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AUDIT REPORT
13-06

Opportunities Exists to Reduce Costs Associated with Oracle Software Licensing

March 29, 2013

U.S. GOVERNMENT PRINTING OFFICE
OFFICE OF INSPECTOR GENERAL

Date

March 29, 2013

To

Chief Information Officer

From

Inspector General

Subject

Audit Report – Opportunities Exist to Reduce Costs Associated with Oracle Software Licensing

Report Number 13-06

Enclosed please find the subject final report. Please refer to the "Results in Brief" for the overall audit results. Our evaluation of your response has been incorporated into the overall body of the report. We consider management's comments responsive to all of the recommendations. The recommendations are resolved and will remain open for reporting purposes pending our verification of the completion of the agreed-upon corrective actions.

If you have any questions or comments about this report, please do not hesitate to contact me at (202) 512-0039.

Michael A Raponi

MICHAEL A. RAPONI
Inspector General

Enclosure

cc:
Acting Public Printer
Assistant Public Printer, Operations
General Counsel

Contents

Office of Inspector General

Report Number 13-06 **March 29, 2013**

Opportunities Exists to Reduce Costs Associated with Oracle Software Licensing

Introduction

OIG initiated an audit to identify any major instances of potential duplication and overlap of Oracle modules and licenses present and if so, what controls could be strengthened to mitigate the condition. This is a follow-on audit related to work we conducted of GPO's Enterprise Architecture in 2012 in which OIG reported that without a matured Enterprise Architecture, GPO assumes the risk that it will invest in Information Technology that is duplicative, not well integrated, costly, not supportive of the agency's strategic goals and mission, or not responsive to emerging technologies.

In Fiscal Year (FY) 2013, GPO reported it will spend approximately $3.2 million on Oracle licenses. Today, in addition to an expanded role in Finance and Administration, GPO uses Oracle to support Business Units such as Plant Operations, Library Services and Content Management, Security and Intelligent Documents, and Customer Services. GPO has executed four key contracts with Mythics, an Oracle resale partner that represents the entire Oracle product line of software, support, hardware, engineered systems, and appliances.

GPO has long recognized the need to modernize its information systems and replace unsustainable legacy systems. GPO decided to standardize the Oracle Enterprise Suite of commercial off-the-shelf (COTS) products as its enterprise software solution of choice and overall technological foundation to replace its legacy systems. The Oracle Enterprise Suite is a suite of more than 150 integrated software modules for financial management, supply-chain management, manufacturing, project systems, human resources, and sales-force automation. GPO began its initial efforts to replace legacy systems with the procurement and implementation of three Oracle Federal Financials modules between 1998 and 2001. Since inception, GPO has greatly expanded its use of Oracle modules.

GPO's policy requires that the Chief Information Officer establish operations and computer support as a part of the security program. Operations planning and computer support includes software license management. GPO policy also establishes the Architecture Review Board (ARB). The ARB, in part, reviews business and system initiatives for compliance with GPO Enterprise Architecture to support interoperability and data sharing and minimize redundancy.

While the areas identified in our report are not intended to represent the full universe of Oracle licenses, we conducted a systematic examination across GPO to identify major uses of Oracle licenses. In most cases, GPO provided technical documentation associated with each license. We examined the major functions of each Oracle purchase order and how it relates to GPO. We reviewed policies and procedures in place as of March 2013. We reviewed acquisition reports, purchase orders, itemized invoices for FY 2013. To gain an understanding of GPO's processes related to the purchase of Oracle licenses, we performed a walk-through of applicable processes with GPO staff. We interviewed key management officials from the GPO Office of Finance and Administration, the Office of Acquisitions, the Office of the Chief Information Officer, and the Security and Intelligent Documents Unit responsible for establishing and monitoring the acquisitions process; and reviewing and approving the purchases.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that provides a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Our objective, scope, methodology, and criteria are detailed in Appendix A.

Results in Brief

The audit disclosed that GPO has worked toward modernizing information systems in which Oracle products play a key role. However, given that GPO will spend approximately $3.2 million on Oracle licenses in FY 2013, further analysis is necessary to ensure all current Oracle licenses and products are needed.

For example, we identified 14 instances where GPO pays for both an application user license and processor license for the same Oracle products costing $301,547. We noted GPO uses Oracle on Demand hosting for its e-Passport production to maintain standby databases, a master repository, and the NetApp Snap Mirror costing GPO $583,693 when a less expensive alternative may be available. We also identified excess user licenses and processor licenses, which may result is cost savings. We attribute these instances to nonexistence of policies and procedures for software license management and an incomplete inventory of Oracle products that crosswalks to GPO applications. As a result, GPO may be paying for excess and duplicate Oracle licenses and products.

Recommendations

The OIG recommended that the Chief Information Officer mitigate risks of potentially investing in duplicative licenses by (1) developing and implementing processes, policies and procedures to address goals and objectives of software

license management program, (2) conducting an assessment of the current Oracle software licenses and Oracle products vs. GPO requirements to determine the correct license and product mix and make the necessary adjustments, and (3) revising the current inventory listing to include a crosswalk from major Oracle COTS software products to GPO applications.

