



# PEOPLESOFT 8.8 W/SP 1 GLOBAL PAYROLL (NETHERLANDS) USING ORACLE9i ON AN IBM® pSERIES 650 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  (English)	PeopleSoft Global Payroll 8.8 (Netherlands)	
	10,000 Payees	
	# Minutes to Process	5.10 minutes
	Payees per Hour	117,647 per hour
	50,000 Payees	
	# Minutes to Process	25.50 minutes
Benchmark  (Nederlands)	PeopleSoft Global Payroll 8.8 voor Nederland	
	10.000 Begunstigden	
	# Minuten per proces	5,10 Minuten
	Begunstigden per uur	117.647 per uur
	50.000 Begunstigden	
	# Minuten per proces	25,50 Minuten

Note that the summary above includes the processing times for the 'identify,' 'calculate' and 'finalize' payroll processes.

## BENCHMARK PROFILE

In November 2004, PeopleSoft conducted a benchmark in Pleasanton, CA to measure the batch performance of the [Employee] Identification, [Payroll] Calculation, Finalize, Banking, Payslip and Tax Reporting processes in PeopleSoft Global Payroll 8.8 Netherlands (Nederland) with Oracle9i™ 9.2.0.4 on an 8-way IBM pSeries® 650 server, running IBM AIX 5L™ V5.2.

The benchmark measured 'Global Payroll' application business process runtimes for two database models. Testing was conducted in a controlled environment with no other applications running. The tuning changes, if any, were approved by PeopleSoft Development and will be generally available in a future update or Release 8.9. **The goal of this Benchmark was to obtain reference performance results for PeopleSoft Global Payroll 8.8 with Oracle9i on an IBM pSeries server.**

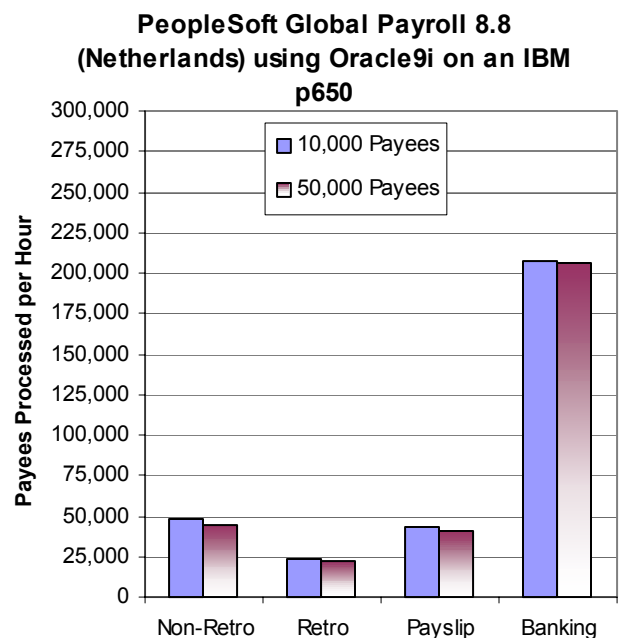


Figure 1: PeopleSoft Global Payroll 8.8 Processing Rates

The "Non-Retro" and "Retro" throughput rates above include the Identification, Calculate and Finalize processes. The "Payslip" and "Banking" processes include "Retro" processing.

## METHODOLOGY

PeopleSoft Global Payroll 8.8 batch processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate COBOL, Application Engine (AE) or SQR jobs.

The Identify, Calculation and Banking processes were run as 8 concurrent processes—based upon the employee ID number ranges. The Banking process is run partly single-threaded and partly as parallel concurrent jobs.

Business Process	Job Streams	Process Type
Identify	8	COBOL
Calculate	8	COBOL
Finalize	Single-Threaded	COBOL
Payslip	Single-Threaded	AE & SQR
Banking	8 Single-Threaded	App Engine & SQR
Personal Info Report	Single-Threaded	AE & SQR
Employer Report	Single-Threaded	AE & SQR

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 Global Payroll 8.8 processes tested are as follows:

**[Employee] Identification:** (COBOL) Identifies eligible payees for the selected Calendar period. The process looks at the Calendar selection criteria and then compares this to the employee's pay system flag (JOB.PAY\_SYSTEM\_FLG), pay group (JOB.GP\_PAYGROUP), and status (JOB.EMPL\_STATUS). When applicable, it also looks at Positive Input information as well as Retro Triggers. The Identification process can be run separately from the other two tasks, usually right before the first calculation is run.

