PeopleSoft8

certified Technology Benchmark

REVISION 2.2

# PEOPLESOFT FINANCIALS 8.4 ONLINE WITH DB2 UDB FOR AIX ON AN IBM eSERVER pSERIES p690 SERVER

*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 Financials 8.4 | |
| | Small Volume Model | |
| (English) | Average Response | Load 1.23 sec, Save 1.38 sec |
| | Concurrent Users | 6,500 |
| Référence d'exécution | PeopleSoft Finances 8.4 | |
| | Petit volume de données | |
| | temps de réponse | Load 1,23 sec, Save 1,38 sec |
| (Français) | Concourants Utilisateurs | 6.500 |
| Benchmark-Test | PeopleSoft Finanzen 8.4 | |
| | Datenbankmodell "Small" | |
| (Deutsch) | Antwortzeit | Load 1,23 sec, Save 1,38 sec |
| | Gleichzeitige Benutzer | 6.500 |
| Patrón de rendimiento | PeopleSoft Finanzas 8.4 | |
| | Volumen pequeño de los datos | |
| | tiempo de reacción | Load 1,23 sec, Save 1,38 sec |
| (Español) | Simultáneos Utilizadores | 6.500 |
| Benchmark | Financials 8.4 do PeopleSoft | |
| | Volume pequeno dos dados | |
| (Português) | tempo de resposta | Load 1,23 sec, Save 1,38 sec |
| | Simultâneos Usuários | 6.500 |

## BENCHMARK PROFILE

In January 2003, PeopleSoft conducted a benchmark in Pleasanton, CA to measure the online performance of PeopleSoft Financials 8.4 with IBM® DB2® Universal Database Version 7.2 for AIX on a 5-way partition of an IBM® eServer pSeries p690 server, running IBM® AIX® 5.1. 24 CPUs were used as the Application Server. The remaining 3 CPUs were used as the Web Server.

The benchmark measured client response times for a single user, 2,000, 4,000, and 6,500 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 8.4Online.**

The figure below illustrates average retrieve and update response times for an individual client and for a single user with 2,000, 4,000, and 6,500 concurrent users.

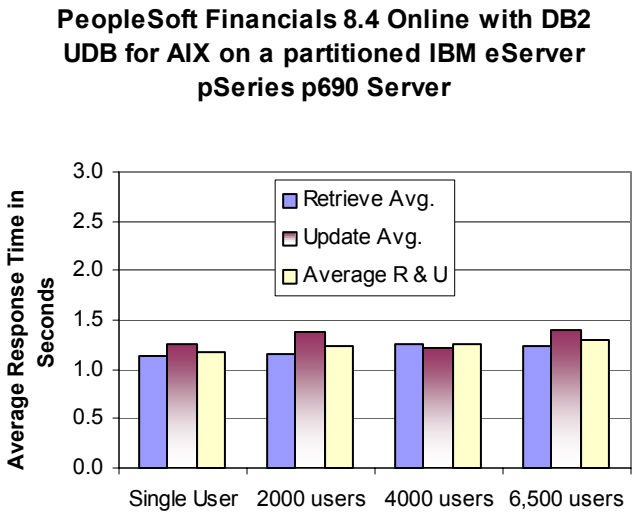


**Figure 1: Average Response Times**

* 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 by utilizing the partitioning capability of a single physical machine.

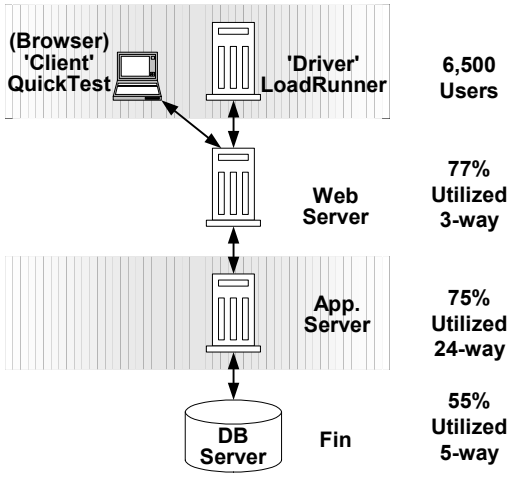


**Figure 2: 4-Tier Configuration**

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 | 2,000 | 4,000 | 6,500 |
| AM01 | Retrieve | 1.05 | 1.04 | 0.92 | 0.89 |
| | Update | 1.20 | 1.55 | 1.68 | 1.25 |
| AM02 | Retrieve | 0.86 | 1.22 | 1.06 | 1.13 |
| | Update | 0.92 | 0.98 | 0.93 | 1.07 |
| AM03 | Retrieve | 0.91 | 1.24 | 1.11 | 1.15 |
| | Update | 0.73 | 0.93 | 0.72 | 0.73 |
| AM04 | Retrieve | 0.84 | 0.71 | 1.04 | 0.86 |
| | Inquiry | 0.69 | 0.70 | 0.69 | 0.68 |
| AM06 | Retrieve | 1.21 | 1.20 | 1.21 | 1.42 |
| | Inquiry | 0.71 | 0.81 | 0.66 | 0.66 |