Management's Response

Management concurred with the recommendations and has planned corrective actions. The complete text of management's response is in Appendix C.

Background

GPO senior managers have long realized that GPO must effectively manage its portfolio of capital assets, including software licenses, to ensure that scarce public resources are wisely invested. This includes software licenses in support of in-house production and procurement services for Congress and federal agencies, passport production, smart cards, the Federal Digital System (FDsys), the Federal Depository Library Program (FDLP), financial management, acquisition management, and human capital management.

GPO has four major Oracle license agreements at a cost of approximately $3.2 million. The environment used by end users for business or other operations is called a production environment. The four major Oracle license agreements support GPO's production environment. The license agreements are illustrated in Tables 1 below.

Table 1. Major Oracle Licenses

Purchase Order Number	Purpose	Service	Fiscal Year 2013 Cost
3014792	Stennis MS Passport Production	Oracle On Demand (Note 1)	$583,693
3014770	D.C. Passport Production, Identity Management, and FDsys	Internal Oracle Database Enterprise Edition and Applications (Note 2)	$680,000
3015018	Government Printing Office Business Information System	Oracle On Demand	$1,055,827
3015200	Support for Government Printing Office Business Information System On Demand	Internal Oracle Database Enterprise Edition and Applications	$921,824
Total Cost			$3,241,344

Note 1. On Demand services refers to a software-as-a-service that allows GPO to have Oracle applications, databases, and supporting Information Technology infrastructure managed by Oracle. The Oracle software is hosted at an Oracle data center in Austin, Texas.

Note 2. Internal services refer to the Oracle software and Information Technology infrastructure managed and hosted by GPO.

The Oracle Enterprise Edition and Applications is a suite of more than 150 integrated software modules for financial management, supply-chain management, manufacturing, project systems, human resources, and sales-force automation. The modules vary in size and complexity. The general classifications within the Oracle enterprise Suite consist of: 1) the Customer Relationship Management module which covers the Marketing, Sales, and Service functions, 2) the Financials modules which cover the general ledger and associated financial accounting modules, 3) the Supply Chain Management module which addresses distribution—getting materials from suppliers to customers, 4) the Manufacturing modules which affect product

design and manufacture, 5) the Human Resources modules which support the administration of human capital, such as compensation and training for organizational needs in terms of hiring, benefits, and reviews of employees, and 6) the Projects module which provides for various project management activities.

Modernizing GPO's Information Systems

In an effort to modernize and support GPO's Enterprise Architecture, GPO acquired product licenses for use with Oracle applications. GPO began its initial efforts to replace legacy systems with the procurement and implementation of three Oracle Federal Financials modules i.e., General Ledger, Accounts Receivables and Fixed Assets. GPO implemented those three modules between 1998 and 2001.

GPO launched the GPO Enterprise Program in 2004 to replace unsustainable legacy systems. This major project has been progressively implementing modern application systems that support GPO business and support units.

In 2007, the Government Printing Office Business Information System (GBIS), as a continuation of this modernization project, was acquired. This was an additional acquisition of product licenses. GBIS replaced mainframe software placed into operation more than 30 years ago. In 2008, GPO acquired additional Business Objects licenses for use with Oracle applications. Business Objects will provide seamless reporting functionality from GBIS.

GPO's Oracle financial system–GBIS–went live in May 2009. Also, GPO decided to standardize its reporting environment using the business intelligence tool Business Objects. At that time, over 100 reports were developed to bring visibility to all aspects of the data stored in GBIS. These reports, available in public folders, are being used to evaluate and address deficiencies.

In 2010, GPO upgraded to a new Oracle application server (WebLogics) in support of FDsys.

In 2011, GPO pursued the migration of several key legacy FDLP systems. The migration and modernization of these systems were in support of GPO's growth and efficiency in service to Federal depository libraries and the public. At the end of fiscal 2011, the Library Information System Transformation Project to migrate three separate legacy systems to one platform was underway. The project utilized Oracle Enterprise Architecture applications to replace the Depository Distribution and Information System's Item Lister functionality in the Library Services and Content Management business unit.

Oracle was further developed to provide the connection between the National Finance Center (NFC), GPO's payroll processor, and GPO's hosted system at Oracle's data center.

Today, in addition to an expanded role in Finance and Administration, GPO uses Oracle to support Business Units such as Plant Operations, Library Services and Content Management, Security and Intelligent Documents, and Customer Services. GPO uses Oracle General Ledger, Oracle Fixed Assets, Oracle Public Sector Payables, Oracle Receivables, Oracle Purchasing, Oracle Inventory Management, Oracle Order Management, Oracle Project (Work-in-progress), and Oracle to support Library Services.

Select Federal Guidance and Legislation

Clinger-Cohen Act

Congress enacted the Information Technology Management Reform Act of 1996 (known as the Clinger-Cohen Act[1]) to address longstanding problems related to federal Information Technology management. The Clinger-Cohen Act requires the head of each federal agency to implement a process that maximizes the value of agency Information Technology investments and assesses and manages acquisition risks. A key goal of the Act is to ensure that agencies implement Information Technology projects at acceptable costs and within reasonable timeframes. The Clinger-Cohen Act assigns to the head of an executive agency the responsibility to develop a capital planning and investment control process that will provide for the selection, management, and evaluation of investments.

