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# Performance Test Results for PeopleSoft FSM 9.1 FP2 General Ledger Using Oracle Database on an Oracle Database Appliance

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## Introduction

This White Paper is a practical guide for technical users, installers, system administrators, and programmers who implement, maintain, or develop applications for your PeopleSoft system. In this White Paper, we describe the batch sizing test results for an Oracle's PeopleSoft application running on Oracle Database Appliance virtualized platform.

## Disclaimer

This material has not been submitted to any formal Oracle test and is published as *is*. It has not been the subject of rigorous review. Oracle assumes no responsibility for its accuracy or completeness. The use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment. While each item may have been reviewed by Oracle for accuracy in a specific situation, there is no guarantee that the same or similar results will be obtained elsewhere. Customers attempting to adapt these techniques to their own environments do so at their own risk.

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## Structure of This White Paper

This White Paper provides guidance for PeopleSoft applications and Oracle Database Appliance.

Oracle updates this document as needed so that it reflects the most current feedback from the field. Therefore, the structure, headings, content, and length of this document may vary with each posted version. To see if the document has been updated since you last downloaded it, compare the date of your version to the date of the version that is posted on My Oracle Support or on OTN.

### Related Materials

This paper is not a general introduction to PeopleSoft applications, Oracle Database, or Oracle Database Appliance, and is written for experienced IT professionals with a good understanding of the PeopleSoft applications and Oracle database systems. To take full advantage of the information in this document, you should have a basic understanding of system administration, basic Internet architecture, integration technologies, relational database concepts and SQL, and how to use PeopleSoft applications.

This document does not replace the PeopleTools 8.5x product documentation. Before you read this document, you should become familiar with the PeopleSoft PeopleTools, PeopleSoft application, and Oracle Database product documentation to ensure that you have a well-rounded understanding of the technology.

**Note.** Much of the information in this document may eventually be incorporated into subsequent versions of the product documentation.

The following product documentation discusses many of the fundamental concepts that are related to the PeopleSoft applications:

- PeopleTools: Getting Started with Enterprise PeopleTools
- PeopleTools: System and Server Administration

- PeopleTools: PeopleSoft Application Designer Developer's Guide
- PeopleTools: PeopleSoft Integration Broker
- PeopleTools: PeopleSoft Integration Broker Administration
- PeopleTools: PeopleCode API Reference
- PeopleTools Installation for your database platform
- PeopleSoft applications Hardware and Software Requirements

Additionally, you should be familiar with the documentation that is delivered with Oracle Tuxedo, Jolt, and Oracle WebLogic.

## Overview

This white paper describes the batch sizing test results for an Oracle's PeopleSoft application running on Oracle Database Appliance (ODA) virtualized platform. The batch test was performed with PeopleSoft Financial Management System (FMS) 9.1 FP2 General Ledger (GL) Journal Edit and Post (with Combination Editing) using Oracle 11gR2 database on an Oracle Database Appliance.

**Important!** There is no guarantee that the tuning that was performed for this test is relevant to your environment. Much depends on the volume and distribution of data values in the tables.

## Common Terms

The following table provides definitions for some of the common terms that are used in this guide.

**TABLE 1. COMMON TERMS**

TERM	DEFINITION
FSM	PeopleSoft Financial Management System product family
GL	PeopleSoft FMS General Ledger product
ODA	Oracle Database Appliance
PIA	PeopleSoft Pure Internet Architecture
RAC	Oracle Database Real Application Clusters
SGA	System global area, Oracle database memory structure
VM	Virtual machine

## Batch Performance Test Workload

In order to document sizing estimates of batch performance of PeopleSoft FMS 9.1 FP2 on ODA virtualized platform, a series of load tests were performed. The tests measured the timings of General Ledger Journal Post and Edit (Combination Editing) processes with large and medium templates that are shipped with ODA, using 16 and 8 concurrent streams.

## Test Environment

Figure 1 shows the system architecture for a PeopleSoft application used for load testing on ODA. This illustrates an ODA machine that is enabled as a virtualized platform running two nodes, and which is configured with an Oracle RAC database.

