

PEOPLESOFT ENTERPRISE CAMPUS SOLUTIONS 8.9 (DAY-IN-THE-LIFE BENCHMARK) USING MICROSOFT SQL SERVER 2000 ON HEWLETT- PACKARD INTEGRITY AND BLADE SERVERS

As a global leader in e-business applications, Oracle is committed to delivering high performance solutions that meet our customers' expectations. Business software must deliver rich functionality with robust performance. This performance must be maintained at volumes that are representative of customer environments.

Oracle benchmarks demonstrate our software's performance characteristics for a range of processing volumes in a specific configuration. Customers and prospects can use this information to determine the software, hardware, and network configurations necessary to support their processing volumes.

The primary objective of our benchmarking effort is to provide as many data points as possible to support this important decision.

SUMMARY OF RESULTS

Day-in-the-Life Benchmark		PeopleSoft Enterprise Campus Solutions 8.9	
Batch	Job Stream 1 (Process Refunds)	Job Stream 2 (Process Test Scores)	
	6,000 Student Records	9,000 Student Records	
	114 minutes	93 minutes	
	3,158 Students per Hour	5,806 Students per Hour	
Online 4,000 Users	Average Logon	0.686 sec	
	Avg. Load Stu Ctr	1.162 sec	
	Avg. Page Load	1.017 sec	
	Avg. Page Save	1.642 sec	

This 'Day-in-the-Life' benchmark measured the concurrent batch and online performance for a large database model. This scenario better represents a production environment situation where users and scheduled batch jobs must run concurrently.

Testing was conducted in a controlled environment with no other applications running. The tuning changes, if any, were approved by Oracle (PeopleSoft) Enterprise Development and will be generally available in a future update. **The goal of this Benchmark was to obtain performance results for Oracle's PeopleSoft Enterprise Campus Solutions 8.9 on SQL Server with HP Integrity and Blade servers.**

BENCHMARK PROFILE

In August 2005, Oracle (PeopleSoft) conducted a benchmark in Pleasanton, CA to measure the concurrent batch and online performance of selected processes in Oracle's PeopleSoft Enterprise Campus Solutions 8.9 w/MP 1 with Microsoft® SQL Server™ 2000 Enterprise Edition w/SP 4. We used an 8-way partition of a Hewlett-Packard® Integrity™ rx8620 as the database server, running Microsoft® Windows® Server 2003 Data Center Edition. Five 2-way HP ProLiant BL20p G2 Blade servers were used as Application Servers running Microsoft® Windows® Server 2003 Enterprise Edition. A single BL20p G2 was used as the Web Server. A single BL20p G2 was used as the Process Scheduler. An HP StorageWorks XP128 disk array was used for data storage.

PeopleSoft Enterprise Campus Solutions 8.9 using SQL Server on HP Integrity and Blade Servers

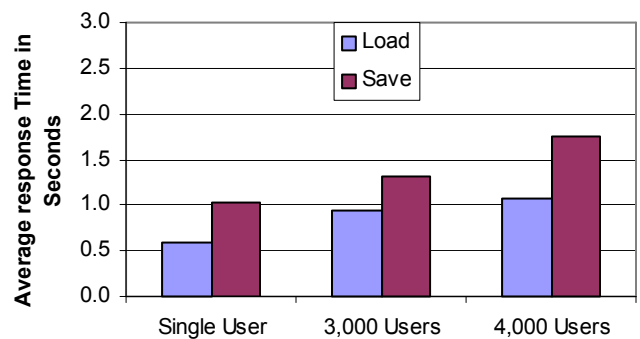


Figure 1: PeopleSoft Enterprise Campus Solutions 8.9 Processing Rates

The weighted averages in Figure 1 correspond to the transaction proportions described in Table 3.

BATCH METHODOLOGY

PeopleSoft Enterprise Campus Solutions 8.9 batch processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate Application Engine (AE) and COBOL jobs.

Batch processes are background processes, requiring no operator intervention or interactivity. Results of these processes are automatically logged in the database. The runtimes are posted to the Process Request database table where they are stored for subsequent analysis.