Office of Management and Budget (OMB) Circular A-130 (A-130)

OMB Circular A-130[2] requires that agencies establish and maintain a capital planning and investment control process that links mission needs, information, and information technology in an effective and efficient manner. A-130 divides the process into the Select, Control, and Evaluate stages.

GPO Directives

GPO Directive 705.31, "GPO Enterprise Architecture Policy", dated December 8, 2008, established the ARB. The ARB, in part, reviews business and system initiatives for compliance with GPO Enterprise Architecture to support interoperability and data sharing and minimize redundancy. The Chief Information Officer designates the Chief Architect or the Chief Information Officer's designee to chair the ARB. Membership of this standing board includes Operational Managers from Business Units, Support Organizations, Office of the Chief Information Officer, and Information Technology Security. Additional members are selected on an as-needed basis (i.e. subject matter experts, project managers, etc.).

[1] Public Law No. 104-106, Division E, February 10, 1996. The law, initially titled the Information Technology Management Reform Act of 1996, was subsequently renamed the Clinger-Cohen Act of 1996 in P. L. 104-208, September 30, 1996.
[2] OMB, Management of Federal Information Resources, Circular No.A-130 (Nov. 28, 2000).

GPO Directive 825.33B, "Information Technology Security Program Statement of Policy," May 24, 2011, establishes a set of controls to safeguard agency Information Technology processes and information, and also assigns responsibilities and accountability to provide reasonable assurance for the protection of system resources against fraud, waste, abuse, disaster, mismanagement, or compromise. GPO's policy, in part, states the Chief Information Officer will establish operations and computer support as a part of the security program. Operations planning and computer support will address loading and executing new software; use of system utility software; authorizations required for system changes and software license management.

Chief Information Officer Council

In September 1999, the Federal Chief Information Officer Council[3] published the Federal Enterprise Architecture Framework to provide Federal agencies with a common construct for their architectures, and facilitate the coordination of system investments among Federal agencies. The Enterprise Architecture (EA) provides guidance and source information for requirements analysts, designers, engineers, and test planners to reference and builds upon management executing their responsibilities. EA is a resource for managing inventory, routine maintenance, and queries. Analysis of the baseline architecture can identify opportunities for consolidating network services, floating or site software licenses, and economies of scale for equipment and services.

Executive Order 13103

Executive Order 13103, Computer Software Piracy, requires that Federal agencies establish procedures to ensure compliance with established computer software licensing laws and regulations.

Although not subject to the Clinger-Cohen Act, OMB Circular A-130, and Executive Orders, GPO generally adopts similar standards and operating procedures because it is consistent with GPO's mission and strategic goals.

Internal Control Requirements

The Government Accountability Office (GAO) *Standards for Internal Controls in the Federal Government*, November 1999, requires ongoing monitoring in the course of normal operation. Internal controls are performed continuously and ingrained in an Agency's operations. GAO's standards include regular management and supervisory activities, comparisons, reconciliations, and other actions people take in performing their duties. Those standards require the use of control activities described below:

[3] The Chief Information Officer Council is the principal interagency forum on the improvement of agency practices related to use of Federal information resources.

Control activities are the policies, procedures, techniques, and mechanisms that enforce management's directives, such as the process of adhering to requirements or budget development and execution. They help ensure that actions are taken to address risks. Control activities are an integral part of an entity's planning, implementing, reviewing, and accountability for stewardship of Government resources and achieving effective results.

OMB Circular No. A-123, *Management's Responsibility for Internal Control,* dated December 21, 2004, requires that managers develop and maintain effective internal controls. Effective internal controls provide assurance that significant weaknesses in the design or operation of internal controls that could adversely affect an agency's ability to meet its objectives would be prevented or detected in a timely manner.

As a legislative branch agency GPO is not required to follow OMB Circulars, including Circulars A-123. However, since those Circulars provide a sound basis for internal controls for any organization, GPO has incorporated the major requirements of Circulars A-123 in its directives.

Prior Reports Highlighted Risks with Information Technology Investments

We identified two reports that are relevant to this audit. In 2012, OIG conducted an audit to determine to what extent GPO had assurance that its Enterprise Architecture was used to guide and constrain ongoing development and support of GPO's strategic transformation. We noted that efforts to develop a fully mature Enterprise Architecture had been underway since 2008. GPO developed and implemented an Enterprise Architecture policy, created the Enterprise Architecture Program Office, appointed a Chief Architect, uses an automated tool that contains reference models to assist in developing an Enterprise Architecture, and from 2008 to 2010 established an ARB. In 2010, GPO performed a self-assessment using GAO's framework and determined a maturity level of Stage 4 in the GAO framework. The highest level of maturity is Stage 6. Stage 4 represents completing and using an initial Enterprise Architecture version for targeted results.

OIG reported that without a matured Enterprise Architecture, GPO assumes the risk that it will invest in Information Technology that is duplicative, not well integrated, costly, not supportive of the agency's strategic goals and mission, or not responsive to emerging technologies.