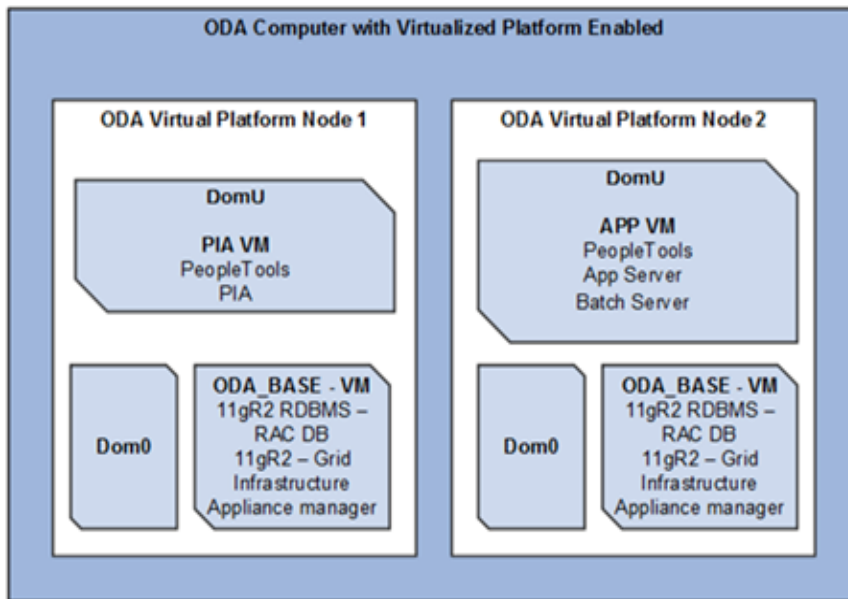


Figure 1: System Architecture of a PeopleSoft Application Used for Load Testing on ODA

The system architecture includes these components:

- **DOM0:** In ODA the dom0 kernel is actually a complete Linux kernel with support for a broad array of devices, file systems, and software RAID and volume management.
- **ODA\_BASE:** A “privileged virtual machine (VM) domain” within ODA virtualized image. Database workload is tied to user determined physical cores within the ODA hardware to ensure reliable performance and isolation from other application workload.
- **APP VM:** The guest VM hosts the PeopleSoft PeopleTools Application server and PeopleSoft Batch Server.
- **PIA VM:** The guest VM hosts the PeopleSoft PeopleTools PeopleSoft Pure Internet Architecture (PIA) domain, which handles online user page requests and web services.

## Methodology

The test used PeopleSoft FMS 9.1 FP2 batch processes that were initiated from the browser. The Edit process was executed in 16 parallel streams for the Large database template and 8 parallel streams for the Medium template for this benchmark. Each (Application Engine) “Edit” process issued an immediate remote call to its associated (COBOL) “Post” process as it finished. In this benchmark, no errors were generated during the Journal Edit process.

See [PeopleSoft General Ledger 9.1 PeopleBook](#), “Processing Journals,” PeopleSoft Online Help web site.

Batch processes are background processes, requiring no operator intervention or interactivity. The results of these processes are automatically logged in the database. The runtimes are posted to a process request database table where they are stored for subsequent analysis.

## Business Processes

The following table describes the characteristics associated with the two General Ledger processes that were used in this benchmark test:

**TABLE 2. BUSINESS PROCESSES USED IN BENCHMARK TESTS**

GL PROCESS	APPLICATION ENGINE PROCESS	PROCESS CHARACTERISTICS
Journal Edit	GL_EDIT	<ul style="list-style-type: none"> <li>• Validate that individual ChartField value is valid.</li> <li>• Validate combination ChartField values.</li> <li>• Validate that the total of debit and credit amounts are balanced.</li> <li>• The Combination Editing process uses 7 ChartField combination rules to validate combinations for up to 5 ChartFields (Account, Department, Product, Operating Unit, and Project).</li> </ul>
Journal Post	GLPOST	<ul style="list-style-type: none"> <li>• Summarize detail line activity of journals with a valid status and post aggregated result to the detail ledger.</li> <li>• There is one ledger row for each unique combination of ChartField values per accounting period, fiscal year.</li> <li>• In this benchmark, the Post processes do 55% of update of the existing ledger rows and 45% insert of new ledger rows.</li> </ul>

## Hardware Configuration

This test used the Oracle Database Appliance X4-2 configured with Virtualized Platform. For details, refer to the "[Oracle Database Appliance X4-2](#)" white paper (Oracle Technology Network).

