

Performance and Scalability
Benchmark: Siebel CRM Release
7.5.2 on Sun Microsystems Sun
Fire Servers and Oracle9i
Database

An Oracle White Paper
Updated September 2006



Performance and Scalability Benchmark: Siebel CRM Release 7.5.2 on Sun Microsystems Sun Fire Servers and Oracle9i Database

INTRODUCTION

This white paper describes the performance and scalability capabilities of Oracle's Siebel Customer Relationship Management (CRM) Release 7.5.2. The benchmark comprised 10,000 concurrent users running Siebel CRM Release 7.5.2 on Sun Microsystems Sun Fire servers and Oracle9i Database. This information should be used as an aid for system planning and sizing to support business requirements.

Results Summary: 10,000-Concurrent-User Benchmark ^{1, 2}

Workload	Number of Users	Average Operation Response Time (sec)	Business Transactions Throughput/Hour	Projected Daily Transactions (BTT/Hour x 8)
Sales /Service Call Center	7,000	0.126	34,778	278,227
PRM	1,000	0.303	12,540	100,320
eSales	1,000	0.274	6,775	54,202
eService	1,000	0.199	12,870	102,960
Totals	10,000	N/A	66,964	535,710

Workload	Business Transactions Throughput/Hour	Projected Daily Transactions (BTT/Hour x 8)
Assignment Manager	11,427	91,416
EAI – HTTP Adapter	278,352	2,226,816
EAI – MQ Series Adapter	181,319	1,450,552
Workflow Manager	53,439	427,512

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 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 Application Suite
Database	Oracle 9.2.0.2
Operating System	Solaris 8 2/04 Generic_117350-02
Hardware	Sun Microsystems Sun Fire E2900, V890, V440, V880, V480, V65

Overview

The Siebel CRM Release 7.5.2 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 7.5.2 architecture and demonstrate that large customers can successfully deploy many thousands of concurrent users. The Siebel CRM Release 7.5.2 architecture features tested in this benchmark include

- **Smart Web Architecture**—Takes advantage of the latest Web browser technology to deliver a highly interactive experience. The interaction 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.
- **Smart Network Architecture**—Allows Siebel CRM Release 7.5.2 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.
- **Smart Database Connection Pooling and Multiplexing**—Allows customers to scale their databases without the introduction of expensive and complex transaction-processing monitors.
- **Server Request Broker**—Provides for component-level load balancing 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 3.6 million integrated transactions during an eight-hour business day.

This test simulated a large corporation with 10,000 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 customer support, generate customer loyalty, and increase revenues through cross-selling and up-selling.
- **Siebel Partner Relationship Management**—Enables organizations to more effectively and more 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, the products and services that meet 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 Enterprise Application Integration supports several adapters. The Siebel Enterprise Application Integration HTTP and MQSeries adapters were used in this benchmark.

METHODOLOGY

The test was executed independently by Sun Microsystems under Oracle's Siebel Platform Sizing and Performance Program guidelines, with test cases based on Siebel applications' customer requirements. These test cases reflect some of the most critical and frequently used components of the Siebel CRM application. The test cases 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 10,000 concurrent users from the call center (sales and service representatives), partner organizations (running Siebel Partner Relationship Management), customers (Web sales and Web services), 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 Enterprise Application Integration MQSeries Adapter) and Web systems (Siebel Enterprise Application Integration HTTP Adapter) with more than 3.6 million EAI transactions that can be executed between systems in a regular business day.

The end users were simulated by use of Mercury Interactive LoadRunner, Release 7.51, with a think time between user operations in the range of 5 to 55 seconds (an average of 30 seconds). Siebel CRM Release 7.5.2 Assignment Manager processed assignment transactions for sales opportunities based on the positions and territories of employees. Siebel CRM Release 7.5.2 Workflow Manager executed workflow steps based on inserted service requests. Siebel 7.5.2 Enterprise Application Integration MQSeries Adapter read from and placed transactions into Microsoft MQSeries queues. Siebel CRM Release 7.5.2 Enterprise Application Integration HTTP Adapter executed requests between different Web infrastructures.

Database Setup

Prior to benchmark execution, the database size was approximately 170GB. It was built to simulate customers with large transaction volumes and data distributions representing the most common customer data shapes. The following table shows 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 was executed simultaneously for 10,000 concurrent users. Between each user operation and the next one, the think time was in the range of 5 to 55 seconds (an average of 30 seconds). The 11 use cases are listed below, with a brief description of each.

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.

Siebel Partner Relationship Management

- Partner creates account, contact, service request, and partner profile.
- Partner creates opportunity and 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, executes complex search, purchases product.

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 with a customized account-integration object. The requests consist of 80 percent selects, 10 percent updates, and 10 percent inserts.

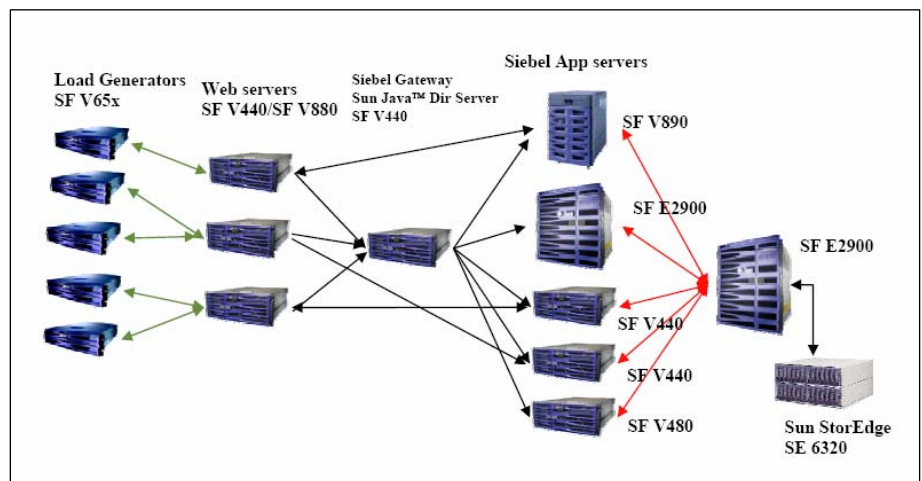
The use cases for the different applications are typically considered heavy transactions. For example, the high-level description of the sequential steps for the “Incoming call creates sales opportunity, quote, and order” use case is as follows:

- 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 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.



Gateway server/LDAP:

- 1 x Sun Fire 440
 - 1 x 1.2GHz UltraSPARC IIIi
 - 16GB RAM
 - Solaris 8 2/04 Generic_117350-02
 - Sun Java System Directory Server
 - LDAP 4.1 SP9

Web servers:

- 2 x Sun Fire 440
 - 4 x1.2 GHz UltraSPARC IIIi
 - 16GB RAM
 - Solaris 8 2/04 Generic_117350-02

- Sun Java System Web Server 6.0 SP2
- Siebel 7.5.2 SWSE
- 1 x Sun Fire 880
 - 2 x 900MHz UltraSPARC IIIi
 - 16GB RAM
 - Solaris 8 2/02 Generic_108528-13
 - Sun Java System Web Server 6.0 SP2
 - Siebel 7.5.2 SWSE

Application servers:

- 1x Sun Fire V890
 - 8 x 1.2GHz UltraSPARC IV
 - 32 GB RAM
 - Solaris 8 2/04 Generic_117350-02
 - Siebel 7.5.2
- 1 x Sun Fire E2900
 - 12 x 1.2GHz UltraSPARC IV
 - 48GB RAM
 - Solaris 8 2/04 Generic_117350-02
 - Siebel 7.5.2
- 2 x Sun Fire 440
 - 4 x 1.2GHz UltraSPARC IIIi
 - 16GB RAM
 - Solaris 8 2/04 Generic_117350-02
 - Siebel 7.5.2
- 1 x Sun Fire V480
 - 4 x 1.2GHz UltraSPARC III+
 - 16GB RAM
 - Solaris 8 2/02 Generic_108528-27
 - Siebel 7.5.2
 - IBM MQ Series 5.2 FP2

Database server:

- 1 x Sun Fire E2900
 - 4 x 1.2GHz UltraSPARC IV
 - 16GB RAM
 - Solaris 9 2/04 Generic_117150-05
 - Oracle 9.2.0.2 32-bit
 - Sun StorEdge SE6320 Storage Array 4 trays (2+2), 4x14x36GB
15Krpm FC-AL drives.

LoadRunner drivers:

- 5 x Sun Fire V65x
 - 4 x 3.02GHz Xeon
 - 3GB RAM
 - Windows XP SP1
 - Mercury LoadRunner 7.5.1

RESULTS

Response Times and Transaction Throughput ^{3, 4, 5}

Workload	Number of Users	Average Operation Response Time (sec)	Business Transactions Throughput/Hour
Sales /Service Call Center	7,000	0.126	34,778
PRM	1,000	0.303	12,540
eSales	1,000	0.274	6,775
eService	1,000	0.199	12,870
Totals	10,000	N/A	66,964

Workload	Business Transactions Throughput/Hour
Assignment Manager	11,427
EAI – HTTP Adapter	278,352
EAI – MQ Series Adapter	181,319
Workflow Manager	53,439

Server Resource Utilization

Node	Functional Use	% CPU Utilization	Memory Utilization (MB)
1 x Sun Fire E2900 (4CPU, 16GB)	Oracle Database Server	51	1690
1 x Sun Fire V480 (4CPU, 16GB)	Siebel App Server – EAI HTTP + WorkFlow	65	2075
1 x Sun Fire V440 (4CPU, 16GB)	Siebel App Server – AM + EAI MQ series	37	1,742
1 x Sun Fire V440 (4CPU, 16GB)	Siebel App Server – 1600 end users	91	10,666
1 x Sun Fire E2900 (12CPU, 48GB)	Siebel App Server – 4800 end users	66	38,956
1x Sun Fire V890 (8CPU, 32GB)	Siebel App Server – 3600 end users	68	25,871
1x Sun Fire V880 (2CPU, 16GB)	Sun Java System Web Server – HTTP Adapter, WorkFlow	8	126
1 x Sun Fire V440 (4CPU, 16GB)	Sun Java System Web Server – Application requests	49	186
1 x Sun Fire V440 (4CPU, 16GB)	Sun Java System Web Server – Application requests	54	225
1 x Sun Fire V440 (1CPU, 16GB)	Siebel Gateway Server/Sun Java System Directory Server	11	81

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.

⁴ 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 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.

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 11 types of transactions tested in the use cases.

Network Utilization

For 10,000 concurrent users, the network utilization measured was 6.2MB for the browser traffic, an average of 5.5 kilobits per second (Kbps) per user. These measurements did not incorporate compression for Web-server-to-browser traffic.

CONCLUSION

The test system demonstrated that the Siebel 7.5.2 architecture on Sun Microsystems Sun Fire servers and Oracle9i Database easily scales to 10,000 concurrent users.

- **Vertical scalability**—The Siebel CRM Release 7.5.2 server showed excellent scalability within a Sun application server.
- **Horizontal scalability**—The benchmark demonstrates scalability across multiple Sun servers without degradation.
- **Low network utilization**—The Siebel CRM Release 7.5.2 Smart Web Architecture and Smart Network Architecture efficiently managed the network, consuming only 5.5 Kbps per user.
- **Efficient use of the database server**—Siebel CRM Release 7.5.2 Smart Database Connection Pooling and Multiplexing allowed the database to service 10,000 concurrent users and the supporting Siebel CRM Release 7.5.2 server application services with 480 database connections on the Sun Fire E2900. To optimize database server resources, a 20:1 ratio of users to database connections was used for Oracle's Siebel Smart Database Connection Pooling and Multiplexing.



Performance and Scalability Benchmark: Siebel CRM Release 7.5.2
on Sun Microsystems Servers and Oracle9i Database
Updated September 2006

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200
oracle.com

Copyright © 2003, 2006, Oracle. All rights reserved.
This document is provided for information purposes only and the contents hereof are subject to change without notice.
This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.
Oracle, JD Edwards, PeopleSoft, and Siebel are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.