

Performance and Scalability
Benchmark: Siebel CRM Release
7.7 Industry Applications on HP
Integrity Server and Microsoft
SQL Server 2005

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INTRODUCTION

This white paper describes the performance and scalability capabilities of Oracle's Siebel Customer Relationship Management (CRM) Application Release 7.7. The benchmark comprised 30,000 concurrent users operating Siebel CRM Release 7.7 industry applications on HP Integrity Server and Microsoft SQL Server 2005 (64-bit).

Oracle's Siebel Platform Sizing and Performance Program is a test suite certified by Siebel and executed independently by HP. HP completed the benchmark on October 7, 2005; Siebel certified it on October 12, 2005. Note that this benchmark data is intended for general information purposes and not as a substitute for implementation-specific sizing or benchmarks.

Results Summary: 30,000-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	24,000	0.15	219,011	1,752,152
Partner Relationship Management	6,000	0.39	153,912	1,231,296
EAI – HTTP Adapter	N/A	N/A	431,530	3,452,240
Totals	30,000		804,453	6,435,624

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 7.7 Industry Application Platform Sizing and Performance benchmarks are based on Siebel CRM Release 7.7 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	MS SQL Server 2005	Enterprise Edition (64-bit) build 9.00.1301.00	HP Integrity rx8620	Windows 2003 Datacenter 64-bit
App Servers	Siebel	7.7.1	HP ProLiant DL585	Windows Server 2003 Enterprise Edition
EAI App Server	Siebel	7.7.1	HP ProLiant BL20pG2	Windows Server 2003 Enterprise Edition
Web Servers	MS IIS	6.0	HP ProLiant BL20pG2	Windows Server 2003 Enterprise Edition
Gateway Server	Siebel	7.7.1	HP ProLiant BL20pG2	Windows Server 2003 Enterprise Edition

OVERVIEW

Siebel CRM Release 7.7 uses the enhanced Siebel CRM Release 7 Smart Web architecture, which introduced a new approach to Web applications. This architecture improves scalability while making efficient use of both network and Web server resources, allowing customers to use their existing network and Web server infrastructure.

Oracle's Siebel Platform Sizing and Performance Program is designed to stress the Siebel CRM Release 7.7 architecture and to demonstrate the performance and scalability of the application in a business solution context. Among the Siebel CRM Release 7.7 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 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.
- **Server Connection Broker**—Offers a preconfigured load-balancing option while also supporting a hardware-based solution. Resonate Central Dispatch may be used in Siebel CRM Release 7.7, but it is not required. In addition, the new Siebel Connection Broker component distributes tasks between multiple processes, improving intraprocess load-balancing characteristics.
- **Smart Database Connection Pooling and Multiplexing**—Allows customers to scale their databases without introducing expensive and complex transaction-processing monitors.

- **Server Request Broker**—Provides component-level load balancing across multiple Siebel servers, without the expense and complex administration of transaction-processing monitors.
- **Enterprise Application Integration**—Allows customers to integrate their existing systems with Siebel CRM applications.

This test simulated a large corporation with 30,000 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 specify logical branching, updates, inserts, and subprocesses to create a workflow process tailored to their unique business requirements.
- **Siebel Enterprise Application Integration (EAI)**—Allows customers to integrate their existing applications with Siebel CRM applications. Siebel EAI supports several adapters. The Siebel EAI HTTP Adapter was used in this benchmark.

METHODOLOGY

This benchmark was executed independently by HP under Oracle's Siebel CRM Release 7.7 Industry Applications Platform Sizing and Performance Program 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 30,000 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 the Siebel HTTP Adapter. In

this case, an eight-hour business day included more than 3,400,000 EAI transactions between systems.

End users were simulated by use of Mercury LoadRunner version 7.8. The think-time range between user operations was 13 to 23 seconds. The Siebel CRM Release 7.7 Scripting Engine was invoked to assign service requests and navigate the user to the appropriate views. Siebel CRM Release 7.7 Workflow Manager executed workflow steps based on inserted service requests. The Siebel CRM Release 7.7 EAI HTTP Adapter executed requests between different Web infrastructures.

Database Setup

Prior to benchmark execution, the database size was approximately 230GB. It was constructed based on Siebel customer experience and requirements and was based 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 standard Siebel volume database.

Business Entity	Number of Records
Accounts	2,233,637
Activities	6,685,419
Addresses	3,475,662
Contacts	3,536,268
Employees	30,000
Opportunities	3,429,952
Orders	496,909
Products	230,102
Quote Items	1,984,252
Quotes	253,693
Service Requests	5,651,814

Business Transactions

Several complex business transactions were executed simultaneously for 30,000 concurrent users. Between user operations, the think-time range was 13 to 23 seconds. This section describes the cases tested.

Siebel Financial Services Call Center—Create and Assign Service Requests

- Service agent searches for contact.
- Service agent checks entitlements.
- Service request is created.
- Service agent populates service request with appropriate detail.

- Service agent creates activity plan to resolve issue.
- Using Siebel Script, the service request is automatically assigned to appropriate representative to address issue.

Siebel Partner Relationship Management—Sales and Service

- Partner creates new service request with appropriate detail.
- Service request is automatically assigned.
- Saving service requests 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 to service requests screen.

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 are typically considered heavy transactions. For example, the high-level description of the sequential steps for the “Create and Assign Service Requests” use case is as follows:

- Enable Siebel Search Center.
- Search for a contact.
- Review contact detail and create a new service request.
- Add details to the service request.
- From the service request view, search for an account.
- Select an account and associate it with the service request.
- Navigate to the verify tab and select entitlements.
- Verify entitlements and continue service request investigation.
- Search for insurance group; select the appropriate policy and product.
- Create a new contact, entering information into all of the fields in the list view.
- Complete service request details and save the service request.

- Select the activity plan option and automatically generate an activity plan for the service request.
- Scripting will automatically assign the service request.
- Summarize the service request with the customer.

TOPOLOGY

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

Web Servers:

- 8x HP ProLiant BL20pG2
 - 2x Intel Xeon DP 3.2GHz/2MB
 - Microsoft Windows Server 2003 Enterprise Edition
 - 2GB RAM

Application Servers:

- 8x HP ProLiant DL 585
 - 4x AMD Opteron Dual Core 2.2GHz/1MB
 - Microsoft Windows Server 2003 Enterprise Edition
 - 32GB RAM

EAI Application Server:

- 1x HP ProLiant BL20pG2
 - 2x Intel Xeon DP 3.2GHz/2MB
 - Microsoft Windows Server 2003 Enterprise Edition
 - 8GB RAM

Gateway Server:

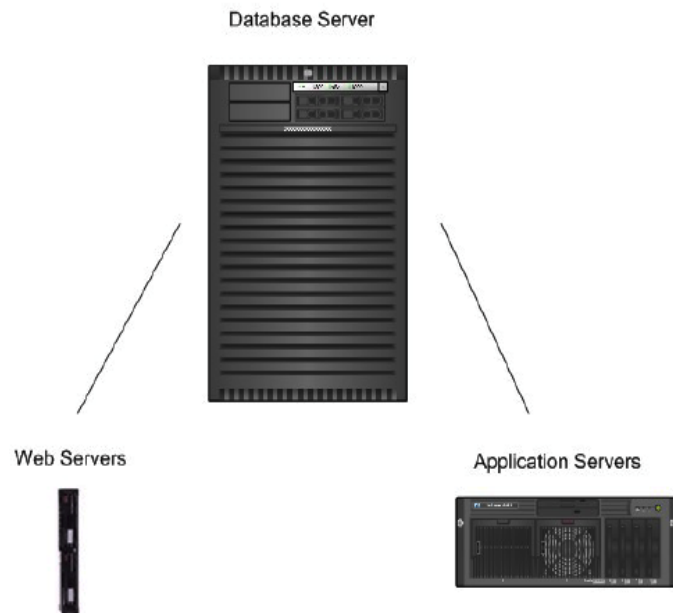
- 1x HP ProLiant BL20pG2
 - 2x Intel Xeon DP 3.2GHz/2MB
 - Microsoft Windows Server 2003 Enterprise Edition
 - 2GB RAM

Database Server:

- 1x HP Integrity rx8620
 - 16x Intel Itanium 1.6GHz/6MB
 - Microsoft Windows Server 2003 (64-bit) Datacenter
 - 64GB RAM

LoadRunner Drivers:

- 13x HP ProLiant DL360G3
 - 2x Intel Xeon DP 3.06GHz/2MB
 - 4GB RAM
 - LoadRunner version 8.0



RESULTS

Response Time 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 Recourse Utilization

Node	Users	Functional Use	% CPU	Memory Utilization (GB)
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	80	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	77	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	78	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	79	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	79	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	79	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	79	20
1 x ProLiant DL585	3,750	Application Server- 3,000 Call Center Users - 750 PRM Users	79	20
1 x ProLiant BL20pG2	N/A	Application Server – EAI	10	1
8 x ProLiant BL20pG2	30,000	Web Server	28	.1
1 x Integrity rx8620	30,000	Database Server	88	49
1 x ProLiant BL20pG2	30,000	Gateway Server	1	.3

Network Utilization

For 30,000 concurrent users, the network utilization measured was 78.44Mbps for the browser traffic, an average of 2.61Kbps per user. These measurements incorporated compression for Web-server-to-browser traffic.

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.

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CONCLUSION

The test system demonstrated that Oracle's Siebel CRM Release 7.7 architecture on HP ProLiant and SQL Server 2005 on HP Integrity Server easily scale to 30,000 concurrent users.

- **Vertical scalability**—The Siebel CRM Release 7.7 server showed excellent scalability within an application server.
- **Horizontal scalability**—The benchmark demonstrated scalability across multiple servers without degradation.
- **Low network utilization**—The Siebel CRM Release 7.7 Smart Web Architecture and Smart Network Architecture efficiently managed the network, consuming only 2.61 kilobits per second per user.
- **Efficient use of the database server**—Siebel CRM Release 7.7 Smart Database Connection Pooling and Multiplexing allowed the database to service 30,000 concurrent users and the supporting Siebel Release 7.7 server application services with 2,912 database connections. SQL Server 2005 nonuniform memory access (NUMA) and connection affinity features maximized the performance and scalability of the HP Integrity rx8620 database server.

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