ORACLE® | PeopleSoft.

PeopleSoft. | Enterprise

IBM®

PEOPLESOFT ENTERPRISE PAYROLL 9.1 FP2 USING DB2 FOR z/OS 10.1 (EBCDIC) ON AN IBM® zENTERPRISE z196 EC 2817-709 [9-way LPAR]

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
	500,480 Payments
	30.5 minutes
Payments/Hour	984,550 per hour

BENCHMARK PROFILE

In September 2014, IBM and Oracle (PeopleSoft) conducted a benchmark in Pleasanton, CA to measure the batch performance of the Paysheet Creation, Payroll Calculation and Payroll Confirmation processes in PeopleSoft Enterprise Payroll 9.1 FP2 (North American) using IBM DB2 for z/OS™ 10.1 on a 9-way IBM System z196 zEnterprise™ model 2817-709 database server, running IBM® z/OS version 2.1. A 56 Terabyte (~18 TB available, ~185.9 GB used) IBM System Storage® DS8300, 2107-922 complex was used for storage.
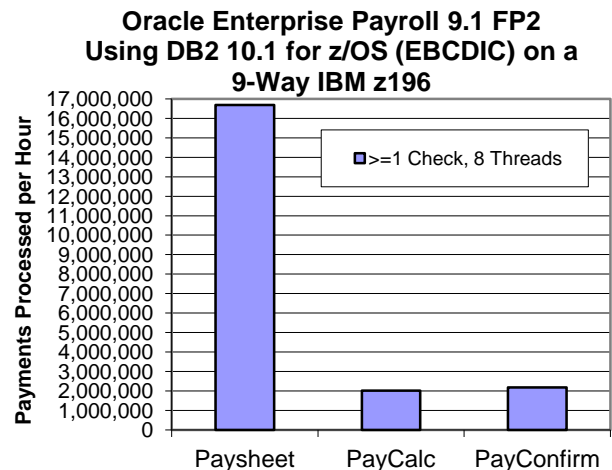
The benchmark measured five Payroll application business process runtimes for one database model representing an extra-large organization. A single execution strategy was executed to model the preferred customer option. Testing was conducted in a controlled environment on an LPAR dedicated to benchmarking. The benchmark DB2 subsystem was the only active subsystem in the entire complex. The tuning changes, (if any) were approved by PeopleSoft Development and are available in DOCID 1549169.1 in Oracle Support under the 'Knowledge' tab. **The goal of this benchmark was to obtain baseline Extra-Large-model results for Oracle (PeopleSoft) Enterprise Payroll 9.1 FP2 using DB2 for z/OS 10.1 (EBCDIC) on an IBM z196 server.**

Figure 1: Enterprise Payroll 9.1 Payments/Hour

METHODOLOGY

For this benchmark, all jobs were initiated on the server using Job Control Language (JCL).

This application was run as eight 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 is run separately from and prior to the other two COBOL tasks before the end date of the given pay cycle.

Payroll Calculation: Looks at Paysheets and calculates earnings, deductions and net pay 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 is measured only on the first run, whereby payments for all employees will be calculated.

Payroll Confirmation: Takes the information generated by Payroll Calculation and updates the employees' balances with the calculated amounts. The system assigns internal 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 was 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 'Single-Check' option was not deployed and multiple job streams were used, as preferred by polled customers.

Single Check-No
8 Job Streams

Figure 2: Batch Job Stream Execution Scenario

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.

Job Streams	**8**
Single Check	**No**
Employees	*500,480*
Jobs	*500,480*
PayCheck	*0*
PayAdvice	*500,480*
Payments	*500,480*
Paysheet	1.8
PayCalc	14.9
PayConfirm	13.8
Total Minutes	30.5
Total Hours	0.51
Print Advice	10.3
Direct Deposit	0.5
Total Minutes	10.8

Table 1: PeopleSoft 9.1 Payroll Process Runtimes

Job Streams	**8**
Single Check	**No**
Paysheet	16,682,667
PayCalc	2,129,702
PayConfirm	2,176,000
Net per Hour	984,551
Print Advice	2,915,417
Direct Deposit	60,057,600

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.
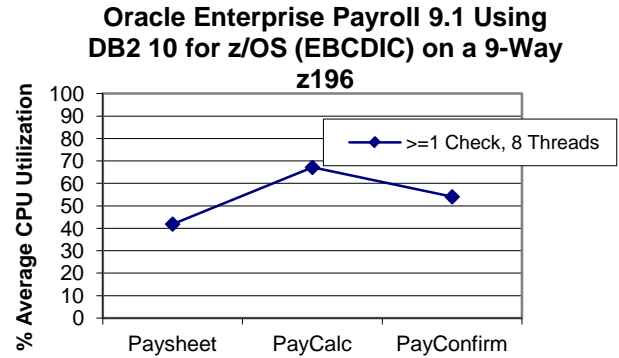
SERVER PERFORMANCE

Oracle Enterprise Payroll 9.1 Using DB2 10 for z/OS (EBCDIC) on a 9-Way z196

Figure 3: Average CPU Utilization

Job Streams	**8**
Single Check	**No**
Paysheet	41.85
PayCalc	67.1
PayConfirm	54
Print Advice	68.6
Direct Deposit	14.95

Table 3: Average CPU Utilization

I/O PERFORMANCE

The 2.4 Terabyte (allocated) IBM System Storage DS8300, 2107-922 complex was used for storage. I/O performance is crucial to batch performance. I/O average response time in milliseconds, and I/O operations per second, are summarized for each of the three runs in the following table.

