

PEOPLESOFT ENTERPRISE ORDER-TO-CASH (COUNTER SALES) 8.9 USING ORACLE10g ON AN HP INTEGRITY BL870c SERVER BLADE

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

Benchmark (English)	PeopleSoft 8.9 Order-to-Cash (Order Fulfillment)	
	Extra-Large Data Volume Model	
	Order Processing	750,000 lines - 199 minutes
	Order Lines/Hour	225,922 per hour
Référéce d'exécution (Français)	PeopleSoft 8.9, Gestion Commerciale	
	Grand modèle supplémentaire de données	
	Order Processing	750.000 lignes – 199 minutes
	Lignes/heure	225.922 par heure
Benchmark-Test (Deutsch)	PeopleSoft 8.9, Auftragsabwicklung	
	Datenbankmodell "Extra-Large"	
	Order Processing	750.000 Zeilen – 199 Minuten
	Zeilen/Stunde	225.922 pro Stunde
Patrón de rendimiento (Español)	PeopleSoft 8.9, Ventas	
	Volumen grande adicional de los datos	
	Order Processing	750.000 líneas – 199 minutos
	Líneas/hora	225.922 por hora
Benchmark (Português)	Gerenciamento de Ordens do PeopleSoft 8.9	
	Volume grande extra dos dados	
	Order Processing	750.000 linhas – 199 minutos
	Linhas/hora	225.922 por a hora

BENCHMARK PROFILE

In December 2007, Oracle (PeopleSoft) and Hewlett-Packard conducted a benchmark in Cupertino, CA to measure the batch performance of processes in Enterprise Order-to-Cash ['Order Fulfillment' -- Order Management, Inventory, and Billing] 8.9 with Oracle10g™ 10.2.0.3 on a 4-way (8 cores) Hewlett-Packard® Integrity™ BL870c Server Blade database server, running HP-UX 11i (11.23).

The purpose of this test is to simulate the daily processes that a large customer, such as a wholesale distributor, goes through to complete 'Counter Sale' orders. Those processes include fulfilling and invoicing orders entered into the PeopleSoft Enterprise system. For Counter Sale orders that are marked complete at the time of order entry (i.e. the customer has received the goods) there is no need for the user to separately reserve, pick or confirm the order within the Inventory product. The Counter Sale complete order transaction does this automatically at the time the transaction is saved and the appropriate quantity balances within Inventory are then updated. In order to record the appropriate accounting entries related to the completed Counter Sale Order, it must be processed through the remaining Inventory and Billing processes required to generate accounting lines.

The tests contained in this report measured the batch-processing times required to process a day's worth of previously entered completed counter sales transactions. The testing was conducted in a controlled environment with no other applications running. **The goal of this benchmark was to show a scalable order-processing throughput for a selected number of orders, for PeopleSoft Enterprise Order Fulfillment (Order Management, Inventory and Billing Batch) 8.9 on HP/Oracle.**

Enterprise Order-to-Cash (Counter Sales) 8.9 using Oracle10g on a 4-way HP Integrity bl870c

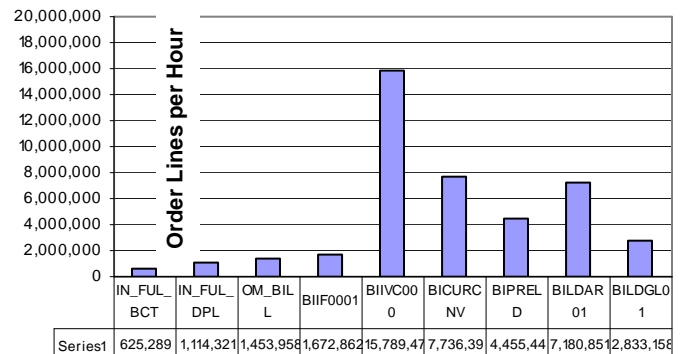


Figure 1: Process Throughput Results

METHODOLOGY

PeopleSoft Enterprise Order-to-Cash 8.9 batch processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate Application Engine (AE) or SQR jobs.

The Fulfillment Requests through Invoice Finalization processes were run as 15 concurrent processes—based upon the Business Unit ranges.

