

Performance and Scalability
Benchmark: Siebel CRM Release 8.0
Industry Applications and Oracle
10gR2 DB on
Sun SPARC Enterprise T5120/T5220
servers running the Solaris 10 OS

*An Oracle White Paper
Released January 2008*



Leading Performance and Scalability of Siebel CRM Release 8.0 Industry Applications and Oracle 10gR2 DB on Sun SPARC Enterprise T5120/T5220 servers running Solaris 10 OS

INTRODUCTION

This white paper describes the performance and scalability capabilities of Oracle's Siebel Customer Relationship Management (CRM) Applications Release 8.0. The benchmark comprised 10,000 concurrent users running Siebel CRM Release 8.0 industry applications and Oracle 10gR2 DB on Sun SPARC Enterprise T5120/T5220 Servers. All servers ran the Solaris 10 operating system.

Oracle's Siebel Platform Sizing and Performance Program is a test suite certified by Siebel and executed independently by Sun Microsystems. Sun completed the benchmark on December 02, 2007; Oracle certified it on January 04, 2008. Note that this benchmark data is intended for general information purposes and not as a substitute for implementation-specific sizing or benchmarks.

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

Workload	Number of Users	Average Operation Response Time (sec)	Business Transactions Throughput/hour	Projected Daily Transactions
Financial Services Call Center	3,000	0.287	29,977	239,816
Partner Relationship Management	1,000	0.481	26,911	215,288
EAI – Web Services	6,000	0.154	85,173	681,384
Totals	10,000	N/A	142,061	1,136,488

¹ 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.

² Siebel CRM Release 8.0 Industry Application Platform Sizing and Performance benchmarks are based on Siebel CRM Release 8.0 customized industry applications and reflect a heavier scenario mix and more-aggressive think times than earlier versions. Results of this benchmark are not comparable with those of prior Siebel CRM Release 7 benchmarks.

Test Component	Software	Version	Hardware	OS
Database Server	Oracle 10gR2	10.2.0.1.0	Sun SPARC Enterprise T5120 Server	Solaris 10 8/07, 64-bit
App/Gtwy Server	Siebel CRM	8.0	Sun SPARC Enterprise T5220 Server	Solaris 10 8/07, 64-bit
App Server	Siebel CRM	8.0	Sun SPARC Enterprise T5220 Server	Solaris 10 8/07, 64-bit
Web Server	Sun Java System Web Server	6.1 SP8	Sun SPARC Enterprise T5120 Server	Solaris 10 8/07, 64-bit

OVERVIEW

Oracle's Siebel Platform Sizing and Performance Program is designed to stress the Siebel CRM Release 8.0 architecture and to demonstrate that large customers can successfully deploy many thousands of concurrent users. Among the Siebel CRM Release 8.0 architecture features **exercised** are the following:

- **Smart Web Architecture**—Takes advantage of the newest 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 8.0 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.
- **Server Connection Broker**—The Siebel Connection Broker (SCBroker) is a server component that provides intraserver loadbalancing. SCBroker distributes server requests across multiple instances of Application Object Managers (AOMs) running on a Siebel Server.
- **Smart Database Connection Pooling and Multiplexing**—Allows customers to scale their databases without introducing expensive and complex transaction-processing monitors.
- **Server Request Broker**— Server Request Broker (SRBroker) processes synchronous server requests—requests that must be run immediately, and for which the calling process waits for completion.
- **Enterprise Application Integration**—Allows customers to integrate their existing systems with Siebel CRM applications.
- **eScript**—eScript is a scripting or programming language that application developers use to write simple scripts to extend Siebel applications. JavaScript, a popular scripting language used primarily on Web sites, is its core language.

This test simulated a large corporation with 10,000 concurrent active users in multiple departments and addressed key business requirements.

- **Siebel Financial Services Call Center**—Provides the most complete solution for sales and service, allowing customer service and telesales representatives to provide superior customer support, improve customer loyalty, and increase revenues through cross-selling and up-selling.

- **Siebel Partner Relationship Management**—Enables organizations to effectively and strategically manage relationships with partners, distributors, resellers, agents, brokers, and dealers.
- **Siebel Workflow**—Automates user interaction, business processes, and integration through use of a business-process-management engine. It allows simple administration and customization through a graphical drag-and-drop user interface. Administrators can add custom or predefined business services and specifies logical branching, updates, inserts, and sub processes to create a workflow process tailored to their unique business requirements.
- **Siebel Enterprise Application Integration (EAI) Integrate Third-Party Application and support of web services**—Allows customers to integrate their existing applications with Siebel CRM applications. Siebel 8.0 is planned to include pre-built Web Services that expose industry leading capabilities to various channels and applications, enabling customers to extend this functionality further across their enterprises, seamlessly exposing it real-time through standard Web portals and other Web Service-enabled environments that service a significantly broader range of customers and interaction models.