Job Streams	**8**	
Single Check	**No**	
	I/O Resp.	*I/O per Sec*
Paysheet	1.2	*3,802*
PayCalc	1.07	*5,218*
PayConfirm	0.85	*6,806*
Print Advice	0.32	*6,888*
Direct Deposit	0.6	*671*

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 500,480 Jobs from which the active employees receive compensation. In the Pay Cycle benchmarked, all employees have one active Job record and will receive 1 payment each. In this benchmark there are a total of 500,480 payments.

The employees were distributed over four monthly, semi-monthly, bi-weekly and weekly pay groups with eight different employee profiles. Each of these was assigned to 32 pay groups. Hence, the benchmark could have been set up for up to 32 concurrent processes instead of the eight (8 Run Control Ids) chosen for this test. The profiles are as follows:

Employee ID	Pay Group	Pay Freq.	Employee Type	Employee Status
KU0200	PB1	Weekly	Hourly	PT 20 Hrs
KU0202, ER0	PB4	Monthly	Salaried	PT 30 Hrs
KU0202, ER1	PB2	Bi-Weekly	Exc Hourly	PT 10 Hrs
KU0203	PB4	Monthly	Salaried	FT
KU0204	PB2	Bi-Weekly	Salaried	FT
KU0205	PB3	Semi-Mon.	Salaried	FT
KU0208, ER0	PB1	Weekly	Salaried	PT 20 Hrs
KU0209	PB3	Semi-Mon.	Hourly	FT

Table 5: Employee Profiles for Seed Data

- Part-time, hourly paid weekly with one additional pay, with Federal and California State tax, two general deductions and eight per pay period benefit deductions, one garnishment (KU0200).

- One Part-time salaried and paid monthly with one additional pay, with Federal and California State tax, one general deduction, three garnishments and seven per pay period benefit deductions with Absence Management (KU0202 ER0).

- One Part-time exception hourly paid bi-weekly with one additional pay, with Federal and California State tax, one general deduction, three garnishments and seven per pay period benefit deductions with Absence Management (KU0202 ER1).

- Full-time salaried paid monthly with Federal, New Jersey and New York State tax and New Jersey local tax, with five benefit deductions and no general deductions with Absence Management (KU0203).

- Full time, salaried paid biweekly with Federal and Pennsylvania State tax and seven per pay period benefit deductions (KU0204).

- Full time, salaried paid semi-monthly with one additional pay, with Federal and Michigan State tax, five per pay period benefit deductions, with Time and Labor (KU0205).

- One Part-time salaried paid weekly with one additional pay, with Federal and Georgia State tax, seven per pay period benefit deductions and one general deduction with Absence Management and Time and Labor (KU0208 ER0).

- Full time, hourly paid semi-monthly with one additional pay, with Federal and California State tax, seven 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, 8.9 and 9.1 (pre-FP2). Direct comparison between this result and results published for those releases is impossible.

BENCHMARK ENVIRONMENT

The IBM® System z196 zEnterprise™ model 2817-709 was used as the database server. It was equipped with the following:

- 9 × 5.2 GHz IBM® System zEnterprise Processors (9 Processors populated, eight processors for workload, one processor for non-workload housekeeping) 8943 MIPS total for 9 engines
- 32 Gigabytes of Memory (32 GB available for this test)

The IBM System z196 was attached to:

- One IBM System Storage DS8300 2107-922 with dual 4-way processors, 146 GB disk size, ~56 Terabytes of total Disk Space, with 18 Terabytes available (~185.9 GB used)

SOFTWARE VERSIONS

Oracle's PeopleSoft HRMS and Campus Solutions 9.1.323 FP2 Shipped

Oracle's PeopleSoft Enterprise (PeopleTools) 8.52.05

IBM® DB2 for z/OS 10.1

IBM® z/OS version 2.1 (on the Database server)

IBM Enterprise COBOL for z/OS 4.2.0

ICE tracking:
  ICE 196334000

ORACLE | *PeopleSoft.*

Oracle (PeopleSoft) Pleasanton
5815 Owens Drive
P. O. Box 8018
Pleasanton, California 94588-8618
Tel 925/694-3000
Fax 925/694-3100
Email info@peoplesoft.com
World Wide Web http://www.oracle.com

ORACLE®

Enterprise HRMS 9.1 on z/OS
September 2014

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200

oracle.com

Hardware and Software, Engineered to Work Together

IBM, the IBM logo, System z, zEnterprise, z/OS and System Storage are trademarks or registered trademarks of International Business Machines, Inc. in the United States, other countries, or both.