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Technology Benchmark

PEOPLESOFT ELM 8.81 SELF-SERVICE USING ORACLE9i ON A MIXED HEWLETT-PACKARD PA-RISC/ITANIUM UNIX ENVIRONMENT

As the world's leading provider of application software for the Real-Time Enterprise, PeopleSoft delivers high performance solutions that exceed our customers' expectations. Business software must deliver rich functionality with robust performance maintained at volumes representative of customer environments.

PeopleSoft benchmarks demonstrate our software's performance characteristics for a range of processing volumes with a specific platform configuration. Customers and prospects can use this information while planning 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

Benchmark	PeopleSoft ELM 8.8 Self-Service	
	Standard Data Model	
(English)	Average Response	Search 3.00 sec, Save 1.07 sec
	Concurrent Users	1,200

Référence d'exécution	PeopleSoft ELM 8.8 Self-Service	
	Norme modèle de données	
(Français)	temps de réponse	Search 3,00 sec, Save 1,07 sec
	Concourants Utilisateurs	1.200

Benchmark-Test	PeopleSoft ELM 8.8 Self-Service	
	Datenbankmodell "Standard"	
(Deutsch)	Antwortzeit	Search 3,00 sec, Save 1,07 sec
	Gleichzeitige Benutzer	1.200

Patrón de rendimiento	PeopleSoft ELM 8.8 Self-Service	
	Volumen Estándar de datos	
(Español)	tiempo de reacción	Search 3,00 sec, Save 1,07 sec
	Simultáneos Utilizadores	1.200

Benchmark	PeopleSoft ELM 8.8 Self-Service	
	Volume Padrão dos dados	
(Português)	tempo de resposta	Search 3,00 sec, Save 1,07 sec
	Simultâneos Usuários	1.200

BENCHMARK PROFILE

In December 2003, PeopleSoft conducted a benchmark in Pleasanton, CA to measure the online performance of PeopleSoft Enterprise Learning Management (ELM) 8.81 using Oracle9i™ 9.2.0.4 on a Hewlett-Packard® Integrity™ rx5670 database server, running Hewlett-Packard® HP-UX 11.23. Additionally, one Hewlett-Packard® rp8400 application server, and two rp2470 web servers ran HP-UX 11.11.

The benchmark measured client response times for 300, 600, 1,000 and 1,200 concurrent users. The standard database composition model represents a large-sized company profile. The testing was conducted in a controlled environment with no other applications running. **The goal of this Benchmark was to obtain baseline results for PeopleSoft ELM 8.8 self-service transactions with Oracle9i on HP.**

The figure below illustrates average load/search and update/save response times for 300, 600, 1,000 and 1,200 concurrent users.
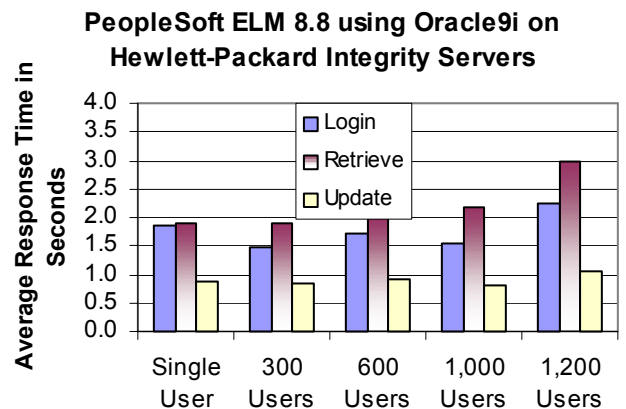

PeopleSoft ELM 8.8 using Oracle9i on Hewlett-Packard Integrity Servers

Figure 1: Average Response Times

* This average is weighted based on the business mix as reflected in Table 1: Business Process Mix.

METHODOLOGY

Mercury Interactive's LoadRunner® was used as the load driver, simulating concurrent users. It submitted a business process at an average rate of one every five minutes for each concurrent user.

Mercury Interactive's 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.