Business Process	Job Streams	Process Type
IN_FUL_BCT	15	App Engine
IN_FUL_DPL	15	App Engine
OM_BILL	15	App Engine
BIIF0001	15	App Engine
BIIVC000	15	App Engine
BICURCNV	Single-Threaded	App Engine
BIPRELD	Single-Threaded	App Engine
BILDAR01	Single-Threaded	SQR
BILDGL01	Single-Threaded	SQR

Table 1: Order Process Summary

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.

Hewlett-Packard (Mercury Interactive) LoadRunner® was used to create the counter sales transactions prior to running the batch processes. This created 100 five-line orders for each of 1,500 Business Units.

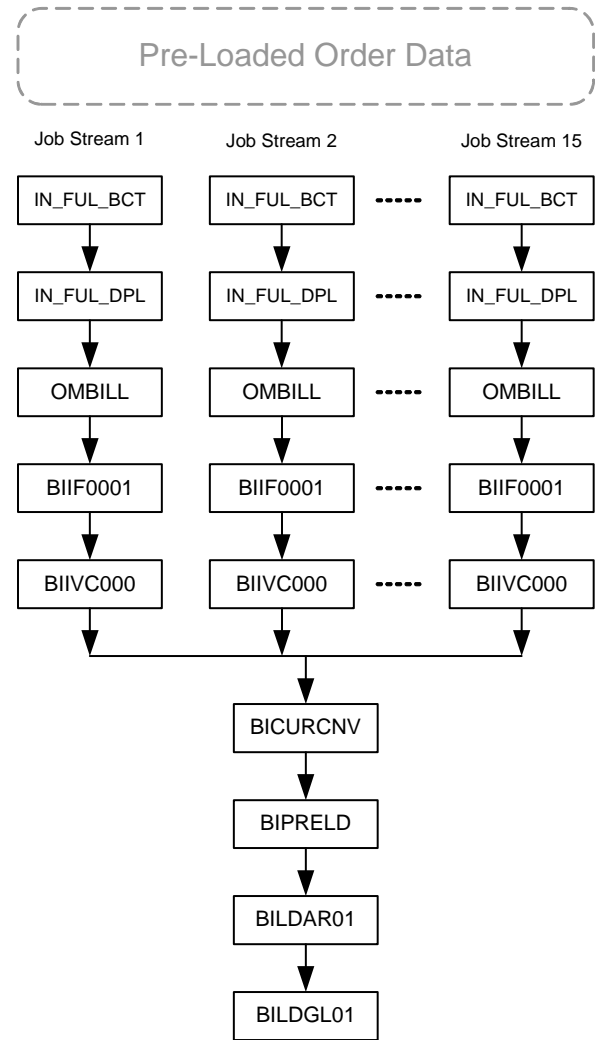


Figure 2: Process Flow

Note that most processes were run in parallel within a job stream, e.g., all of the Order Management and Inventory processes, which were partitioned by business unit. Only the last four Billing processes had to be run serially (single-threaded) to avoid contention.

The strategy and partitioning shown here worked well for the sample data on the test hardware. Customers will need to tailor this to their own production requirements.

BUSINESS PROCESSES

Inventory

Fulfillment Requests (IN_FUL_BCT) [AE]: Processes demand lines generated from Counter Sale Orders and completes the Inventory Confirmations and Shipping steps.

Depletions (IN_FUL_DPL) [AE]: Depletes the shipped quantities from Inventory.

Billing

Populate Billing (OM_BILL) [AE]: Processes shipped Counter Sale Orders and relevant billing information, and passes the data to the Billing Interface tables.

Billing Interface (BIIF0001) [AE]: Groups transactions in staging tables and creates invoices by populating tables in the Billing table structure.

Invoice Finalization (BIIVC000) [AE]: Performs various tasks including calculating taxes, invoice due date, and validating data integrity and readiness for downstream processing to AR and GL.

Currency Conversion (BICURCNV) [AE]: Calculates base currency and euro currency amount values and stores them in the Billing tables with the amounts in the bill transaction currency.

Pre-Load (BIPRELD) [AE]: Prepares preliminary accounting information for subsequent Load to GL and AR processes.

Load to AR (BILDAR01) [SQR]: Creates staging entries for interfacing with PeopleSoft AR to create receivable entries.

