MANAGEMENT AUDIT REPORT

OF

PERSONAL COMPUTER LICENSING

REPORT NO. 04-107

City of Albuquerque
Office of Internal Audit and Investigations

City of Albuquerque
Office of Internal Audit and Investigations
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Accountability in Government Oversight Committee
City of Albuquerque
Albuquerque, New Mexico 87102

Audit: Personal Computer Licensing
         04-107

FINAL

INTRODUCTION

Software is one of the most valuable technologies of the Information Age. The illegal copying and distribution of software persists globally. One in four software programs in the United States is unlicensed. Software is important to every business, government, school, and consumer. Many organizations do not manage software as they would any other valuable asset. Poor software management can cost an entity not only in terms of legal and financial risk but also in terms of lost efficiency and productivity.

When software is purchased, the buyer does not become the owner of the copyright. Instead, the buyer purchases the right to use the software under certain restrictions imposed by the license accompanying it. In addition to the legal consequences, using copied or counterfeit software means:

- Greater exposure to software viruses
- Inadequate or no documentation
- Lack of technical product support
- Ineligibility for software upgrades

Computer software is protected by U.S. copyright laws, U.S. code Title 17 and 18. Software theft is stealing. The City could be held liable under both civil and criminal law. A civil action could include the owner immediately preventing the City from using the software and monetary damages. The software owner can choose between actual damages, which includes the amount it

has lost due to the infringement as well as any profits attributable to the infringement and statutory damages, which can be as high as $150,000 per program copied. In addition, the government could criminally prosecute the City for copyright infringement. The conviction would include a fine up to $250,000, or 5 years in jail, or both.

The Office of Internal Audit and Investigations (OIAI) conducted an audit of Personal Computer Licensing as part of the FY 2004 audit plan.

AUDIT OBJECTIVES

The objectives of our audit were to determine:

- Does each department have policies regarding software controls and the structure to implement the controls?

- Are purchasing controls designed to encourage and enhance compliance with software licensing requirements?

- Is software, loaded on desktop computers, used in accordance with licensing and copyright regulations?

- Do any City computers contain unlicensed software?

- Do performance measures exist for software licensing citywide?

SCOPE

Our audit did not include an examination of all aspects of software licensing. Our audit test work was limited to licenses for software loaded on a sample of City computers for the period of June 1, 2004 thru June 30, 2004.

This report and its conclusions are based on information taken from a sample of transactions and do not purport to represent an examination of all related transactions and activities. A review of internal controls relating to software licensing was made to assure management that City policies and regulations regarding software licensing are being properly administered. The audit report is based on our examination of activities through the completion date of our fieldwork, and it does not reflect events after that date.

The audit was conducted in accordance with Government Auditing Standards, except Standard 3.49, requiring an external quality control review. The audit was also conducted in accordance with Control Objectives for Information and related Technology (COBIT) Audit Guidelines, of the IT Governance Institute. These guidelines enable the auditor to review specific Information

Technology (IT) processes against COBIT's recommended Control Objectives to help assure management where controls are sufficient. These guidelines also advise management where processes need to be improved.

METHODOLOGY

We reviewed a statistical sample of 89 users which included users within the Office of Internal Audit and Investigations to determine if they were using software that is not licensed. We reviewed the following for each department: 1) Control environment, 2) Software acquisition procedures, 3) Software installation and management, and 4) Performance measures for software licensing.

FINDINGS

The following findings concern areas that we believe could be improved by the implementation of the related recommendations.

1.   THE CAO SHOULD ENSURE THAT ALL EMPLOYEES ARE AWARE OF THE CITY'S SOFTWARE LICENSING POLICIES.

Software Licensing Policies and Software Licensing Review Process and Guidelines were written and published in July 1993. They have never been revised/reissued. The Software Code of Ethics is no longer included as part of the City of Albuquerque's Code of Ethics.

OIAI tested the software applications on the desk top computers of 89 user names and determined the following:

- 76 contained software that is not licensed.
- 8 had non-city approved instant messaging software.
- 8 had the same application loaded, but only one license was purchased.
- 6 were accessed using a generic user id.
- 5 contained personally owned software.
- 3 had dial-up access via modems.
- 2 had transferred applications that were not removed from the desktops in which they were initially loaded.
- 1 contained 2 remote access applications.

In addition, while we were reviewing software licensing logs, we found the following:

- Five desktop computers had the same application loaded, but only one license was purchased.

- A software application loaded on 17 separate desktop computers, but only 3 licenses were located.

The City of Albuquerque Software Code of Ethics states, "All employees shall use software only in accordance with its license agreement."

City IT policy states:

> No remote connectivity software (i.e. PC Anywhere, Procomm, etc.) will be used to connect to the City's network in any way unless approved in advance and then registered with the Technical Review Committee (TRC).

> The installation and/or use of instant messaging software and facilities other than those approved for use in conducting official City business are prohibited. Personal or non-City business use is prohibited in all instances.

> City information technology facilities shall not be used to access personal, non-City e-mail accounts, (e.g., AOL, Hotmail, MSN), addresses or mailboxes. City e-mail users shall not automatically forward e-mail messages from personal or non-City e-mail accounts to any City e-mail account or address.

City Software Licensing Policies and Guidelines state:

> A singled licensed copy of a software application can be installed and used on only one computer at a time.

> Employees are not permitted to bring software from home and load it on City computers. All software used by the City on City computers will be properly purchased through appropriate procedures.

City IT policy, does not state what the consequences are for employees who violate Software Licensing agreements.

> RECOMMENDATION

> The CAO should ensure that all employees are aware of the City's Software Licensing Policies and understand the seriousness of the consequences if they are violated.

> The CAO should ensure that disciplinary consequences for employees who violate licensing policies are a part of the Software Code of Ethics.

RESPONSE FROM THE CAO

"The CAO agrees that the use of unlicensed software represents a risk to the City and notes that the City has expended significant resources on bringing software licensing into compliance over the last eighteen to twenty-four months.

"However, the CAO respectfully disagrees with some of the specific findings as noted below:

- *"Of the 76 computers found to contain software that was not licensed, 53 of them had software that is not required to be licensed if it has been installed for use for thirty days or less. This particular software is not often needed by City users so the 30-day installation option is often used when there is a need. Because the test period for this audit was the month of June, 2004, it seems more likely than not that this finding of non-compliance is overstated;*
- *"Of the six computers found to be accessible using a generic user id, all six are located in either a security environment or a 24/7 operation. Use of a generic id is permitted under these circumstances with approval from the Information Systems Committee (ISC) or the Technical Review Committee (TRC).*
- *"The use of dial-up modems is permitted with ISC and or TRC approval for specific instances involving law enforcement or public safety applications where it is desirable that the user not be identified as the City.*

"The CAO notes that many of the findings in this audit are based on two documents (Software Licensing Policies and Software Licensing Review Process and Guidelines) published in 1993. It appears these two documents were provided to OIAI by a long-time employee of DFAS/ISD even though they have been out of circulation and common use for many years and, in many cases, the policies and guidelines promulgated in those documents are outdated, no longer best practice, or have been superseded by policies, standards and guidelines issued by the ISC which was created by Ord. 46-1990 to "study and establish standards governing the city's acquisition and use of information technology.

"In July, 2005, the ISC adopted an Employee IT Security Certification Policy to ensure that every employee who uses City information technology assets is regularly informed of expectations concerning the safe and secure use of those assets. Work on the subject areas and

testing methods is almost complete and DFAS/ISD anticipates that initiation of the annual certification process will be completed by June, 2006.

"The CAO has requested that the Human Resources Department modify the New Employee Orientation curriculum to include a section about the proper use of City IT assets, including software licensing compliance."