In 2004, GAO conducted a review in response to both a mandate requiring GAO to examine the state of printing and dissemination of public government information and a congressional request that GAO conduct a general management review of GPO focusing on the inevitable transformation of GPO. In part, GAO concluded that GPO did not have an Enterprise Architecture at the time. The Chief Information Officer was in the process of documenting GPO's business processes and supporting Information Technology architecture (the "as-is" enterprise architecture).

Enterprise Architecture programs establish roadmaps for as-is and target to-be architectures, transition plans for affected agency management and investment decisions coordinated across boards or committees. Such roadmaps include an agency's capital planning and investment control process.

Results and Recommendations

While GPO is making progress on modernization of its information systems and replacing its unsustainable legacy systems, it could strengthen controls over management of software licenses. We identified several areas where GPO could possible reduce costs by analyzing application and processor licenses, develop and implement policies and procedures to facilitate management of software licenses , and crosswalk Oracle products to GPO applications.

Processor vs. Application User License

Oracle products can be licensed by processor or by application user metric. Our review revealed GPO pays for both application user and processor licenses for the same Oracle products. If licensing by processor, all processors where the database is installed and/or running must be licensed. If licensing by application user, the number of licenses required is generally the total number of actual users accessing the Database. Table 2 below is an example of paying for both a user license and a processor license associated with the same Oracle product. Our complete listing can be found in Appendix B.

Table 2. Example of Both a User and Processor License for the Same Oracle Product

Oracle Product Description	License Type	Number of Licenses	Price	Purchase Order	Processor License Charge
Oracle Diagnostics Pack for Database	Licensed User	2500	$13,464.43	3014770	N/A
Oracle Diagnostics Pack	Processor	20	$2,276.55	3015200	$2,276.55
Oracle Diagnostics Pack	Processor	2	$199.88	3015200	$199.88
Oracle Diagnostic Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22

In general, a product license agreement is a software license contract between Oracle and the user–GPO. The software license grants GPO specific rights to use the software. It also allows Oracle to continue to own the software.

License types or metrics are selected to reflect the functionality of the product. Essentially, a license metric determines how the software usage is being measured when Oracle licenses a product to a customer. Oracle's technology products are primarily licensed using an application user metric or a processor metric. An application user is used in environments where users and/or devices can be easily identified and counted.

The processor metric is mostly used in environments where the software users cannot be easily identified or counted, such as internet-based applications. The processor metric is also used when it is more cost effective than application use licenses. All processors where the Oracle programs are installed and/or running must be licensed.

A comparison of the application user and processor licenses with Oracle products reveals that an opportunity may exist to reduce the number of licenses. In FY 2013, GPO will pay $301,547 for the potential duplicate licenses.

Commercial Host (Oracle on Demand for e-Passport)

GPO has contracted for hosting services from Oracle Corporation located in Austin, Texas to maintain standby databases, a master repository, and the NetApp Snap Mirror since November 2007. While we commend GPO for establishing a baseline of preparedness for a full range of potential emergencies ensuring the performance of its essential e-Passport functions, this approach may be a costly alternative to its alternate operation facility Manassas, Virginia and may not fully recognize that GPO maintains 1 million blank passports in inventory at any given time. Purchase Order 3014792 provides Oracle on Demand for the following three types of services related to e-Passport production.

1. Standby Databases
   - Data Guard product used to provide each production (HQ & SPF) facility with a "Standby Database"
   - 2 Oracle Technology On Demand Windows Servers hosted in the Federal Zone at the Oracle's Austin Data Center (ADC) communicate with the servers at the production facilities.

2. Master Repository
   - Master repository of Passport information that meets the 15 year regulatory requirement 1 Production Oracle Technology On Demand Instance.
   - 2 Oracle Technology On Demand Instances on Linux -1 production and 1 Test Instance.

3. NetApp Snap Mirror: Filers located at each production (HQ & SPF) facility communicate with a Filer in the Federal Zone at the ADC and push data for a backup of their production data.

In FY 2013, GPO will pay $583,693 for this service. Our audit disclosed that additional analysis is needed to fully understand alternate Oracle products that may provide sufficient continuity of operations support, use of GPO's alternate operation facility in Manassas, Virginia, and varying quantities of passport inventory to sustain an interruption in the processing of e-Passports.

Number of Purchased User Licenses

An Oracle user license enables GPO employees to connect devices to Oracle products. In FY 2013, GPO purchased 2,500 Oracle user licenses under purchase order number 3014770. A comparison of the number of licenses purchased with

the actual number of GPO employees revealed an excess number of licenses. As of October 10, 2012, GPO's headcount totaled 1,879 employees.

Our analysis disclosed GPO had more user licenses than actual users. For example, between December 2012 and February 2013 there were 731 users that regularly logon to GBIS. Mythics told us that the 2,500 Oracle user licenses represented the entire GPO employee count at the time of the initial purchase several years ago. Mythics told us they do not have the GPO requirements detailing the specific need for 2,500 users and licenses.

A comparison between the 2,500 user licenses and the 731 users utilizing Oracle GBIS products revealed that additional analysis may be needed. We also noted, an Oracle license would be required for all WebTA users.