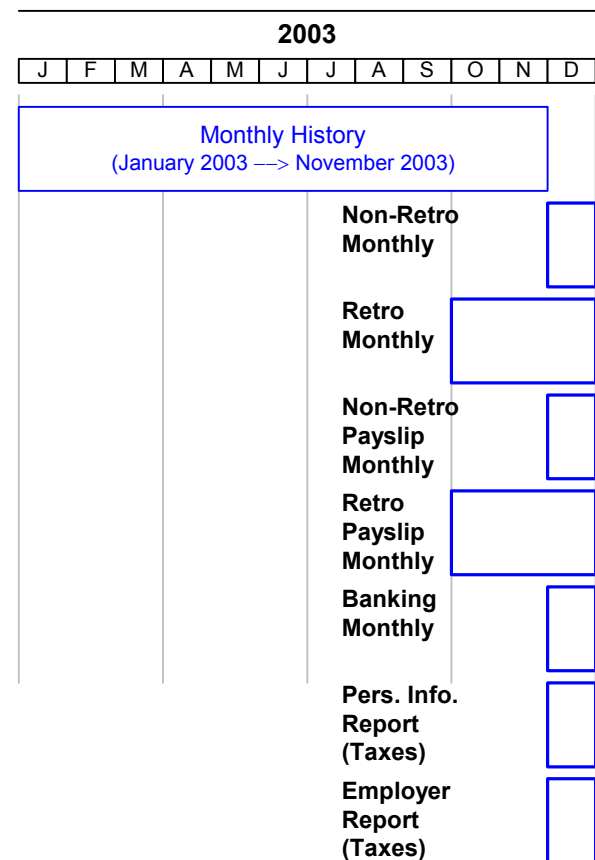
**[Payroll] Calculation:** (COBOL) Looks at identified payees and performs appropriate payroll calculations for those employees. Payroll Calculation can be run any number of times throughout the pay period. The first run will do most of the processing, while each successive run updates only the calculated totals of changed items. This iterative design minimizes the time required to calculate a payroll run, as well as the processing resources required. In this benchmark, Payroll Calculation was run only once, as though at the end of a payroll period.

**Finalize:** (COBOL) Takes the information generated by Calculation and 'closes' the period. Finalize can only be run once, and therefore, must be run at the end of the pay period.

**Payslip:** (AE & SQR) Provides payroll information at the employee-level, allowing the employee to view their net pay.

**Banking:** (AE & SQR) Setup to prepare for the creation of a single entity for each payroll result that needs to be 'paid out,' in an interface table. The table keeps all of the information required to execute the payment (net payment and external deductions). This process generates a flat file for Electronic File Transfer purposes.

**Tax Reporting (Personal Information Report/Employer Report):** (AE) Two processes specific to the Netherlands used to report tax withholding records.



**Figure 2: History and Execution Plan**

Figure 2 summarizes the periods used in the creation of historical data and the corresponding execution periods. Eleven months of history were created and then the year-end payroll calculations were performed.

The monthly payroll with retroactivity and monthly payslip with retroactivity processes were the only processes involving more than a single (monthly) pay period. Other processes may take into account the results of retro calculations. In this case, all of the payees had their payroll recalculated for two previous periods.

## BATCH RESULTS

The retro calculation involved all of the ‘monthly’ population having their payroll recalculated for October and November. Thus, the 10,000-payee monthly [Retro] run processed 60,000 segments rather than the base 10,000 employees. Likewise, the 50,000 payee monthly [Retro] run processed 300,000 segments rather than the base 50,000 payees. The computed transaction rates are still based upon the 10,000 or 50,000 monthly payees.

	10,000 Payees	50,000 Payees
Active Payees	10,000	50,000
Total Segments (No Retro)	20,000	100,000
Total Segments (Including Retro)	60,000	300,000

**Table 1: Payee and Retro Correspondence**

Tables 2 and 3 contain the actual runtimes, in minutes, for the Global Payroll processes.