**Table 2: AM Business Transaction Runtimes**

| Payables (AP) | | | # Users | | |
|---|---|---|---|---|---|
| Bus. Transaction | | 1 | 2.000 | 4.000 | 6.500 |
| AP01 | Retrieve | 0.77 | 1.10 | 0.97 | 1.00 |
| | Update | 0.92 | 1.26 | 1.02 | 1.08 |
| AP02 | Retrieve | 1.56 | 1.79 | 1.60 | 1.77 |
| AP03 | Retrieve | 0.82 | 0.95 | 0.90 | 0.92 |
| AP04 | Retrieve | 1.04 | 0.95 | 1.06 | 1.42 |
| | Update | 1.33 | 1.42 | 1.36 | 1.41 |

**Table 3: AP Business Transaction Runtimes**

| Receivables (Ar) | | | # Users | | |
|---|---|---|---|---|---|
| Bus. Transaction | | 1 | 2.000 | 4.000 | 6.500 |
| AR01 | Retrieve | 1.11 | 0.83 | 1.06 | 1.03 |
| | Update | 1.11 | 0.91 | 0.99 | 0.71 |
| AR02 | Retrieve | 0.85 | 0.77 | 0.90 | 0.90 |
| | Update | 0.86 | 0.87 | 0.86 | 0.87 |
| AR03 | Retrieve | 0.81 | 0.81 | 1.33 | 1.00 |
| | Build | 1.68 | 1.51 | 1.51 | 1.97 |
| | Edit | 1.35 | 1.22 | 1.54 | 1.31 |
| | Update | 0.67 | 0.68 | 0.70 | 0.80 |
| | Worksheet | 1.19 | 1.19 | 2.38 | 1.74 |
| AR04 | Retrieve | 0.95 | 0.99 | 0.97 | 1.00 |
| | Inquiry | 0.80 | 1.09 | 0.91 | 0.85 |

**Table 4: AR Business Transaction Runtimes**

| General Ledger (GL) | | | # Users | | |
|---|---|---|---|---|---|
| Bus. Transaction | | 1 | 2.000 | 4.000 | 6.500 |
| GL01 | Retrieve | 1.21 | 0.87 | 1.04 | 1.19 |
| | Update | 1.01 | 1.27 | 1.01 | 1.19 |
| GL03 | Retrieve | | | | |
| | Inquiry | 2.30 | 2.21 | 2.23 | 2.34 |
| GL05 | Retrieve | 0.81 | 0.71 | 0.71 | 0.81 |
| | Inquiry | 1.62 | 1.53 | 1.97 | 1.75 |
| GL06 | Retrieve | 1.17 | 1.08 | 1.08 | 1.23 |
| | Update | 0.89 | 0.96 | 0.94 | 1.31 |

**Table 5: GL Business Transaction Runtimes**

The following table shows the average runtimes for all business transactions. The database and application servers were processing a total of 1,300 business transactions per minute at the peak load of 6,500 concurrent users.

| AVERAGE RUNTIMES | | # Users | | |
|---|---|---|---|---|
| * Weighted Avg. | 1 | 2,000 | 4,000 | 6,500 |
| Retrieve | 1.12 | 1.16 | 1.26 | 1.23 |
| Update | 1.24 | 1.36 | 1.20 | 1.38 |
| Ret. & Update | 1.16 | 1.22 | 1.24 | 1.28 |
| Transactions/Minute | N/a | 400 | 800 | 1,300 |

**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 two domains on the App Server, with 48 PSAPPSRV instances per domain. There were twenty Web Server instances per physical machine.

| # Users | 1 | 2,000 | 4,000 | 6,500 |
|---|---|---|---|---|
| # App Servers | 1 | 1 | 1 | 1 |
| # Domains / PSAPPSRVs | 1 | 2/48 | 2/48 | 2/48 |
| # Domains / Web Servers | 1 | 1/20 | 1/20 | 1/20 |