## Software Versions

- Operating system: Oracle Enterprise Linux version 5.9 (2.6.39-400.126.1.el5)
- RDBMS: Oracle11gR2 11.2.0.3 (64-bit) RAC DB
- PeopleSoft PeopleTools release: 8.52
- PeopleSoft Application: PeopleSoft FMS 9.1 FP2
- Tuxedo: Oracle Tuxedo, Version 10.3
- Oracle WebLogic: 10.3.5
- Micro Focus COBOL Server Express 5.1 wp6 (64 bit)



## Database Templates

Oracle Database Appliance provides pre-built configuration templates that are used to create databases of different sizes and capacities. The database templates described in the following table were used to create the databases for testing.

For more information, see Oracle® Database Appliance Getting Started Guide, [http://docs.oracle.com/cd/E22693\\_01/doc.21/e22692/sizing.htm#autoId0](http://docs.oracle.com/cd/E22693_01/doc.21/e22692/sizing.htm#autoId0)

The following table lists the configuration features for the Small, Medium, and Large ODA templates:

**TABLE 3. DATABASE TEMPLATE PARAMETERS**

FEATURE	SMALL TEMPLATE	MEDIUM TEMPLATE	LARGE TEMPLATE
CPU count (each instance)	4	8	12
SGA (GB)*	8	16	24
PGA (GB)*	4	8	12
Processes	400	800	1200

\*SGA and PGA refer to Oracle Database instance memory structures, system global area (SGA) and program global area (PGA).

See Oracle® Database Administrator's Guide, "Managing Memory," [Oracle Database Online Documentation](#).

**Note:** These templates do not include a PeopleSoft application database. You must create or migrate a PeopleSoft application database to the RAC database created on ODA\_BASE based on the Small, Medium, or Large template.

## Results

This section provides the summary of test results. For every test run, average CPU utilization, memory usage and weighted average response time of search and save are captured.

**Note:** One vCPU is equivalent to half a CPU core. Therefore, 16 vCPUs correspond to 8 CPU cores or a 4-processor license.

### Workload Execution

The workload was executed under the following conditions:

- The PIA VM was running on ODA Server Node 1.
- The APP Server VM was running on ODA server node 2.

- The database was created as a RAC database using the “Large/Medium/Small” templates.
- The heap size was set to 1024 MB for PIA domains.

### Test 1 – Large Database Template

#### Purpose

The goal of this test is to collect and compare the baseline results for PeopleSoft FMS 9.1 FP2 GL batch time and CPU utilization of database servers with RAC and single instance databases created using the Large template with 16 concurrent streams.

#### Test Environment

There were 2 tests executed on RAC and single instance databases created using Large database templates, and a single APP VM with 16 concurrent streams.

- PIA VM
  - One PIA Oracle WebLogic domain
  - Heap size 1024 MB
- APP VM
  - 40 GB of RAM
  - Single Process Scheduler (PRCSDOM) domain
  - 16 PSAERSV processes
- ODA\_BASE VM
  - ODA base at 6 cores and 96 GB of RAM
  - RAC and Single Instance Databases created using the Large database template
  - Database Processes=1200
  - Database Cpu\_count=12
  - Database Sga\_target=24 GB
  - Database Pga\_aggregate\_size=12 GB

#### Average Server Utilization (%)

The following table reports the average percent utilization for server features for the RAC and single instance databases used in the test:

**TABLE 4. AVERAGE SERVER UTILIZATION RESULTS FOR LARGE DATABASE TEMPLATE**

FEATURE	RAC DATABASE	SINGLE INSTANCE DATABASE
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TABLE 4. AVERAGE SERVER UTILIZATION RESULTS FOR LARGE DATABASE TEMPLATE

