PeopleSoft Enterprise

REVISION 2.1

PEOPLESOFT FINANCIALS 8.4 ONLINE WITH MICROSOFT SQL SERVER 2000 ON HEWLETT-PACKARD PROLIANT SERVERS

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 (English)	PeopleSoft Financials 8.4	
	Small Volume Model	
	Average Response	Load 1.35 sec, Save 2.05 sec
	Concurrent Users	13,000
Référence d'exécution (Français)	PeopleSoft Finances 8.4	
	Petit volume de données	
	temps de réponse	Load 1,35 sec, Save 2,05 sec
	Concourants Utilisateurs	13.000
Benchmark-Test (Deutsch)	PeopleSoft Finanzen 8.4	
	Datenbankmodell "Small"	
	Antwortzeit	Load 1,35 sec, Save 2,05 sec
	Gleichzeitige Benutzer	13.000
Patrón de rendimiento (Español)	PeopleSoft Finanzas 8.4	
	Volumen pequeño de los datos	
	tiempo de reacción	Load 1,35 sec, Save 2,05 sec
	Simultáneos Utilizadores	13.000
Benchmark (Português)	Financials 8.4 do PeopleSoft	
	Volume pequeno dos dados	
	tempo de resposta	Load 1,35 sec, Save 2,05 sec
	Simultâneos Usuários	13.000

BENCHMARK PROFILE

In November 2003, PeopleSoft and Hewlett-Packard conducted a benchmark in Houston, TX to measure the online performance of PeopleSoft Financials 8.4 using Microsoft® SQL Server™ 2000 Enterprise Edition w/SP 3a and QFE 856 on a Hewlett-Packard® ProLiant® DL740 database server, running Microsoft® Windows® Server 2003 Enterprise Edition. Ten DL740 systems were used as Application Servers running Microsoft® Windows® 2000 Advanced Server.

The benchmark measured client response times for a single user, 4,000, 7,000, 10,000, and 13,000 concurrent users using a standard 'small' data composition model. The testing was conducted in a controlled environment with no other applications running. Tuning changes, if any, were approved by PeopleSoft Development and will be available in a future update or release. **The goal of this benchmark was to obtain baseline performance data for PeopleSoft Financials 8.4 Online on Microsoft SQL Server 2000 with Windows Server 2003 Enterprise Edition and HP ProLiant servers.**

The figure below illustrates average retrieve and update response times for an individual client and for a single user with 4,000, 7,000, 10,000, and 13,000 concurrent users.

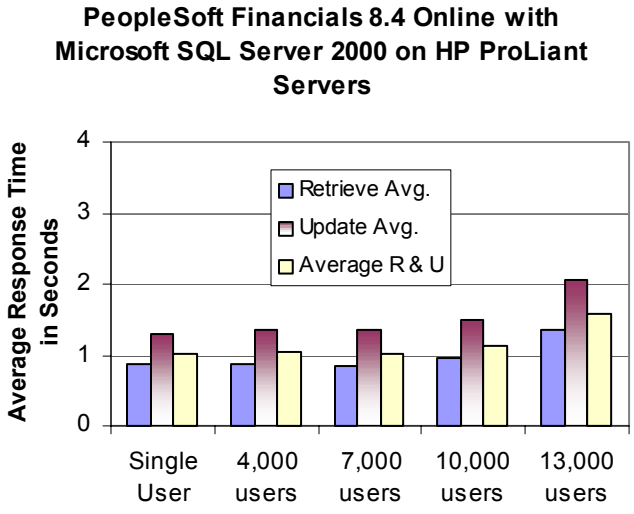

Figure 1: Average Response Times

* Results are weighted averages corresponding to the transaction mix specified in the Data Composition model.

METHODOLOGY

Mercury Interactive's LoadRunner® was used as the load driver, simulating concurrent users. It submitted a business transaction at an average rate of one every 5 minutes for each concurrent user to the application servers via the web servers.

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. This benchmark was run as a "Physical" 4-Tier configuration with separate servers for each role.