<u>AUDITOR'S COMMENT</u>

The CAO's response states that the software in question "is not required to be licensed if it has been installed for use for thirty days or less." *The software license states that "one copy" of the software may be used "on one (1) computer or workstation, for evaluation purposes without charge for a period of 21 days."*

The CAO's response states, "This particular software is not often needed by City users so the 30-day installation option is often used when there is a need." *The CAO should instruct City users to track their time when using the application in question.*

The CAO's response states "Use of a generic id is permitted under…circumstances with approval from the Information Systems Committee (ISC) or the Technical Review Committee (TRC)." *According to the <u>Approved Exceptions to User ID Security Policy</u>, "No exceptions have been granted at this time."*

The CAO's response states, "The use of dial-up modems is permitted with ISC and or TRC approval for specific instances involving law enforcement or public safety applications where it is desirable that the user not be identified as the City." *The dial-up modem in question was not approved by ISC and or TRC, and does not involve law enforcement or public safety applications.*

The CAO's response states, that the Software Licensing Policies and Software Licensing Review Process and Guidelines "have been superseded by policies, standards and guidelines issued by the ISC." *The Office of Internal Audit and Investigations has inquired with ISD and researched the <u>Information Technology Policies and Standards</u> and has not found any policies, standards or guidelines superseding either of the documents in question.*

2.   DFAS/ISD MANAGEMENT SHOULD REGULARLY REVIEW AND UPDATE SOFTWARE LICENSING POLICIES AND GUIDELINES.

Software Licensing Policies (policies) and Software Licensing Review Process and Guidelines (guidelines) have not been updated since July 1993. DFAS/ISD management does not review these policies and guidelines on a regular basis.

The Control Objectives for Information and related Technology (COBIT) – Plan and Organize (PO6.5), Maintenance of Policies, state:

"Establishing a regular maintenance programme for policies in line with control practices will help:

- Ensure frequent updates to accommodate new business and IT threats
- Promote management's endorsement of and commitment to the validity of the information contained in organizational policies."

ISD management stated that the Software Licensing Policies and Review Processes and Guidelines have not been updated for the following reasons:

- There was a change in management in the mid 1990s
- Other issues such as Y2K and Enterprise Resource Planning have taken a higher priority
- ISD management did not know that the 1993 policy and guidelines existed until the issue of Software Licensing was brought to their attention by the Office of Internal Audit and Investigations (OIAI).

If policies and guidelines are not regularly updated, revised, and re-issued City employees will not be aware of or know that they need to follow them.

RECOMMENDATION

DFAS/ISD management should regularly review and update software licensing policies and guidelines. DFAS/ISD should make departments aware of changes and updates to software policies and guidelines.

The CAO should ensure that departments follow software licensing policies and guidelines.

RESPONSE FROM THE CAO AND DFAS/ISD

"The CAO and DFAS/ISD respectfully submit that it is the responsibility of the ISC to ensure that policies, standards, guidelines and procedures regarding the acquisition, implementation and use of all City IT assets are current and reflect best practices.

"DFAS/ISD monthly holds an IT Users Group meeting for the purpose of making departmental IT liaisons aware of changes in policies, standards, guidelines and procedures. In addition, DFAS/ISD will assume responsibility to post new or revised policies, standards, guidelines and procedures to the employee intranet no later than July, 2006."

3.   THE CAO SHOULD ENSURE THAT CITY DEPARTMENTS FOLLOW SOFTWARE LICENSING POLICIES AND GUIDELINES.

OIAI conducted interviews with 29 departments/divisions using a questionnaire to review 1) Control environment, 2) Software acquisition procedures, 3) Software installation and management, and 4) Performance measures for software licensing.

Our interviews revealed the following for the departments/divisions interviewed:

- Twenty-four do not maintain a separate register listing of all software within the department/division
- Twenty-two do not explain the City's software licensing policies/guidelines to new hires or transfers
- Eighteen do not regularly educate their employees about software copyright compliance
- Thirteen do not store software centrally within the department/division
- Eight do not register software after the initial purchase
- Six do not retain and file software license agreements
- Six do not have a software manager
- Four do not authorize or purchase software centrally within the department/division
- Two do not analyze software licenses based on the expected use of the software

City departments/divisions are not following City software licensing policies and guidelines.

If software is not centrally managed, or inventoried by each department/division, the City will not have a complete record of all software that has been purchased for City

computers. If departments/divisions do not analyze software licenses based on the number of users, the City may purchase too few licenses. A software application might get loaded on more computers than the license permits.