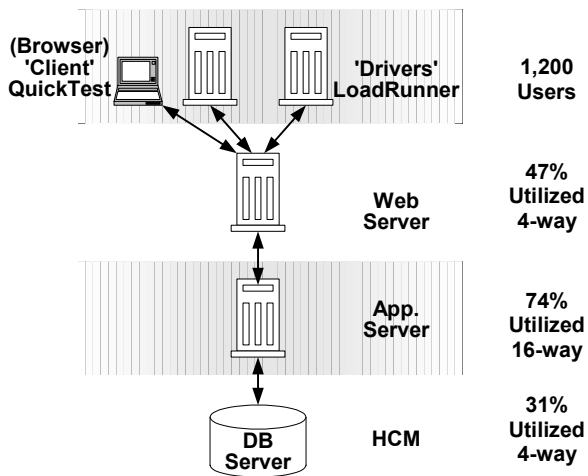Figure 2 shows a typical 4-tier benchmark configuration.

Figure 2: 4-Tier Configuration

Load times were measured from the time the user clicks the <OK> button until all the data for the entire business transaction has been retrieved.

Update times were measured from the time the user clicks the <SAVE> button until the system has released the page.

BUSINESS PROCESSES

PeopleSoft defines a business transaction as a series of HTML pages that guide a user through a business process, such as browsing a course catalog.

The thirteen PeopleSoft ELM 8.8 business processes tested in this benchmark are as follows:

LEARNER SELF-SERVICE

Browse Course Catalog: User logs in and navigates to a specified course in the course catalog via the browse feature.

Search Course Catalog: User logs in and navigates to a specified course in the course catalog utilizing the search feature.

Add Learning to Plan from Catalog: The user logs in and navigates to their learning plan. They navigate to a specified course, add it to their learning plan, and enroll in the course.

Enroll in Blended Activity: The user logs in and navigates to their learning plan. They navigate to a specified blended course, add it to their learning plan, and enroll in the course.

Launch Web-Based Content: User logs in and navigates to a specified course. The specified course is launched, then the user quits and logs out.

Register in Program: The user logs in and navigates to a specified program. Then, they register in the program.

MANAGER SELF-SERVICE

Approve Learning: The manager logs in and navigates to their Team Learning Home page. They approve a specified learner's pending selection.

Add to Learner's Plan: The manager logs in and navigates to their Team Learning Home page and then to a specified Team Member's Learning Plan. Next, the manager searches for a specified course and adds it to the team members learning plan.

Enroll Team Member: The manager logs in and navigates to their Team Learning Home page and then to a specified Team Member's Learning Plan. Next, the manager searches for a specified course and enrolls a Team Member. The enrollment is confirmed.

Review and Add Team Member's Objectives: The manager logs in and navigates to their Team Learning Home page. They add a specified Objective to a Team member's Learning Plan.

Review Team Learning History: The manager logs in and navigates to their Team Learning Home page and then to a specified Team Member's Learning History.

INSTRUCTOR SELF-SERVICE

Mark Grades and Attendance: The user logs in and navigates to the Learning Roster for a specified course. Then the user marks the grades and attendance for the enrolled learners.

BACK OFFICE/CALL CENTER

Process Enrollment Request: The user logs in and navigates to the Learning Roster for a specified course. Then the user updates the course status for a specified learner.

Process by Role	Percent Within Role	Net Percent of Total	Average Pacing (Minutes)
Learner Self-Service 67% Overall			
Browse the Course Catalog	48%	32%	7 min
Search Catalog	12%	8%	7 min
Add Learning to Plan from Catalog	12%	8%	7 min
Enroll in Blended Activity	4.5%	3%	5 min
Launch Web-Based Content	22%	15%	5 min
Register in Program	1.5%	1%	9 min
Manager Self-Service 26% Overall			
Approve Learning	31%	8%	7 min
Add to Learner's Plan	15%	4%	9 min
Enroll Team Member	8%	2%	9 min
Add Team Member's Objective	31%	8%	9 min
Review Team Learning History	15%	4%	5 min
Instructor Self-Service 4% Overall			
Mark Grades & Attendance	100%	4%	17.5 min
Back Office/Call Center 3% Overall			
Process Enrollment Request	100%	3%	15 min
Total		100%	

Table 1: Business Process Mix

The table above 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

The table below shows average retrieval (search) and update (save) times, in seconds, for each business process.