BUSINESS PROCESSES

The PeopleSoft Enterprise Campus Solutions 8.9 processes tested are as follows:

Process Batch Refunds: (COBOL & AE) This process refunds excess credits or financial aid credits to students with using the Payroll Refund option. It selects the appropriate students eligible for a refund, posts the refund to the students' accounts, creates a JOB record in HRMS, if necessary, and then generates payroll input (paysheets). The final processes are the normal PeopleSoft payroll jobs.

Process Test Scores: (AE) This process searches for, matches and posts external test scores for selected students. This consolidates scores and associated test data for use in the admissions process.

BATCH RESULTS

Two parallel job streams are run concurrent with the online user transactions. Job Stream 1 processes refunds for 6,000 students. Job Stream 2 processes test scores for 9,000 students. Each job stream is kicked off when the 3,000 self-service users (or 4,000 self-service users) are all running.

Process	Batch	3,000 Users		4,000 Users	
		Time	Hourly	Time	Hourly
SFPREFND		29	12,414	29	12,414
SSF_POIJOB_A		9	40,000	9	40,000
SSF_PAYINTFC		9	40,000	10	36,000
PYRE_PRELOAD		1	360,000	1	360,000
PSPPSHUP		23	15,652	24	15,000
PSPPYRUN		13	27,692	16	22,500
PSPCNFRM		11	32,727	12	30,000
PAY003		8	45,000	9	40,000
SSF_PAYCNFR		4	90,000	4	90,000
Totals:		107	3,364	114	3,158

Table 1: Job Stream 1, Batch Results (6,000 Students)

Process	Test	3,000 Users		4,000 Users	
		Time	Hourly	Time	Hourly
SAD_TST_LOAD		30	18,000	31	17,419
SAD_TEST_PST		61	8,852	62	8,710
Totals:		91	5,934	93	5,806

Table 2: Job Stream 2, Batch Results (9,000 Students)

Performance may vary on other hardware and software platforms and with other data composition models.

ONLINE METHODOLOGY

Mercury Interactive LoadRunner® was used as the load driver, simulating concurrent users. It submitted a business transaction at an average rate of one every 10 minutes for each concurrent user to the application servers via the web servers.

Mercury Interactive QuickTest® Professional was used to automatically submit transactions and to record the benchmark measurements on the client PC.

Measurements were recorded when the user load was attained and the environment reached a steady state.

Figure 2 shows a typical 4-tier benchmark configuration. This benchmark was run using a physical 4-tier configuration; with the database server, the application server and the web server all being hosted on separate boxes. The Process Scheduler was also hosted on a separate server

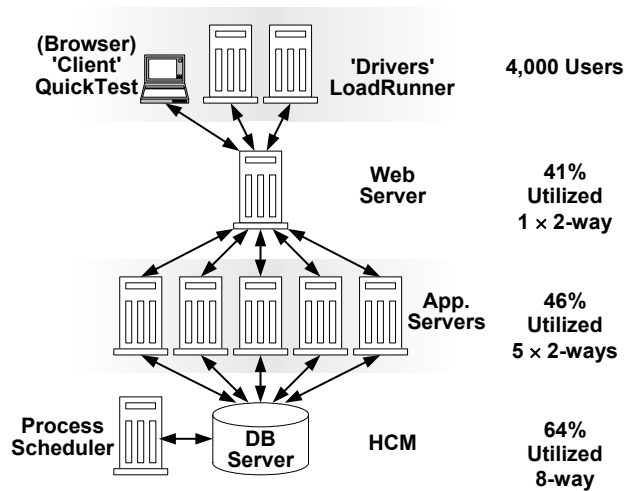


Figure 2: 4-Tier Configuration

Load times were measured from the time the user clicks a hyperlink or push button until the new HTML page has been rendered. Update times were measured from the time the user clicks the <SAVE> button until the new HTML page has been rendered.

Measurements were recorded on all of the servers when the user load was attained and the environment reached a steady state.

BUSINESS PROCESSES

Oracle (PeopleSoft) defines a business transaction as a series of HTML pages that guide a user through a business process, such as creating a new business case.