10,000 Payees	Payroll – Not Including Retroactivity			Payroll - Including Retroactivity		
	# Min. to Process	# Payees Processed per Hour	# Segments Processed per Hour	# Min. to Process	# Payees Processed per Hour	# Segments Processed per Hour
<b>Payroll</b>						
Identify	0.53	1,125,000	2,250,000	0.77	782,609	4,695,652
Calculate	4.30	139,535	279,070	10.30	58,252	349,515
Finalize	0.27	2,250,000	4,500,000	0.25	2,400,000	14,400,000
<b>Payroll SubTotal:</b>	5.10	117,647	235,294	11.32	53,019	318,115
<b>Payslip</b>						
<b>Payslip Subtotal</b>	7.52	79,823	159,645	13.78	43,531	261,185
<b>Payroll + Payslip Totals</b>	12.62	47,556	95,112	25.10	23,904	143,426
<b>Banking</b>						
Banking Prep	1.00	600,000	1,200,000	0.52	1,161,290	6,967,742
Banking NL	0.25	2,400,000	4,800,000	0.25	2,400,000	14,400,000
EFT File	1.75	342,857	685,714	1.75	342,857	2,057,143
Payment List Rept.	0.37	1,636,364	3,272,727	0.38	1,565,217	9,391,304
<b>Banking SubTotal:</b>	3.37	178,218	356,436	2.90	206,897	1,241,379
<b>Payroll + Payslip + Banking Totals</b>	15.98	37,539	75,078	28.00	21,429	128,571
<b>Personal Information Report</b>						
<b>Per. Tax SubTotal:</b>	5.50	109,091	218,182	5.53	108,434	650,602
<b>Payroll + Payslip + Banking + P. Tax Totals</b>	21.48	27,929	55,857	33.53	17,893	107,356
<b>Employer Tax Report</b>						
<b>Employ. SubTotal:</b>	1.25	480,000	960,000	1.27	473,684	2,842,105
<b>Payroll + Payslip + Banking + P. Tax+ Employer Tax Totals</b>	22.73	26,393	52,786	34.80	17,241	103,448

**Table 2: PeopleSoft Global Payroll 8.8 w/SP 1 Process Runtimes**

<b>50,000 Payees</b>	<b>Payroll – Not Including Retroactivity</b>			<b>Payroll - Including Retroactivity</b>		
<b>Process Tested</b>	<b># Min. to Process</b>	<b># Payees Processed per Hour</b>	<b># Segments Processed per Hour</b>	<b># Min. to Process</b>	<b># Payees Processed per Hour</b>	<b># Segments Processed per Hour</b>
<b>Payroll</b>						
Identify	1.52	1,978,022	3,956,044	3.53	849,057	5,094,340
Calculate	23.22	129,218	258,435	56.98	52,647	315,882
Finalize	0.77	3,913,043	7,826,087	1.00	3,000,000	18,000,000
<b>Payroll SubTotal:</b>	<b>25.50</b>	<b>117,647</b>	<b>235,294</b>	<b>61.52</b>	<b>48,767</b>	<b>292,604</b>
<b>Payslip</b>						
<b>Payslip Subtotal</b>	<b>41.10</b>	<b>72,993</b>	<b>145,985</b>	<b>74.43</b>	<b>40,305</b>	<b>241,827</b>
<b>Payroll + Payslip Totals</b>	<b>66.60</b>	<b>45,045</b>	<b>90,090</b>	<b>135.95</b>	<b>22,067</b>	<b>132,402</b>
<b>Banking</b>						
Banking Prep	2.77	1,084,337	2,168,675	3.90	769,231	4,615,385
Banking NL	1.00	3,000,000	6,000,000	1.25	2,400,000	14,400,000
EFT File	8.00	375,000	750,000	8.25	363,636	2,181,818
Payment List Rept.	1.13	2,647,059	5,294,118	1.12	2,686,567	16,119,403
<b>Banking SubTotal:</b>	<b>12.90</b>	<b>232,558</b>	<b>465,116</b>	<b>14.52</b>	<b>206,659</b>	<b>1,239,954</b>
<b>Payroll + Payslip + Banking Totals</b>	<b>79.50</b>	<b>37,736</b>	<b>75,472</b>	<b>150.47</b>	<b>19,938</b>	<b>119,628</b>
<b>Personal Information Report</b>						
<b>Per. Tax SubTotal:</b>	<b>28.58</b>	<b>104,956</b>	<b>209,913</b>	<b>28.87</b>	<b>103,926</b>	<b>623,557</b>
<b>Payroll + Payslip + Banking + P. Tax Totals</b>	<b>108.08</b>	<b>27,756</b>	<b>55,513</b>	<b>179.33</b>	<b>16,729</b>	<b>100,372</b>
<b>Employer Tax Report</b>						
<b>Employ. SubTotal:</b>	<b>3.52</b>	<b>853,081</b>	<b>1,706,161</b>	<b>5.28</b>	<b>567,823</b>	<b>3,406,940</b>
<b>Payroll + Payslip + Banking + P. Tax+ Employer Tax Totals</b>	<b>111.60</b>	<b>26,882</b>	<b>53,763</b>	<b>184.62</b>	<b>16,250</b>	<b>97,499</b>

**Table 3: PeopleSoft Global Payroll 8.8 w/SP 1 Process Runtimes**

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

## SERVER PERFORMANCE

Table 4 shows the average CPU utilization for each process. The value shown is the average across all eight processors.