Number of Purchased Processor Licenses

Licensing by processor requires that all processors where the database is installed and/or running must be licensed. We were told that FDSys is the only external facing system using Oracle products within GPO. Therefore, the processor licenses needed for FDSys totals six production processors.

As depicted in Table 3 below, our review of Oracle purchase orders disclosed GPO has the rights to run the following processors for external users:

Table 3. Internal Processor Licenses by Purchase Order and Product

Purchase Order	Oracle Product Description	License Type	Number of Processors	License Charge
3015200	Oracle 9i Database, Enterprise Edition	Processor	20	$77,052.34
	Oracle Partitioning	Processor	20	$19,263.09
	Oracle Diagnostics Pack	Processor	20	$2,276.55
	Oracle Tuning Pack	Processor	20	$1,926.32
	Oracle Change Management Pack	Processor	20	$1,926.32
	Oracle Internet Application Server, Enterprise Edition	Processor	20	$39,176.98
	Oracle iStore	Processor	10	$48,157.70
	Configurator	Processor	8	$115,578.52
	iSupport	Processor	4	$19,263.08
	Oracle Database, Enterprise Edition	Processor	2	$7,995.13
	Oracle Diagnostics Pack	Processor	2	$199.88
	Oracle Partitioning	Processor	2	$1,998.78
3014770	Oracle Audit Vault Server Processor	Processor	4	$10,467.43
	Oracle Audit Vault Collection Agent Listener	Processor	40	$6,280.45
	Oracle Configuration Management Pack for Database	Processor	8	$1,256.09
	Oracle Provisioning Pack for Database	Processor	8	$1,256.09
	Oracle Advanced Security	Processor	8	$4,186.97
	Oracle Real Application Clusters	Processor	8	$8,373.95
	Oracle Label Security	Processor	8	$4,186.97
	Oracle Internet Application Server Enterprise Edition	Processor	8	$16,149.75
	Oracle Diagnostic Pack for Internet Application Server	Processor	8	$1,354.49
	Oracle Configuration Management Pack for Internet Application Server	Processor	8	$1,354.49
	Oracle Database Enterprise Edition	Processor	20	$41,869.72
	Oracle Diagnostic Pack for Database	Processor	20	$3,140.22
	Oracle Tuning Pack for Database	Processor	20	$3,140.22
	Oracle Change Management Pack for Database	Processor	20	$3,140.22
	Oracle Configuration Management Pack for Database	Processor	20	$3,140.22
	Oracle Provisioning Pack for Database	Processor	20	$3,140.22
	Oracle Internet Application Server Enterprise Edition	Processor	20	$40,374.38
	Oracle Diagnostic Pack for Internet Application Server	Processor	20	$4,740.70
	Oracle Configuration Management Pack for Internet Application Server	Processor	20	$4,740.70
Total			436	$497,107.97

Table 4 below depicts the information GPO's Enterprise Architecture provided regarding internal Oracle installations and processor usage at GPO. We were told that some information may be missing.

Table 4. Internal Processor Usage at GPO

Hostname	Production/Test/Development /Unknown	Number of CPUs
GPO.GOV\OFREACFORA (172.19.4.30)	Unknown	2
GPO.GOV\HQMSONBSDB01 (hqmsonbsdb01.gpo.gov)	Production (old)	2
GPO.GOV\HQMSONBSDB02 (hqmsonbsdb02.gpo.gov)	Production (old)	2
GPO.GOV\HQMSORAMC01 (hqmsoramc01.gpo.gov)	Unknown	2
GPO.GOV\HQMSORAMC01 (hqmsoramc01.gpo.gov)	Unknown	2
GPO.GOV\HQMSONBSFTP01 (hqmsonbsftp01.gpo.gov)	Unknown	2
GPO.GOV\HQMSADCM1714 (webta.gpo.gov)	Production	2
GPO.GOV\HQMSDDCM1716 (hqmsddcm1716.gpo.gov)	Production	2
GPO.GOV\HQMSPROBE01 (172.16.41.12)	Production	2
GPO.GOV\HQMSPROBETEST (162.140.96.124)	Test	2
GPO.GOV\HQMSORACLETST01 (162.140.96.211)	Test	2
GPO.GOV\HQVMONBSTEST01 (hqvmonbstest01.gpo.gov)	Test	1
GPO.GOV\HQVMWEBTADB (162.140.96.217)	Unknown	1
GPO.GOV\HQVMWEBTADB1 (hqvmwebtadb1.gpo.gov)	Unknown	1
GPO.GOV\HQMSORACLECLST2 (162.140.96.77)	Test	2
DATACENTER\FMSNFC02 (fmsnfc02.datacenter.gpo.gov)	Production	2
DATACENTER\FMSNFC02 (fmsnfc02.datacenter.gpo.gov)	Production	2
GPO.GOV\HQVMADCM1317 (172.16.43.101)	Unknown	1
GPO.GOV\HQVMENTARCH1 (172.16.43.93)	Development	1
GPO.GOV\HQVMMSPERQ (hqvmmsperq.gpo.gov)	Unknown	2
GPO.GOV\HQMSBCDMFR25 (hqmsbcdmfr25.ofr.gpo.gov)	Unknown	2
GPO.GOV\HQMSBCDMFR24 (hqmsbcdmfr24.gpo.gov)	Test	2
GPO.GOV\OFREDCORA (ofredcora.ofr.gpo.gov)	Production	2
GPO.GOV\HQVMDC51A (hqvmdc51a.gpo.gov)	Test (old)	1
GPO.GOV\HQVMDC51 (hqvmdc51.gpo.gov)	Production (old)	1
GPO.GOV\HQMSNW70416 (hqmsnw70416.main.gpo.gov)	Unknown	2
GPO.GOV\HQVMMSPQDB (172.16.43.172)	Production (new)	2
GPO.GOV\HQMSONBSDB04 (hqmsonbsdb04.gpo.gov)	Test (new)	2

FDsys

Hostname	Production/Test/Development /Unknown	Number of CPUs
hqlxfdsyspcmsdb1.gpo.gov	Production	2
hqlxfdsyspcmsdb2.gpo.gov	Production	2
acflxfdsysdb1.gpo.gov	COOP	2
hqlxfdsystdb1.test.fdsys.gpo.gov	Test	2
hqlxfdsystdb2.test.fdsys.gpo.gov	Test	2
hqlxfdsysddb1.gpo.gov	Development	2
hqlxfdsysddb2.gpo.gov	Development	2

e-Passports

Hostname	Production/Test/Development /Unknown	Number of CPUs
hqepassprododa1	Production	6
hqepassprododa2	Production	6
hqepasstestoda1	Production	6
hqepasstestoda2	Test	6
hqmsencp01	Production	16
hqmsencp02	Production	16
hqmsoem01	Production	8
spfepassoda1	Production	6
spfepassoda2	Production	6
spfmsencp01	Production	16
spfmsoem01	Production	8
Total		163

A comparison between the 436 internal processor licenses and the 163 internal processor usage at GPO reveals additional analysis may be need.

Standard Operating Procedures Should be Developed and Software Inventory Should be Cross Walked to GPO Applications

In part, the above conditions occurred because standard operating procedures were not developed and software inventory was not cross walked to GPO applications.

Software License Management Procedures

GPO Directive 825.33B, "Information Technology Security Program Statement of Policy", dated May 24, 2011, sets forth GPO's policy regarding software license management. GPO's policy states the Chief Information Officer will establish operations and computer support as a part of the security program. The directive also states that "operations planning and computer support will address loading and executing new software; use of system utility software; authorizations required for system changes and software license management."

However, GPO has not yet developed procedures for ensuring this is carried out. For example, among other things, GPO does not cross walk software licensing information. In addition, GPO does not have a software management tool that performs license tracking and inventory GPO-wide.

GPO is responsible for developing and implementing an enterprise-level plan for conducting periodic audit checks to ensure it is in compliance with software license agreements. Executive Order 13103, Computer Software Piracy, requires that Federal agencies establish procedures to ensure compliance with established computer software licensing laws and regulations. Executive Order 13103 was signed by the President on September 30, 1998. It directed, among other things, that each executive agency adopt procedures to ensure that it does not acquire,

reproduce, distribute, or transmit computer software in violation of applicable copyright laws; and each executive agency establish procedures to ensure that it uses only computer software not in violation of applicable copyright laws.

By not having procedures in place to support its policy, GPO is at risk that it will not be in compliance with software licensing terms and/or may purchase excess licenses and products.

Inventory of Oracle COTS Software Products

Generally, GPO maintains and updates its systems inventory, including agency and contractor systems. While, GPO maintains some Oracle products in its inventory, a detailed inventory of Oracle products and their support of GPO programs and operations (i.e. a crosswalk from Oracle products to GPO applications) was missing.

The Federal Information Security Management Act of 2002 (FISMA) requires that agencies have in place an information systems inventory. According to FISMA, the head of each agency shall develop and maintain an inventory of major information systems operated by or under the control of such agency. The identification of information systems in an inventory under this subsection shall include an identification of the interfaces between each such system and all other systems or networks, including those not operated by or under the control of the agency. The inventory should contain the following information for each piece of hardware and software in the organization:

- Description of asset
- Manufacturer
- Model number
- Date of purchase or lease
- Date of deployment
- Date of last upgrade performed
- Record of service
- Maintenance and repairs performed
- Customization or modifications performed
- Disposition (recycle, disposal, resale)

Also, GPO's current inventory did not identify interfaces between Oracle contractor-managed systems and GPO internal networks as required by FISMA. Unidentified Oracle products and interfaces could pose significant risks to GPO operations if not properly evaluated and mitigated by appropriate compensating controls. As a result, GPO cannot be sure that it has a complete and accurate inventory of its systems.

Recommendations

To mitigate risks of potentially investing in duplicative licenses, the OIG recommended that the Chief Information Officer:

1. **Develop and implement processes, policies and procedures to address goals and objectives of software license management program.**

Management's Response

Concur. The GPO Office of Information, Technology, and Systems (IT&S) will document and assign license management duties for each of its component divisions and a single IT&S lead will be established to monitor and coordinate license management activities while validating planned renewals or purchase (see Appendix C).

Evaluation of Management's Response

Management's planned action is responsive to the recommendation. The recommendation is resolved but will remain open for reporting purposes pending the completion of the proposed action.