The six PeopleSoft Enterprise Campus Solutions 8.9 self-service processes tested in this benchmark are as follows:

CAMPUS SOLUTIONS

Add Class: - The student logs on and navigates to the Student Center page. They click on the “Add a Class” link and enter the term and class id for two separate classes. The student completes the extensive enrollment options and hits “Save.”

Calculate Tuition: - The student logs on and navigates to the Student Center page. They click on the “Finances Section” link and navigate to the ‘Account Inquiry’ option. After viewing their balance, sign out.

Drop Class: - The student logs on and navigates to the Student Center page. They click on the “Drop a Class” link and enter the term and class id. The student completes the extensive enrollment options and hits “Save.”

Load Student Center: - The student logs on and navigates to the Student Center page. They view some information then sign out.

Make A Payment: - The student logs on and navigates to the Student Center page. They click on the “Finances Section” link and navigate to the ‘Make a Payment’ option. Select ‘Pay by Credit Card’ and enter the credit card info and payment info. Hit “Save” and sign out.

Schedule Planner Validation: - The student logs on and navigates to the Student Center page. Navigate to the “Schedule Planner” page, enter the term and course numbers. Click to “Validate” the selected courses. Hit “Save” and sign out.

Process	% of Users	Avg. Pacing
Add Class	20%	10 min
Calculate Tuition	15%	10 min
Drop Class	10%	10 min
Load Student Center	35%	10 min
Make a Payment	10%	10 min
Schedule Planner Validation	10%	10 min
Total	100%	

Table 3: Business Process Mix

Table 3 shows the proportions of the business processes used in the measurements of this benchmark. The proportions are intended to simulate a typical user scenario.

ONLINE PROCESS RESULTS

Table 4 shows average response times, in seconds, for each business process along with the overall averages. It also shows the approximate overall transaction rate.

Process	Single User	3,000 Users	4,000 Users
Add Class			
Logon	0.534	0.773	0.566
Load SC	0.618	1.105	1.184
Page Load	0.647	0.842	1.06
Page Save	0.793	1.529	1.603
Calculate Tuition			
Logon	0.529	0.547	0.714
Load S C	0.711	1.057	1.174
Page Load & Save *	1.653	2.736	3.425
Drop Class			
Logon	0.535	0.614	0.795
Load SC	0.629	1.082	1.309
Page Load	0.92	1.102	1.252
Page Save	0.962	1.412	1.467
Load Student Center			
Logon	0.533	0.559	0.729
Load SC	0.677	1.066	1.112
Make Payment			
Logon	0.541	0.609	0.637
Load SC	0.658	1.064	1.101
Page Load	0.668	0.635	0.648
Page Save	1.094	1.686	1.792
Schedule Plan			
Logon	0.535	0.594	0.679
Load SC	0.629	0.99	1.188
Page Load	0.601	0.939	1.066
Page Save	1.023	1.321	1.746
Weighted Logon	0.534	0.614	0.686
Weighted Load SC	0.659	1.066	1.162
Weighted Page Load	0.697	0.872	1.017
Weighted Page Save	0.933	1.495	1.642
Transactions/minute	N/a	300	400

Table 4: Business Process Response Times

Note that the combined 'Page Load & Save' result in the "Calculate Tuition" transaction is not included in the weighted average for Page Load or Page Save.

The database and application servers were processing a total of ~400 business processes per minute at the peak load of 4,000 concurrent users. The transaction rate is calculated by dividing the number of users by the corresponding pacing.

SERVER PERFORMANCE

PeopleSoft Enterprise Campus Solutions 8.9 using SQL Server on HP Integrity and Blade Servers

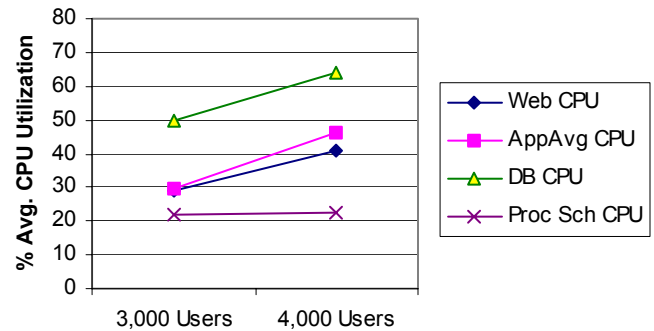


Figure 3: Average CPU Utilization

DATA COMPOSITION DESCRIPTION

Table 7 summarizes the structure of the target organization.

