



National Archives and Records Administration

8601 Adelphi Road
College Park, Maryland 20740-6001

Date : December 4, 2006

Reply to

Attn of : Office of Inspector General (OIG)

Subject : Audit Report No. 07-02, Review of Archives II File Server Disk Space Utilization

To : Allen Weinstein, Archivist of the United States (N)

Enclosed is the subject report containing the results of our review of the amount of Archives II file server disk space occupied by digital media computer files. Specifically, we sought to determine if media files, i.e., music, video, audio files, etc., were taking up a significant amount of server disk space, and whether the storage of that type of computer file by NARANet (NARA's computer network) users complied with NARA policy.

Our review revealed that disk storage space on the Archives II Novell file servers was not adversely impacted by huge volumes of potentially inappropriate files, e.g., movie files, music files, etc. However, we did find that potentially inappropriate files were stored on the servers, in violation of the provisions of NARA 802, *Appropriate Use of NARA Office Equipment*, and, possibly, U.S. copyright laws.

The report contains one recommendation, with sub-recommendations, to correct the reported condition. Management concurred with two sub-recommendations, and nonconcurred with the other sub-recommendation. Management's comments in their entirety are included as an appendix to the audit report.

In accordance with the requirements of NARA 1201, *Audits of NARA Programs and Operations*, you have up to 45 calendar days to respond with an action plan for implementing the report recommendations and status reports on any completed or in-progress implementation efforts. Should you have any questions concerning the report and recommendations, please e-mail me or Mr. James Springs, or call us at (301) 837-3000.

Paul Brachfeld
Inspector General

Enclosure

**REVIEW OF ARCHIVES II FILE
SERVER DISK SPACE UTILIZATION**

OIG Report No. 07-02

December 4, 2006

REVIEW OF ARCHIVES II FILE SERVER DISK SPACE UTILIZATION

EXECUTIVE SUMMARY

The overall objective of our review was to identify the amount of server disk drive¹ space utilized by digital media² computer files³ on the eight Novell file servers located at Archives II. Specifically, we determined if media files, i.e., music, video, audio files, etc., took up a significant amount of server disk space, and whether the storage of that type of computer file by NARANet (NARA's computer network) users complied with NARA policy. The review was performed as a result of an allegation received during our monitoring of the Novell Software Upgrade Project that a large percentage of server disk storage space was occupied by inappropriate files, including music, movies, and pornography. We were also concerned that some of the files might contain copyrighted material.

Our review disclosed that disk storage space on the Archives II Novell file servers was not adversely impacted by huge volumes of potentially inappropriate files, e.g., movie files, music files, etc. The percentage of disk space occupied by the types of media files for which information was provided by Office of Information Services officials was 6.83 percent, leaving 93.17 percent available for other types of files, e.g., word processing files, spreadsheets, databases, etc. However, while our review did not disclose that a large amount of disk space was occupied by media files, we did find that potentially inappropriate files were stored on the servers, in violation of the provisions of NARA 802, *Appropriate Use of NARA Office Equipment*, August 27, 2004, and, possibly, U.S. copyright laws⁴. As a result, valuable disk storage space that could be used to store government-related data was taken up by potentially inappropriate data, possibly resulting in additional expense to the agency to acquire additional storage space for Archives-related material.

Prior to the completion of our review, NHT officials requested that they be allowed to immediately delete inappropriate media files, i.e., files for personal use and not government business, from the Archives II servers, because upgrading of the Novell software was scheduled to begin at Archives II within a few days. Because migrating the media files to the new environment would have required additional

¹ A *disk drive* is a machine that reads data from and writes data onto a disk. A disk drive rotates the disk very fast and has one or more heads that read and write data.

² *Digital media* encompasses digital audio, digital video, the World Wide Web and other technologies that can be used to create and distribute digital content.

³ A *file* in a computer system is a stream (sequence) of bits stored as a single unit, typically in a file system on disk or magnetic tape.

⁴ U.S. Copyright Law includes Title 17 U.S.C. et seq., and Title 18 U.S.C. Section 2319.

time and effort by the contractor to complete the software upgrade at Archives II, we granted their request, even though our review was not yet complete.

We made one recommendation, with sub-recommendations, that when implemented by management, will assist the agency in freeing-up valuable disk storage space, previously taken up by inappropriate data, that could be used to store government-related data.

INTRODUCTION

BACKGROUND

NARA's computer network consists of a *client/server* type of architecture. This is a network architecture in which each computer or process on the network is either a client or a server. The *client*, a user's personal computer, is the requesting machine, and the *server* is the supplying machine, both of which are connected via a local area network (LAN) or wide area network (WAN). The client contains the user interface (Windows, Mac, etc.) and can perform some or all of the application processing. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). File servers, which range in size from personal computers to mainframes, store data and programs and share those files with the clients. In this case, the server functions as a remote disk drive to the clients.

Our effort involved analyzing information pertaining to computer network users who have stored media files (music, movies, photographs, etc) on eight Novell file servers⁵, maintained at Archives II, identified as: (1) Adams, (2) Federal Register, (3) Jefferson, (4) Madison, (5) NARA, (6) Suitland, (7) Van Buren, and (8) Washington.

OBJECTIVES, SCOPE, AND METHODOLOGY

The overall objective of our review was to identify the amount of server disk space occupied by digital media computer files. Specifically, we sought to determine if media files, i.e., music, video, audio files, etc., took up a significant amount of server disk space, and whether the storage of that type of computer file by NARANet (NARA's computer network) users complied with NARA policy.

⁵ A *file server* is a computer on a network that stores computer programs and data files shared by the users of the network. A file server is the nerve center of the network, and also acts as a remote disk drive, enabling users to store information.