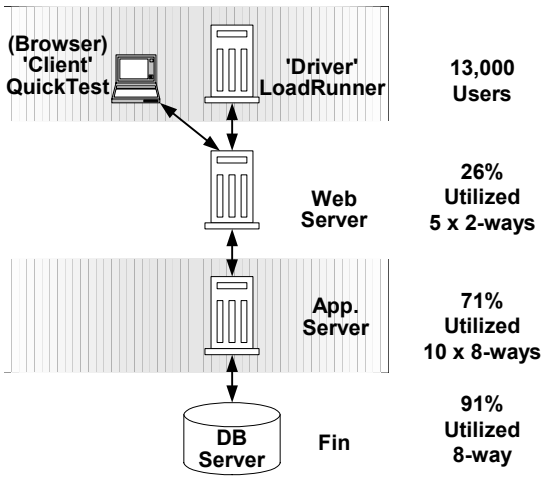

Figure 2: 4-Tier Configuration

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 TRANSACTIONS

PeopleSoft defines a business transaction as a series of HTML pages that guide a user through a business process, such as applying payments or entering a journal entry. Seventeen business transactions in four financial applications were tested in this benchmark. They are as follows:

ASSET MANAGEMENT (AM)

Asset Additions: Add capitalized assets automatically, with most of the information defaulted from an asset profile.
AM01: Asset Add

Asset Update: Change an existing asset's Tag number
AM02: Asset Update
AM03: Update Acquisition Details

Asset Inquiry: Retrieve non-financial descriptive information, detailed depreciation by period or by year, and detailed historical cost information for assets.
AM04: Calculate Net Book Value (NBV)
AM06: Cost History Listings

PAYABLES (AP)

Maintain Vendor Information: Create or update profiles for all types of vendors.
AP01: Vendor Add

Review Vendor Information: Review payment status, then link to detailed voucher information.
AP02: Inquire Payment Information
AP03: Inquire Voucher

Enter Vouchers: Record vendor invoice information on pages that are the equivalent of electronic voucher forms.
AP04: Voucher Add

RECEIVABLES (AR)

Maintain Customers: Establish and maintain customer processing requirements and attributes.
AR01: Customer Add
AR02: Customer Update

Apply Payments: Apply payments to open items through the use of a payment worksheet.
AR03: Apply Payments

Customer Item Inquiry: Sift through a customer's account looking for trends in open items, closed items, or both.
AR04: Inquire Customer Item

GENERAL LEDGER (GL)

Journal Entry: Enter Journal Header and line information in domestic or foreign currencies.
GL01: Journal Add
GL06: Journal Add - Foreign Currency

Ledger Inquiry: Pinpoint ledger balances using intuitive views based on specific Chart Field combinations.
GL03: Inquire Ledger

Journal Inquiry: Access detailed journals lines based on the Journal Header selected.
GL05: Inquire Journal

The following table shows how the business transactions were weighted in the measurements of this benchmark. The weightings are intended to simulate a typical user environment.

Application	Business Transaction	Percentage of Total
AM (10%)	AM01	0.71%
	AM02	5.33%
	AM03	1.71%
	AM04	1.13%
	AM06	1.13%
AP (35%)	AP01	2.19%
	AP02	2.73%
	AP03	2.73%
	AP04	27.36%
AR (30%)	AR01	0.85%
	AR02	0.99%
	AR03	9.14%
	AR04	19.02%
GL (25%)	GL01	15.24%
	** GL02	0.00%
	GL03	6.11%
	GL05	3.03%
	GL06	0.62%
Total		100.00%

Table 1: Business Transaction Mix

** Once every 15 minutes GL02: Edit/Post process is executed. This processes all journals added during that period. It is a batch process that is run in the background without being timed.

ONLINE TRANSACTION RESULTS

The following tables show average retrieval and update times, in seconds, for each business transaction.