		Single User	300 Users	600 Users	1,000 Users	1,200 Users
Learner Self-Service						
Browse Course Catalog	Login	1.794	1.491	1.669	1.446	1.913
	R1	1.254	1.374	1.222	1.180	1.311
	R2-1	0.813	1.037	0.809	0.831	0.845
	R2-3	0.961	0.786	1.020	0.911	0.819
Search Catalog	Login	1.893	1.406	1.692	1.457	2.100
	R1	1.851	1.809	1.778	1.625	2.774
	R2-1	4.873	5.268	5.727	7.083	20.94
	R2-2	0.949	0.943	1.039	0.974	2.483
	R2-3	0.696	0.696	0.749	0.810	0.974
Add Plan	Login	1.796	1.372	1.581	1.473	1.748
	R1	2.788	2.368	2.635	2.407	2.724
	R2	5.486	6.174	6.426	8.305	8.557
	U1	0.960	0.939	0.957	0.893	0.898
	G1	7.799	8.444	8.859	10.54	10.78
Enroll	Login	2.029	1.441	1.802	1.497	1.955
	R1	2.763	2.549	2.668	2.677	2.825
	R2	5.619	5.518	7.023	11.75	10.45
	U1	1.317	1.393	1.488	1.526	1.413
Launch	Login	1.910	1.363	1.523	1.839	1.836
	R1	2.772	2.461	2.688	2.554	2.775
	R2	1.259	1.239	1.246	1.302	1.241
	U1	0.416	0.321	0.342	0.202	0.297
Register	Login	1.935	1.464	1.723	1.531	1.880
	R1	2.553	2.583	2.500	2.473	2.983
	R2	4.595	4.884	5.150	5.820	10.66
	U1	1.246	1.314	1.311	1.211	1.251

Table 2a: Employee Process Runtimes

Note: the tabular results continue on the next page.

		Single User	300 Users	600 Users	1,000 Users	1,200 Users
Manager Self-Service						
Approve Learning	Login	1.888	1.447	2.038	1.552	2.734
	R1	2.706	2.256	2.676	2.754	3.178
	U1	0.966	0.771	0.918	0.806	1.057
Add to Plan	Login	1.806	1.549	1.898	1.599	1.962
	R1	2.617	2.516	2.727	2.259	6.368
	R2	0.796	0.853	0.833	0.871	1.009
	U1	1.118	1.160	1.173	1.210	1.366
Enroll Team Member	Login	1.799	1.418	1.594	1.689	1.835
	R1	1.369	1.331	1.366	1.461	1.402
	R2	5.451	5.617	6.019	13.48	11.98
	U1	1.306	1.318	1.316	1.318	1.463
Add Objective	Login	1.803	1.851	1.996	1.645	5.106
	R1	2.720	3.079	3.270	2.819	5.886
	R2	0.689	0.700	0.785	0.883	0.997
	U1	0.646	0.665	0.827	0.661	1.511
Review Team	Login	1.893	1.802	1.702	1.542	1.904
	R1	3.195	2.801	3.415	3.018	3.173
Instructor Self-Service						
	Login	1.786	1.333	1.780	1.542	2.147
	R1	2.809	2.268	2.679	2.952	3.038
	R2	1.757	1.688	1.845	1.699	1.760
	U3	1.598	1.782	1.747	1.672	1.773
Back Office / Call Center						
	Login	1.892	1.381	1.849	1.463	2.321
	R1	2.819	2.447	2.904	2.872	5.636
	R2	2.119	2.003	2.072	1.909	1.966
	U2	1.148	1.123	1.365	1.036	2.205
Average Login		**1.843**	**1.483**	**1.721**	**1.554**	**2.247**
Average Search		**1.885**	**1.880**	**1.990**	**2.168**	**3.000**
Average Save		**0.874**	**0.841**	**0.909**	**0.803**	**1.067**
Transactions per Minute			43	87	145	174

Table 2b: Manager/Instructor Process Runtimes

The database and application servers were processing a total of 174 business processes per minute at the peak load of 1,200 concurrent users. The estimated transaction rate is calculated by dividing the total number of concurrent users by the average pacing rate.

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

SERVER PERFORMANCE

Figure 3 shows the average CPU utilization for each of the servers in this test. The CPU utilization is the average across all of the CPUs in each server.

