PEOPLESOFT ENTERPRISE PAYROLL 9.1 USING ORACLE FOR SOLARIS (UNICODE) ON AN ORACLE'S SPARC T4-4

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

PeopleSoft Enterprise Payroll (North American) 9.1	
Extra-Large Volume Model	
Payroll	500,480 Employees
	750,720 Payments
	30.84 minutes
Payments/Hour	1,460,544 per hour

The benchmark measured five Payroll application business process runtimes for one database model representing an extra-large organization. A single execution strategy was executed to model the preferred customer option. 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 release or update. **The goal of this benchmark was to obtain baseline Extra-Large-model results for Oracle (PeopleSoft) Enterprise Payroll 9.1 using Oracle on a SPARC T4-4 server.**

BENCHMARK PROFILE

In September 2011, Oracle Sun conducted a benchmark in Burlington, MA in collaboration with Oracle (PeopleSoft) to measure the batch performance of the Paysheet Creation, Payroll Calculation and Payroll Confirmation processes in PeopleSoft Enterprise Payroll 9.1 (North American) using Oracle11*g*™ on a 4-way Eight-Core (32 cores in all – 256 vcpus) Oracle's SPARC T4-4 database server, running Solaris 10 8/11. Approximately 824 GB of storage from one 1,920 GB Oracle's Sun Storage F5100 Flash Array storage system was allocated to the database instance.

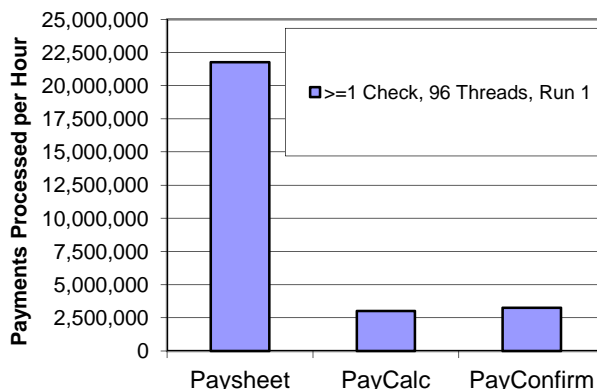**Oracle Enterprise Payroll 9.1 Using Oracle11*g* for Solaris on a SPARC T4-4**

Figure 1: Enterprise Payroll 9.1 Payments/Hour

METHODOLOGY

For this benchmark, all jobs were initiated on the server from a browser.

This application was run as ninety-six concurrent processes.

Batch processes are background processes, requiring no operator intervention or interactivity. Results of these processes are automatically logged in the database.

BUSINESS PROCESSES

The five Payroll processes tested are as follows:

Paysheet Creation: Generates payroll data worksheets for employees, consisting of standard payroll information for each employee for the given pay cycle. The Paysheet process can be run separately from the other two tasks, usually before the end of the pay period.

Payroll Calculation: Looks at Paysheets and calculates checks 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, as well as the processing resources required. In this benchmark, Payroll Calculation was run only once, as though at the end of a pay period.

Payroll Confirmation: Takes the information generated by Payroll Calculation and updates the employees' balances with the calculated amounts. The system assigns check numbers at this time and creates direct deposit records. Confirm can only be run once, and therefore, must be run at the end of the pay period.

Print Advice Forms: This process takes the information generated by Payroll Calculation and Confirmation and produces an Advice for each employee to report Earnings, Taxes, Deductions, net pay and bank accounts where Net Pay were sent.

Create Direct Deposit File: This process takes the information generated by Payroll Calculation and Confirmation and produces an electronic transmittal file used to transfer payroll funds directly into an employee's bank account.

BATCH PROCESS STRATEGIES

The figure below summarizes the execution strategy that was undertaken for this benchmark. The first run did not use the 'Single-Check' option but did use multiple job streams.
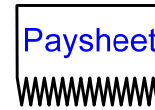

Figure 2: Batch Job Stream Execution Variations

BATCH RESULTS

The table below contains the actual runtimes, in minutes, for the Payroll processes. It also shows how many employees were processed and the number of checks and advices produced.