Data Model	Large
Person Records	600,000
Enrolled Students	100,000
Employees	10,000
Student Career Records	500,000
Courses in Course Catalog	5,000
Classes in Schedule of Classes	150,000
Student Enrollment Records	10,000,000
SF Accounts	2,000,000
Item Types	2,500
ITEM_SF Lines	9,000,000

Table 7: Selected Data Composition

Note that the Large Data Model represents five year's worth of history data.

BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

A Hewlett-Packard® Integrity™ rx8620 was used as the batch/database server. It was equipped with the following:

- 8 × 1.6 GHz Intel® Itanium®2 Processors, each with 16 Kilobytes of Level-1 Cache, 256 Kilobytes of Level-2 Cache and 6 Megabytes of Level-3 Cache
- 16 Gigabytes of Memory (~XX GB used at peak load)
- 1 SAN-Connected HP StorageWorks XP128 disk array with 2 fibre-channel connections
- ~4.6 Terabytes of total Disk Space available (64 × 73 GB + 2 × 73 GB internal disk drives), approximately 325 GB of RAID 0+1 storage used for this benchmark
- 2 × Hewlett-Packard® Tachyon™ XL2 Fibre Channel Host Bus Adapters

Application Server(s):

5 × HP ProLiant® BL20p G2 blade servers were used as the application servers. They were equipped with the following:

- 2 × 3.06 GHz Intel® Xeon™ processors, each with 512 Kilobytes of Level 2 Cache and 1 Megabyte of Level-3 write-back cache per CPU
- 3 Gigabytes of Memory
- ~36.4 GB of storage with an integrated SmartArray 5i Plus Controller

Web Server(s):

1 × HP ProLiant® BL20p G2 blade server was used as the web server. It was equipped with the following:

- 2 × 3.06 GHz Intel® Xeon™ processors, each with 512 Kilobytes of Level 2 Cache and 1 Megabyte of Level-3 write-back cache per CPU
- 3 Gigabytes of Memory
- ~36.4 GB of storage with an integrated SmartArray 5i Plus Controller

QuickTest Client PC:

HP Evo D510 mini-tower with the following:

- 1 × 2.4 GHz Intel® Pentium® IV Processor
- 768 Megabytes of Memory

Load Simulation Driver(s):

1 × Hewlett-Packard® NetServer® 1p1000r was used as the load driver controller. It was equipped with the following:

- 2 × 1 Gigahertz Pentium® III Xeon™ Processors, each with 1 Megabyte of Level-2 Cache
- 4 Gigabytes of Memory

1 × Hewlett-Packard® NetServer® 1p1000r was used as the load driver. It was equipped with the following:

- 2 × 1 Gigahertz Pentium® III Xeon™ Processors, each with 1 Megabyte of Level-2 Cache
- 4 Gigabytes of Memory

SOFTWARE VERSIONS

Oracle's PeopleSoft Enterprise Campus Solutions 8.9 MP1

Oracle's PeopleSoft Enterprise (PeopleTools) 8.46.02

Microsoft® SQL Server™ 2000 Enterprise Edition w/SP 4

Microsoft® Windows® Server 2003 Data Center Edition (64 bit) (on the database server)

Microsoft® Windows® Server 2003 Enterprise Edition (on the Application, Web and Process Scheduler servers)

Microsoft® Windows 2000 Advanced Server 5.0 Build 2195 (on the Drivers)

Microsoft® Windows® XP Professional w/SP 2 (on the client)

BEA WebLogic Server™ 8.10 w/SP 1

Mercury Interactive LoadRunner® 7.8

Mercury Interactive QuickTest® Professional 6.5

BEA Tuxedo® 8.1 RP89 with Jolt 8.1

Microsoft Internet Explorer® 6.0



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