FEATURE	RAC DATABASE	SINGLE INSTANCE DATABASE
ODA_BASE	12 vCPUs	12 vCPUs
Tests	Test 1.1	Test 1.2
Streams	16	16
DB1: CPU Utilization (%)	10.05	25.74
DB2: CPU Utilization (%)	11.33	NA
DB1: RAM Utilization (%)	98	98
DB2: RAM Utilization (%)	87	NA
Edit and Post Number of Lines	9,620,820	9,620,820
Edit and Post Duration (minutes)	18.55	19.28

## Test 2 – Medium Database Template

### Purpose

The goal of this test is to collect and compare the baseline results for PeopleSoft FMS 9.1 FP2 GL batch time and CPU utilization of database servers with RAC and single instance databases created using the Medium template with 8 concurrent streams.

The difference between Test1 and Test2 is that Test1 was executed with the Large database template.

### Test Environment

There were 2 tests executed on RAC and single instance databases created using the Medium database template, and a single APP VM with 8 concurrent streams.

- PIA VM
  - 20 GB of RAM
  - One PIA Oracle WebLogic domain
  - Heap Size 1024 MB
- APP VM
  - 40 GB of RAM
  - Single Process Scheduler (PRCSDOM) domain
  - 8 PSAESRV processes

- ODA\_BASE VM
  - ODA base at 4 cores and 64 GB of RAM
  - RAC and Single Instance databases created using the Medium database template
  - Database Processes=800
  - Database Cpu\_count=8
  - Database Sga\_target=16 GB
  - Database Pga\_aggregate\_size=8 GB

**Average Server Utilization (%)**

The following table reports the average percent utilization for server features for the RAC and single instance databases used in the test:

**TABLE 5. AVERAGE SERVER UTILIZATION RESULTS FOR MEDIUM DATABASE TEMPLATE**

FEATURE	RAC DATABASE	SINGLE INSTANCE DATABASE
ODA_BASE	8 vCPUs	8 vCPUs
Tests	Test 2.1	Test 2.2
Streams	8	8
DB1: CPU Utilization (%)	8.64	34.64
DB2: CPU Utilization (%)	6.04	NA
DB1: RAM Utilization (%)	67.75	70
DB2: RAM Utilization (%)	61.9	NA
Edit and Post Number of Lines	4,720,000	4,720,000
Edit and Post Duration (minutes)	10.6	10.23

## Conclusion

The sizing of your hardware and resources need to be adequate for the requirement of your environment. In general, to avoid hardware related performance bottlenecks, each hardware component should operate at no more that 80% of capacity.

The batch sizing test results for PeopleSoft FMS 9.1 FP2 based on Oracle Database Appliance shows that elapsed time for batch results are good even if we change configuration at the database server

level. However, average server utilization changes accordingly. The following table summarizes the results for the databases created using the Large and Medium templates:

**TABLE 6. RESULT COMPARISON FOR LARGE AND MEDIUM DATABASE TEMPLATES**

FEATURE	RAC (LARGE TEMPLATE)	SINGLE INSTANCE (LARGE TEMPLATE)	RAC (MEDIUM TEMPLATE)	SINGLE INSTANCE (MEDIUM TEMPLATE)
ODA_BASE (vCPUs)	12	12	8	8
Streams	16	16	8	8
DB1: CPU Utilization (%)	10.05	25.74	8.64	34.64
DB2: CPU Utilization (%)	11.33	NA	6.04	NA
DB1: RAM Utilization (%)	98	98	67.75	70
DB2: RAM Utilization (%)	87	NA	61.19	NA
Edit and Post Number of Lines	9,620,820	9,620,820	4,720,000	4,720,000
Edit and Post Duration (minutes)	18.55	19.28	10.6	10.23

These test results show that Oracle Database Appliance provides a solution in a box that can increase performance to new levels with simple changes to the configuration. In the data shown in Table 6, as the number of cores changed at ODA\_BASE in Test2 (Medium database template) and Test1 (Large database template) the server utilization changes accordingly.

The Oracle Database Appliance virtualized platform provides a solution in a box which is an excellent solution for customers looking for rapid, easy PeopleSoft FMS application deployments with solid performance and availability characteristics.



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9.1 FP2 General Ledger Using Oracle  
Database on an Oracle Database Appliance  
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