Asset Management (AM)			# Users			
Bus. Transaction		**1**	**4,000**	**7,000**	**10,000**	**13,000**
AM01	Retrieve	0.141	0.141	0.136	0.142	0.138
	Update	1.235	1.13	1.178	1.314	1.811
AM02	Retrieve	1.196	1.241	1.145	1.283	1.621
	Update	0.747	0.776	0.812	0.787	1.067
AM03	Retrieve	0.886	1.088	1.007	1.162	1.371
	Update	0.676	0.674	0.673	0.669	0.881
AM04	Retrieve	0.775	0.74	0.848	0.887	1.155
	Inquiry	0.644	0.65	0.644	0.65	0.649
AM06	Retrieve	1.139	1.148	1.373	1.546	3.134
	Inquiry	0.714	0.666	0.652	0.793	0.766

Table 2: AM Business Transaction Runtimes

Payables (AP)			# Users			
Bus. Transaction		**1**	**4,000**	**7,000**	**10,000**	**13,000**
AP01	Retrieve	0.624	0.626	0.674	0.83	1.123
	Update	0.901	0.921	0.967	0.933	1.277
AP02	Retrieve	1.357	1.243	1.407	1.35	2.26
	Inquiry	0.726	0.721	0.711	0.713	0.826
AP03	Retrieve	0.9	0.788	0.839	0.792	0.923
AP04	Retrieve	1.316	1.332	1.258	1.589	2.186
	Update	1.789	2.005	1.959	2.08	3.076

Table 3: AP Business Transaction Runtimes

Receivables (AR)			# Users			
Bus. Transaction		**1**	**4,000**	**7,000**	**10,000**	**13,000**
AR01	Retrieve	0.639	0.635	0.692	0.693	0.895
	Update	0.908	0.901	0.98	1.084	1.168
AR02	Retrieve	0.63	0.69	0.645	0.688	1.127
	Update	0.871	0.904	0.732	0.903	1.018
AR03	Retrieve	0.677	0.677	0.676	0.678	0.777
	Build	1.143	0.973	0.923	1.158	1.063
	Edit	1.227	1.161	1.384	1.173	1.744
	Update	1.533	1.503	1.732	2.02	2.875
	Workshee	0.605	0.635	0.638	0.636	0.653
AR04	Retrieve	0.9	0.896	0.718	0.808	1.115
	Inquiry	0.663	0.645	0.661	0.755	1.117

Table 4: AR Business Transaction Runtimes

General Ledger (GL)			# Users			
Bus. Transaction		**1**	**4,000**	**7,000**	**10,000**	**13,000**
GL01	Retrieve	0.642	0.649	0.711	0.75	1.358
	Update	0.807	0.718	0.73	0.854	1.058
GL03	Inquiry	1.204	1.154	1.202	1.236	1.919
GL05	Retrieve	0.806	0.646	0.65	0.787	0.764
	Inquiry	0.164	0.168	0.162	0.17	0.17
GL06	Retrieve	0.668	0.661	0.768	0.818	1.261
	Update	1.011	0.835	1.004	0.995	1.264

Table 5: GL Business Transaction Runtimes

Table 6 shows the overall average responses. The database and application servers were processing a total of 2,600 transactions per minute at the load of 13,000 concurrent users.

AVERAGE RUNTIMES		# Users			
*** Weighted Avg.**	**1**	**4,000**	**7,000**	**10,000**	**13,000**
Retrieve	0.88	0.88	0.85	0.97	1.35
Update	1.31	1.35	1.36	1.50	2.05
Ret. & Update	1.02	1.03	1.02	1.14	1.58
Transactions/Minute	N/a	800	1,400	2,000	2,600

Table 6: Average Runtimes

4-TIER ENVIRONMENT

The following table shows the number of Application Servers utilized for each level of concurrent users. There were 20 App Serve instances per physical machine.

# Users	1	4,000	7,000	10,000	13,000
# App Servers	1	10	10	10	10

Table 7: Physical Application Servers

SERVER PERFORMANCE

Figure 3 shows the average Database Server CPU utilization, the average Application Server CPU utilization, and the average Web Server CPU utilization.

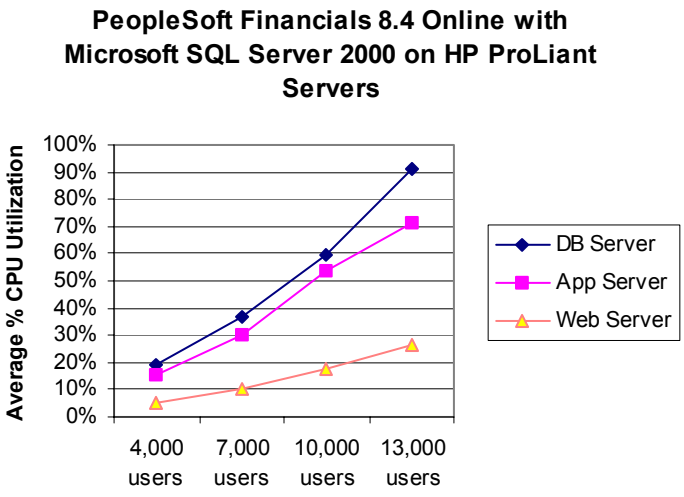

Figure 3: CPU Utilization

DATA COMPOSITION DESCRIPTION

The database was based on our standard Small Data Composition Model as discussed below.

