Performance and Scalability Benchmark
8,500 Concurrent User using Siebel 7.7 Industry Applications
on IBM eServer BladeCenter and p5 550

Siebel Systems, Inc. is a leading provider of business applications software, enabling corporations to develop rich, multi – channel customer relationships as they sell, service and market products and services to their customers across multiple lines of business. With more than 4,000 deployments worldwide, Siebel Systems provides organizations with a proven set of industry-specific business applications, market-leading analytics products, best practices and business processes, empowering them to consistently deliver superior customer experiences and establish more profitable customer relationships. Siebel Systems conducts business worldwide and maintains offices in more than 30 countries.

This document describes performance and scalability capabilities for Siebel 7.7. The Siebel Platform Sizing and Performance Program is a Siebel-certified test suit executed independently by IBM. The benchmark was completed by IBM on 12/04/2004 and Siebel Systems certified it on 12/21/2004. This benchmark data is intended for general information purposes, and not for use as a substitute for implementation-specific sizing or benchmarks.

Results[1] Summary: 8,500 Active Concurrent User Benchmark[2]

Workload	Users	Average Operation Response Time (sec)[3]	Business Transactions Throughput/hour[4]
Siebel Financial Services Call Center	6,800	0.24	56,029
Siebel Partner Relationship Management	1,700	0.45	37,283
Siebel Enterprise Application Integration – HTTP Adapter	N/A		277,618
Totals	8,500	N/A	370,930

Test Component	Software	Version	Hardware	OS
DB Server	DB2 UDB	8.16	IBM eServer pSeries 550	AIX 5.3 429A SMT
Application Servers	Siebel 7.7.1	7.7.1 (18305)	eServer BladeCenter HS20	Windows 2003
Web Servers	MS IIS	6.0	eServer BladeCenter HS20	Windows 2003

| Network Utilization[5]	
Total usage (MB)	19.27
Bytes per user per second	2378

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[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. Siebel Systems 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. Siebel Systems 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 7.7 Industry Application Platform Sizing and Performance benchmarks are based on Siebel 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 prior Siebel 7 benchmarks.

[3] Response times are measured at the web server instead of 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 content.

[4] A business transaction is defined set of steps, activities and application interactions used to complete a business process such as Create and assign Service Requests. Search for a customer is an example of a step in the business transaction. For a detailed description of business transactions see section "Business Transactions".

[5] Measurements do not include web server to browser compression for static content.
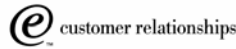
| Node	Users	Functional Use	% CPU	Memory Utilization (GB)
Blade 1	800	Web/Application Server	80	3.49
Blade 2	800	Web/Application Server	80	3.49
Blade 3	800	Web/Application Server	80	3.49
Blade 4	800	Web/Application Server	81	3.50
Blade 5	800	Web/Application Server	81	3.49
Blade 6	800	Web/Application Server	80	3.50
Blade 7	800	Web/Application Server	81	3.49
Blade 8	800	Web/Application Server	81	3.49
Blade 9	340	Web/Application Server	63	2.25
Blade 10	340	Web/Application Server	63	2.25
Blade 11	340	Web/Application Server	64	2.27
Blade 12	340	Web/Application Server	64	2.26
Blade 13	340	Web/Application Server	64	2.27
Blade 14	400	Gateway/Web/ Application Server	68	2.30
P5 550		Database Server	65	7.28

IBM Siebel Partnership

IBM is a recipient of five Siebel Systems Partner Excellence Awards and is a global leader in the eBusiness development and implementation. IBM was the first Siebel Global Strategic Partner. Since the inception of the program in 1999, Siebel Systems and IBM have collaborated on software and hardware development and established a worldwide network of solution partnership centers resulting in more than $1 billion in joint revenue across hundreds of eBusiness implementations. IBM and Siebel Systems have leveraged core competencies to significantly improve their business operations. IBM is currently implementing the largest global CRM deployment worldwide. This deployment will provide over 80,000 users with a single view of the customer across all channels and will integrate more than 2,500 business partners in the IBM ecosystem through a Web-based partner portal. IBM brings a compelling value proposition to Siebel System's customers, offering a high-performance database, scalable and reliable hardware platforms, and an extensive IT services organization, with more than 700 Siebel Certified Consultants. IBM's extensive industry knowledge, hardware, software, and services dramatically reduce risk, accelerate deployment, and increase returns for our joint customers. Together, IBM and Siebel Systems have more than 500 joint customers.