2. **Conduct a cost effectiveness assessment of the current Oracle software license and Oracle products vs. GPO requirements to determine the correct license and product mix and make the necessary adjustments.**

Management's Response

Concur. IT&S will conduct a license audit for all Oracle products.

Evaluation of management's Response

Management's planned action is responsive to the recommendation. The recommendation is resolved but will remain open for reporting purposes pending the completion of the proposed action.

3. **Revise the current inventory listing to include a crosswalk from major Oracle COTS software products to GPO applications.**

Management's Response

Concur. IT&S will develop a crosswalk to illustrate how each licensed feature of the Oracle product line maps to usage by the Commercial Off-The-Shelf and custom developed applications to ensure that GPO is not paying for unnecessary features.

Evaluation of Management's Response

Management's planned action is responsive to the recommendation. The recommendation is resolved but will remain open for reporting purposes pending the completion of the proposed action.

Appendix A - Objectives, Scope, and Methodology

We performed the audit from December 2012 through March 2013 at the GPO Central Office in Washington, D.C. We conducted the audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that will provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Objectives

We conducted this audit to identify any major instances of potential duplication and overlap of Oracle modules and licenses present and if so, what controls could be strengthened to mitigate the condition.

Scope and Methodology

To meet our objectives we performed the following:

- Reviewed Federal and GPO software licensing policies and procedures including the Information Technology Management Reform Act of 1996; OMB Circular A-130; OMB Circular A-123; Federal Chief Information Officer Council publication: Executive Order 13103; GAO's Standards for Internal controls in the Federal Government; GPO Directive 705.31; GPO Directive 825.33B; and applicable standard operating procedures.

- We interviewed key management officials from the GPO Office of Finance and Administration, the Office of Acquisitions, the Office of the Chief Information Officer, and the Security and Intelligent Documents Unit responsible for establishing and monitoring the acquisitions process; and reviewing and approving the purchases.

- We reviewed prior OIG and GAO audit reports.

- We analyzed the number of processor and user application licenses, commercial hosting activities, conducted an Oracle access utilization analysis, and processor data.

- Examined GPO's Oracle purchase order numbers 3014792, 3014770, 3015018, and 3015200 to identify Oracle products and license agreements.

Appendix A - Objectives, Scope, and Methodology

Management Controls Reviewed

We determined that the following internal controls were relevant to our audit objective:

Program Operations – Policies and procedures management implemented to reasonably ensure that software license management program met GPO's objectives.

Validity and Reliability of Data – Policies and procedures management implemented to reasonably ensure that valid and reliable data are obtained, maintained, and fairly disclosed in reports (See Computer-generated Data below).

Compliance with Laws and Regulations – Policies and procedures management implemented to reasonably ensure that resource use is consistent with laws and regulations.

The details of our examination of management controls, the results of our examination, and noted management control deficiencies are in the report narrative. Implementing the recommendations in this report should improve those management control deficiencies.

Computer-generated Data

We relied on computer-generated data during this audit. Specifically, we relied on the internal processor usage report provided by GPO. We assessed the reliability of the data but did not test general system and application controls. In order to test the reliability of the data on the report, we attempted to compare the host names with Oracle applications and processor licenses. As a result of GPO's lack of supporting documentation, for the most part we were unable to perform those tests. Therefore, we determined that the data were unreliable but nevertheless usable to meet our audit objectives and support our conclusions.

Appendix B – Products with Both Processor and User Licenses

Oracle Product Description	License Type	Number of Licenses	Price	Purchase Order	Processor License Charge
Oracle Advanced Security	**Licensed User**	**2500**	**$30,049.89**	**3014770**	
Oracle Advanced Security	Processor	8	$4,186.97	3014770	$4,186.97
Oracle Change Management Pack	Processor	20	$1,926.32	3015200	$1,926.32
Oracle Change Management Pack for Database	Licensed User	2500	$9,306.14	3014770	
Oracle Change Management Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22
Oracle Configuration Management Pack for Database	Licensed User	2500	$9,189.70	3014770	
Oracle Configuration Management Pack for Database	Processor	8	$1,256.09	3014770	$1,256.09
Oracle Configuration Management Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22
Oracle Configuration Management Pack for Internet Application Server	Licensed User	2500	$7,850.58	3014770	
Oracle Configuration Management Pack for Internet Application Server	Processor	8	$1,354.49	3014770	$1,354.49
Oracle Configuration Management Pack for Internet Application Server	Processor	20	$4,740.70	3014770	$4,740.70
Oracle Database Enterprise Edition	Licensed User	2500	$134,081.12	3014770	
Oracle Database Enterprise Edition	Processor	20	$41,869.72	3014770	$41,869.72
Oracle Database, Enterprise Edition	Processor	2	$7,995.13	3015200	$7,995.13
Oracle 9i Database, Enterprise Edition	Processor	20	$77,052.34		$77,052.34
Oracle Diagnostics Pack for Internet Application Server	Licensed User	2500	$7,850.58	3014770	
Oracle Diagnostic Pack for Internet Application Server	Processor	8	$1,354.49	3014770	$1,354.49
Oracle Diagnostic Pack for Internet Application Server	Processor	20	$4,740.70	3014770	$4,740.70