**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.

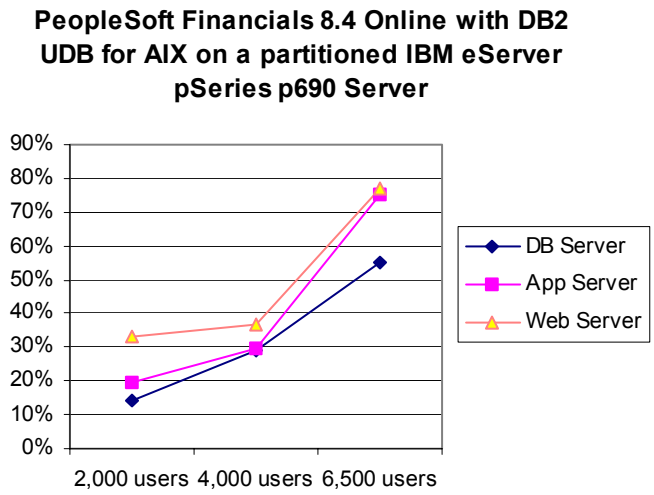


**Figure 3: CPU Utilization**

### I/O SUBSYSTEM PERFORMANCE

The 2.4 Terabyte IBM® TotalStorage Enterprise Server (SHARK) was used for storage. I/O performance is crucial to batch performance and is summarized in Table 3.

The 'average' and 'peak' transfer rates are shown for each server for the 6,500 concurrent user test.

| | MB/Second | | Transfers/Second | |
|---|---|---|---|---|
| | Average | Peak | Average | Peak |
| DB Server | 1.118 | 24.727 | 259.584 | 1034.8 |
| App Server | 0.063 | 3.540 | 8.035 | 184.6 |
| Web Server | n/a | n/a | n/a | n/a |

**Table 8: I/O Performance**

## 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 5-CPU LPAR of the IBM® eServer pSeries p690 (RS/6000 7040-681) server was used as the database server. It was equipped with the following:

- 5 × 1.3 GHz POWER4® Processors, each with 32 Kilobytes of Level-1 Data Cache and 64 Kilobytes of Level-1 Instruction Cache, 0.72 Megabytes of Level-2 Cache, with an average of 16 Megabytes of Level 3 Cache
- 22 Gigabytes of Memory
- 798 Gigabytes of total Disk Space (1 × 18.2 GB SCSI + 13 × 60 GB LUNs from an ESS 2105-F20)
- 3 Disk Controllers (1 × SCSI, 2 × 1 Gbit Fibre Channel)

The IBM® pSeries p690 was attached to:

- One IBM® TotalStorage™ Enterprise Server, 2105-F20, 36 and 72 GB disk size, 12 Terabytes of total Disk Space, with 800 Gigabytes allocated for this benchmark

#### *Application Server(s):*

A 24-CPU LPAR of the IBM® eServer pSeries p690 (RS/6000 7040-681) server was used as the application server. It was equipped with the following:

- 24 × 1.3 GHz POWER4® Processors, each with 32 Kilobytes of Level-1 Data Cache and 64 Kilobytes of Level-1 Instruction Cache, 0.72 Megabytes of Level-2 Cache, with an average of 16 Megabytes of Level 3 Cache
- 16 Gigabytes of Memory

### *Web Server(s):*

A 3-CPU LPAR of the IBM® eServer pSeries p690 (RS/6000 7040-681) server was used as the web server. It was equipped with the following:

- 3 × 1.3 GHz POWER4® Processors, each with 32 Kilobytes of Level-1 Data Cache and 64 Kilobytes of Level-1 Instruction Cache, 0.72 Megabytes of Level-2 Cache, with an average of 16 Megabytes of Level 3 Cache
- 22 Gigabytes of Memory

### *Load Driver(s):*

An 8-CPU LPAR of the IBM® eServer pSeries p690 (RS/6000 7040-681) server was used as the load driver. It was equipped with the following:

- 8 × 1.3 GHz POWER4® Processors, each with 32 Kilobytes of Level-1 Data Cache and 64 Kilobytes of Level-1 Instruction Cache, 0.72 Megabytes of Level-2 Cache, with an average of 16 Megabytes of Level 3 Cache
- 16 Gigabytes of Memory

1 × Toshiba® Equium 7100D served as the load controller. It was equipped with the following:

- 500 Megahertz Pentium® III Xeon™ Processor
- 256 Megabytes Memory

### *Client PC:*

Toshiba® Tecra 9000 with the following:

- 1.2 Gigahertz Pentium® III Mobile Processor
- 1.1 Gigabytes Memory

## SOFTWARE VERSIONS

PeopleSoft Financials 8.4

PeopleTools 8.41

IBM® AIX® 5.1 (on the database server, application server, web server and driver)

Microsoft® Windows 2000 Advanced Server 5.00.2195 (on the client PC)

IBM® DB2® Universal Database Version 7.2 for AIX w/FP 8

Mercury Interactive's LoadRunner® 7.51 w/SP 1

Mercury Interactive's QuickTest® Professional 5.6

BEA Tuxedo® 6.5 with Jolt 1.2

IBM® WebSphere® Single Server Version 4.0.0 with JRE 1.3.1

Merant™ (Micro Focus) Server Express™ 1.1

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