

# E-BUSINESS SUITE PAYROLL 11i (11.5.10) USING ORACLE10g ON A SUN SPARC ENTERPRISE T5220

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

5,000 Employees (8-64 Threads)	Time	Hourly Throughput
Payroll Process	1.87 min	160,714
PrePayments	0.20 min	1,500,000
Ext. Proc. Archive	1.90 min	157,895
NACHA	0.05 min	n/a
Check Writer	0.38 min	782,609
Costing	0.23 min	1,285,714
<b>Total</b>	<b>4.63 min</b>	<b>64,748</b>

Note that the hourly throughput numbers above are linear extrapolations. Many factors can influence performance and your results may differ.

## BENCHMARK PROFILE

In February 2008, Oracle and Sun conducted a benchmark in Menlo Park, CA to measure the batch performance of the Payroll processes in Oracle's E-Business Suite Payroll 11i (11.5.10) with Oracle10g™ 10.1.0.4 for Solaris on an 8-core Sun® SPARC™ Enterprise T5220™ batch/database/application server, running Sun Solaris 10 (8/07).

The benchmark measured 'Payroll' application business process runtimes for a small database model. Testing was conducted in a controlled environment with no other applications running. The tuning changes, if any, were approved by Oracle Applications Development and will be generally available in a future update. **The goal of this Benchmark was to obtain reference 'CMT' (Chip Multi-Threading) performance results for Oracle's E-Business Suite 11i Payroll on a Sun SPARC Enterprise T5220 server.**

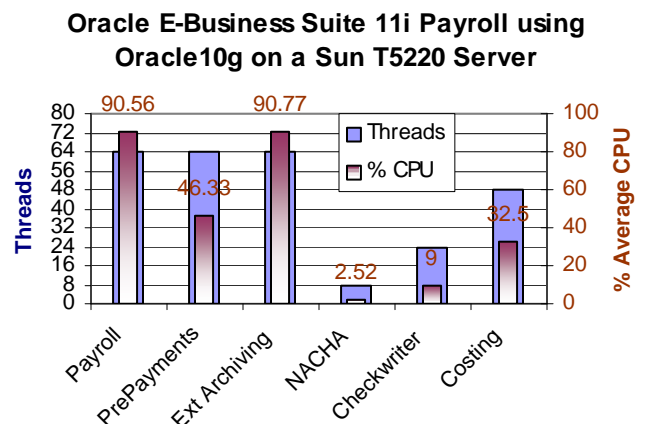


Figure 1: Assigned Threads Vs CPU Utilization

## METHODOLOGY

E-Business Suite 11i Payroll 11.5.10 batch processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate Pro-C, PL/SQL and Oracle Report Writer jobs.

The batch processes were run as a single concurrent process, which automatically and dynamically divides the employee population across the number of sub-processes configured by the user (AKA threads). The Payroll multithreading engine is fully load balanced ensuring that each of the threads has a roughly equal amount of work to do. For this benchmark Sun selected the number of threads used to showcase their CMT performance.

Business Process	Threads	Process Type
Payroll Process	64	Pro-C
PrePayments	64	Pro-C
Ext. Process Archive	64	Pro-C & PL/SQL
NACHA	8	Pro-C
Check Writer	24	Pro-C & Oracle Report Writer
Costing	48	Pro-C

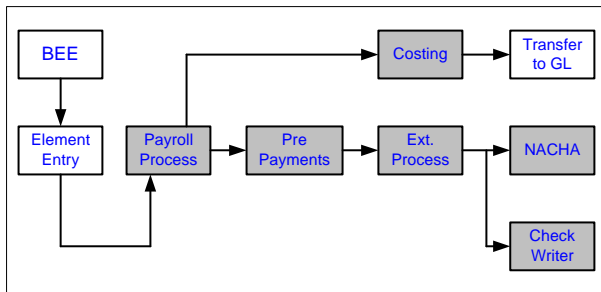


Figure 2: Process Flow

## BUSINESS PROCESSES

The Oracle E-Business Suite 11i Payroll processes tested are as follows:

**Payroll Process:** (Pro-C) Identifies all employees to be processed and performs calculations required to complete the gross to net calculation including earnings, deductions, and taxes. The specific groups of employees processed can be controlled by multiple parameters to the payroll process including the ability for a user to define a rules based set of employees.

**PrePayments:** (Pro-C) Distributes the net pay for each employee across the various payment methods (Direct Deposit, Check, or Cash). This a single payroll process or can be run across multiple payroll processes.

**External Process Archive:** (Pro-C, PL/SQL) Replicates the results of the Payroll run into a separate archive for audit purposes. This data is primarily used for Payslips (Both printed and on line), as a source for check and direct deposit printing, third party interfaces, and tax remittance reporting.

**NACHA:** (Pro-C) This is the US version of the Global Direct Deposit process which creates the bank interface file as per NACHA rules based on the rules in the Pre Payment process.