METHODOLOGY

This benchmark was executed independently by Sun Microsystems under the Siebel CRM Release 8.0 Industry Applications Platform Sizing and Performance Program (PSPP) guidelines. Test cases are based on Siebel customer requirements and exercise 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 real-world requirements of a large organization, consisting of 10,000 concurrent, active users in a call center organization. Test conditions simulated service representatives running Siebel Financial Services Call Center and partner organizations running Siebel Partner Relationship Management (Web Sales and Web service).

Siebel Workflow and the Siebel Scripting Engine were used to incorporate business-process-management customizations.

The application also simulated integration with Web systems, using the Siebel Enterprise Application Integration component and Siebel Web Services.

End users were simulated by use of Mercury LoadRunner version 8.1. The think time range between user operations was 10 to 30 seconds. The Siebel CRM Release 8.0 Scripting Engine was invoked to assign service requests and navigate the user to the appropriate views. Siebel CRM Release 8.0 Workflow Manager executed workflow steps based on inserted service requests. The Siebel CRM Release 8.0 EAI Web Services executed requests between different Web infrastructures.

Database Setup

Prior to benchmark execution, the database was approximately 115GB. It was constructed based on Siebel customer experience and requirements and on the Siebel CRM Industry Application repository and data model—representing the most common data distribution and volumes in high-transaction-rate implementations. The table below shows a sampling of record volumes for key business entities in the Siebel CRM Industry Application volume database.

Business Entity	Number of Records
Accounts	1,876,349
Activities	6,107,269
Addresses	3,821,180
Contacts	3,689,371
Employees	60,564
Opportunities	3,397,927
Orders	499,806
Products	288,618
Quote Items	1,990,122
Quotes	20,430
Service Requests	5,777,129

Business Transactions

Several complex business transactions were executed simultaneously for 10,000 concurrent users. Between each user operation and the next one, the think time averaged approximately 15 seconds. This section provides a high-level description of the use cases tested.

Siebel Financial Services Call Center— Incoming Call Creates Opportunity, Quote and Order

- Create a new contact
- Create a new Opportunity for that contact
- Add two products to Opportunity
- Navigate to Opportunities - Quotes View
- Click "AutoQuote" button to generate quote
- Enter Quote Name, and Price List
- Drilldown on the quote name to go to Quote - Line Items View and specify discount
- Click "Reprice All" button
- Update opportunity
- Navigate to Quotes - Orders View
- Click on "AutoOrder" button to automatically generate order
- Navigate back to Opportunity

Siebel Partner Relationship Management—Sales and Service

- Partner creates new service request with appropriate detail.
- Service request is automatically assigned.
- Saving service request invokes scripting that brings user to the appropriate opportunity screen.
- New opportunity with detail is created and saved.
- Saving opportunity invokes scripting that brings user back to service request screen.

WebServices - Find, Submit a New Service Request and Update the Service Request

- There is no UI presentation layer, LR simulates J2EE web application to send web service request to Siebel server (EAIObjMgr_enu) to invoke Siebel business services.
- Siebel Web Services framework has an ability to generate WSDL files to describe the Web Services hosted by the Siebel application. Also, the Siebel Web Services framework can call external web services. This is accomplished by importing a WSDL document, described as an external Web Service, using the WSDL import wizard in Siebel Tools.
- Each Web Service exposes multiple methods. PSPP3 scenario covers methods like Query Service Request, Create Service Request and Update Service Request
- The Web Service authentication is done using session token.
- "ServerDetermine" session type is used and session token is maintained between each request to avoid "Login" for each request. To use "ServerDetermine" session type a login WS call (SessionAccessPing) should be made to retrieve session token before calling other web services. At the end of scenario, a logout (SessionAccessPing) should be called to make session token unavailable.