Appendix B – Products with Both Processor and User Licenses

Oracle Product Description	License Type	Number of Licenses	Price	Purchase Order	Processor License Charge
Oracle Diagnostics Pack for Database	Licensed User	2500	$13,464.43	3014770	
Oracle Diagnostics Pack	Processor	20	$2,276.55	3015200	$2,276.55
Oracle Diagnostics Pack	Processor	2	$199.88	3015200	$199.88
Oracle Diagnostic Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22
Oracle Identity and Access Management Suite	Licensed User	2500	$10,661.33	3014770	
Oracle Identity Management Connector - CA Top Secret	Connector	1	$2,093.48	3014770	$2,093.48
Oracle Identity Management Connector –E-Business	Connector	1	$2,093.48	3014770	$2,093.48
Oracle Internet Application Server Enterprise Edition	Licensed User	2500	$76,567.58	3014770	
Oracle Internet Application Server Enterprise Edition	Processor	8	$16,149.75	3014770	$16,149.75
Oracle Internet Application Server Enterprise Edition	Processor	20	$40,374.38	3014770	$40,374.38
Oracle Internet Application Server, Enterprise Edition	Processor	20	$39,176.98	3015200	$39,176.98
Oracle Label Security	Licensed User	2500	$30,049.89	3014770	
Oracle Label Security	Processor	8	$4,186.97	3014770	$4,186.97
Oracle Partitioning	Licensed User	2500	$31,989.90	3014770	
Oracle Partitioning	Processor	20	$19,263.09	3015200	$19,263.09
Oracle Partitioning	Processor	2	$1,998.78	3015200	$1,998.78
Oracle Provisioning Pack for Database	Licensed User	2500	$9,189.70	3014770	
Oracle Provisioning Pack for Database	Processor	8	$1,256.09	3014770	$1,256.09
Oracle Provisioning Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22
Oracle Real Application Clusters	Licensed User	2500	$60,100.23	3014770	
Oracle Real Application Clusters	Processor	8	$8,373.95	3014770	$8,373.95
Oracle Tuning Pack	Processor	20	$1,926.32	3015200	$1,926.32

Appendix B – Products with Both Processor and User Licenses

Oracle Product Description	License Type	Licenses	Price	Purchase Order	Processor License Charge
Oracle Tuning Pack for Database	Licensed User	2500	$9,840	3014770	
Oracle Tuning Pack for Database	Processor	20	$3,140.22	3014770	$3,140.22
				TOTAL	**$301,547.75**

Appendix C – Management's Response

U.S. GOVERNMENT PRINTING OFFICE
KEEPING AMERICA INFORMED

Date: March 26, 2013

TO: Inspector General (IG)

FROM: Chief Information Officer (CIO)

SUBJECT: IT&S Response on Draft OIG Report 13-06: Software License Management.

The Office of the Inspector General (OIG) issued a Draft Report 13-06 on March 15, 2013 concerning software license management. This document is the official GPO Information Technology and Systems (IT&S) response to the report and its recommendations.

IT&S Response to OIG Recommendations

Recommendation #1: Developing and implementing processes, policies and procedures to address goals and objectives of software license management program.

IT&S Response: Concur.

Comments: IT&S will document and assign license management duties for each of its component divisions. Each area has distinct responsibilities that will necessitate policies and procedures for acquisition, use, and reduction of licenses. A single IT&S lead will be established to monitor and coordinate license management activities while also validating planned renewals or purchases.

Expected Date of Disposition: 9/30/13

Recommendation #2: Conduct an assessment of the current Oracle software licenses and Oracle products versus GPO requirements to determine the correct license and product mix and make product mix and make the necessary adjustments.

IT&S Response: Concur.

Comments: IT&S will conduct a license audit, to include the individual features, for all Oracle products. This assessment will inform the FY14 maintenance renewal activity to ensure GPO

Appendix C – Management's Response

reduces costs where possible.

Expected Date of Disposition: **9/30/13**

Recommendation #3: Revise the current inventory listing to include a crosswalk from major Oracle COTS software products to GPO applications.

IT&S Response: **Concur.**

Comments: IT&S will develop a crosswalk to illustrate how each licensed feature of the Oracle product line maps to usage by COTS and custom developed applications. This crosswalk will ensure GPO is not purchasing or paying maintenance for features no longer necessary for our business.

Expected Date of Disposition: **9/30/13**

Thank you for the opportunity to comment on the draft report. If you have any questions or comments about this response, or would like to discuss further, please do not hesitate to contact me at (202)512-1040.

Charles E. Riddle, Jr
Chief Information Officer

cc:
Acting Public Printer
Assistant Public Printer, Operations
General Counsel

2

Appendix D - Status of Recommendations

Recommendation	Resolved	Unresolved	Open/ECD*	Closed
1	x		9/30/13	
2	x		9/30/13	
3	x		9/30/13	

*Estimated Completion Date.

Appendix E – Final Report Distribution

Acting Public Printer
Assistant Public Printer, Operations
General Counsel

Major Contributors to the Report

Daniel Rose, Lead Information Technology Specialist