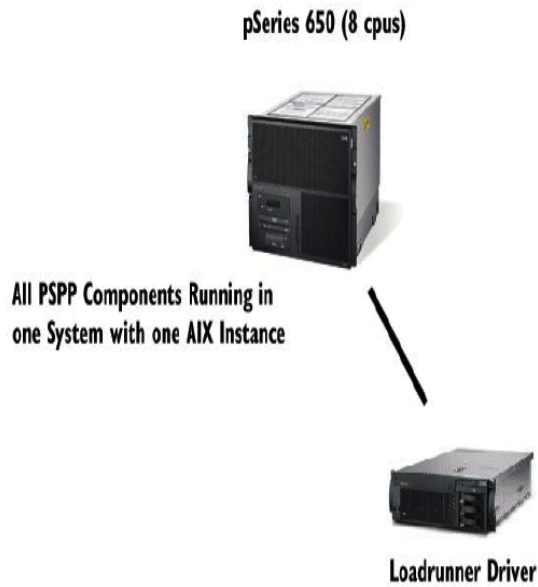
This section shows the hardware topology of the systems used for the test as well as the hardware and software combinations used.

All PSPP Components (Application server, Database server, Gateway server, LDAP, Web Server):

- 1x IBM eServer pSeries 650
 - 8 x 64-bit POWER4+ 1.45GHz
 - 16GB RAM
- IBM HTTP server version 2.0.30
- Siebel CRM Release 7.5.2.211
- AIX 5L
- IBM Secureway Directory v3.2.2
- DB2 UDB for AIX v7.1 FP7s

LoadRunner Driver:

- IBM Netfinity 5500
 - 4 x 500MHz Pentium III Xeon
 - 4GB RAM
- LoadRunner version v7.51 SP1
- Microsoft Windows 2000 Server SP4



RESULTS

Response Times and Transaction Throughput ^{3 4 5}

Workload	Number of Users	Avg. Operation Response Time (sec)	Business Transactions Throughput/ hour
Call Center – Sales and Service	1,750	0.121	9,108
Partner Relationship Management	250	0.109	3,363
Interactive Selling Suite	250	0.207	1,697
eService	250	0.134	3,225
Totals	2,500	N/A	17,393

³ Response times are measured at the Web server instead of at the end user. The response times at the end user would depend on the network latency, the bandwidth between Web server and browser, and the time for browser rendering of content.

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⁵ The Business Transaction Throughput provides a measure of efficiency for a full sequence or iteration of Siebel operations that constitute a business transaction, using the 10 types of transactions that were simulated in the benchmark.

Workload	Business Transactions Throughput/hour
Assignment Manager	43,020
EAI - HTTP Adapter	154,296
EAI - MQ Series Adapter	116,285
Workflow Manager	16,108

Node	Functional Use	% CPU Utilization	Memory Utilization (GB)
IBM eServer pSeries Model 650	Web Server, Application Server, LDAP, Gateway Server	92	12

Network Utilization

For 2,500 concurrent users, the network utilization measured was 11.2 Mbps for the browser traffic, an average of 4.4 Kbps per user. These measurements did not incorporate compression for Web-server-to-browser traffic.

CONCLUSION

The test system demonstrated that Oracle's Siebel CRM Release 7 architecture on IBM eServer pSeries and DB2 UDB easily scales to 2,500 concurrent users.

- **Vertical scalability**—Siebel CRM Release 7 Server showed excellent scalability within an application server.
- **Horizontal scalability**—The benchmark demonstrates scalability across multiple servers without degradation.
- **Low network utilization**—Siebel CRM Release 7 Smart Web Architecture and Smart Network Architecture efficiently managed the network, consuming only 4.4 kilobits per second per user.
- **Efficient use of the database server**—Siebel CRM Release 7 Smart Database Connection Pooling and Multiplexing allowed the database to service 2,500 concurrent users and the supporting Siebel CRM Release 7 Server application services with 88 database connections.

During the test, the database grew by about 1GB, demonstrating that the workload simulated by the system exceeded the requirements of some of the most demanding Siebel customers.

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