	10,000 Payees		50,000 Payees	
	Non-Retro	Retro	Non-Retro	Retro
Payroll				
Identify	<i>31.0</i>	73.71	69.39	86.14
Calculate	93.82	95.33	82.9	87.1
Finalize	<i>13.0</i>	<i>7.5</i>	20.88	19.7
Payslip	13.95	14.49	13.96	14.49
Banking				
Prep	<i>3.4</i>	<i>61.6</i>	63.39	64.19
NLD	<i>13.33</i>	<i>13.33</i>	20.55	18.46
EFT	12.84	12.18	13.04	13.04
Pay. Rept.	<i>7.5</i>	<i>6</i>	6	7.17
Personal Info. Report	14.58	15.03	15.35	15.71
Employer Tax Report	<i>25.17</i>	<i>16.91</i>	19.76	20.86

**Table 4: Average CPU Utilization**

Eight CPU values for processes lasting less than 35 seconds are shown in *italics* in Table 4. Their averages are based on few samples and thus offer less insight into this implementation's behavior.

## I/O PERFORMANCE

An IBM TotalStorage™ DS4500 with 10 × 66 GB disks set up in RAID 0 configuration (as 5 sets of 2 disks per 'hdisk') was used for the benchmark. I/O performance is crucial to system performance and is summarized in the following table.

(50K employees – Retro)	Average	Peak
Disk Read KiloBytes/Sec	4,731.9	78,788.4
Disk Write KiloBytes/Sec	4,788.0	66,922.7
I/O Operations/Sec	566.1	5,331.9

**Table 5: I/O Performance**

## DATA COMPOSITION DESCRIPTION

History data for January 2003 through November 2003 was created prior to the timed benchmark runs (11 periods for monthly payees). This is shown graphically in Figure 2.

A payroll calendar was run for each month of this benchmark using individual Calendar Groups for each month.

The Retro calculation primarily involves the first three processes (ID, Calc, Finalize). All of the 'monthly employee' profiles have retro processing for the previous two months (October and November).

The employees were distributed over a single pay entity and a single pay group. There are 10 different monthly employee profiles. The distribution is as follows:

Pay Entities	Monthly
Payees (Population)	100%
Payees with Element Segmentation	2%
Payees Terminated in 1 Month	2%
Payees with Special Tax Rules (35%)	
Tax Reduction	5%
No Tax Credit	5%
Advantage Rule	15%
30% Rule	1%
Tax Exemption	2%
Green Tax Table (Pension)	5%
Student Rule	1%
Handicapped (Wajong)	1%
Payees without Social Insurances	6%
Payees w/o Additional Insurances	16%
Payees with Positive Input (32%)	
Overtime	15%
Travel Allowance	10%
Bonus	5%
Time for Time	2%
Absence (36%)	
Vacation	15%
Reduced Hours (ADV)	5%
Sickness	5%
Paid Leave	4%
Time for Time	2%
Maternity	2%
Un-Paid Leave	2%
Short-Term Care Leave	1%
Payees with Special Earnings	
Commuting Allowance	25%
Regular Reimbursement	20%
Hourly Salary	3%
Net-to-Gross	4%
Payees with Special Deductions	24%
Average Number of Earnings/Deductions Calculated	20
Average Number of Accumulators	38

**Table 6: Netherlands Specific Setup**

## BENCHMARK ENVIRONMENT

### HARDWARE CONFIGURATION

The IBM pSeries 650 (7038-6M2) server was used as the database server. It was equipped with the following:

- 8 × 1.45 GHz POWER4™ Processors, each with 32 Kilobytes of Level-1 Data Cache and 64 Kilobytes of Level-1 Instruction Cache, 0.75 Megabytes of Level-2 Cache, with an average of 16 Megabytes of Level 3 Cache
- 32 Gigabytes of Memory
- ~788 Gigabytes of total Disk Space (4 × 32GB + 10 × 66) (~150 GB used)
- 3 Disk Controllers (1 × SCSI, 2 × 1 Gbit Fibre Channel DS4500)
- One IBM TotalStorage DS4500

### SOFTWARE VERSIONS

PeopleSoft Global Payroll (Netherlands ext.) 8.8 w/SP 1

PeopleTools 8.44.04b

Oracle9i™ 9.2.0.4 (64-bit)

IBM AIX 5L V5.2 (64-bit) (on the Database server)

Micro Focus™ Server Express™ (COBOL) 2.2 w/SP 1

BEA Tuxedo® 8.1 with Jolt 8.1

**Oracle Patch 3769909**

**Opatch 2617419**

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