**Check Writer:** (Pro-C and Oracle Report Writer) This process allocates check numbers and creates/prints the payroll check and associated paper payslip.

**Costing:** (Pro-C) This process associates the payroll transaction data with the General Ledger (GL) accounts in preparation for transfer of the data to GL. This process uses a sophisticated hierarchical rules based engine to determine the mapping of the HRMS data and payroll results to the GL accounts.

## BATCH RESULTS

5,000 employees were processed for the semi-monthly payroll in this test. Table 1 shows the processing time in minutes.

5,000 Employees	Threads	Minutes	Hourly Throughput
Payroll Process	64	1.87	160,714
PrePayments	64	0.20	1,500,000
Ext. Proc. Archive	64	1.90	157,895
NACHA	8	0.05	6,000,000
Check Writer	24	0.38	782,609
Costing	48	0.23	1,285,714
<b>Totals:</b>		4.63	64,748

Table 1: Batch Performance

## SERVER PERFORMANCE

Table 2 shows the average CPU utilization for each process. The value shown is the average across all 8 cores in the batch/database/application server.

5,000 Employees	Threads	% CPU
Payroll Process	64	90.56
PrePayments	64	46.33
Ext. Proc. Archive	64	90.77
NACHA	8	2.52
Check Writer	24	9.0
Costing	48	32.50
Average:		40.77

Table 2: Average CPU Utilization

5,000 Employees	K Reads/sec	K Writes/sec
Average:	50.8169	3,784.01

Table 3: Average I/O Activity

## DATA COMPOSITION DESCRIPTION

History data was created prior to the timed benchmark runs. This yielded data for 6 semi-monthly pay periods.

	Medium Model
# of employees	Configurable (5,000)
# of assignments	Equal to number of employees (5,000)
# of elements	11
# of payroll	1
# of consolidation sets	1
# of Location	2

Table 4: Payroll Data

	Criteria & Deductions
Elements	Regular Salary
	Federal Income Tax (FIT)
	FUTA
	SS_EE
	SS_ER
	Medicare_EE
	Medicare_ER
	Vertex
	Workers Compensation
	Union Dues
	After-Tax Life
Payroll	Semi-Monthly
Locations	Texas
	Orlando (FL)

Table 5: Workload Factors

## TUNING RECOMMENDATIONS

### 1) OS:

Add the following line to /etc/system to enable 256M large pages on Solaris 10 8/07:

```
set max_uheap_lpsize=0x10000000
```

### 2) E-Business Suite:

2.1) Set desired number of Payroll threads with the SQL:

```
update pay_action_parameters
set parameter_value = <desired_number_of_threads>
where parameter_name = 'THREADS';
```

2.2) Set the number of target processes for Standard Manager greater than the threads defined in the database.

2.3) The database was on UFS with asynchronous I/O enabled for better performance.

2.4) All tablespaces are locally managed.

2.5) Follow the recommendations in Metalink document 216205.1, "Database Initialization Parameters and Configuration for Oracle Applications 11i."

## BENCHMARK ENVIRONMENT

### HARDWARE CONFIGURATION

One Sun SPARC Enterprise T5220™ was used as the batch, database and application server. It was equipped with the following:

- 1 × 1.4 Gigahertz (eight-core, 64 simultaneous threads of execution) UltraSPARC® T2 Processors with 4 Megabytes of Level-2 Cache
- 64 Gigabytes of Memory (~9 used)
- 2 × Sun StorEdge® 3510 Array(s) for the Enterprise (RAID 0)
- ~1,800 Gigabytes of total Disk Space (6 × 300 GB)
- 4 × Sun Integrated Fibre Channel Disk Controllers

### SOFTWARE VERSIONS

Oracle's E-Business Suite (E-Business Standard Benchmark Kit) 11.5.10

Oracle10g™ 10.1.0.4 R1 (64-bit)

Sun Solaris 10 8/07

Glossary & Acronyms:

CMT Chip Multi-Threading

The Oracle logo is displayed in a bold, red, sans-serif font. The word "ORACLE" is in all caps, with a registered trademark symbol (®) at the end.

**Oracle**

**Applications Performance & Benchmarks**

500 Oracle Lane

Redwood Shores, California 94065

Tel 650/506-0658

Fax 650/506-0658

Email [info@oracle.com](mailto:info@oracle.com)

World Wide Web <http://www.oracle.com>

E-Business Suite, AppsNet, Collaboration Suite, Oracle Direct and RAC are trademarks of Oracle, Inc. Oracle, JD Edwards, PeopleSoft and Siebel are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. The information contained herein is subject to change without notice. Copyright © 2008 Oracle, Inc. All rights reserved. C/N 0XXX-0308 Results Registration Number: 0XXX

©2008 Sun Microsystems, Inc. All rights reserved. Sun, the Sun logo, and SPARC are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries.