



January 2024

FEDERAL SOFTWARE LICENSES

Agencies Need to Take Action to Achieve Additional Savings

Why GAO Did This Study

Each year, the federal government spends more than \$100 billion on IT and cyber-related investments, including the purchase of software licenses. Federal agencies annually purchase thousands of software licenses from vendors.

GAO was asked to review federal agency software licenses. Its objectives were to identify (1) the most widely used and the highest amounts paid for software licenses by vendor and product, and (2) the extent to which selected agencies determined whether they purchased too many or too few software licenses.

GAO reviewed the 24 Chief Financial Officers Act of 1990 agencies' self-reported data on their five most widely used and highest amounts paid for software licenses. GAO then ranked these by the number of instances agencies cited specific vendors and products across the government. In addition, GAO selected nine of these agencies based on the size of their IT budgets for further review. GAO compared documentation for these agencies' five most widely used licenses to key activities identified in federal guidance. GAO also interviewed responsible officials at each of the 24 agencies.

What GAO Recommends

GAO is making 18 recommendations to nine agencies to consistently track software license usage and compare the inventories with purchased licenses. Eight agencies agreed with the recommendations and one neither agreed nor disagreed.

View [GAO-24-105717](#). For more information, contact Carol C. Harris at (202) 512-4456 or harriscc@gao.gov.

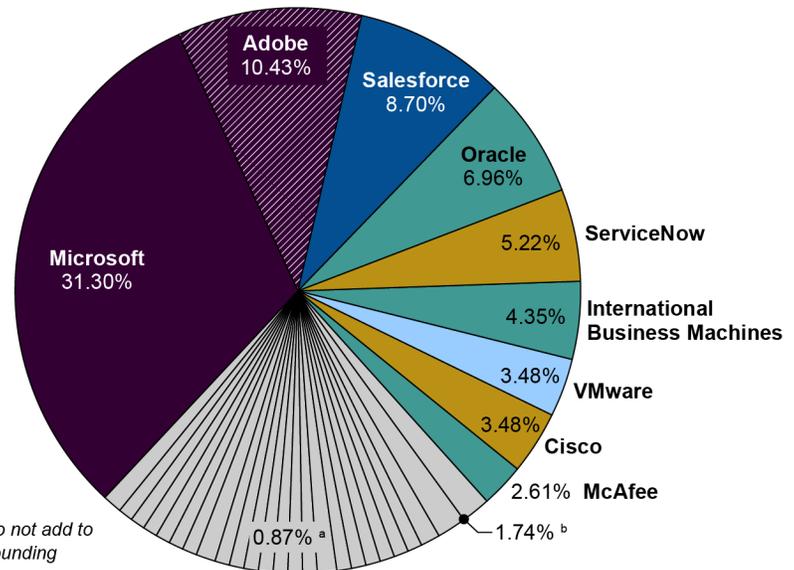
FEDERAL SOFTWARE LICENSES

Agencies Need to Take Action to Achieve Additional Savings

What GAO Found

Twenty-four federal agencies collectively identified 36 software vendors as those with the highest quantity of licenses installed, as of July 2022. Similarly, agencies reported 34 software vendors that were paid the highest amounts for fiscal year 2021 (see figure).

Software Vendors with the Highest Amounts Paid Reported by Agencies for Fiscal Year 2021



Percentages do not add to 100% due to rounding

Source: GAO analysis of agency data. | GAO-24-105717

^aThe 23 vendors shown as 0.87 percent are Broadcom, Computer Associates International, Entrust, ESCgov, FCN, Four, Intelligent Editing, LinkedIn, Mercom, MicroStrategy, NCS Technologies, Palantir Technologies, PKWARE, PTC, Quest Software, SAS Institute, Skillsoft, Splunk, Symantec, Thomson Reuters, Unison Software, Zoom Video Communications, and Zscaler.

^bThe two vendors shown as 1.74 percent are Environmental Systems Research Institute and Google.

The most widely used and highest amounts paid for software products cannot be identified across the 24 agencies because agencies' license data for products were inconsistent and incomplete. For example, multiple software products within license agreements were not separately priced.

Key activities for assessing the appropriate number of software licenses are (1) tracking licenses currently in use and (2) regularly comparing the inventory of software licenses currently in use to purchase records. Conducting such activities can help avoid purchasing too many licenses—referred to as over-purchasing—or purchasing too few licenses that may result in additional fees—referred to as under-purchasing. None of the nine agencies selected based on the size of their IT budgets—the Departments of Agriculture, Energy, Housing and Urban Development, Justice, State, Veterans Affairs; the Office of Personnel Management; Social Security Administration; and U.S. Agency for International Development—fully determined that their five most widely used software licenses were over- or under-purchased.

Contents

Letter		1
	Background	5
	Information on Agencies' Software License Usage and Costs	16
	Selected Agencies Have Not Fully Determined Over- or Under- Purchasing of Widely Used Software Licenses	23
	Conclusions	31
	Recommendations for Executive Action	31
	Agency Comments	34
Appendix I	Objectives, Scope, and Methodology	37
Appendix II	Frequently Reported Software Vendors by Agencies	41
Appendix III	Comments from the Department of Energy	43
Appendix IV	Comments from the Office of Personnel Management	46
Appendix V	Comments from the Social Security Administration	48
Appendix VI	Comments from the Department of State	49
Appendix VII	Comments from the Department of Veterans Affairs	52
Appendix VIII	Comments from the U.S. Agency for International Development	54
Appendix IX	GAO Contact and Staff Acknowledgments	56

Tables

Table 1: Examples of Leading Practices for Managing Software Licenses	10
Table 2: Extent to Which Selected Agencies Tracked Software Licenses and Compared Software Usage against Purchased Licenses for Their Five Most Widely Used Licenses, as of October 2023	24
Table 3: Description of the Software Vendors Frequently Reported across Federal Agencies as Most Widely Used or with Highest Amounts Paid	41

Figures

Figure 1: Total of the Five Most Widely Used Software Vendors Reported by the 24 Chief Financial Officers Act of 1990 Agencies, as of July 31, 2022	17
Figure 2: Total of the Five Software Vendors with the Highest Amounts Paid Reported by 23 of 24 Chief Financial Officers Act of 1990 Agencies for Fiscal Year 2021	19

Abbreviations

Agriculture	Department of Agriculture
CFO Act	Chief Financial Officers Act of 1990
CIO	Chief Information Officer
Commerce	Department of Commerce
DFARS	Defense Federal Acquisition Regulation Supplement
DHS	Department of Homeland Security
DOD	Department of Defense
Energy	Department of Energy
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulation
FITARA	Federal Information Technology Acquisition Reform Act
GSA	General Services Administration
HHS	Department of Health and Human Services
HUD	Department of Housing and Urban Development
Interior	Department of the Interior
ITVMO	IT Vendor Management Office
Justice	Department of Justice
MEGABYTE	Making Electronic Government Accountable By Yielding Tangible Efficiencies Act
NASA	National Aeronautics and Space Administration
NIST	National Institute of Standards and Technology
NSF	National Science Foundation
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
OPM	Office of Personnel Management
SAMOSAS	Strengthening Agency Management and Oversight of Software Assets Act
SSA	Social Security Administration
State	Department of State
Treasury	Department of the Treasury
USAID	U.S. Agency for International Development
VA	Department of Veterans Affairs

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



January 29, 2024

The Honorable James Comer
Chairman
The Honorable Jamie B. Raskin
Ranking Member
Committee on Oversight and Accountability
House of Representatives

The Honorable Nancy Mace
Chairwoman
The Honorable Gerald E. Connolly
Ranking Member
Subcommittee on Cybersecurity, Information Technology, and
Government Innovation
Committee on Oversight and Accountability
House of Representatives

The federal government spends more than \$100 billion annually for IT and cyber-related investments, including for software such as purchases of commercial software licenses.¹ Federal agencies engage in thousands of software licensing agreements with vendors² annually.

Effective management of commercial software licenses can help organizations avoid purchasing too many licenses that result in unused software (hereinafter referred to as over-purchasing). In addition, effective management can help avoid purchasing too few licenses (hereinafter referred to as under-purchasing), which may result in noncompliance with license terms and cause the imposition of additional fees.

We first identified IT acquisitions and operations as a high-risk area in our 2015 high risk report.³ In that report, we identified the management of software licenses as a focus area, in part, because of the potential for

¹Commercial software is software that is ready-made and commercially available to the public. According to the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS), software licenses specify the government's legal rights to use software in accordance with terms and provisions agreed to by the software copyright owner. FAR § 52.227-19(a) and DFARS § 227.7202-3(a).

²For the purposes of this report, we use the term vendor to also include original equipment manufacturers and publishers.

³GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015).

cost savings. As early as 2014, we had reported on the need for agencies to ensure better management of software licenses. We noted that to maximize the value of these investments, agencies should effectively manage them by, among other things, regularly (1) tracking and maintaining a comprehensive inventory of software licenses, and (2) analyzing agency-wide software license data.⁴

Subsequently, in June 2016, the Office of Management and Budget (OMB) issued a memorandum that directed agencies to take specific actions to better manage their software licenses. This included establishing a comprehensive software license inventory to track and analyze software usage to make cost-effective decisions.⁵ Since 2014, agencies have reported about \$2.1 billion in cost savings related to better management of software licenses.

You asked us to review federal agencies' software licenses. Our objectives were to identify (1) the most widely used and the highest amounts paid for software licenses by software vendor and product in the federal government, and (2) the extent to which selected agencies determined whether they purchased too many or too few software licenses.

To address our first objective, we collected and reviewed the 24 Chief Financial Officers Act of 1990⁶ (CFO Act) agencies' self-reported data of their five software vendors with the highest quantity of licenses installed⁷ and actual total costs for fiscal year 2021, as well as their associated

⁴GAO, *Federal Software Licenses: Better Management Needed to Achieve Significant Savings Government-Wide*, [GAO-14-413](#) (Washington, D.C.: May 22, 2014).

⁵Office of Management and Budget, *Category Management Policy 16-1 Improving the Acquisition and Management of Common Information Technology: Software Licensing*, M-16-12 (Washington, D.C.: June 2, 2016).

⁶The 24 Chief Financial Officers Act of 1990 agencies are the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, Transportation, the Treasury, and Veterans Affairs; the Environmental Protection Agency; General Services Administration; National Aeronautics and Space Administration; National Science Foundation; Nuclear Regulatory Commission; Office of Personnel Management; Small Business Administration; Social Security Administration; and the U.S. Agency for International Development.

⁷Installed licenses are software licenses deployed for use on department or agency owned or controlled computers. For purposes of this report, we used the terms "installed" and "deployed" interchangeably.

products and applications.⁸ Agencies supplemented this data with information on each of their five most widely used software licenses by vendor, including how the agency determined which ones were widely used and had the highest total actual costs for fiscal year 2021. This included supporting documentation such as reports from their software license inventories.

To determine the most widely used licenses in the federal government by vendor, we sorted the list of vendors from highest to lowest based on the frequency a vendor was cited in agency top five lists. This resulted in 36 total vendors. We used the same approach to identify the software licenses by vendor with the highest amounts paid by agencies for fiscal year 2021 across the government which resulted in 34 total vendors. We were unable to determine the most widely used and the highest amounts paid for software products due to the challenges discussed later in this report on inconsistent and incomplete agency data.

We also interviewed agency officials responsible for software management at each of the 24 CFO Act agencies to discuss how they manage their software licenses. Additionally, we interviewed officials in OMB's Office of Federal Procurement Policy and the General Services Administration's (GSA) Federal Acquisition Service, including officials from the IT Vendor Management Office (ITVMO)⁹ to discuss any efforts that they have taken or planned to take related to managing federal agencies' software licenses.

To address the second objective, we selected a sample of CFO Act agencies based on the size of their total IT budgets allocated to IT software for fiscal year 2022. Specifically, we categorized each of the 24 CFO Act agencies by the size of their IT budgets: large (over \$3 billion), medium (\$1 billion to \$3 billion), and small (less than \$1 billion). We then selected three agencies with the largest percentage of fiscal year 2022 IT budgets allocated to IT software from each of the three budget categories. Using these criteria, we selected nine agencies: the Departments of Agriculture (Agriculture), Energy (Energy), Housing and Urban Development (HUD), Justice (Justice), State (State), and Veterans Affairs (VA); Office of Personnel Management (OPM); Social Security

⁸For purposes of this report, we used the terms software application and software products interchangeably.

⁹In October 2020, OMB created the ITVMO to assist agencies when they buy commodity IT and leverage existing IT contract vehicles.

Administration (SSA); and U.S. Agency for International Development (USAID).

In addition, we reviewed federal requirements,¹⁰ OMB guidance,¹¹ and leading software license management practices identified from our prior work.¹² We selected the practices of tracking and maintaining software inventories and analyzing the software data for decision making because they aligned closely with assessing purchasing of software licenses against usage. From these practices, we then identified two key activities for assessing the appropriate number of software licenses. These two activities are: (1) tracking software licenses that are currently in use and (2) regularly comparing the inventories of software licenses that are currently in use to purchase records.

For each of the five most widely used licenses reported by agencies in objective 1, we compared software license usage and purchase data to these key activities. Specifically, we collected and reviewed relevant software license documentation including license agreements and software contracts, and spreadsheets with license usage and purchase data. The documentation also included annual renewal market assessment reports, and screenshots or reports generated from automated inventory tools related to usage and purchasing of licenses (e.g., reconciliation reports), including any increases or decreases of the number of software licenses in calendar year 2022.

To assess the reliability of the data selected agencies provided from their software license inventories, we reviewed the documentation (e.g., reports) related to license usage and purchases for obvious issues and for completeness, including missing or questionable values. We also reviewed each agency's responses to questions about efforts to ensure the reports from their inventories are accurate and complete. We determined that the agencies' data were sufficiently reliable for the

¹⁰Making Electronic Government Accountable by Yielding Tangible Efficiencies Act of 2016, or the "MEGABYTE Act" further enhances federal agency Chief Information Officers' management of software licenses, among other requirements. Pub. L. No. 114-210, 130 Stat. 824 (2016).

¹¹Office of Management and Budget, *Category Management Policy 16-1: Improving the Acquisition and Management of Common Information Technology: Software Licensing*, M-16-12 (Washington, D.C.: June 2, 2016).

¹²[GAO-14-413](#).

purposes of this report, which was to determine whether agencies had over- or under-purchased their five most widely used software licenses.

We also assessed selected agencies' policies, procedures, and guidance related to their software license management efforts, including any related to determining over- and under-purchasing of software licenses. Moreover, we interviewed agency officials responsible for software license management within the Office of the Chief Information Officer (OCIO) to discuss their policies and processes for managing software licenses, including how they determine if licenses are over- or under-purchased. We also interviewed other appropriate offices of each of the agencies. We also focused on the agencies' efforts at the departmental or agency level. Additional details on our objectives, scope, and methodology are included in appendix I.

We conducted this performance audit from January 2022 to January 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to 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.

Background

According to the Federal Acquisition Regulation and the Defense Federal Acquisition Regulation Supplement, software licenses specify the government's legal rights to use software in accordance with terms and provisions agreed to by the software copyright owner.¹³ Rights to use software are separate from the legal rights to the software itself, which are normally kept by the software manufacturer or other third party. Licenses may be bought and are normally required whenever externally acquired software is used, which will typically be when the software is installed on a computer (or when executed on a computer even if installed elsewhere such as on a server). Licenses may be purchased in bundle packages, which are multiple software products offered under a single license agreement. They may also be defined in enterprise terms, such as number of workstations or employees, in which case a license is required for each qualifying unit or individual regardless of actual usage.

Many software products are commercial-off-the-shelf, meaning the software is sold in substantial quantities in the commercial marketplace.

¹³FAR § 52.227-19(a) and DFARS § 227.7202-3(a).

Commercial software typically includes fees for initial and continued use of licenses. These fees may include, as part of the license contract, access to product support and/or other services, including upgrades.

License models and definitions may significantly differ depending on the software product and vendor. For example, the basic types of licenses vary by duration and measure of usage.

Duration

- *Perpetual licenses*: use rights are permanent once purchased.
- *Subscription or rental licenses*: are used for a specific period of time, which can vary from days to years and may or may not include upgrade rights.
- *Term licenses*: are used for a limited period of time and are not owned in perpetuity.

Measure of Use

- *Per copy, by workstation/seat/device, name used*: Historically most licenses sold have been on a per-copy-used basis, with several different units of measure possible. Sometimes multiple users will be allowed per license.
- *Concurrent usage*: This type of license allows agencies to permit a specified number of users to connect simultaneously to a software application.
- *Per server speed or per processor*: These licenses are linked to the speed or power of the server on which they run, or the number of processors.
- *Enterprise or site*: These licenses are sold on an enterprise or site basis.
- *Other complexities*: Other, more complex licensing situations related to usage also exist with regard to licensing and the use of techniques such as cloud computing.¹⁴ For example, software can be used as

¹⁴According to the National Institute of Standards and Technology (NIST) guidance, cloud computing is a means for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. National Institute of Standards and Technology, *The NIST Definition of Cloud Computing*, Special Publication 800-145 (Gaithersburg, MD: Sept. 2011).

part of different cloud service models (e.g., software as a service, platform as a service, and infrastructure as a service).¹⁵

Software license management is intended to manage, control, and protect an organization's software assets, including management of the risks arising from the use of those software assets. Proper management of software licenses helps to minimize risks by ensuring that licenses are used in compliance with licensing agreements and cost-effectively deployed. It also ensures that software purchasing and maintenance expenses are properly controlled.

For example, sound software license management includes a regular reconciliation review by agencies to ensure they have the appropriate number of licenses for each item of software in use. Vendors also perform reviews to assess the number of licenses in use to ensure that the legal agreements that come with procured software licenses are adhered to and that organizations avoid purchasing unnecessary licenses. These reviews are called true-up and true-down. The true-up review compares the current software deployment to the software purchase data to revalidate and reconcile software utilization with historical software procurement data and terms and conditions. On the other hand, the true-down review determines if fewer licenses are required. These reviews are to occur prior to software license renewals or exercising of options under a software license agreement.

Federal Laws and Guidance and GAO's Leading Practices Call for Agencies to Manage Software Licenses

In December 2014, Congress enacted IT acquisition reform legislation (commonly referred to as the Federal Information Technology Acquisition Reform Act or FITARA) as part of the Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015.¹⁶ FITARA is intended to enable Congress to monitor covered agencies' increased efficiency and effectiveness of IT investments, as well as for

¹⁵According to National Institute of Standards and Technology (NIST) guidance, infrastructure as a service delivers and manages the basic computing infrastructure of servers, software, storage, and network equipment; platform as a service delivers and manages the infrastructure, operating system, and programming tools and services that the agency can use to create applications; and software as a services delivers one or more applications and all the resources (operating system and programming tools) and underlying infrastructure, which the agency can use on demand. National Institute of Standards and Technology, *The NIST Definition of Cloud Computing*, Special Publication 800-145 (Gaithersburg, MD: Sept. 2011).

¹⁶Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015, Pub. L. No. 113-291, division A, title VIII, subtitle D, 128 Stat. 3292, 3438-50 (Dec. 19, 2014).

holding agencies accountable for reducing duplication and achieving cost savings.¹⁷ FITARA contained specific requirements related to seven areas, including allowing for the purchase of a government-wide software licensing agreement that is available for use by agencies.¹⁸

Additionally, the Making Electronic Government Accountable by Yielding Tangible Efficiencies (MEGABYTE) Act of 2016 further enhanced Chief Information Officers' (CIO) management of software licenses by requiring agency CIOs to establish an agency software licensing policy and a comprehensive software inventory to track and maintain licenses, among other requirements.¹⁹

In accordance with the MEGABYTE Act requirements, in June 2016, OMB issued a memorandum that provided software license management guidance to federal agencies.²⁰ Specifically, the guidance required, among other things, that agencies

- move to a more centralized and collaborative software management approach that includes appointing a software manager to be responsible for managing software licenses;
- maintain an agency-wide inventory of software licenses; and
- analyze inventory data to ensure compliance with software license agreements, consolidate redundant applications, and identify other cost-saving opportunities.

Additionally, in 2014, and again in March 2019, OMB directed agencies to take actions to implement category management principles. These principles are based on industry leading practices to streamline and manage entire categories of spending. They involve purchasing software licenses across the government, more like a single enterprise—to, among

¹⁷The provisions apply to the agencies covered by the CFO Act, 31 U.S.C. § 901(b). However, FITARA has generally limited application to the Department of Defense.

¹⁸FITARA included requirements for covered agencies to enhance agency CIO authority and transparency, improve risk management in IT investments, and advance portfolio review and the federal data center consolidation initiative.

¹⁹Pub. L. No. 114-210, 130 Stat. 824 (2016).

²⁰Office of Management and Budget, *Category Management Policy 16-1: Improving the Acquisition and Management of Common Information Technology: Software Licensing*, M-16-12 (Washington, D.C.: June 2, 2016).

other things, leverage the government's buying power, save taxpayer dollars, and reduce duplicative contracts. For example:

- In December 2014, OMB's Office of Federal Procurement Policy issued a memorandum that directed agencies to take specific actions to implement category management to include a broader set of strategies, such as developing common standards in practices and contracts, and improving data analysis and information sharing to better leverage the government's buying power and reduce unnecessary contract duplication and yield other benefits, which includes software.²¹
- In March 2019, OMB issued a memorandum that directed agencies to implement additional category management actions to more effectively manage contract spending and reduce unnecessary contract duplication.²² These actions include developing effective vendor management strategies to improve communications with contractors, and sharing information for purchased IT goods and services government-wide. It also requires agencies to analyze their purchasing of common goods and services such as software by conducting demand management to eliminate inefficient purchasing and consumption behaviors and developing an inventory of software licenses so agencies can make better purchasing and management decisions.

Additionally, in May 2014, we identified leading practices that federal agencies can follow for managing their software licenses. Table 1 describes these leading practices in managing software licenses.

²¹Office of Management and Budget, Office of Federal Procurement Policy, *Memorandum for Chief Acquisition Officers, Senior Procurement Executives: Transforming the Marketplace: Simplifying Federal Procurement to Improve Performance, Drive Innovation, and Increase Savings* (Washington, D.C.: Dec. 4, 2014).

²²Office of Management and Budget, *Category Management: Making Smarter Use of Common Contract Solutions and Practices*, M-19-13 (Washington, D.C.: Mar. 20, 2019).

Table 1: Examples of Leading Practices for Managing Software Licenses

Leading practice	Description
Centralize management of software licenses	Employ a centralized software license management approach that is coordinated and integrated with key personnel (e.g., the acquisition and IT management personnel responsible for software purchases and decisions). Such an approach allows for centralized record keeping of software licensing details including the terms of the licenses. Further, agencies should centralize the governance and oversight of specific enterprise and commercial software licenses consistent with agency policy (e.g., software licenses reflective of the majority (80 percent) of agency software license spending and/or agency enterprise licenses) in order to make department-wide decisions.
Establish a comprehensive inventory of software licenses	Establish a comprehensive inventory of the software licenses consistent with agency policy (e.g., an inventory representative of majority (80 percent) of the agency’s software license spending and/or enterprise licenses). This inventory should incorporate automated discovery and inventory tools that provide easy search and access to software license information (e.g., contract terms and agreement records). Such a repository allows managers to monitor performance (e.g., how many employees are using software compared to the amount of software purchased) and conduct analysis reporting needed for management decision making. A comprehensive inventory will better ensure compliance with software license agreements and allow for agency-wide visibility that consolidates redundant applications and identification of other cost-saving opportunities.
Regularly track and maintain comprehensive inventories of software licenses using automated discovery and inventory tools and metrics	Regularly track and maintain comprehensive inventories of software licenses using automated discovery and inventory tools and metrics (e.g., metrics related to employee usage and number of licenses purchased) to ensure that the agency has the appropriate number of licenses for each item of software in use. Agencies should track inventories and compare software licenses purchased with licenses installed regularly (e.g., at least annually) and consistent with their policies.
Analyze the software license data to inform investment decisions and identify opportunities to reduce costs	Make decisions about software license investments that are informed by an analysis of department-wide software license data (e.g., costs, benefits, usage, and trending data). Such an analysis helps agencies make cost-effective decisions, including decisions about what users need.

Source: GAO-14-413. | GAO-24-105717

The Federal Government Has Initiated Efforts Intended to Improve Software License Management

Recent government-wide software license initiatives and, if enacted, proposed legislation are aimed at improving agencies’ management of software licenses to, among other things, consolidate government software purchasing. Specifically,

Government-wide initiatives. In October 2020, OMB created the ITVMO to assist agencies when they buy common goods and services, including the purchasing of software licenses and leveraging existing IT contract vehicles.²³ In June 2023, ITVMO program officials stated they have three

²³The ITVMO is a partnership between GSA, National Aeronautics and Space Administration, National Institutes of Health, and the Department of Defense and is led by an Executive Steering Committee that represents several agencies and the largest IT Best-in-Class contract solutions in the federal government. Best-in-Class contract solutions are government-wide contracts that satisfy key criteria defined by OMB, including offering competitive pricing and terms and conditions within the federal marketplace and reflecting the strongest contract management practices.

initiatives aimed at standardizing software license data, among other things. Specifically,

- **Vendor Assessment Initiative.** According to the ITVMO office, vendor assessments are intended to encourage cross-governmental acquisition knowledge sharing, identify common procurement challenges, and determine opportunities to reduce duplication of similar procurements while building best-practice acquisition approaches and standardizing terms and conditions. Officials from the program office work with the agencies to address specific challenges they face with vendors. These challenges include improving transparency from the vendors about product features or prices. As of June 2023, the office has completed vendor assessments with four vendors. One of the challenges identified during these assessments was a vendor using versions of the same product with different prices that are difficult to identify and match to deployments. Another challenge identified by agencies was a specific vendor using multiple unique codes for products that caused significant confusion to agencies when they needed to de-bundle a product offering.
- **Government-wide IT Taxonomy Modernization Initiative.** According to the Governmentwide IT Category Manager, in fiscal year 2021, the ITVMO launched a strategic initiative to modernize the federal government IT taxonomy. The program officials stated that this effort is intended to improve tracking of common IT products and services, such as software licenses, by aligning the terminology with current technologies and how agencies buy or acquire it. As of June 2023, the program office reported that it uses the IT spending information annually to inform the agencies on strategies for working with the vendors including software contracts and licensing.
- **Government-wide Licensing Agreement Initiative.** In partnership with OMB's Office of Federal Procurement and Policy, ITVMO program officials stated they are working on a new initiative in fiscal year 2024 to develop a government-wide enterprise licensing agreement for one of the highest spending vendors. According to the ITVMO officials, the objective would be to establish an agreement directly with a single vendor on standard government terms and conditions available to all federal agencies.

Proposed legislation on improving software license management. In March 2023, legislation was introduced in Congress titled the Strengthening Agency Management and Oversight of Software Assets Act (SAMOSA) to provide Congress improved visibility of federal agency

software asset management practices.²⁴ If enacted, the proposed legislation would build upon the 2016 MEGABYTE Act by requiring each agency to complete a comprehensive assessment of their software entitlements²⁵ and software inventories which would be used to develop a plan for addressing costly, unnecessary licenses.

In particular, the proposed legislation specifies that each agency must use the information from these assessments to develop a plan to consolidate software licenses and adopt enterprise license agreements by type or category of software. It also states that in order to ensure the standardization of the comprehensive assessment of software licenses across the federal government, the Director of OMB, in consultation with the GSA Administrator, may share information, best practices, and recommendations related to these activities.

Furthermore, the proposed legislation states that the Director, in coordination with others including the Chief Information Officers Council, the Chief Acquisition Officers Council, and the Administrator may also establish processes to identify, define, and harmonize common definitions and other information and criteria to support agencies.

Prior Inspectors General Reports Identified Examples of Over- or Under-Purchasing on Software Licenses

Inspectors General from three agencies have reported on millions of dollars of wasteful spending related to software licenses including licenses that were underreported or unused. For example:

- In March 2021, the Environmental Protection Agency (EPA) Office of Inspector General reported on the management of contracts with respect to software licenses.²⁶ According to the report, EPA underreported and incorrectly identified purchased equipment in the agency's property reporting system and did not record \$1.18 million in software licenses in the agency's asset management system. The Inspector General made 10 recommendations to recover the unallowable equipment purchased. As of November 2023, the agency had addressed nine of the 10 recommendations.

²⁴ H.R. 1695, 118th Cong. (Mar. 22, 2023). A companion bill was introduced in the Senate, S. 931, 118th Cong. (Mar. 22, 2023).

²⁵ According to the proposed legislation, the term software entitlements would mean any software that has been purchased, leased, or licensed by or billed to an agency under any contract or other business arrangement; and is subject to use limitations.

²⁶ EPA, OIG, *EPA Improperly Awarded and Managed Information Technology Contracts*, 21-P-0094 (Washington, D.C.: Mar. 10, 2021).

-
- In July 2021, the Department of Energy Office of Inspector General found that the department's Office of Cybersecurity, Energy Security, and Emergency Response spent \$2.1 million more than necessary for unused software licenses associated with analyzing the cybersecurity data of utility companies.²⁷ In response to this weakness and others, the Inspector General made four recommendations to improve the management of this office. As of November 2023, the agency had addressed all four recommendations.
 - In January 2023, the National Aeronautics and Space Administration (NASA) Office of Inspector General reported on the agency's software asset management practices.²⁸ According to the report, NASA had not implemented a centralized Software Asset Management tool to discover, inventory, and track license data as required by federal policy, resulting in NASA spending approximately \$15 million over the past 5 years on unused licenses. The office also found that the agency's software applications suffered from a lack of centralization and inventory visibility.

Further, the office reported that the software asset management office and software manager positions did not report to the CIO as required by federal policy. The Inspector General made nine recommendations, including establishing enterprise-wide software asset management policy and procedures, implementing a software asset management tool across the agency, and aligning the agency software manager position to report to the agency CIO. As of January 2024, the agency had addressed four of the nine recommendations.

GAO Previously Recommended Improvements in Software License and Category Management

In May 2014, we reported on 24 federal agencies' management of software licenses and stressed that better management was needed to achieve significant savings government-wide.²⁹ Specifically, we found that OMB and the vast majority of the 24 agencies reviewed did not have adequate policies for managing software licenses. We also reported that federal agencies were not adequately managing their software licenses because they generally did not follow leading practices in this area.

²⁷Energy, OIG, *Inspection Report on "Allegations Related to the Office Cybersecurity, Energy Security, and Emergency Response,"* DOE-OIG-21-29 (July 7, 2021).

²⁸NASA, OIG, *NASA's Software Asset Management*, IG-23-008 (Washington, D.C.: Jan. 12, 2023).

²⁹GAO, *Federal Software Licenses: Better Management Needed to Achieve Significant Savings Government-Wide*, [GAO-14-413](#) (Washington, D.C.: May 22, 2014).

We made recommendations to the 24 agencies in our review to improve their policies and practices for managing software licenses. As of October 2023, the agencies had implemented 133 of the 136 recommendations.

Since our work in 2014, agencies reported having about \$2.1 billion in cost savings related to better management of software licenses. Specifically, in April 2019,³⁰ we reported that several agencies reported that their actions to better manage software licenses led to effective agency-wide decisions regarding software purchases, and those decisions have yielded cost savings. For example,

- Agriculture identified instances where multiple software contracts at different price points among component agencies could be consolidated into one contract at the lowest price. This resulted in reducing the cost per license for a software product, saving the agency approximately \$85,000 between 2016 and 2017, according to Agriculture documentation.
- VA made effective agency-wide decisions regarding the purchase of software products and reported that it has realized approximately \$65 million in cost savings between 2017 and 2020 due to analyzing one of its software licenses.
- GSA centralized the management of its purchases of software licenses that led the agency to make effective decisions regarding its software licenses and avoid future costs, according to agency documentation. For example, in fiscal year 2015, the agency consolidated licenses for one of its software products, saving the agency over \$400,000 and avoiding over \$3 million in future costs.
- USAID identified opportunities to reduce costs on its software licenses through consolidation or elimination of software. This resulted in the agency reporting a cumulative savings from fiscal year 2016 to fiscal year 2018 of over \$2.5 million on software licenses.

³⁰GAO, *Information Technology: Effective Practices Have Improved Agencies' FITARA Implementation*, [GAO-19-131](#) (Washington, D.C.: Apr. 29, 2019).

While the implementation of these recommendations and resulting cost savings are evidence of improvement, we reported in January 2022 that agencies' continued efforts over managing software licenses remained important.³¹

We have also previously reported on agencies' efforts to reduce IT contract duplication using category management principles and practices, including strategic sourcing for common goods and services including software. For example:

- In September 2020, we reported that agencies could use OMB category management to prevent, identify, and reduce duplication in IT contracts including software licenses.³² We noted that three of the seven agencies in our report were not fully sharing prices paid, terms, and conditions for purchased IT goods and services that agencies can use to make informed acquisition decisions, including identifying opportunities to reduce IT contract duplication. We also reported that five of the seven agencies had not regularly used a spend analysis to identify opportunities to reduce IT contract duplication.³³ Accordingly, we made 20 recommendations to six agencies to fully implement the category management and spend analyses activities. As of October 2023, agencies implemented 14 recommendations and six remain open.
- In November 2020, we reported that OMB could further advance its category management initiative—in which spending is managed by categories such as IT—by focusing on requirements, data, and training.³⁴ We reported, among other things, that poor data hindered agencies' efforts to implement category management and realize the initiative's benefits. Specifically, agencies struggled to collect and share data on prices paid for common products and services, including software licenses. Additionally, agencies lacked access to

³¹GAO, *Information Technology: Biannual Scorecards Have Evolved and Served as Effective Oversight Tools*, [GAO-22-105659](#) (Washington, D.C.: Jan. 20, 2022).

³²GAO, *Information Technology: Selected Federal Agencies Need to Take Additional Actions to Reduce Contract Duplication*, [GAO-20-567](#) (Washington, D.C.: Sept. 30, 2020).

³³A spend analysis is an effort to identify how much is being spent for which products and services and where opportunities exist to leverage buying power.

³⁴GAO, *Federal Buying Power: OMB Can Further Advance Category Management Initiative by Focusing on Requirements, Data, and Training*, [GAO-21-40](#) (Washington, D.C.: Nov. 30, 2020).

the granular data needed to facilitate spending analysis that is central to the category management initiative.

- Furthermore, OMB had not pursued government-wide solutions for data challenges that hindered category management implementation. We made 10 recommendations to OMB, including to establish a strategic plan to coordinate agencies' responses to government-wide data challenges hindering implementation of the category management initiatives, including challenges involving prices-paid and spending data. As of October 2023, OMB has implemented three recommendations and seven recommendations remained open, including for the agency to establish a strategic plan for addressing government-wide data challenges.

Information on Agencies' Software License Usage and Costs

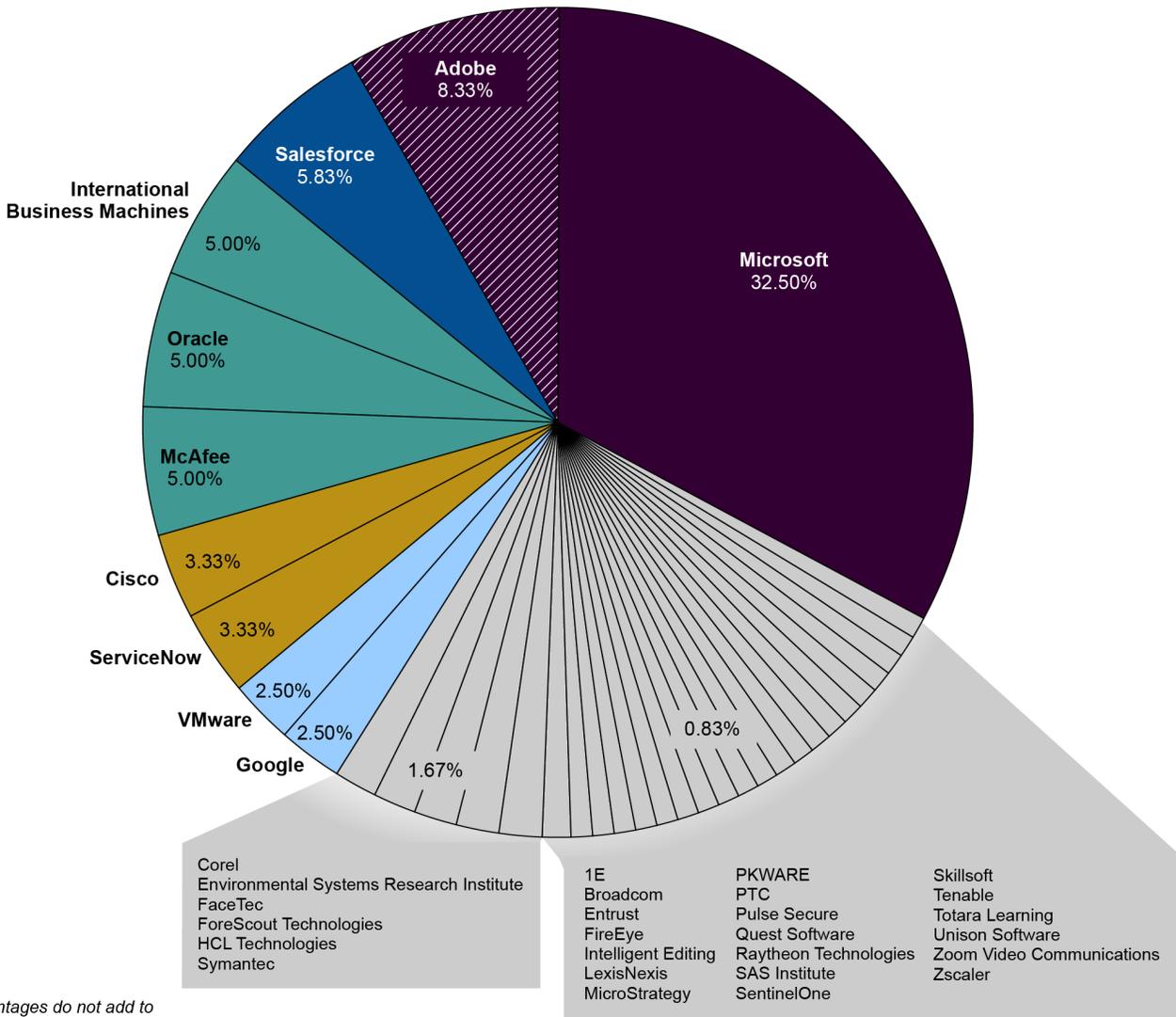
The 24 CFO Act agencies reported 36 software vendors with the highest quantity of licenses installed, as of July 2022. Similarly, the agencies reported 34 software vendors that were paid the highest amounts for fiscal year 2021. The software products that were most widely used and had the highest amounts paid cannot be determined across the government because agencies' software data were inconsistent or incomplete.

Federal Agencies Reported Most Widely Used and the Highest Paid Software Vendors

Each of the 24 CFO Act agencies reported their five most widely used software vendors with the highest quantity of licenses installed, as of July 31, 2022. Specifically, they reported a total of 36 vendors across the government that were widely used by their agencies. Ten of these vendors accounted for the majority (about 73 percent) of these licenses. Specifically, Microsoft, Adobe, Salesforce, International Business Machines, Oracle, McAfee, Cisco, ServiceNow, VMware, and Google were reported frequently by agencies as vendors with the highest quantity of licenses installed across the government (see appendix II for more details about these vendors). The remaining approximately 27 percent of the licenses are vendors that were cited two times or less across these agencies.

Figure 1 illustrates the total of the five most widely used software vendors across the government as reported by agencies, including 10 vendors accounting for the majority of these licenses, as of July 2022.

Figure 1: Total of the Five Most Widely Used Software Vendors Reported by the 24 Chief Financial Officers Act of 1990 Agencies, as of July 31, 2022



Percentages do not add to 100% due to rounding

Source: GAO analysis of 24 Chief Financial Officers Act Agencies' data. | GAO-24-105717

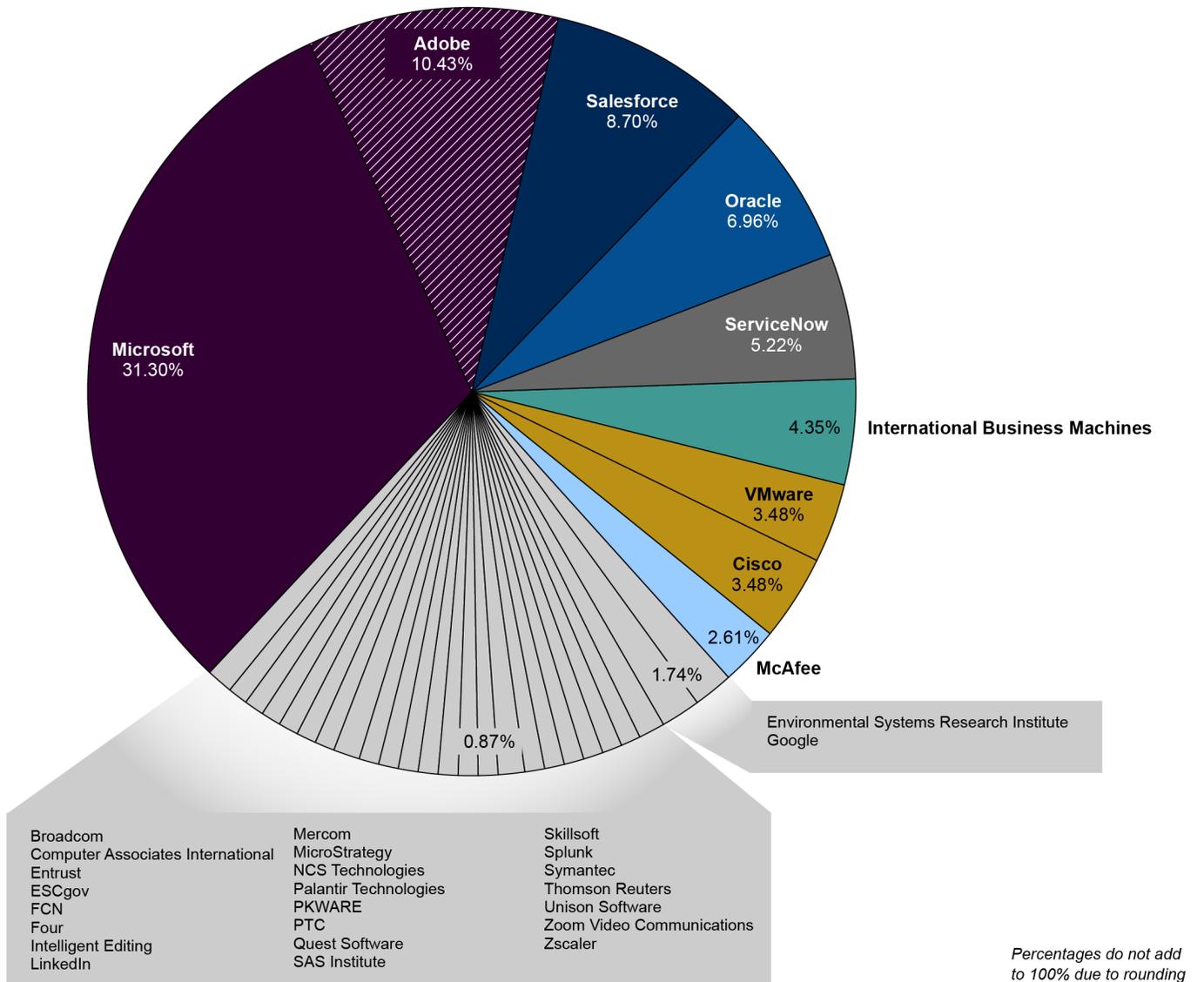
Additionally, 23 of the 24 agencies reported their vendors with the highest amounts paid for fiscal year 2021.³⁵ Specifically, they reported a total of 34 vendors across the government that they had paid the highest amounts for fiscal year 2021, totaling about \$5.16 billion across the government.³⁶ Nine of these vendors accounted for the majority (about 77 percent) of these licenses: Microsoft, Adobe, Salesforce, Oracle, ServiceNow, International Business Machines, VMware, Cisco, and McAfee. (See appendix II for more details about these vendors.) The remaining approximately 23 percent of the licenses are vendors that were cited two times or less across these agencies.

Figure 2 illustrates the total of the five vendors that were paid the highest amounts across the government as reported by agencies, including nine vendors accounting for the majority of these licenses, for fiscal year 2021.

³⁵The Department of Health and Human Services stated that it was unable to provide data on the software licenses with the highest amounts paid because the research tool to report this data was not operational for fiscal year 2021 data. In August 2023, the agency stated that it may be able to provide data on the licenses with the highest amounts paid for fiscal years 2022 and 2023. Thus, this agency was not included in our review of vendors that were paid the highest amounts across the government for fiscal year 2021.

³⁶The data does not include the Department of Health and Human Services because it was unable to provide the software license vendors with the highest amounts paid for fiscal year 2021. According to officials, a research tool to report this type of data was not operational at the time.

Figure 2: Total of the Five Software Vendors with the Highest Amounts Paid Reported by 23 of 24 Chief Financial Officers Act of 1990 Agencies for Fiscal Year 2021



Source: GAO analysis of 23 of the 24 Chief Financial Officers Act agencies' data (with the exception of the Department of Health and Human Services). | GAO-24-105717

Furthermore, agencies frequently reported that there were nine vendors that agencies paid the highest amounts for their licenses, accounting for billions of dollars for total actual cost for fiscal year 2021. Specifically,

- Microsoft was reported 36 times, totaling about \$2.4 billion;³⁷
- Adobe was reported 12 times, totaling about \$63.5 million;
- Salesforce was reported 10 times, totaling about \$195.6 million;
- Oracle was reported eight times, totaling about \$494.4 million;
- ServiceNow was reported six times, totaling about \$66.8 million;
- International Business Machines was reported five times, totaling about \$70.8 million;
- VMware was reported four times, totaling about \$263.0 million;
- Cisco was reported four times, totaling about \$1.1 billion; and
- McAfee was reported three times totaling \$3.3 million.

Agencies' Software Product Data Were Inconsistent and Incomplete

In contrast to the information on software vendors, the data provided on the most widely used and highest amounts paid for software products were inconsistent and incomplete, and thus cannot be compared across the government.

Inconsistent data. Agencies provided data on widely used and highest amounts paid for software products in various ways, including by bundles and different naming conventions for similar products. For example:

- Several agencies reported that multiple software products are bundled within a license agreement with one single vendor. Thus, they were unable to breakout the name of the specific product that had the highest quantity installed, as of July 2022 or the total cost for fiscal year 2021. For example, one agency (Department of Commerce (Commerce)) reported about 140 specific products for one software vendor (Microsoft) but did not identify the highest installed products or the highest amounts paid among them.

Another agency (HUD) reported about 180 specific products for one software vendor (Microsoft) but did not identify the highest installed product among them. Further, Agriculture officials from the OCIO

³⁷Five of these 36 citations were from the Departments of the Interior and Transportation, three were from EPA and Small Business Administration, and two were from Commerce and the Department of Homeland Security.

reported that the agency installed 122,728 licenses with a cost of approximately \$41.94 million for its Salesforce spring 2022 software products, but it was unable to identify the products that were widely used within this agreement. Officials noted that this usage data is for all Salesforce products and not a specified license. Similarly, Energy officials from the OCIO reported that the agency installed 177,953 licenses for its multiple Microsoft products including Office 365, Teams, and Visio, but it was unable to provide specific quantities for each of these products.

- The majority of agencies reported variations of similar software license products. For example, one agency reported “Office Productivity Suite” and another agency reported it as “Productivity Suite;” an agency reported “Acrobat Pro” while another reported “Acrobat Prof;” and an agency reported “Service Cloud Unlimited Edition” while another reported it as “Service Cloud (Enterprise).”

As another example, agencies reported product names as “Office 365 G3,” “365 E3 from Software Assurance Government Community Cloud,” and “Office 365 Suite,” but based on the details from the vendor’s publicly available data these may all be “Office 365 Government.” Another example of this is when agencies reported product names as “365 Apps for enterprise-en-us” and “O365 Apps for Enterprise,” which appear to be “365 Apps for Enterprise” based on the vendor’s publicly available data.

Incomplete data. The cost data provided by agencies on its widely used and the highest amounts paid for products were not always complete. For example:

- Six agencies—the Department of Defense (DOD), the Department of Health and Human Services (HHS), VA, the National Science Foundation (NSF), OPM, and the Department of the Interior (Interior)—stated that they were unable to provide the granular prices for widely used licenses and licenses with the highest amounts paid because the multiple software products within the agreement are not separately priced. Specially, DOD OCIO officials stated that they could not provide total actual costs for fiscal year 2021 for DOD’s most widely used Microsoft and McAfee software products because the multiple software products within the agreement are not separately priced.

Similarly, Interior, VA, and HHS officials stated that they could not provide total actual costs for fiscal year 2021 for their Microsoft software products because multiple software products within the

agreement are not separately priced. In addition, NSF officials also stated that they could not provide the total cost for fiscal year 2021 for the agency's Cisco software products as they are not separately priced. OPM officials stated that they also were not able to identify the specific product for any of its five widely used software licenses because they were not separately priced. As a result, these agencies were not able to identify which specific products within the bundled agreements have the highest amounts paid.

- Two agencies—the Departments of Homeland Security (DHS) and the Treasury (Treasury)—stated they could only provide the most widely used vendors and vendors with the highest amounts paid based on reported obligation data and not the total actual cost for fiscal year 2021. One of these agencies, Treasury, was unable to provide specific product names for any of its five vendors with the highest amounts paid for several reasons, including that a single acquisition may have multiple products and the agency does not break out how many of each product was purchased, nor the price for each. Treasury officials noted that they are currently increasing their capabilities to collect more detailed information on what is being purchased including for software.
- Two agencies (Agriculture and OPM) stated that they could not provide the total actual cost for fiscal year 2021 for one of their most widely used software licenses due to how it was funded. Specifically, Agriculture's VMware software product is funded through DHS's Continuous Diagnostics Mitigation program. OPM also stated that its Oracle software costs include funding through the Defense Counterintelligence and Security Agency so it was unable to provide total actual costs of its widely used products. Thus, these agencies were unable to break out the specific details on products.

As previously discussed, OMB's ITVMO has begun to take action to understand and overcome these challenges through its vendor assessment efforts. Among other things, it is assisting agencies in software license management and purchasing, including comparing what other agencies pay for a similar service or product. According to OMB, this will help to reduce price variances and secure more favorable terms and conditions on common enterprise-wide software licenses. Similarly, the proposed SAMOSA Act, if enacted and effectively implemented, calls for actions that could address the data challenges related to identifying specific software license products that are widely used and have the highest amounts paid across the government, among other things.

Selected Agencies Have Not Fully Determined Over- or Under-Purchasing of Widely Used Software Licenses

As previously noted, our prior report and OMB guidance³⁸ identify leading practices for effectively managing software licenses. Two key activities that can assist agencies' software license management efforts and result in assessing the appropriate number of software licenses:

- track software licenses that are currently in use and
- regularly compare the inventories of software licenses that are currently in use to purchase records to determine if licenses have been over- or under-purchased.

None of the nine selected agencies fully determined that they over- or under-purchased their five most widely used software licenses.³⁹

Specifically, the agencies did not fully address either of the activities in assessing the appropriate number of software licenses.

Table 2 lists the nine agencies and shows the extent to which they have addressed each of the two activities to determine whether their most widely used licenses were over- or under-purchased, as of October 2023.

³⁸GAO-14-413; and Office of Management and Budget, *Category Management Policy 16-1 Improving the Acquisition and Management of Common Information Technology: Software Licensing*, M-16-12 (June 2, 2016).

³⁹For the purposes of this report, the phrase "most widely used software licenses" refers to the licenses that come from a specific vendor and means the aggregate number of software licenses an agency uses that originate with a particular vendor.

Table 2: Extent to Which Selected Agencies Tracked Software Licenses and Compared Software Usage against Purchased Licenses for Their Five Most Widely Used Licenses, as of October 2023

Agency	Activities	
	Track software licenses that are currently in use	Regularly compare the inventories of software licenses that are currently in use to purchase records
Department of Agriculture	○	○
Department of Energy	◐	◐
Department of Housing and Urban Development	○	○
Department of Justice	◐	◐
Department of State	◐	◐
Department of Veterans Affairs	○	○
Office of Personnel Management	◐	○
Social Security Administration	◐	◐
U.S. Agency for International Development	◐	◐

Legend:

- Fully met—the agency provided evidence which showed that it fully or largely addressed the elements of the criteria.
- ◐ Partially met—the agency provided evidence that showed it had addressed at least part of the criteria.
- Not met—the agency did not provide evidence that it had addressed any part of the criteria.

Source: GAO analysis of agency data. | GAO-24-105717

As shown in the table, five of the nine agencies that we reviewed (Energy, Justice, State, SSA, and USAID) partially addressed both key activities to determine whether their widely used software licenses were over- or under-purchased.

- **Energy.** Energy partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses. Specifically, two software license vendors—Microsoft and Adobe—provided spreadsheets to the department to verify license usage. According to Energy officials, after all license usage have been verified, recommendations are made to the vendor to either reduce or add additional licenses and a true-up/renewal quote was generated. Additionally, the agency’s Software and License Compliance Policy dated May 24, 2022, identified software license data on the number of licenses owned and consumed for these two vendors. However, the agency did not track licenses that are currently in use for the three remaining most widely used software licenses—from vendors

ServiceNow, VMware, and Environmental Systems Research Institute.

Energy officials stated that until an enterprise license agreement⁴⁰ with software vendors for these licenses is established, it is incumbent on the agency components to assure that they are tracking the number of licenses in use. As of October 2023, Energy officials stated that one of the enterprise-wide agreements (ServiceNow) will be available to the entire agency in fiscal year 2024, but it did not provide a time frame for tracking the usage for the other two widely used software licenses.

Energy partially addressed comparing the inventories of licenses in use to purchase records on a regular basis. Specifically, the agency compared its usage of two most widely used software licenses (from vendors Microsoft and Adobe) at the OCIO level with purchase records.

Energy stated that it does an annual reconciliation review with two vendors (Microsoft and Adobe) to verify their licenses by either increasing or decreasing quantities based on what is currently being used. Specifically, in May 2022, the agency had an increase of 203 licenses and decrease of 4,400 licenses, resulting in an increase of \$1.51 million for its Microsoft licenses. In December 2022, the agency had an increase of 395 licenses and decrease of 248 licenses for Adobe, resulting in a decrease of \$21,460.07.

However, Energy did not provide a similar analysis of software licenses in use against purchase records for the remaining three most widely used software licenses.

- **Justice.** Justice partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses. Specifically, Justice officials stated that they track and manage software deployment and usage as a collaborative process between the OCIO, components, and vendors for all its software. For example, for its Microsoft licenses, the agency's OCIO Contract Management Services conducted an annual data call to the components asking for their license counts from the previous year and requests each component to update the spreadsheet with any increases or decreases. In addition, Justice tracked the number of licenses purchased in its inventory for the remaining four most widely used software licenses (from vendors International Business Machines,

⁴⁰Enterprise-wide agreements are contracts that are at the department or agency level.

Oracle, Adobe, and LexisNexis). However, it did not fully track the number of licenses that are in use.

Justice partially addressed comparing the inventories of software licenses that are currently in use to purchase records on a regular basis. For example, the agency's OCIO Contract Management Services compared the vendor usage reports to a Justice component's spreadsheet on count and any related adjustments to validate the vendor data for its Microsoft licenses.

However, Justice did not implement its approach for comparing the inventories of software licenses that are currently in use for the other four most widely used software licenses.

- **State.** State partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses. For example, the agency developed reports from the automated discovery and inventory tool to capture the number of licenses purchased and the number of licenses in use for its five most widely used software licenses. However, in October 2023, State officials stated that there is an ongoing effort to enhance the data quality within its automated discovery and inventory tool to accurately depict what is deployed and what had been procured. Thus, it is unclear if the agency has accurately accounted for the appropriate number of licenses in use for all its most widely used software licenses.

State also partially addressed comparing the inventories of software licenses in use to purchase records on a regular basis. Specifically, the agency analyzed its usage of Oracle licenses installed with those purchased to determine whether it needed to purchase an additional product license, Java, from this vendor. The agency initially intended to purchase Java for its employees for about \$1 million but learned that Java licenses were included with Oracle licenses during the review, resulting in cost savings.

However, the agency did not provide documentation of analyzing its software licenses in use against purchase records for the remaining four most widely used software licenses.

- **SSA.** SSA partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses. Specifically, for each of the most widely used software license, SSA's Enterprise Architect team works with the components to review end user requirements that determine projected and actual requirements before contract renewal. SSA is tracking its Microsoft licenses that are in use through its annual true-up process. In addition, the agency tracked the projected usage for the remaining four licenses (from

vendors McAfee, Quest Software, International Business Machines, and Broadcom). However, it did not track the number of licenses that are currently in use.

SSA partially addressed comparing the inventories of software licenses in use to purchase records on a regular basis. According to SSA officials, before each acquisition, stakeholders must provide license count requirements and projected usage. Each year the stakeholders are required to confirm that requirements for the software licenses are still valid prior to any contract/subscription renewal or maintenance costs. If requirements have changed, SSA makes the necessary adjustments, which could require the purchase of additional licenses. For example, SSA analyzed its Microsoft server environment and provided the vendor with the actual number of core licenses, increasing to 4,500 additional users, that would be needed in fiscal year 2021. SSA officials noted in its renewable market assessment report that if SSA had accepted Microsoft's original numbers, the agency would have been under-licensed and would have had to pay an additional \$8.8 million to make up the difference.

However, the agency did not provide documentation demonstrating that it compared licenses that are currently in use to purchase records for the remaining four most widely used software licenses.

- **USAID.** USAID partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses. Specifically, the agency tracked its inventory for four of the five widely used licenses but did not do so for the remaining license. For example, the agency's documentation, such as spreadsheets and reports on installed data, demonstrated that it tracked usage of Google licenses, adjusted the number of Microsoft licenses for software products in 2021, and made adjustments to its ServiceNow and Oracle licenses as needed through a true-up process. However, while the agency tracked purchasing of licenses for its fifth software (Unison Software), it did not demonstrate that it tracked the number of licenses currently in use.

USAID partially addressed comparing the inventories of software licenses that are currently in use to purchase records on a regular basis. Specifically, USAID officials from the OCIO stated that the agency's technical points of contact who manage each software application determine whether they are over- or under-utilizing licenses by reviewing the data for each application and through the day-to-day management experience. USAID officials stated that the agency continually works with vendors and components to track and adjust licenses throughout the year based on user requirements. They

adjust the licenses as needed, and any over- or under-purchasing of licenses are resolved. For example, for the Microsoft licenses, USAID reported adjustments made in 2022 due to user growth, resulting in a total increase of \$153,380. Additionally, for ServiceNow, in 2022, the agency reported adjustments due to the addition of a new capability, resulting in a net increase of \$727,768.

However, the agency did not provide supporting documentation that it analyzed software license in use to purchase records for the remaining three most widely used software licenses.

One agency, OPM, partially addressed the activity to track licenses that are currently in use for its five most widely used software licenses and did not address the other key activity.

- **OPM.** For its Microsoft licenses, the agency provided a spreadsheet showing that it tracked its software data on quantity, usage, and adjustments of licenses. However, while the remaining four most widely used software licenses tracked the number of licenses purchased, OPM did not track the number of licenses currently in use.

OPM did not compare the inventories of software licenses that are currently in use to purchase records on a regular basis. According to its policy, the system owner (or designee) and Contracting Officer's Representative for the software publisher conduct annual reviews as part of the license or maintenance agreement reviews or renewals. According to OPM officials, when the contract is approaching the renewal period, the trend of growth or decrease of usage is evaluated by the Contracting Officer's Representative and the program/project manager. Subsequently, adjustments are made to meet the change in user demand.

OPM officials stated that its Cisco licenses are perpetual and licensed per device, which does not require an annual review. However, OPM's Software Asset Management policy states that where annual purchases are not required, vendor reviews for compliance will be conducted annually with a date predetermined based on minimizing scheduling conflicts with larger reviews. However, OPM was not able to demonstrate that it had analyzed software licenses that are currently in use to purchase records for any of its five most widely used software licenses using this process.

The remaining three agencies (Agriculture, HUD, and VA) did not address either key activity to determine whether their five most widely used software licenses were over- or under-purchased.

-
- **Agriculture.** Agriculture did not track its software licenses that are currently in use for its five most widely used software licenses. Specifically, for the five most widely used licenses, the agency provided screenshots or spreadsheets illustrating a count of licenses. However, it did not provide documentation of tracking the appropriate number of licenses for each item of software currently in use.

In addition, the agency did not compare the inventories of software licenses that are currently in use to purchase records on a regular basis. Specifically, it did not analyze usage of its most widely used software licenses per its defined process. For example, officials in Agriculture's OCIO reported that the agency does not over- or under-purchase software licenses and instead has varying processes with each vendor to analyze usage and purchase its most widely used software licenses consistent with the agency's policy and procedures. However, it was unable to provide documentation showing it had performed these reviews for any of its five most widely used software licenses. According to Agriculture officials, the mission areas determine the exact quantity needed based on their needs and thus do not over-purchase. Additionally, these officials also stated that based on its annual reconciliation or true-up process, the agency has also not identified any under-purchased licenses and noted that for one vendor there is no verification process in place between the agency and the vendor regarding the self-reported usage data used during the annual true-up process.

- **HUD.** HUD did not track software licenses that are currently in use for its five most widely used software licenses. Specifically, for the five most widely used software licenses, the agency did not provide documentation of the number of software licenses currently in use.

In addition, the agency did not compare the inventories of software licenses that are currently in use to purchase records on a regular basis. Specifically, it did not analyze usage of its five most widely used software licenses per its defined process. For example, HUD's *Information Technology Asset Management Policy* dated April 2022 states that it is to analyze usage and establish controls to ensure maximum use of installed software. According to OCIO officials, it has established varying processes with each vendor to analyze usage and purchase its most widely used software licenses. However, HUD was unable to provide documentation detailing these reviews and how it assesses its inventories and usage against installed software according to its policies. HUD officials stated that there is not a formal automated or centralized process to determine software end dates, usage, and number of active licenses. The agency reported that it

plans to obtain funding to procure a software license management solution between fiscal years 2024 to 2025.

- **VA.** VA did not track software licenses that are currently in use for all five of its most widely used software licenses. Specifically, for the five most widely used software licenses, the agency provided screenshots of count data by product, but it did not provide documentation of tracking the appropriate number of licenses for each item of software currently in use.

In addition, the agency did not compare the inventories of software licenses that are currently in use to purchase records on a regular basis. Specifically, it did not analyze usage of its five most widely used software licenses per its defined process. For example, according to VA officials, it has established varying processes with each vendor to analyze usage and purchasing of its most widely used software licenses. VA also stated that in fiscal year 2022, the agency reviewed its licenses and reported an increase of 10,000 licenses at a cost of \$678,610.40 for one of its widely used licenses, HCL Technologies. However, VA did not provide documentation as evidence of these analyses. VA officials also stated that in most software contracts, the Office of Information Technology has a contract line item to allow for purchasing of additional licenses on an as needed basis. Nonetheless, VA did not compare software licenses purchased with licenses that are currently in use, and thus, has not determined if it has over- or under-purchased these licenses. Additionally, officials stated that the Office of Information Technology utilizes the features within software products to track licenses and monitors the historical data and trends to determine if usage is increasing or decreasing. However, it did not demonstrate how it utilizes these tools to compare software licenses purchased with licenses currently in use for any of its five most widely used software licenses on a regular basis.

Agencies cited various reasons for the lack of tracking software licenses in use and comparing inventories of software licenses in use with known purchases to determine whether their five most widely used software licenses were over- or under-purchased. Specifically, six agencies (HUD, Justice, State, SSA, VA, and USAID) have not developed and implemented procedures for both activities to determine that their licenses are over- or under-purchased. The remaining three agencies (Agriculture, Energy, and OPM) developed procedures for both activities to determine that their licenses are over- or under-purchased, but did not consistently implement these procedures.

Until selected agencies consistently track software licenses that are currently in use and compare their inventories of software licenses in use to known purchases for each of their five most widely used software licenses, the agencies are likely to miss opportunities to reduce costs on duplicative or unnecessary software licenses. Additionally, by developing and implementing procedures that define the steps to be taken to determine over- and under-purchasing, including how to track licenses in use within their inventories and compare them with purchase records, agencies can better ensure they are consistently reviewing usage with what they purchased to optimize costs. As a result, agencies will be better positioned to negotiate with vendors regarding user needs when analyzing purchasing of licenses.

Conclusions

In fulfilling its vast and complex missions, federal agencies engage in thousands of software license agreements with vendors to use their products. About 10 software vendors accounted for the majority of the most widely used software licenses and licenses with the highest amounts paid across the 24 CFO Act agencies. However, the specific products across these agencies cannot be identified due to inconsistent and incomplete data. Federal initiatives are underway intended to better position agencies to maximize cost savings when purchasing software licenses.

Although essential to effective management of licenses, selected agencies have not fully determined over- or under-purchasing of their five most widely used software licenses. Until agencies consistently track their software licenses that are currently in use and compare their inventories of software licenses with known purchases, they are likely to miss opportunities to reduce costs on duplicative or unnecessary licenses.

Recommendations for Executive Action

We are making a total of 18 recommendations to nine agencies.

The Secretary of Agriculture should ensure that the agency tracks software licenses that are currently in use for its widely used licenses by, at a minimum, consistently implementing its procedures for tracking license usage. (Recommendation 1)

The Secretary of Agriculture should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should consistently implement its

procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 2)

The Secretary of Energy should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, consistently implementing its procedures for tracking license usage. (Recommendation 3)

The Secretary of Energy should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should consistently implement its procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 4)

The Secretary of HUD should ensure that the agency tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 5)

The Secretary of HUD should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 6)

The Attorney General should ensure that the Department of Justice consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 7)

The Attorney General should ensure that the Department of Justice consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 8)

The Secretary of State should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 9)

The Secretary of State should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 10)

The Secretary of Veterans Affairs should ensure that the agency tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 11)

The Secretary of Veterans Affairs should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 12)

The Director of OPM should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, consistently implementing its procedures for tracking license usage. (Recommendation 13)

The Director of OPM should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should consistently implement its procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 14)

The Commissioner of the Social Security Administration should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and

implementing procedures for tracking license usage. (Recommendation 15)

The Commissioner of the Social Security Administration should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 16)

The Administrator of USAID should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 17)

The Administrator of USAID should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 18)

Agency Comments

We provided a draft of this report to 24 agencies and OMB for their review and comment. Of the nine agencies to which we made recommendations in this report, eight agencies (Agriculture, Energy, Justice, State, VA, OPM, SSA, and USAID) agreed with the recommendations and one agency (HUD) neither agreed nor disagreed with the recommendations.

The following eight agencies agreed with our recommendations:

- In comments provided via email on December 8, 2023, an Audit Liaison Official stated that Agriculture generally concurred with the findings and recommendations in the draft report.
- In written comments, reprinted in appendix III, Energy concurred with our recommendations and stated that it plans to address our recommendations by, among other things, pursuing a new proactive strategy where software entitlements are captured in advance during the acquisition process combined with tracking through the deployment lifecycle. The department also states that the inventory of product suites procured will be periodically compared to the Master

Device Records gathered by sites to identify variances between the installed software suites and the software entitlements. The department estimates completion by September 30, 2025.

- In comments provided via email on December 1, 2023, an audit liaison from the Justice Management Division at Justice stated that the agency agrees with our recommendations.
- In written comments, reprinted in appendix IV, OPM concurred with both recommendations.
- In written comments, reprinted in appendix V, SSA agreed with the recommendations.
- In written comments, reprinted in appendix VI, State concurred with our recommendations and stated that it is in process of implementing a software solution that will consistently track software licenses currently in use and will compare the inventories of software licenses that are currently in use with information on purchased licenses.
- In written comments, reprinted in appendix VII, VA agreed with our recommendations and stated that it will provide the detailed actions planned to address both recommendations in the 180-day update to the final report.
- In written comments, reprinted in appendix VIII, USAID concurred with the recommendations and stated that the agency recently implemented a software asset management solution to track software licenses purchased and is actively working on a process and an automated solution to consistently compare the inventories of software licenses in use to purchase records.

The following agency did not state whether it agreed or disagreed with our recommendations:

- In comments provided via email on December 11, 2023, an Audit Liaison Officer from the Office of the Chief Information Officer stated that HUD had no additional comments and noted that it is in process of remediating the issue to develop and implement procedures for comparing the inventories of licenses in use to purchase records.

In addition, of the 16 agencies to which we did not make recommendations in this report, one stated that it agreed with the report (Department of Labor), and the 15 remaining agencies (Departments of Commerce, Defense, Education, Health and Human Services, Homeland Security, the Interior, NASA, Transportation, and the Treasury; and EPA, GSA, NSF, Nuclear Regulatory Commission, OMB, and the Small Business Administration) did not provide comments on the report's

findings. We also received technical comments from three agencies (Commerce, Justice, and NASA), which we have incorporated into the report, as appropriate.

We are sending copies of this report to appropriate congressional committees; the Secretaries of the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Labor, State, Transportation, the Treasury, and Veterans Affairs; the Attorney General; the Administrator of the Environmental Protection Agency; the Administrator of the General Services Administration; the Administrator of the National Aeronautics and Space Administration; the Director of the National Science Foundation; the Chairman of the Nuclear Regulatory Commission; the Director of the Office of Management and Budget; the Director of the Office of Personnel Management; the Administrator of the Small Business Administration; the Commissioner of the Social Security Administration; the Administrator of the U.S. Agency for International Development; and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions on matters discussed in this report, please contact me at (202) 512-4456 or Harriscc@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IX.



Carol C. Harris
Director, Information Technology and Cybersecurity Issues

Appendix I: Objectives, Scope, and Methodology

The objectives of this review were to identify (1) the most widely used and the highest amounts paid for software licenses by software vendor and product in the federal government, and (2) the extent to which selected agencies determined whether they purchased too many or too few software licenses.

To address our first objective, we collected and reviewed the 24 Chief Financial Officers Act of 1990 (CFO Act) agencies'¹ self-reported data of their five software vendors with the highest quantity of licenses installed² and actual total costs for fiscal year 2021, as well as their associated products and applications.³ Agencies supplemented this data with information on each of their five most widely used software licenses by vendor, including how they determined which ones were widely used and had the highest total actual costs for fiscal year 2021. Agencies also provided supporting documentation, including examples of reports from their software license inventories, contracts and license agreements containing cost data, spreadsheets of usage and purchase data, or screenshots from their automated software license management tools identifying the license usage and/or purchase data.

To determine the most widely used licenses in the federal government by vendor, we sorted the list of vendors from highest to lowest based on the frequency a vendor was cited in agency top five lists. This resulted in 36 total vendors. We used the same approach to identify the software licenses by vendor with the highest amounts paid by agencies for fiscal year 2021 across the government which resulted in 34 total vendors.

Additionally, in an effort to compare software licenses across the government, we normalized some of the agencies' software vendor names by researching and grouping common names under one category

¹The 24 Chief Financial Officers Act of 1990 agencies are the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, Transportation, the Treasury, and Veterans Affairs; the Environmental Protection Agency; General Services Administration; National Aeronautics and Space Administration; National Science Foundation; Nuclear Regulatory Commission; Office of Personnel Management; Small Business Administration; Social Security Administration; and the U.S. Agency for International Development.

²Installed licenses are software licenses deployed for use on department or agency owned or controlled computers. For purposes of this report, we used the terms "installed" and "deployed" interchangeably.

³For purposes of this report, we used the terms software application and software products interchangeably.

to ensure that the data set was consistent with other agencies' data. We were unable to determine the most widely used and highest amounts paid for software products across the government due to the challenges as discussed in this report on inconsistent and incomplete agency data.

We also interviewed agency officials responsible for software management at each of the 24 CFO Act agencies to discuss how they manage their software licenses. Additionally, we interviewed officials in the Office of Management and Budget's (OMB) Office of Federal Procurement Policy and the General Services Administration's (GSA) Federal Acquisition Service, including officials from the IT Vendor Management Office (ITVMO),⁴ to discuss any efforts that they have taken or planned to take related to managing federal agencies' software licenses.

To address the second objective, we selected a sample of CFO Act agencies based on the size of their total IT budget allocated to IT software for fiscal year 2022. Specifically, we categorized each of the 24 CFO Act agencies by the size of their IT budgets: large (over \$3 billion), medium (\$1 billion to \$3 billion), and small (less than \$1 billion). We then selected three agencies with the largest percentage of their fiscal year 2022 IT budgets allocated to IT software from each of the three budget categories. Using these criteria, we selected nine agencies: the Departments of Agriculture (Agriculture), Energy (Energy), Housing and Urban Development (HUD), Justice (Justice), State (State), and Veterans Affairs (VA); Office of Personnel Management (OPM); Social Security Administration (SSA); and U.S. Agency for International Development (USAID).

The selected agencies reported, respectively, the following as their five most widely used software licenses (by vendor), as of July 2022:

- **Agriculture:** Totara Learning, VMware, Microsoft, Salesforce, and Skillsoft;
- **Energy:** Microsoft, Adobe, ServiceNow, VMware, and Environmental Systems Research Institute;
- **HUD:** Microsoft, Salesforce, MicroStrategy, SAS Institute, and Environmental Systems Research Institute;

⁴In October 2020, OMB created the ITVMO to assist agencies when they buy commodity IT and leverage existing IT contract vehicles.

- **Justice:** International Business Machines, Oracle, Microsoft, Adobe, and LexisNexis;
- **State:** Oracle, Microsoft, Symantec, Entrust, and ServiceNow;
- **VA:** Microsoft (identified twice by VA), HCL Technologies, 1E, and Raytheon Technologies;
- **OPM:** Microsoft, SentinelOne, Cisco, Oracle, and VMware;
- **SSA:** McAfee, Quest Software, Microsoft, International Business Machines, and Broadcom; and
- **USAID:** Google, Microsoft, ServiceNow, Oracle, and Unison Software.

We reviewed federal requirements,⁵ OMB guidance,⁶ and leading software license management practices identified from our prior work.⁷ We selected the practices of tracking and maintaining software inventories and analyzing the software data for decision making. We selected these practices because they aligned closely with assessing purchasing of software licenses against usage. From these practices, we identified key activities to assess the appropriate number of software licenses. These two activities are: (1) tracking software licenses that are currently in use and (2) regularly comparing the inventories of software licenses that are currently in use to purchase records.

For each selected agency's five most widely used software licenses, we compared software license usage and purchase data to these key activities. To determine an overall rating, we summarized the results of our assessment of the evaluation criteria as:

- Fully met—the agency provided evidence which showed that it fully or largely addressed the elements of the criteria.
- Partially met—the agency provided evidence that showed it had addressed at least part of the criteria.

⁵Making Electronic Government Accountable by Yielding Tangible Efficiencies Act of 2016, or the "MEGABYTE Act" further enhances federal agency Chief Information Officers' management of software licenses, among other requirements. Pub. L. No. 114-210, 130 Stat. 824 (2016).

⁶Office of Management and Budget, *Category Management Policy 16-1: Improving the Acquisition and Management of Common Information Technology: Software Licensing*, M-16-12 (Washington, D.C.: June 2, 2016).

⁷GAO, *Federal Software Licenses: Better Management Needed to Achieve Significant Savings Government-Wide*, [GAO-14-413](#) (Washington, D.C.: May 22, 2014).

- Not met—the agency did not provide evidence that it had addressed any part of the criteria.

Specifically, we collected and reviewed relevant software license documentation including license agreements and software contracts, and spreadsheets with software license usage and purchase data, annual renewal market assessment reports, and screenshots or reports generated from automated inventory tools related to usage and purchasing of licenses (e.g., reconciliation reports). We also reviewed any increases or decreases of the number of software licenses in calendar year 2022.

To assess the reliability of the data selected agencies provided from their software license inventories, we reviewed the documentation (e.g., reports) related to license usage and purchases for obvious issues and for completeness, including missing or questionable values. We also reviewed each agency's responses to questions about efforts to ensure the reports from their inventories are accurate and complete. We determined that the agencies' data were sufficiently reliable for the purposes of this report, which was to determine whether agencies had over- or under-purchased their five most widely used software licenses. Even though we found the data to be sufficiently reliable for the purposes of this report, we identified that agencies reported inconsistent and incomplete data, including usage and granular prices for their specific software products.

We also assessed selected agencies' policies, procedures, and guidance related to their software license management efforts, including any related to determining over- and under-purchasing of software licenses. Moreover, we interviewed agency officials responsible for software license management within the Office of the Chief Information Officer to discuss their policies and processes for managing software licenses including how they determine if licenses are over- or under-purchased. We also interviewed other appropriate offices of each of the agencies. We also focused on the agency's efforts at the departmental or agency level.

We conducted this performance audit from January 2022 to January 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to 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.

Appendix II: Frequently Reported Software Vendors by Agencies

Each of the 24 Chief Financial Officers Act of 1990 agencies reported their five most widely used software licenses and the licenses with the highest amounts paid by vendors.¹ Among these licenses, 10 vendors accounted for about 73 percent of the most widely used software licenses, as of July 2022, and nine vendors accounted for about 77 percent of the licenses with the highest amounts paid for fiscal year 2021. Table 3 provides a description of these vendors and whether they were identified as one of the most widely used software licenses or licenses with the highest amounts paid by agencies.

Table 3: Description of the Software Vendors Frequently Reported across Federal Agencies as Most Widely Used or with Highest Amounts Paid

Software vendor name	Software vendor description	Identified as one of the most widely used, as of July 2022	Identified as one of the highest amounts paid for fiscal year 2021
Adobe	Adobe is a computer software company. It specializes in software products used across all types of print and electronic media. It is used for its multimedia and creativity software.	√	√
Cisco	Cisco is a digital communications technology company. It provides software-defined networking, cloud, and security solutions.	√	√
Google	Google is a technology company that provides online advertising, search engine technology, cloud computing, computer software, quantum computing, e-commerce, artificial intelligence, and consumer electronics.	√	N/A
International Business Machines	International Business Machines is a technology company. It provides hardware, software, cloud-based services, and cognitive (data analytics) computing.	√	√
McAfee	McAfee is a computer security software company that provides antivirus and identify theft services.	√	√
Microsoft	Microsoft is a technology company. It provides a multitude of operating systems, server applications, software development, and cloud enterprise technology and services.	√	√
Oracle	Oracle is a computer technology company. It provides cloud applications across business functions, such as enterprise resource planning, supply chain management, and human capital management. It also provides database software and technology.	√	√

¹The data does not include the Department of Health and Human Services because they were unable to provide the software license vendors with the highest amounts paid for fiscal year 2021. According to officials, a research tool to report this type of data was not operational at the time.

Appendix II: Frequently Reported Software Vendors by Agencies

Software vendor name	Software vendor description	Identified as one of the most widely used, as of July 2022	Identified as one of the highest amounts paid for fiscal year 2021
Salesforce	Salesforce is a cloud-based software company that provides customer relationship management software and applications focused on sales, customer service, marketing automation, e-commerce, analytics, and application development.	√	√
ServiceNow	ServiceNow is a software company that develops a cloud computing platform to help agencies manage digital workflows for enterprise operations.	√	√
VMware	VMware is a cloud computing and virtualization technology company that provides multi-cloud services for applications.	√	√

Legend:

√ - the agency identified the software vendor as one of the most widely used as of July 31, 2022, or one of the vendors with the highest amounts paid for fiscal year 2021.

N/A – the agency did not identify the software vendor as one of the vendors with the highest amounts paid for fiscal year 2021.

Source: GAO analysis of software vendor websites and agencies subject to the Chief Financial Officers Act of 1990, except the Department of Health and Human Services. | GAO-24-105717

Appendix III: Comments from the Department of Energy



Department of Energy
Washington, DC 20585

December 28, 2023

Carol C. Harris
Director of Information Technology and Cybersecurity Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Carol C. Harris,

The Department of Energy (DOE or Department) appreciates the opportunity to provide a response to the Government Accountability Office's (GAO) Draft report titled, GAO Draft Report: *Federal Software Licenses: Agencies Need to Take Action to Achieve Additional Savings (GAO-24-105717)*. DOE concurs with each of the two (2) recommendations listed in the report. DOE plans to implement the activities as described in the enclosure.

GAO should direct any questions to Bridget Carper, Deputy Chief Information Officer for Architecture, Engineering, Technology, and Innovation at Bridget.Carper@hq.doe.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann Dunkin".

Ann Dunkin
Chief Information Officer

Enclosure



Printed with soy ink on recycled paper

Enclosure

MANAGEMENT RESPONSE

GAO Draft Report, *Federal Software Licenses: Agencies Need to Take Action to Achieve Additional Savings (GAO-24-105717)*

Recommendation 3: The Secretary of Energy should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, consistently implementing its procedures for tracking license usage.

Management Response: *Concur*

Tracking software entitlements¹ and software use has typically been accomplished after the fact based on discovery of installed software using commonly used discovery tools. GAO's report notes that the basis upon which software is licensed has become increasingly complex with products licensed by individual and concurrent users, devices, capacity, and enterprise. Wide adoption of mobile devices and cloud services, and in particular software as a service (SaaS), adds significant complexity. The changes require a fundamentally different approach to acquiring and managing software. Thus, DOE plans a new approach to tracking software entitlements and use to better meet the objectives of the MEGABYTE Act.

DOE will pursue a new proactive strategy where software entitlements are captured in advance during the acquisition process combined with tracking through the deployment lifecycle. This approach will simplify the complexity of tracking software entitlements and usage across all platforms, environments, and licensing models and will enhance the accuracy and timeliness of both entitlements and use. The DOE Office of the Chief Information Officer (OCIO) will develop a new tool – utilizing current methodologies to support this strategy, pending funding availability. Under the new strategy, software vendors will directly enter SKUs for their products into the new tool. Departmental Elements will identify target quantities by SKUs, thus allowing DOE to consolidate procurements. Systems administrators will identify software at the time of installation by SKU allowing total entitlements to be immediately compared to installed quantities. This tracking of entitlements and usage will support an annual true-up (under entitled) and true-down (over entitled) agreements that DOE established with our vendors.

DOE will establish enterprise license agreements or conduct consolidated procurements for the most costly software suites identified by GAO to the extent they are used within DOE. This will be accomplished by fourth quarter of FY 2025. The DOE strategy aligns with the GAO report, which is focused on the most costly software suites where major savings can be achieved. Focusing on the same product suites will allow federal agencies to measure collective progress and accurately compare costs and savings. This will inform the Office of Management and Budget Information Technology Vendor Management Office as it prioritizes cross-government procurement solutions.

DOE will develop a detailed implementation plan by the fourth quarter of FY 2024. The plan will be developed with key stakeholders from the DOE Enterprise Architecture Review Board, to include OCIO, DOE's Procurement Office, and the Office of the Chief Financial Officer. OCIO

Appendix III: Comments from the Department of Energy

Enclosure

will consult with the Enterprise Architecture Review Board on the specific software suites for which licensing should be coordinated at the DOE level.

Estimated Completion Date: September 30, 2025

Recommendation 4: The Secretary of Energy should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce licenses on a regular basis. At a minimum, it should consistently implement its procedures for comparing the inventories of licenses in use to purchase records.

Management Response: *Concur*

The inventory of product suites procured will be periodically compared to the Master Device Record gathered by sites as part of the Continuous Diagnostics and Mitigation (CDM) program to identify variances between the installed software suites and the software entitlements. Sites that have not yet implemented the CDM tools will continue to provide software inventories to OCIO in response to regular data requests.

As a second validation, industry partners will be asked to extract information from the vendor's sales information records to identify DOE purchases by site. Gaps will be identified, and mitigations will be implemented to resolve any inconsistencies.

The accuracy of entitlements and usage will be greatly enhanced by comparing DOE purchase data with usage data collected through CDM and the sales records of the vendors. The usage validation will help reduce the extent of over entitlements.

The enterprise agreements for high-use product suites will form the core of the preferred products for use across the enterprise. Favorable pricing achieved through enterprise agreements will drive adoption and consolidation. OCIO will monitor appropriate use of enterprise agreements when it reviews planned IT procurements, as required by FITARA.

Estimated Completion Date: September 30, 2025

¹ Software entitlements represent software that has been purchased, leased, or licensed by or billed to an agency under any contract or other business arrangement and is subject to use limitations.

Appendix IV: Comments from the Office of Personnel Management



Office of the
Chief Information
Officer

UNITED STATES OFFICE OF PERSONNEL MANAGEMENT
Washington, DC 20415

December 13, 2023

Niti Tandon
Assistant Director, Information Technology and Cybersecurity Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Tandon:

Thank you for the opportunity to respond to the Government Accountability Office (GAO) draft report, Federal Software Licenses – Agencies Need to Take Action to Achieve Additional Savings, GAO-24-105717.

Responses to the recommendations are below.

Recommendation #13: The Director of OPM should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, consistently implementing its procedures for tracking license usage.

Management Response: The Office of Personnel Management (OPM) concurs with the GAO's recommendation to ensure consistent tracking of software licenses currently in use, particularly for widely used licenses.

Recommendation #14: The Director of OPM should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should consistently implement its procedures for comparing the inventories of licenses in use to purchase records.

Management Response: OPM concurs with the recommendation to compare the inventories of software licenses that are currently in use with information on purchased licenses.

**Appendix IV: Comments from the Office of
Personnel Management**

Federal Software Licenses – Agencies Need to Take Action to Achieve Additional Savings
(Report No. GAO-24-105717)

I appreciate the opportunity to respond to this draft report. If you have any questions regarding our response, please contact Mark Lambert ((202) 606-2980, mark.lambert@opm.gov).

Sincerely,

GUY CAVALLO Digitally signed by GUY CAVALLO
Date: 2023.12.14 11:31:55 -05'00'

Guy Cavallo
Chief Information Officer
U.S. Office of Personnel Management

Appendix V: Comments from the Social Security Administration



SOCIAL SECURITY
Office of the Commissioner

December 12, 2023

Carol C. Harris
Director, Information Technology and Cybersecurity Issues
United States Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Director Harris,

Thank you for the opportunity to review the draft report "Federal Software Licenses: Agencies Need to Take Action to Achieve Additional Savings" (GAO-24-105717). We agree with the recommendations.

Please contact me at (410) 965-2611 if I can be of further assistance. Your staff may contact Trae Sommer, Director of the Audit Liaison Staff, at (410) 965-9102.

Sincerely,

A handwritten signature in blue ink that reads "Scott Frey".

Scott Frey
Chief of Staff

Appendix VI: Comments from the Department of State



United States Department of State
Comptroller
Washington, DC 20520

December 20, 2023

Jason Bair
Managing Director
International Affairs and Trade
Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20548-0001

Dear Mr. Bair:

We appreciate the opportunity to review your draft report, "FEDERAL SOFTWARE LICENSES: Agencies Need to Take Action Additional Savings." GAO Job Code 105717.

The enclosed Department of State comments are provided for incorporation with this letter as an appendix to the final report.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Walsh".

James A. Walsh

Enclosure:
As stated

cc: GAO – Carol C. Harris
OIG - Norman Brown

Department of State Response to GAO Draft Report

**FEDERAL SOFTWARE LICENSES: Agencies Need to Take Action to Achieve
Additional Savings**
(GAO-24-105717, GAO Code 105717)

Thank you for the opportunity to comment on the GAO draft report,
*“Federal Software Licenses: Agencies Need to Take Action to Achieve
Additional Savings.”*

Recommendation: *The Secretary of State should ensure that the agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 9)*

Response: The department of State concurs with the recommendation. The Department is in the process of implementing a software solution that will consistently track software licenses currently in use for our enterprise agreements, which includes the most widely licensed software products. This software solution is the Service Now Software Asset Management (SAM) module. Our process will be one of reconciling licenses that have been bought versus what is deployed on the network. ITA/SSM is working closely with the Discovery team and Configuration Management Database (CMDB) teams to improve data quality so that the install records will be usable for software reporting.

Recommendation: *The Secretary of State should ensure that the agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 10)*

2

Response: The Department of State concurs with the recommendation. The Department is in the process of implementing a software solution that will compare the inventories of software licenses that are currently in use with information on purchased licenses. This will allow the Department to identify opportunities to potentially reduce costs and better inform investment decision-making for the most widely used software in the Department. Once data quality issues have been resolved with the configuration management database, and the discovery team is capturing data from the totality of the Department's Network(s), we will have an automated process by which to monitor license usage and the number of licenses purchased.

Appendix VII: Comments from the Department of Veterans Affairs



DEPARTMENT OF VETERANS AFFAIRS
WASHINGTON

Ms. Carol C. Harris
Director
Information Technology and Cybersecurity Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Harris:

The Department of Veterans Affairs (VA) has reviewed the Government Accountability Office (GAO) draft report: **FEDERAL SOFTWARE LICENSES: Agencies Need to Take Action to Achieve Additional Savings** (GAO-24-105717).

The enclosure contains the action plan to address the draft report recommendations. VA appreciates the opportunity to comment on your draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Kimberly Jackson", with a long horizontal line extending to the right.

Kimberly Jackson
Chief of Staff

Enclosure

Attachment

The Department of Veterans Affairs (VA) Comments to
the Government Accountability Office (GAO) Draft Report
**FEDERAL SOFTWARE LICENSES: Agencies Need to Take Action
to Achieve Additional Savings**
(GAO-24-105717)

Recommendation 1: The Secretary of Veterans Affairs should ensure that the agency tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage. (Recommendation 11).

VA Comment: Concur. VA agrees with GAO's conclusions and concurs with its recommendation to the Department. VA established an Enterprise Software Asset Management Integrated Product Work Group in October 2023 to address the agency's enterprise license agreements. VA will provide the detailed actions planned to address this GAO draft report recommendation in the 180-day update to the final report.

Recommendation 2: The Secretary of Veterans Affairs should ensure that the agency compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records. (Recommendation 12).

VA Comment: Concur. VA agrees with GAO's conclusions and concurs with GAO's recommendation to the Department. VA is working to identify opportunities to reduce costs and better inform investment making decisions using true up and true down provisions, where applicable, to adjust quantities purchased based on any usage metrics available. VA will provide the detailed actions planned to address this GAO draft report recommendation in the 180-day update to the final report.

Appendix VIII: Comments from the U.S. Agency for International Development



December 15, 2023

Carol C. Harris
Director, Information Technology and Cybersecurity Issues
U.S. Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20226

Re: Federal Software Licenses: Agencies Need to Take Action to Achieve Additional Savings
(GAO-24-105717)

Dear Ms. Harris:

I am pleased to provide the formal response of the U.S. Agency for International Development (USAID) to the draft report produced by the U.S. Government Accountability Office (GAO) titled, Federal Software Licenses: Agencies Need to Take Action to Achieve Additional Savings: (GAO-24-105717).

USAID concurs with the recommendations in the report. The Agency recently implemented a software asset management solution to track software licenses purchased, following the GAO report findings. USAID is actively working on a process and an automated solution to consistently compare the inventories of software licenses in use to purchase records.

I am transmitting this letter and the enclosed comments from USAID for inclusion in the GAO's final report. Thank you for the opportunity to respond to the draft report, and for the courtesies extended by your staff while conducting this engagement. We appreciate the opportunity to participate in the complete and thorough evaluation of our Software License management and tracking.

Sincerely,

Colleen Allen

Colleen Allen
Assistant Administrator
Bureau for Management

Enclosure: a/s

**COMMENTS BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT ON THE DRAFT
REPORT PRODUCED BY THE U.S. GOVERNMENT ACCOUNTABILITY OFFICE (GAO) titled, Federal
Software Licenses: Agencies Need to Take Action to Achieve Additional Savings
(GAO-24-105717)**

The U.S. Agency for International Development (USAID) would like to thank the U.S. Government Accountability Office (GAO) for the opportunity to respond to this draft report. We appreciate the extensive work of the GAO engagement team, and the specific findings that will help USAID achieve greater effectiveness in our software license management effort.

Recommendation 1: The Administrator of USAID should ensure that the Agency consistently tracks software licenses that are currently in use for its widely used licenses by, at a minimum, developing and implementing procedures for tracking license usage.

Response: USAID agrees with this recommendation. As part of addressing the GAO findings, USAID will implement a software asset management solution to track software licenses that are currently in use, including the widely used licenses, as it matures its Asset Management Program. USAID recently automated the contract renewal workflow to notify responsible parties of contracts nearing their expiration date or are already expired as an initial step towards tracking license usage. This workflow ensures that the software inventory is kept up to date through automated alerts and notifications for when to retire old licenses and deploy new ones after renewal. It streamlines and enhances the management of the contract renewals process. Leveraging the existing Enterprise Discovery efforts, the next phase will ensure the completeness and correctness of the data, to include the defined widely used licenses. USAID's targeted action completion date is 12/31/2024.

Recommendation 2: The Administrator of USAID should ensure that the Agency consistently compares the inventories of software licenses that are currently in use with information on purchased licenses to identify opportunities to reduce costs and better inform investment decision making for its widely used licenses on a regular basis. At a minimum, it should develop and implement procedures for comparing the inventories of licenses in use to purchase records.

Response: USAID agrees with this recommendation. USAID is actively working on a process and an automated solution to consistently compare the inventories of software licenses in use to purchase records. The automated solution will reconcile software rights owned against software installed using Enterprise Discovery and software entitlements. This allows Contracting Officer's Representatives (CORs) and technical points of contact to determine the appropriate remediation options (e.g., reduce or increase the number of licenses). USAID will work towards developing and implementing procedures for comparing the inventories of software licenses in use to purchase records. USAID's targeted action completion date is 12/31/2024.

Appendix IX: GAO Contact and Staff Acknowledgments

GAO Contact

Carol C. Harris, (202) 512-4456, or HarrisCC@gao.gov

Staff Acknowledgments

In addition to the contact named above, Niti Tandon (Assistant Director), Angela Watson (Analyst in Charge), Amanda Andrade, Tasha Beyzavi, Christopher Businsky, Donna Epler, Rebecca Eyler, Franklin Jackson, Teresa Smith, Andrew Stavisky, Emmet Ryan, Adam Vodraska, and Holly Williams made key contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through our website. Each weekday afternoon, GAO posts on its [website](#) newly released reports, testimony, and correspondence. You can also [subscribe](#) to GAO's email updates to receive notification of newly posted products.

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <https://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [Email Updates](#). Listen to our [Podcasts](#).
Visit GAO on the web at <https://www.gao.gov>.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact FraudNet:

Website: <https://www.gao.gov/about/what-gao-does/fraudnet>

Automated answering system: (800) 424-5454 or (202) 512-7700

Congressional Relations

A. Nicole Clowers, Managing Director, ClowersA@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548

Strategic Planning and External Liaison

Stephen J. Sanford, Managing Director, spel@gao.gov, (202) 512-4707
U.S. Government Accountability Office, 441 G Street NW, Room 7814,
Washington, DC 20548