Load GL Interface (BILDGL01) [SQR]: Creates accounting entries for billing activities, and populates staging tables for interfacing with PeopleSoft GL.

BATCH PROCESS RESULTS

Table 2 shows the run times, in minutes, for each process. Note that the first five processes were run as fifteen parallel jobs while the final four were single-threaded. For the multi-threaded processes, two times are noted; the elapsed time for the single longest thread and the time from the earliest start until the last finish. The total time of 199.18 minutes represents the time from the earliest start of the first process until the completion of the last process. Note that the sum of the right hand 'multi-threaded' jobs' times and the 'single-threaded' jobs' times is slightly greater than the 199.18 minute total given because there was overlap in the execution of the parallel threads. Hence, using the absolute earliest start and absolute last finish times for the total.

Process	Longest Thread	Earliest Start – Last Finish
IN_FUL_BCT	71.97	72.00
IN_FUL_DPL	40.38	41.72
OM_BILL	30.95	30.95
BIIF0001	26.90	27.75
BIIVC000	2.85	2.90
BICURCNV	5.82	
BIPRELD	10.10	
BILDAR01	6.27	
BILDGL01	15.88	
Total		199.18
Hourly Throughput		225,922.5

Table 2: Order Process Runtimes in Minutes

The batch processes ran for just over three hours, yielding an hourly throughput of 225,922 order lines.

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

DATA COMPOSITION DESCRIPTION

The extra-large database was comprised of:

Database Requirements	Instances	Value
Order Management BU	1,500	1500 paired OM/IN/BI Business Units (all three named the same)
Inventory BU	1,500	
Billing BU	1,500	
Customers	1,000,000	
Locations	1,000,000	1 Location per customer
Users	5,000	5,000 users defined within the system.
Items	500,000	
Items by BU	8,000,000	5,000 items in each of the 1500 IN BUs, 5,000 additional items defined for 100 of the IN BUs (for a total of 10,000 items in each of those 100 BUs)
Products	500,000	
Orders/Day	100,000	5-50 lines per order. Average 5.4.
Order Lines/Day	540,000	
Order Schedules/Day	540,000	1 schedule per line
Price Rules	100,000	Set up by Customer Group and Product Group
Price Formulas	300,000	Three Price Formulas per Price Rule
Arbitration Plans	1	
Price Lists	10 lists 5,000,000 details	Create 10 Different Price Lists and attach them to Customer Groups. Each Customer would then be attached to a Price List via a Customer Group
History Order Headers	2,400,000	
History Order Lines	12,000,000	
History Order Schedules	12,000,000	

Table 5: Data Composition Summary

SERVER PERFORMANCE

Process	User	System	I/O Wait	Idle
IN_FUL_BCT	97	2	1	0
IN_FUL_DPL	97	1	2	0
OM_BILL	88	8	1	3
BIIF0001	92	5	1	2
BIIVC000	81	7	1	11
BICURCNV	11	0	2	87
BIPRELD	13	0	1	86
BILDAR01	11	2	1	86
BILDGL01	13	0	0	87

Table 3: Average Percent CPU Utilization

The CPU utilization percentages are the average across all 8 cores in the Integrity server. The four single-threaded processes essentially use but a single CPU. Consequently, their "Idle" percentages approach 87.5% (i.e., 7÷8).

Figure 3 summarizes the CPU utilization for each of the server instances.

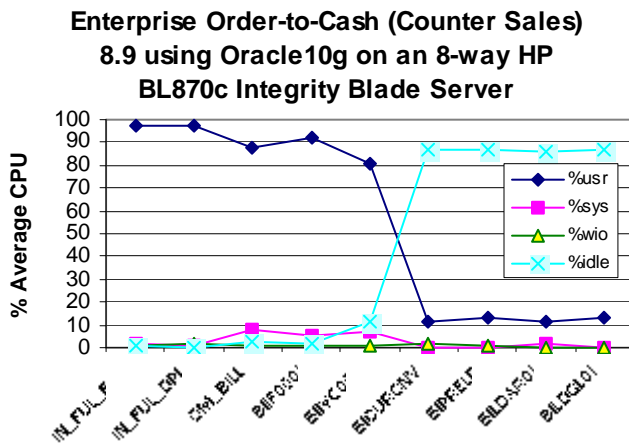


Figure 3: Average CPU Utilization

An HP SAN-Connected HP EVA 8000 disk array with 2 fibre-channel connections was used for data storage.

