

Performance and Scalability  
Benchmark: Siebel CRM Release 8.0  
Industry Applications and  
Oracle 10g R2 DB on  
Sun SPARC Enterprise T5440 server  
running the Solaris 10 OS

*An Oracle White Paper*  
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# Leading Performance and Scalability of Siebel CRM Release 8.0 Industry Applications and Oracle 10g R2 DB on Sun SPARC Enterprise T5440 server 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 14,000 concurrent users running Siebel CRM Release 8.0 industry applications and Oracle 10g R2 DB on a single Sun SPARC Enterprise T5440 Server running free and open Solaris 10 OS using Solaris Containers to improve server utilization while greatly reducing energy, space and cooling requirements.

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 September 07, 2008; Oracle certified it on October 08, 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: 14,000-Active-Concurrent-User Benchmark <sup>1 2</sup>

Workload	Number of Users	Average Operation Response Time (sec)	Business Transactions Throughput/hour	Projected Daily Transactions
Financial Services Call Center	4,200	0.349	40,105	320,840
Partner Relationship Management	1,400	0.558	33,350	266,800
EAI – Web Services	8,400	0.186	126,682	1,013,456
<b>Totals</b>	<b>14,000</b>	<b>N/A</b>	<b>200,137</b>	<b>1,601,096</b>

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<sup>1</sup> 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.

<sup>2</sup> 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 10g R2	10.2.0.3.0	1x Sun SPARC Enterprise T5440 Server	Solaris 10 5/08, 64-bit
App/Gateway Server	Siebel CRM	8.0		
Web Server	Sun Java System Web Server	6.1 SP10		

## 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 14,000 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 14,000 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 14,000 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 5/08
- Oracle 10g R2 Database Server v10.2.0.3.0
- Sun Java System Web Server 6.1 SP10

### **Sun's CoolThreads Server based on UltraSPARC T2 Plus processor**

The Sun SPARC Enterprise T5440 is designed to leverage considerable resources of the UltraSPARC T2 Plus processor and offers the industry's first quad socket CMT server that packs a massively scalable 256 threads and half a Terabyte memory into just a 4RU form factor with a vastly smaller energy footprint than competitive server designs. The server optimized for heavily threaded workloads including but not limited to web servers, service oriented architectures, application servers, portals and databases, offers a cost effective general-purpose platform 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 and multi-threaded web server that provides stable and scalable deployment platform.

## **Web Server, Gateway / Application Server, Database Server**

The entire Siebel stack was deployed on a single Sun SPARC Enterprise T5440 server. On the T5440, three non-global zones were configured to isolate the web, application and the database servers.

- 1x Sun SPARC Enterprise T5440 Server
  - 4 x 1.4 GHz UltraSPARC T2 Plus CPUs each with 8 Cores
  - 128 GB RAM
  - Solaris 10 5/08, 64-bit
  - Siebel CRM 8.0 SIA [20204] ENU
  - Sun Java System Web Server 6.1 SP10, 32-bit
  - Oracle 10g R2 Database Server v10.2.0.3.0, 64-bit
- Storage
  - 2 x Sun StorageTek 2540 Arrays [5x 73GB 15,000rpm SAS Disks]

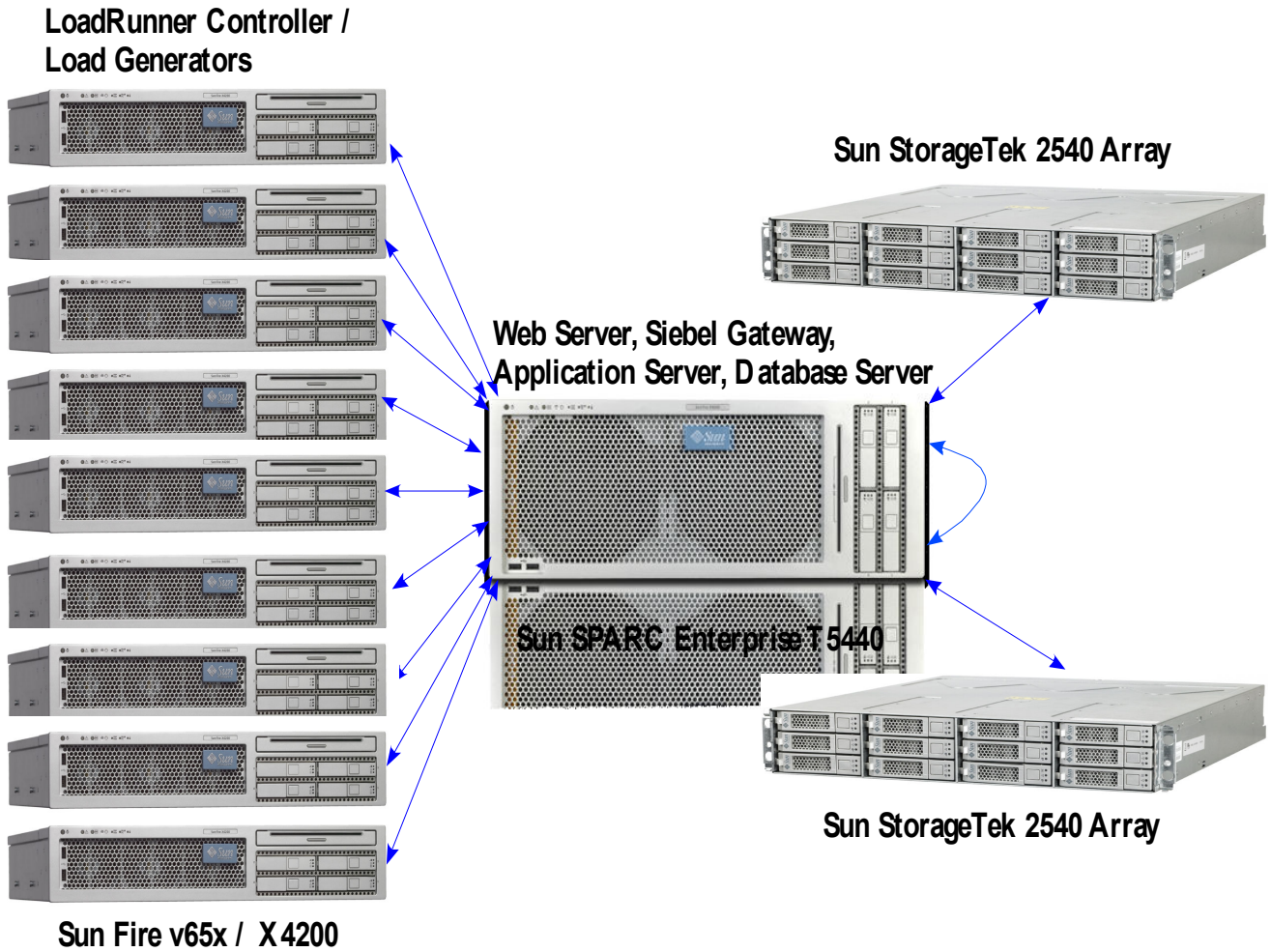
## **LoadRunner Controller**

- 1 x Sun Fire V65x Server
  - 2 x 3.06 GHz Intel Xeon CPUs
  - 4 GB RAM
  - Microsoft Windows XP SP2
  - LoadRunner version 8.1 FP4

## **LoadRunner Generators**

- 8 x Sun Fire X4200 Servers
  - 4 x Dual-Core AMD Opteron - Model 2220 CPUs
  - 4 GB RAM
  - Microsoft Windows Server 2003 R2 SE SP2
  - LoadRunner version 8.1 FP4

## TOPOLOGY DIAGRAM



## 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
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### Server Resource Utilization

Node	Users	Functional Use	% CPU	Memory Utilization (GB)
T5440	14,000	Web Server	81.8	93.58
		Gateway/Application Server		
		Database Server		

## Network Utilization

For 14,000 concurrent users, the network utilization measured was 88.08 Mbps for the browser traffic, an average of 6.48 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 entire solution on a single Sun SPARC Enterprise T5440 server based on UltraSPARC T2 Plus 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 Plus platform** — All tiers of the Siebel CRM Release 8.0 architecture ran on a single quad socket Sun SPARC Enterprise T5440 server based on UltraSPARC T2 plus processor running Solaris 10 5/08. Multithreading capability of the US T2 Plus 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 48 object managers serviced the work load of 14,000 concurrent users.

- **Scalability** — The Sun SPARC Enterprise T5440 server and Solaris 10 proves once again to be the best combination for scalability and resource utilization using Solaris Containers in the datacenter, giving users a consistent response time and future growth on critical applications as 14,000 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 6.48 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 14,000 concurrent users and the supporting Siebel CRM Release 8.0 server application services with only 957 database connections using Siebel database pooling ratio 15:1.

- **Energy efficiency** — While supporting 14,000 concurrent Siebel users, the entire Sun Solution based on a single Sun SPARC Enterprise T5440 server running Siebel CRM Release 8.0 and Oracle 10g R2 on top of Solaris 10 consumed 1276 watts in a 4U rack space. As a result the T5440 supports 10.97 users per watt of energy consumed and supports 3500 users per rack unit.

<sup>3</sup> 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.

<sup>4</sup> 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.

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**Performance and Scalability Benchmark:**

**Siebel CRM Release 8.0 Industry Applications  
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