The Asset Management tables were comprised of:

- 500,000 assets in 3 asset books
- 10 Business Units

The Payables tables were comprised of:

- 10,000 Vendors
- 415,000 Vouchers (400,000 Paid / 15,000 Unpaid)

The Receivables tables were comprised of:

- 262,500 Items (½ of customers have 5 invoice items and ½ of customers have 30 invoice items)
- 15,000 Customers

The General Ledger tables were comprised of:

- 8,000,000 Journal Lines (1 Year)
- 2,500,000 Total Ledger Rows (2 Years)

BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

Database Server:

A Hewlett-Packard® ProLiant® DL740 was used as a database server. It was equipped with the following:

- 8 × 2.8 GHz Intel® Xeon™ processors MP, each with 2 Megabytes of Level 2 Cache
- 16 Gigabytes of Memory
- ~1.56 Terabytes of total Disk Space (88 × 18.2GB)
- 3 × Hewlett-Packard® SmartArray 5312 Disk Controllers

Batch Server:

A Hewlett-Packard® ProLiant® DL360 G3 server was used as the batch server. It was equipped with the following:

- 2 × 2.8 GHz Intel® Xeon™ processors MP, each with 512 Kilobytes of Level 2 Cache
- 2 Gigabytes of Memory
- ~18 Gigabytes of Disk Space
- 1 × Hewlett-Packard® Integrated SmartArray 5i Plus Disk Controller with optional BBWC

Application Server(s):

10 × Hewlett-Packard® ProLiant® DL740 servers were used as the application servers. They were equipped with the following:

- 8 × 2 GHz Intel® Xeon™ processors MP, each with 2 Megabytes of Level 2 Cache
- 4 Gigabytes of Memory
- ~72 Gigabytes of Disk Space
- 1 × Hewlett-Packard® Integrated SmartArray 5i Plus Disk Controller

Web Server(s):

5 × Hewlett-Packard® ProLiant® BL20p G2 blade servers were used as the web servers. They were equipped with the following:

- 2 × 2.8 GHz Intel® Xeon™ processors, each with 512 Kilobytes of Level 2 Cache
- 8 Gigabytes of Memory

Load Driver(s):

5 × Compaq® ProLiant® DL580 servers were used as the load drivers. They were equipped with the following:

- 2 × 700 MHz Pentium® III processors, each with 2 Megabytes of Level 2 Cache
- 4 Gigabytes of Memory

1 × Compaq® ProLiant® DL580 served as the load controller. It was equipped with the following:

- 2 × 700 MHz Pentium® III processors, each with 2 Megabytes of Level 2 Cache
- 4 Gigabytes of Memory

Client PC:

Compaq® Evo D510 desktop (470057-004) with the following:

- 2.4 Gigahertz Pentium® IV Processor
- 768 Megabytes of Memory

SOFTWARE VERSIONS

PeopleSoft Financials 8.4

PeopleTools 8.43.08

Microsoft® SQL Server™ 2000 Enterprise Edition w/SP 3a and QFE 856

Microsoft® Windows® Server 2003 Enterprise Edition (on the Database server)

Microsoft® Windows® 2000 Advanced Server w/SP 3 (on the Application servers, Web servers, Drivers and Driver controller)

Microsoft® Windows® 2000 Professional w/SP 2 (on the Client)

Mercury Interactive's LoadRunner® 7.51 w/SP 1

Mercury Interactive's QuickTest® Professional 6.0

BEA Tuxedo® 6.5 with Jolt 1.2

BEA WebLogic® 6.1 w/SP 1 with Java Hotspot Client VM 1.3.1-b24

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