If software is not registered: the vendor may not have record of the City's ownership; the software may get loaded on too many computers and place the City in violation of the software usage agreement; the City might not be eligible for technical product support that is normally available to licensed users who have registered their software with the vendor. If there is not a complete record of all software purchased, the City may be unaware that it is at risk of illegal software use.

The City of Albuquerque Software Licensing Policies states the following:

- "Each Department is required to assign a departmental software manager."
- "The Departmental Software Manager is responsible for completing the registration card and returning it to the software publisher."
- "The Departmental Software Manager shall maintain a register of all of the department's software and shall keep a library of software licenses."

The City of Albuquerque Software Licensing Review Process and Guidelines states the following:

- "New employees must receive a copy of the Employee Code of Ethics (Software Licensing Policies, Page 4) and a copy of the City of Albuquerque Software Policy (Software Licensing Policies, Pages 1, 2 and 3)."
- The Department will be sure that all employees are provided with the Policy and informed of employee accountability and will decide on disciplinary action for software license violations."
- "Software will be centrally managed by the Departmental Software Manager."
- "Each Department is required to complete a software inventory annually and report the results to the Department's Director and City-wide Software License Coordinator."

The Software Code of Ethics section was removed from the City Personnel Rules and Regulations February 1, 2001, and has never been reinstated.

      RECOMMENDATION

      The CAO should include representation from ISD as part of the new employee orientation process. The ISD representative(s) could discuss important Information Technology issues, such as software licensing and use of City computers.

The CAO should develop a new Software Code of Ethics and set it up as an electronic certification process that employees are required to complete on an annual basis. New employees should be required to complete this process prior to receiving access to City computer systems.

RESPONSE FROM THE CAO

"As noted in the response to Finding Number 1, the CAO has requested that New Employee Orientation be modified to include a component on the proper use of City IT assets.

"As noted in the response to Finding Number 1, DFAS/ISD expects to implement an electronic annual certification process by June, 2006."

4.   DFAS SHOULD RE-INSTATE THE CITY-WIDE SOFTWARE LICENSING COORDINATOR POSITION.

ISD no longer has a City-wide Software Licensing Coordinator. The last person to hold this position transferred to another position six years ago. The position was eliminated during the FY1999 budget cycle.

The City of Albuquerque Software Policy states, "The Information Services Division will assign a City-wide Software Coordinator who will provide guidance to the Departments when required."

The Control Objectives for Information and related Technology (COBIT) – Plan and Organize (PO8.4), Privacy, Intellectual Property and Data Flow, state:

"Compliance with privacy, intellectual property, and data flow requirements in line with the control practices will avoid costly legal disputes and reputational damage as a result of infringing on privacy and intellectual property rights."

When the Software Licensing Coordinator position was eliminated, there was no longer anyone to provide software licensing guidance to City departments. Without proper guidance departments might be less likely to follow and enforce software licensing guidelines. The risk of copyright infringement might be greater, and controls in place to protect the integrity of the City's computer environment from viruses may decrease.

RECOMMENDATION

DFAS should re-instate the City-wide Software Licensing Coordinator position.

RESPONSE FROM DFAS/ISD

"Rather than adding another position, DFAS/ISD is exploring different ways to exercise more control over the software licensing issue in the City. For example, as computer equipment is replaced, ZenWorks is installed on each machine. This automated monitoring tool can be very effective in a non-centralized environment.

"Currently the City contracts the service of deployment of new computers. The vendor accepts shipment of the computers, installs the software specified for each one and delivers them to the departments, along with the applicable software license(s). The vendor provides the City with a list of the equipment received and deployed. DFAS/ISD will discuss with the vendor possible alternative methods of controlling the software licenses along with the computer hardware that is delivered to the Departments."

5.   THE CAO SHOULD ENSURE THAT THE SOFTWARE CODE OF ETHICS IS INCLUDED AS PART OF THE CITY OF ALBUQUERQUE PERSONNEL RULES AND REGULATIONS.

The Software Code of Ethics is no longer part of the Personnel Rules and Regulations.