DB Server	Reads	Writes	Writes (Logs)
Average	4.86 MB/Sec	12.45 MB/Sec	17.93 MB/Sec
Peak	78.4 MB/Sec	142.9 MB/Sec	167.8 MB/Sec

Table 4: I/O Performance

PATCH/UPDATE COMPLIANCE

The execution of this benchmark generated several performance-specific issues that are addressed in ICE fixes. The fixes will be rolled out in service packs or patches.

Order Management

ICE Report ID 1377075000 - PERF:OM_BILL – Resolution 652101,

Bundle 642741, SCM 8.9 Bundle #4

ICE Report ID 1367854000 - PERF: OM_BILL – Resolution 652100,

Bundle 642741, SCM 8.9 Bundle #4

ICE Report ID 1365382000 - PERF: OM_BILL – Resolution 652099,

Bundle 642741, SCM 8.9 Bundle #4

Inventory

ICE Report ID 1365388000 - PERF: IN_FULFILL – Resolution 638085,

Bundle 631780, SCM 8.9 Bundle #2

Billing

ICE Report ID 1365339000 - PERF: BI_ILINE_TAO – Resolution

644680, Bundle 637588, SCM 8.9 Bundle #3

ICE Report ID 1452048000 - PERF: CRCARD-AUTH-CHECK -

Resolution 656719, Bundle 647221, SCM 8.9 Bundle #5

BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

Database/Batch Server:

One Hewlett-Packard® Integrity™ BL870c Server Blade was used as the batch/database server. It was equipped with the following:

- 4 × 1.6 GHz Intel® Itanium®2 9000 Series Dual-Core Processors; each core is configured with 16 Kilobytes of Level-1 Data Cache, 16 Kilobytes of Level-1 Instruction Cache, 256 Kilobytes of Level-2 Data Cache, 1 Megabyte of Level-2 Instruction Cache, and 9 Megabytes of Level-3 Cache
- 32 Gigabytes of Memory (~30 GB used)
- ~144 Gigabytes of internal SCSI Disk Space (2 × 72 GB)
- 1 SAN-Connected HP EVA 8000 disk array with 2 fibre-channel connections
- ~10 Terabytes of total Disk Space available (140 × 72 GB disk drives), approximately 512 GB of RAID 0+1 storage (4 × 128 GB Vdisks) was used for this benchmark
- One Hewlett-Packard® 4Gb Dual Port PCIe Fibre Channel Mezzanine Adapter connected via one HP 2Gb Fibre Channel 16B switch

Application/Web Server(s):

1 × One Hewlett-Packard® Integrity™ BL870c Server Blade was used as the Application/Web server. This server was idle during the benchmark run; it was configured to support the LoadRunner seeding of the orders in preparation for the batch runs. It was equipped with the following:

- 4 × 1.6 GHz Intel® Itanium®2 9000 Series Dual-Core Processors; each core is configured with 16 Kilobytes of Level-1 Data Cache, 16 Kilobytes of Level-1 Instruction Cache, 256 Kilobytes of Level-2 Data Cache, 1 Megabyte of Level-2 Instruction Cache, and 9 Megabytes of Level-3 Cache
- 32 Gigabytes of Memory
- ~144 Gigabytes of internal SCSI Disk Space (2 × 72 GB)

SOFTWARE VERSIONS

Oracle's PeopleSoft Enterprise FSCM 8.9 MP2

Oracle's Enterprise PeopleTools 8.47.08

Oracle10g™ 10.2.0.3

Hewlett-Packard® HP-UX® 11.23 (64-bit) (on the Database server, Application server, and Web server)

Microsoft® Windows 2003 Enterprise Server w/SP 1 (on the driver and controller)

Mercury Interactive's LoadRunner® 8.0 w/PeopleSoft add-on

BEA Tuxedo® 8.1 RP135 with Jolt 8.1

BEA WebLogic Server™ 8.10 w/SP 5



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