TOPOLOGY

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

PSPP Components

- Siebel CRM Release 8.0 Industry Applications
- Solaris 10 8/07
- Oracle 10gR2 Database Server v10.2.0.1.0
- Sun Java System Web Server 6.1 SP8

Sun's CoolThreads Server based on UltraSPARC T2 processor

The UltraSPARC T2 processor provides up to eight cores with each core supporting up to eight threads. This translates into industry's first massively threaded System on a Chip, with a single processor die hosting up to 64 threads per processor, On-chip Level-1 and Level-2 caches, per-core floating point capabilities, per-core cryptographic acceleration, as well as 10Gb Ethernet and PCI Express interfaces.

The Sun SPARC Enterprise T5120 and T5220 servers are designed to leverage considerable resources of the UltraSPARC T2 processor in the form of cost effective general-purpose platforms that is ideal for infrastructure applications as well as enterprise class applications like Siebel CRM and Oracle database.

Solaris Operating System

The world's leading enterprise operating system - Solaris, can span the entire enterprise from the Web tier, to the data warehouse, to the most demanding applications, all while delivering the performance, stability and security that could satisfy even the most demanding customers.

Sun Java System Web Server

Designed for medium and large organizations, Sun Java System Web Server is a secure, reliable, easy-to-use web server that provides stable and scalable deployment platform.

Database Server

- 1x Sun SPARC Enterprise T5120 Server
 - 1 x 1.2GHz UltraSPARC T2 CPU with 8 Cores
 - 32GB RAM
 - Solaris 10 8/07, 64-bit
 - Oracle 10gR2 Database Server v10.2.0.1.0, 64-bit

Gateway/Application Server

- 1x Sun SPARC Enterprise T5220 Server
 - 1 x 1.4GHz UltraSPARC T2 CPU with 8 Cores
 - 32GB RAM
 - Solaris 10 8/07, 64-bit
 - Siebel CRM 8.0 SIA [20204] ENU

Application Server

- 1x Sun SPARC Enterprise T5220 Server

- 1 x 1.2GHz UltraSPARC T2 CPU with 8 Cores
- 32GB RAM
- Solaris 10 8/07, 64-bit
- Siebel CRM 8.0 SIA [20204] ENU

Web Server

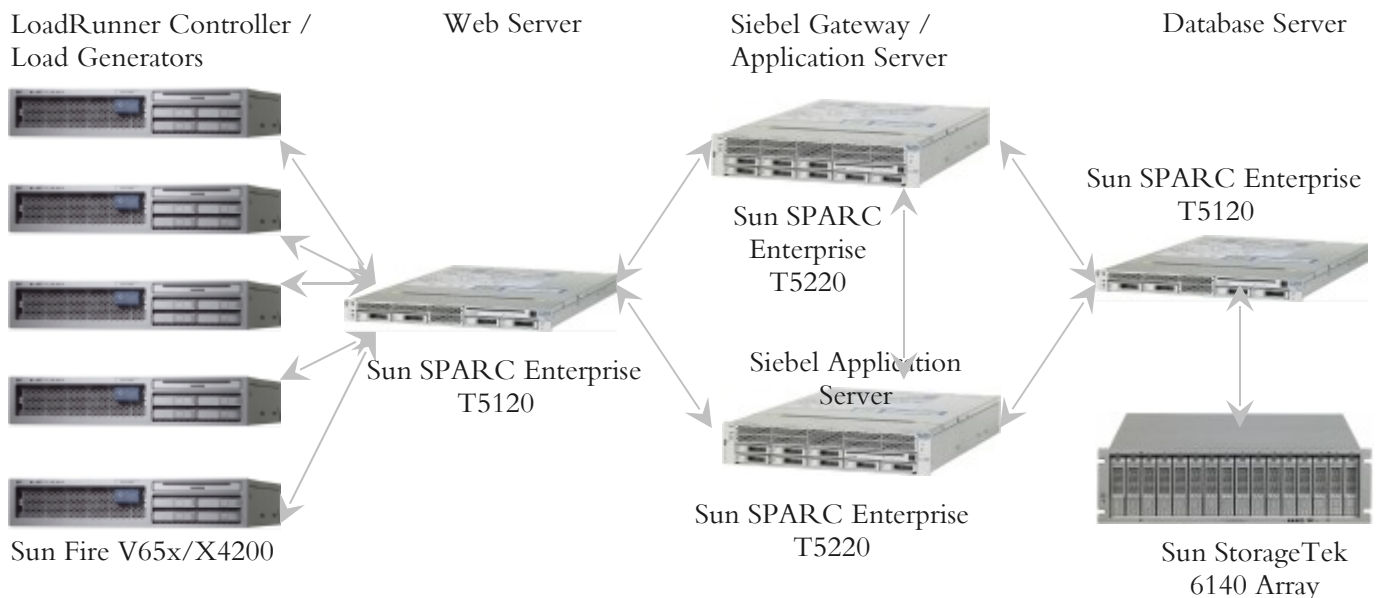
- 1x Sun SPARC Enterprise T5120 Server
 - 1 x 1.2GHz UltraSPARC T2 CPU with 4 Cores
 - 8GB RAM
 - Solaris 10 8/07, 64-bit
 - Sun Java System Web Server 6.1 SP8, 32-bit
 - Siebel CRM 8.0 SIA [20204] ENU

LoadRunner Controller

- 1x Sun Fire V65x Server
 - 2 x 3.06GHz Intel Xeon CPUs
 - 4GB RAM
 - Microsoft Windows XP SP2
 - LoadRunner version 8.1

LoadRunner Generators

- 4x Sun Fire X4200 Servers
 - 4 x Dual-Core AMD Opteron - Model 2220 CPUs
 - 4GB RAM
 - Microsoft Windows Server 2003 R2 SE SP2
 - LoadRunner version 8.1



RESULTS

Response Times and Transaction Throughput 3 4 5

Workload	Number of Users	Average Operation Response Time (sec)	Business Transactions Throughput/hour	Projected Daily Transactions
Financial Services Call Center	3,000	0.287	29,977	239,816
Partner Relationship Management	1,000	0.481	26,911	215,288
EAI – Web Services	6,000	0.154	85,173	681,384
Totals	10,000	N/A	142,061	1,136,488

Server Resource Utilization

Node	Users	Functional Use	% CPU	Memory Utilization (GB)
T5120	10,000	Web Server	33	2.36
T5220	5,200	Gateway/Application Server	76	25.6
T5220	4,800	Application Server	81	24.2
T5120	10,000	Database Server	24	18.12

Network Utilization

For 10,000 concurrent users, the network utilization measured was 70.01 Mbps for the browser traffic, an average of 7.17 Kbps per user.

CONCLUSION

The test system demonstrated that the powerful combination of Oracle's Siebel CRM Release 8.0 architecture with Oracle 10g R2 database running on a 8-core / 64 threads UltraSPARC T2 processor, Sun Java System Web Server, and industry-leading free and open Solaris 10 OS, provides the highest performing and the most cost-effective business solution.

- **Siebel on UltraSPARC T2 platform** — All tiers of the Siebel CRM Release 8.0 architecture ran on chip multithreading (CMT) processor, UltraSPARC T2 based T5120/T5220 systems running Solaris 10 8/07. Multithreading capability of the US T2 processor allowed each of the active Object Manager (OM) processes to run hundreds of Light Weight Processes (LWP), thus utilizing the available resources very effectively. A total number of 30 object managers serviced the work load of 10,000 concurrent users.
- **Scalability** — The Solaris 10 OS and CoolThreads based servers proves once again to be the best combination for scalability and resource utilization in the datacenter, giving users a consistent response time and future growth on critical applications as 10,000 users benchmark on Siebel CRM Release 8.0 application shows.
- **Low network utilization** — The Siebel CRM Release 8.0 Smart Web Architecture and Smart Network Architecture efficiently managed the network, consuming only 7.17 kilobits per second per user.
- **Efficient use of the database server** — Siebel CRM Release 8.0 Smart Database Connection Pooling and Multiplexing allowed the database to service 10,000 concurrent users and the supporting Siebel CRM Release 8.0 server application services with only 357 database connections using Siebel database pooling ratio 25:1.
- **Energy efficiency** — While supporting 10,000 concurrent Siebel users, the entire Sun Solution based on Sun SPARC Enterprise T5120/T5220 servers running Siebel CRM Release 8.0 and Oracle 10g R2 on top of Solaris 10 consumed 1202 watts in a 6U rack space. As a result the T5210/T5220 supports 8.3 users per watt of energy consumed and supports 1666 users per rack unit.

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 A business transaction is a defined set of steps, activities, and application interactions used to complete a business process, such as “Create and Assign Service Requests.” “Search for a contact” is an example of a step in a business transaction. For a detailed description of business transactions, see the “Business Transactions” section.

⁵ 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.

[Released January 04, 2008]

**Performance and Scalability Benchmark:
Siebel CRM Release 8.0 Industry Applications
on Sun SPARC Enterprise T5120/T5220
Released January 2008**

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 © 2005, 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.