Performance and Scalability
Benchmark: Siebel CRM Release
7.7 Industry Applications on IBM
eServer P690S and IBM DB2
UDB on eServer P5 570

An Oracle White Paper
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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 15,000 concurrent users running Siebel CRM Release 7.7 industry applications on IBM eServer p690 and IBM DB2 UDB on eServer p5 570.

Oracle’s Siebel Platform Sizing and Performance Program is a Siebel-certified test suit executed independently by IBM. Note that this benchmark data is intended for general information purposes, and not for use as a substitute for implementation-specific sizing or benchmarks.

Results Summary: 15,000-Concurrent-User Benchmark

<table>
<thead>
<tr>
<th>Workload</th>
<th>Number of Users</th>
<th>Average Operation Response Time (sec)</th>
<th>Business Transactions Throughput/hour</th>
<th>Projected Daily Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Services Call Center</td>
<td>12,000</td>
<td>0.098</td>
<td>99,946</td>
<td>448,232</td>
</tr>
<tr>
<td>Partner Relationship Management</td>
<td>3,000</td>
<td>0.251</td>
<td>66,357</td>
<td>530,953</td>
</tr>
<tr>
<td>EAI – HTTP Adapter</td>
<td>N/A</td>
<td>N/A</td>
<td>395,892</td>
<td>3,167,136</td>
</tr>
<tr>
<td>Totals</td>
<td>15,000</td>
<td>N/A</td>
<td>562,195</td>
<td>4,594,553</td>
</tr>
</tbody>
</table>

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.
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 that large customers can successfully deploy many thousands of concurrent users. 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 among 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 15,000 concurrent 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 IBM under the 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 15,000 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 2,700,000 EAI transactions between systems.

End users were simulated by use of Mercury Interactive 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.
CRM Release 7.7 EAI HTTP Adapter executed requests between different Web infrastructures.

Database Setup
Prior to benchmark execution, the database 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 Siebel Industry Application volume database.

<table>
<thead>
<tr>
<th>Business Entity</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts</td>
<td>2,233,637</td>
</tr>
<tr>
<td>Activities</td>
<td>6,685,419</td>
</tr>
<tr>
<td>Addresses</td>
<td>3,475,662</td>
</tr>
<tr>
<td>Contacts</td>
<td>3,521,040</td>
</tr>
<tr>
<td>Employees</td>
<td>30,000</td>
</tr>
<tr>
<td>Opportunities</td>
<td>3,429,952</td>
</tr>
<tr>
<td>Orders</td>
<td>496,609</td>
</tr>
<tr>
<td>Products</td>
<td>230,102</td>
</tr>
<tr>
<td>Quote Items</td>
<td>1,084,252</td>
</tr>
<tr>
<td>Quotes</td>
<td>253,693</td>
</tr>
<tr>
<td>Service Requests</td>
<td>5,851,814</td>
</tr>
</tbody>
</table>

Business Transactions
Several complex business transactions were executed simultaneously for 15,000 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 Financials Call Center—Create and Assign Service Requests
- Service agent searches for contact
- Service agent checks entitlements
- Service request is created
- Service agent populates the service request with appropriate detail
- Service agent creates an activity plan to resolve the issue
- Using Siebel Script, the service request is automatically assigned to the appropriate representative to address the issue

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

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 “Create and Assign Service Request” use case consists of more than a dozen steps as the call center representative fulfills the customers’ requirements.

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 7.7 Industry Applications

• AIX 5L

• DB2 UDB for AIX v8.16

Database Server

• 1x4way IBM eServer p5 570
  o 2 x 2 1.9GHz POWER5 MCM (dual-core)
  o AIX 5.3 (SMT-enabled)
  o 32GB RAM

Web/Application Servers

• 5x16way IBM eServer pSeries 690 partitions
  o 5 x 8 1.9GHz POWER4+ dual-core MCMs
  o AIX 5.2
  o 64GB RAM

• 1x IBM eServer pSeries 650
  o 1 x 2 1.45GHz POWER4+ dual-core MCMs
  o AIX 5.2
- 32GB RAM

**LoadRunner Driver:**

- 15x IBM Netfinity 5500
  - 4 x 500MHz Pentium III Xeon
  - 4GB RAM
  - LoadRunner version 7.81
RESULTS

Response Times and Transaction Throughput

<table>
<thead>
<tr>
<th>Workload</th>
<th>Number of Users</th>
<th>Avg Operation Response Time (sec)</th>
<th>Business Transactions Throughput/hour</th>
<th>Projected Daily Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINS Call Center</td>
<td>12,000</td>
<td>0.979</td>
<td>99,976</td>
<td>799,811</td>
</tr>
<tr>
<td>eChannel</td>
<td>3,000</td>
<td>0.219</td>
<td>66,448</td>
<td>531,584</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15,000</strong></td>
<td><strong>N/A</strong></td>
<td><strong>166,424</strong></td>
<td><strong>1,331,396</strong></td>
</tr>
</tbody>
</table>

Server Resource Utilization

<table>
<thead>
<tr>
<th>Node</th>
<th>Functional Use</th>
<th>% CPU Utilization</th>
<th>Memory Utilization (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>690 Partition 1</td>
<td>Web and Application Server</td>
<td>58</td>
<td>14</td>
</tr>
<tr>
<td>690 Partition 2</td>
<td>Web and Application Server</td>
<td>58</td>
<td>14</td>
</tr>
<tr>
<td>690 Partition 3</td>
<td>Web and Application Server</td>
<td>60</td>
<td>14</td>
</tr>
<tr>
<td>690 Partition 4</td>
<td>Web and Application Server</td>
<td>61</td>
<td>14</td>
</tr>
<tr>
<td>690 Partition 5</td>
<td>Web and Application Server</td>
<td>60</td>
<td>14</td>
</tr>
<tr>
<td>650</td>
<td>Batch HTTP Server</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>P5 570</td>
<td>Database Server</td>
<td>85</td>
<td>14</td>
</tr>
</tbody>
</table>

Network Utilization

For 15,000 concurrent users, the network utilization measured was 40.70 Mbps for the browser traffic, an average of 2.71Kbps per user. These measurements incorporated compression for Web-server-to-browser traffic.

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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 IBM eServer pSeries and DB2 UDB easily scales to 15,000 concurrent users.

- **Vertical scalability**—Siebel CRM Release 7.7 Server showed excellent scalability within an application server.

- **Horizontal scalability**—The benchmark demonstrates 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 2.71 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 15,000 concurrent users and the supporting Siebel CRM Release 7.7 server application services with 719 database connections.

During the test, the database grew by 14.8GB, demonstrating that the workload simulated by the system exceeded the requirements for some of the most demanding Siebel customers.

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