The Control Objectives for Information and related Technology (COBIT) – Plan and Organize (PO6.6), Compliance with Policies, Procedures and Standards, state:

"Requiring compliance with organizational policies, procedures and standards in line with control practices will:

- Raise awareness about risks to information systems and networks
- Educate employees on the policies, practices, measures and procedures available to address risk
- Result in a level of competence that will allow individuals to accomplish their assigned duties
- Promote a culture of security throughout the organization."

When the Personnel Rules and Regulations were updated on February 1, 2001 the Software Code of Ethics was not included.

If the Software Code of Ethics is not included in the Personnel Rules and Regulations, the importance of using software in accordance with the license agreement may not be

communicated to City employees. The City may be liable for unauthorized used of software by City employees.

RECOMMENDATION

The CAO should ensure that the Software Code of Ethics is included as part of the Personnel Rules and Regulations.

RESPONSE FROM THE CAO

"The CAO will consult with the Director of the Human Resources Department about the feasibility of amending Parts 301.15 and 902.1 of the Personnel Rules and Regulations to address software licensing compliance, with reference to the on-line policies, and possible disciplinary action for violations."

6.   THE CAO SHOULD ENSURE THAT DEPARTMENT MANAGEMENT IMPLEMENT PERFORMANCE MEASURES FOR MONITORING SOFTWARE LICENSING.

The City of Albuquerque does not have performance measures for monitoring software licensing. Performance measures enable management to review the department's/ division's progress toward identified goals. The Control Objectives for Information and related Technology (COBIT) – Monitor and Evaluate (M1.4), Management Reporting, state:

"Management reporting in line with the control practices will:

- Ensure that performance information can be effectively and efficiently used for strategic, managerial and day-to-day operations.
- Enhance the decision-making processes in responding to business needs and concerns, and focus on process improvement opportunities.
- Increase satisfaction of management and its governance with performance reporting."

If performance measures are not established, City management will not have a benchmark to compare its progress in regard to software licensing.

City departments/divisions are not aware that they should have performance measures for software licensing.

RECOMMENDATION

The CAO should ensure that department management implement performance measures for monitoring software licensing. DFAS should consider centralizing the monitoring of software licensing by placing ISD in charge of this process.

RESPONSE FROM CAO

"The issue of software licensing compliance is a City-wide issue, not a specific Department issue. The CAO will attempt to include a performance measure in the FY/07 Priority Objectives that reflects the City's commitment to fully comply with all software licensing provisions."

RESPONSE FROM DFAS/ISD

"As noted in the response to Finding Number 4, DFAS/ISD is installing ZenWorks on all new and replacement computers and laptops to control the installation of unauthorized software by users. Because the IT replacement schedule is directly impacted by available funding, DFAS/ISD is unable at this time to project a date when all City IT equipment will be so equipped."

7.   THE TRANSIT DEPARTMENT SHOULD COMPLY WITH THE CITY OF ALBUQUERQUE NETWORK ACCESS/CONNECTIVITY POLICY.

The City of Albuquerque's Network Access/Connectivity policy, states "No remote connectivity software (i.e. PC Anywhere, Procomm, etc.) will be used to connect to the City's network in any way unless approved in advance and then registered with the Technical Review Committee (TRC)."

We discovered five workstations that contained remote access software during our review of Software Licenses at the Transit Department (Transit.) This software is used by Transit IT personnel to access Transit computer systems from a remote site. The Transit information systems representative was not aware of the Network Access/Connectivity policy. Remote access software in conjunction with a modem places an unlocked backdoor in the security boundary that has been designed to protect the internal network

RECOMMENDATION

Transit should comply with Network Access/Connectivity policy, and consider using Virtual Private Network connections as an alternative for remote access connectivity.

RESPONSE FROM TRANSIT

"Transit will work with DFAS/ISD to convert all remote access to the Virtual Private Network (VPN), which is the City standard, by April 30, 2006."

CONCLUSION

Software license policies and guidelines are outdated. The CAO should make departments aware of these policies and ensure that they follow them.

We appreciate the cooperation of the DFAS/ISD staff during the audit.

_____
Senior Information Systems Auditor

REVIEWED:

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Audit Supervisor

APPROVED: **APPROVED FOR PUBLICATION:**

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