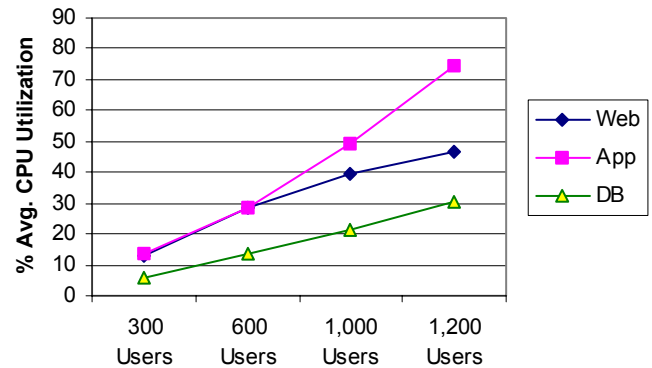### PeopleSoft ELM 8.8 using Oracle9i on Hewlett-Packard Integrity Servers

Figure 3: Average Server CPU Utilization

DATA COMPOSITION DESCRIPTION

The standard database was comprised of:

- 100,000 Employees
- 100 Course Catalog Categories
- 10,000 Catalog Items
- 1.2 Million Session rows

History:

- 20 Items per Learner
- 2.5 Million Enrollment transactions (current + historic)

BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

Database Server:

A Hewlett-Packard® Integrity™ rx5670 was used as the batch/database server. It was equipped with the following:

- 4 × 1 GHz Intel® Itanium®2 Processors, each with 32 Kilobytes of Level-1 Cache, 256 Kilobytes of Level-2 Cache, 3 Megabytes of Level-3 Cache
- 32 Gigabytes of Memory
- 1 × HP VA7410 Disk Array with two 2GB Fibre Channel disk controllers, configured with 15 × 36 GB drives in RAID 1+0 level. Approximately 100 GB used of 234 GB available.
- 2 × Hewlett-Packard® Fibre Channel Host Bus Adapters connected directly (point-to-point) to the VA7410 Disk Array

Application Server(s):

1 × Hewlett-Packard® rp8400® server was used as the application server. It was equipped with the following:

- 16 × 875 MHz PA-RISC 8700+® processors, each with 1.5 MB of Data Cache and 768 KB of Instruction Cache
- 64 Gigabytes of Memory
- ~144 Gigabytes of total Disk Space (4 × 36 GB)
- 2 × Dual-channel Internal SCSI Disk Controllers

Web Server(s):

1 × Hewlett-Packard® hp server rp2470® server was used as the web server. It was equipped with the following:

- 2 × 750 MHz PA-RISC 8700® processors, each with 1.5 MB of Data Cache and 768 KB of Instruction Cache
- 8 Gigabytes of Memory
- ~72 Gigabytes of total Disk Space (2 × 36 GB)
- 2 × Internal SCSI Disk Controllers

Client PC:

Toshiba® Tecra 8200 with the following:

- 850 Megahertz Pentium® III Xeon™ Processor, with 512 Kilobytes of Level-2 Cache
- 256 Megabytes Memory

Load Simulation Driver(s):

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

- 2 × 1.2 Gigahertz Pentium® III Xeon™ Processors, each with 512 Kilobytes of Level-2 Cache
- 4 Gigabytes of Memory

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

- 2 × 1 Gigahertz Pentium® III Xeon™ Processors, each with 256 Kilobytes of Level-2 Cache
- 2 Gigabytes of Memory

SOFTWARE VERSIONS

PeopleSoft ELM 8.81

PeopleTools 8.43.11

Oracle9i™ 9.2.0.4

Hewlett-Packard® HP-UX® 11.23 (database server)

Hewlett-Packard® HP-UX® 11.11 [11i] (application server and web servers)

Microsoft® Windows 2000 Advanced Server 5.0 Build 2195 (on the drivers and client)

Mercury Interactive's LoadRunner® 7.51 w/SP 1 and Caching Patch

Mercury Interactive's QuickTest® Professional 6.0

BEA Tuxedo® 6.5 with Jolt 1.2

BEA WebLogic Server™ 6.10 w/SP 4

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