Overview

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

The Siebel Platform Sizing and Performance Program is designed to stress the Siebel 7.7 Architecture and to demonstrate the performance and scalability of the application in a business solution context. The Siebel 7.7 Architecture features the benchmark tested include:

- **Smart Web Architecture** – Takes advantage of the newest Web browser technology to deliver a highly interactive experience meeting the requirements of our most discriminate users. The interactivity model which is similar to windows based applications, improves productivity. Utilization rates are low on the Web server allowing customers to retain existing web server infrastructure.
- **Smart Network Architecture** – Allows Siebel 7 customers to leverage their existing network infrastructure by compressing user interface objects, caching user interface components such that the interaction between browser and Web server is reduced to transmitting only the data requested by the application. This allows customers to avoid the expense of a network upgrade that could be necessary with competing products.
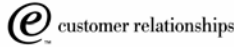
- **Server Connection Broker for load balancing** - Siebel 7.7 offers a pre-configured load balancing option while also supporting a hardware based solution. In Siebel 7.7, Resonate Central Dispatch may be used however it is not required. In addition, the new Siebel Connection Broker (SCBroker) component distributes tasks between multiple processes improving intra-process 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 of work across multiple Siebel Servers without the expense and complex administration of transaction processing monitors.

This test simulated a large corporation with 8,500 concurrent active users in multiple departments, 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 world-class customer support, improving customer loyalty, and increasing 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** – This business process management engine automates user interaction, business processes, and integration. It allows simple administration and customization through a graphical drag-and-drop user interface. Administrators can add custom or pre-defined business services; specify logical branching, updates, inserts, and subprocesses to create a workflow process tailored to their unique business requirements.
- **Siebel Enterprise Application Integration** – Allows customers to integrate their existing applications with Siebel. EAI supports several adapters. The Siebel EAI HTTP Adapter was used in this test.
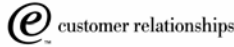
Methodology

The test was executed independently by IBM under the Siebel Platform Sizing and Performance Program guidelines with test cases based on Siebel customer requirements. These test cases reflect some of the most critical and frequently used components. The test cases must run in steady state for at least one hour and certain key performance indicators must be reached prior to certification.

The test simulated real world requirements of a large organization consisting of 8,500 concurrent active users in a call center organization including sales and service representatives running Siebel Financial Service Call Center, a partner management organizations with customers (Web sales and Web service) running Siebel Partner Relationship Management.

The Siebel Scripting Engine and Siebel Workflow were used incorporating 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 2,200,000 EAI transactions between systems.

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

Database Setup

Prior the benchmark execution, the database size was approximately 230 gigabytes. It was constructed based on Siebel customer experience and requirements. This database, which used the Siebel Industry Application repository and data model, represented the most common data distribution and volumes in high transaction rate implementations. The following table represents the key objects and their size.

Business Entity	Number of Records
Accounts	2,233,637
Activities	6,685,419
Addresses	3,475,662
Contacts	68,062
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
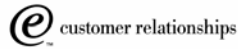
Business Transactions

Several complex business transactions were executed simultaneously for 8,500 concurrent users. Between each user operation, the average think time was 13-23 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 the service request with appropriate detail
    Service agent creates an activity plan to resolve the issue
    Service request is automatically assigned to the appropriate representative to address the issue

Siebel Partner Relationship Management – Sales and Service
    The partner creates a new service request with appropriate detail
    The service request is automatically assigned
    Saved service request invokes scripting and brings user to opportunity screen
    New opportunity with detail is created and saved
    The saved opportunity invokes scripting that brings user back to service request screen

Siebel Enterprise Application Integration- Integrate Third Party Application
    Using a customized account integration object, process requests consisting of:
    80% selects, 10% updates and 10% inserts

Topology

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

Database Server running AIX 5.3 (SMT enabled)

- 1x4way IBM eServer p5 550
    - 2 x 2 1.65 GHZ POWER5™ dual-core MCM's (4 CPU cores total)
    - 16 GB RAM

Web Servers and Siebel Application Servers running AIX 5.2

One BladeCenter, with 14 HS20 Blades, was used. Each Blade ran both Web Servers and Siebel Application Servers. One Blade ran the Siebel Gateway and HTTP servers in addition to Web/Application servers.
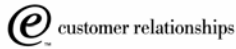
1 IBM eServer BladeCenter
    - 14 x 2 3.06 GHZ Intel single-core CPU's
    - 4 GB RAM per Blade

Test Driver Running Mercury™ LoadRunner v7.81

- 15x IBM Netfinity 5500
    - 4 x 500MHZ Pentium III Xeon
    - 4GB RAM

Summary

The test system demonstrated that Siebel 7.7 Architecture on IBM eServer pSeries and DB2 UDB easily scale to 8,500 concurrent users.

- **Vertical scalability** – The Siebel 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 7.7 Smart Web Architecture and Smart Network Architecture efficiently managed the network consuming only 2.37 KB per second per user.
- **Efficient use of the database server** – The Siebel 7.7 Smart Database Connection Pooling and Multiplexing allowed the database to service 8,500 concurrent users and the supporting Siebel 7.7 Server application services with 733 database connections.

During the test, the database grew by 8.2 GB, demonstrating the workload simulated by the system exceeded the requirements for some of the most demanding Siebel customers.

For Further Information

For further metrics on scalability and performance or information on any Siebel 7 product, please contact:

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