	Shortest
	Run 1
Job Streams	**96**
Single Check	**No**
Employees	*500,480*
Jobs	*750,720*
PayCheck	*100,096*
PayAdvice	*650,624*
Payments	*750,720*
Paysheet	2.07
PayCalc	14.9
PayConfirm	13.87
Total Minutes	30.84
Total Hours	0.51
Print Advice	12.1
Direct Deposit	0.82
Total Minutes	12.92

Table 1: PeopleSoft 9.1 Payroll Process Runtimes

	Highest
	Run 1
Job Streams	**96**
Single Check	**No**
Paysheet	21,760,000
PayCalc	3,023,033
PayConfirm	3,247,527
Net per Hour	1,460,544
Print Advice	3,226,234
Direct Deposit	47,606,634

Table 2: PeopleSoft 9.1 Payroll Process Throughputs

The throughputs above are linear extrapolations only. For Paysheet, PayCalc and PayConfirm the throughputs are payments per hour. For Print Advice and Direct Deposit, throughputs are PayAdvice per hour. Performance may vary on other hardware and software platforms and with other data composition models.

SERVER PERFORMANCE

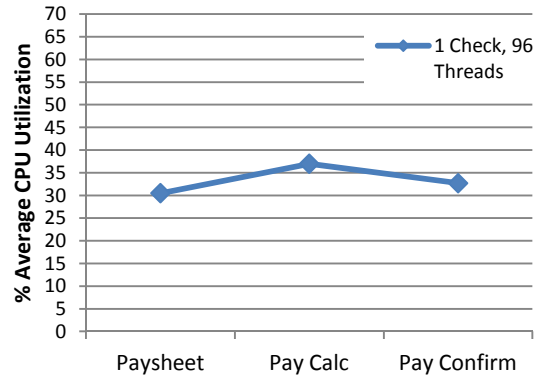**Oracle Enterprise Payroll 9.1 using Oracle11*g* for Solaris on a SPARC T4-4**

Figure 3: Average CPU Utilization

96 Job Streams			
	User	**System**	**Idle**
Paysheet	24.96	5.67	69.42
PayCalc	31.98	4.84	63.07
PayConfirm	26.76	5.91	67.32
Print Advice	21.72	4.62	73.75
Direct Deposit	22.38	3.13	74.5

Table 3: Average CPU Utilization

I/O PERFORMANCE

The Oracle's Sun Storage F5100 Flash Array was used for storage of tables, indexes and for undo and redo logs. I/O performance is crucial to batch performance. Reads and Writes per second are summarized in the following table.

		Run 1			
Job Streams		96			
Single Check		No			
		Reads/S	*Writes/S*	KB R./S	*KB W./S*
Paysheet		4,916	*631*	79,218	*84,793*
PayCalc		2,901	*739*	71,894	*73,554*
PayConfirm		3,150	*1,307*	102,878	*124,104*
Print Advice		991	*93*	28,729	*7,479*
Direct Deposit		40	*34*	1,482	*188*

Table 4: I/O Performance

DATA COMPOSITION DESCRIPTION

There are 500,480 active employees and each employee has eleven months of payroll history. Within the active employee population, there are a total of 750,720 Jobs from which the active employees receive compensation. In the Pay Cycle benchmarked, 350,336 employees have one active Job record and will receive 1 payment each. 50,048 employees have two active Job records (Employee ID KU0202(a) and KU0202(b)). Each Job is in a similarly defined Paygroup and each employee will receive two payments for a total of 100,096 payments. Lastly, 100,096 employees have three active Job records (Employee ID KU0207 and KU0208). Each Job is in a similarly defined Paygroup and each employee will receive 3 payments for a total of 300,288 payments. In this benchmark there are a total of 750,720 payments.

The employees were distributed over four monthly, semi-monthly, bi-weekly and weekly pay groups. Each of these pay groups were assigned to 32 pay groups for a total of 128 pay groups. With further sub-divisions, the benchmark was set up for 96 concurrent processes for the Paysheet, PayCalc and PayConfirm processes for this test. The employee profiles are as follows:

Employee ID	Pay Group	Pay Freq.	Employee Type	Employee Status
KU0200	PB1	Weekly	Hourly	PT 20 Hrs
KU0201	PB2	Bi-Weekly	Hourly	FT
KU0202(a)	PB2	Bi-Weekly	Salaried	PT 30 Hrs
	PB2	Bi-Weekly	Exc Hourly	PT 10 Hrs
KU0202(b)	PB4	Monthly	Salaried	PT 30 Hrs
	PB4	Monthly	Exc Hourly	PT 10 Hrs
KU0203	PB4	Monthly	Salaried	FT
KU0204(a)	PB2	Bi-Weekly	Salaried	FT
KU0204(b)	PB2	Bi-Weekly	Salaried	FT
KU0205	PB3	Semi-Mon.	Salaried	FT
KU0207	PB1	Weekly	Hourly	PT 20 Hrs
	PB1	Weekly	Hourly	PT 10 Hrs
	PB1	Weekly	Hourly	PT 10 Hrs
KU0208	PB1	Weekly	Salaried	PT 20 Hrs
	PB1	Weekly	Salaried	PT 10 Hrs
	PB1	Weekly	Salaried	PT 10 Hrs
KU0209	PB3	Semi-Mon.	Hourly	FT

Table 5: Employee Profiles for Seed Data

- Part-time, hourly paid weekly with Federal and California State tax, three general deductions and nine per pay period benefit deductions, one garnishment deduction and two direct deposits (KU0200).

- Full time, hourly, paid biweekly with federal and Ohio State and local tax deductions and nine per pay period benefit and two general deductions with Time and Labor. (KU0201)

- Two Part-time jobs, one salaried and the other exception hourly both paid biweekly, with federal and California State tax, four general deductions and eight per pay period benefit deductions with Absence Management (KU0202(a))

- Two Part-time jobs, one salaried and the other exception hourly both paid monthly, with federal and California State tax, four general deductions and eight per pay period benefit deductions with Absence Management (KU0202(b))

- Full-time salaried paid monthly with Federal and California and New York reciprocity tax, with six benefit deductions and no general deductions with Absence Management (KU0203)

- Full time, salaried paid biweekly with federal and Pennsylvania state and four local tax deductions and eight per pay period benefit deductions (KU0204) (Used twice)

- Full time, salaried paid semi-monthly, with federal and Michigan state and local tax deductions, six per pay period benefit deductions, with Time and Labor (KU0205)

- Three Part-time jobs, all hourly paid weekly, with federal and Tennessee State tax, three general deductions and eight per pay period benefit deductions and one direct deposit with Absence Management and Time and Labor (KU0207)

- Three Part-time jobs, all salaried paid weekly, with federal and Georgia State tax, one general deduction and eight per pay period benefit deductions with Absence Management and Time and Labor (KU0208)

- Full time, hourly paid semi-monthly, with federal and California state tax deductions, eight per pay period benefit deductions and no general deductions (KU0209)

The benchmarking payroll Pay_End_Dt is Dec 9th (PB1 weekly), Dec 16th (PB2 bi-weekly), Dec 15th (PB3 semi-monthly), or Dec 31st (PB4 monthly). The database reflects ~11 months history in calendar year 2006.

Note that this 'Data Model' is different, and more complex, than that used for benchmarking Releases 8.8 and 8.9. Direct comparison between this result and results published for those releases is impossible.

BENCHMARK ENVIRONMENT

An Oracle's SPARC® T4-4 was used as the database server and process scheduler. It was equipped with the following:

- 4 × 3.0 GHz T4 Eight-Core processors (sockets), each with 16 Kilobytes of Instruction and 16 Kilobytes of Data Level-1 on core cache, 128 Kilobytes of shared Instruction and Data Level-2 cache per core, and 4 Megabytes of Level-3 on-chip cache (32 cores total – 256 vcpus)

- 256 Gigabytes of Memory (~125 GB used at peak load)

One of Oracle's Sun Storage F5100 Flash Array storage systems with 80 Flash Modules (FMODs) was used. The F5100 Flash Array was equipped with the following:

- 80 × 24 GB FMODs in Sun Storage Flash Array F5100 device

- Approximately 824 GB of storage from one 1,920 GB Oracle's Sun Storage F5100 Flash Array storage system was allocated to the database instance.

SOFTWARE VERSIONS

Oracle's PeopleSoft HRMS and Campus Solutions 9.10.303

Oracle's PeopleSoft Enterprise (PeopleTools) 8.51.03

Oracle11*g* 11.2.0.1.0 (64-bit)

Oracle Solaris 10 8/11

Micro Focus COBOL Server Express 5.1 (64-bit)

ICE tracking:
ICE 196334000

ORACLE | PeopleSoft.