To accomplish the objective, we analyzed and summarized information pertaining to disk space and music, video, and audio files stored by NARANet users on NARA's Archives II Novell file servers (Adams, Federal Register, Jefferson, Madison, NARA, Suitland, Van Buren, and Washington).

We also reviewed U.S. copyright laws and examined guidance contained in NARA 802, *Appropriate Use of NARA Office Equipment*, dated August 27, 2004.

Our audit work was performed at Archives II in College Park, Maryland. The review, which we began in July 2006 and completed in September 2006, was performed in accordance with generally accepted government auditing standards.

APPROPRIATE USE OF NARA OFFICE EQUIPMENT

NARA 802, *Appropriate Use of NARA Office Equipment*: (a) defines appropriate use of NARA office equipment; (b) defines acceptable use conditions for personal use of NARA office equipment by NARA staff; (c) defines misuse and inappropriate personal use of NARA office equipment; and (d) emphasizes the role of NARA staff in helping to ensure security and performance of NARANet.

In accordance with the provisions of NARA 802, NARA staff members are expected to conduct themselves professionally in the workplace and to refrain from using NARA office equipment for activities that are inappropriate.

Misuse or inappropriate personal use of NARA office equipment during work and staff non-work time includes, among other things, any personal use that could cause congestion, delay, or disruption of service to any NARA system or equipment, and any use of NARA office equipment that could generate more than minimal additional expense to NARA.

Employees do not have a right to and should not expect privacy while using any NARA office information technology equipment at any time, including accessing the Internet or using e-mail.

A *copyright* is a set of exclusive rights granted by the federal government for a limited time to protect the particular form, way or manner in which an idea or information is expressed. Copyright may subsist in a wide range of creative or artistic forms or "works", including literary works, movies, musical works, sound recordings, paintings, photographs, software, and industrial designs. Copyright is a type of intellectual property

Media Files for Personal Use were Stored on Archives II File Servers

While storage of media files on the Archives II file servers did not appear to be a significant problem (see Table 1 below), we identified a small percentage of potentially inappropriate media files stored on the servers, in violation of the provisions of NARA 802 and, possibly, U.S. copyright laws. Specifically, approximately 6.8 percent of available server disk storage space was occupied by these media files, i.e., music, video, audio files, etc.

SERVER	TOTAL DISK SPACE (GBs) ⁶	MEDIA FILE DATA STORAGE (GBs)	PERCENTAGE OF DISK SPACE	PERCENTAGE OF FREE DISK SPACE
Washington	244	30.91	12.67	87.33
Madison	189	7.76	4.11	95.89
Adams	341	40.28	11.81	88.19
Jefferson	340	20.8	6.12	93.88
NARA	195	4.31	2.21	97.79
FedReg	16	.29	.18	99.82
Van Buren	137	10.88	7.94	92.06
Suitland	251	1.62	.06	99.94
TOTALS	1713	116.85	6.83	93.17

Table 1
Media Files Stored on Archives II Servers

Table 2 provides the results of our analysis of music, video, and audio files stored by NARA's computer network users on the Archives II Novell file servers. The remaining users for which information was provided had stored less than 100 megabytes of media files on the servers. (For additional details concerning these files, see Attachments 1 through 8.)

MEDIA FILES STORED ON ARCHIVES II FILE SERVERS	NARANET USERS
More than 1 Gigabyte	16
Between 500 and 1,023 Megabytes	20
Between 100 and 499 Megabytes	64

⁶ One *gigabyte* is equal to 1,024 megabytes. Gigabyte is often abbreviated as *G* or *GB*.

Table 2
Number of NARANet Users Storing Large amounts of Media Files on Archives II Servers

To illustrate the amount of disk drive space occupied by these files, (1) one megabyte is equal to a small novel or a 3.5 inch floppy disk; (2) two megabytes is equal to a high-resolution photograph; (3) 10 megabytes equals one minute of high-fidelity sound; (4) 500 megabytes equals a CD-ROM; and (5) one gigabyte is equal to a pickup truck filled with paper. A typical three-minute song from a CD takes up about 30 megabytes of disk space. Compressed into MP3 format, the file is about three megabytes.

We did not determine if the files were actually inappropriate, because we did not review their contents to determine if they were for government or personal use. According to the NARA Chief Information Officer (CIO), "These files might be legitimate and be used for NARA business, since NARA does have lots of reasons to be using music and video files." However, in our opinion, based on reviewing the file names, most of the files in question did not appear to be related to NARA business and may be evidence of network misuse. For example, file names included: (1) my music, (2) my pictures, (3) fun photos, (4) jims gospel music, (5) flowers from keith, (6) wedding, (7) luther vandross, (8) merry christmas, (9) honeymoon photos, (10) Tom's sendoff to Hawaii, (11) icecube, (12) jokes, (13) games, (14) star trek adventure, and (15) lion king.

In accordance with the provisions of NARA 802, NARA staff members are expected to refrain from using NARA office equipment for activities that are inappropriate. Misuse or inappropriate personal use of NARA office equipment during work and staff non-work time includes, among other things, (1) any personal use that could cause congestion, delay, or disruption of service to any NARA system or equipment, and (2) any use of NARA office equipment that could generate more than minimal additional expense to NARA.

We believe this condition existed because: (1) users are unaware that storing music, audio, and photographic files, for personal use, on NARA servers is inappropriate; (2) the guidance in NARA 802 does not specifically address the downloading and storage of media files; and (3) no one has the responsibility for regularly monitoring the type(s) of data stored on NARA's servers, and for ensuring that any data not used for government business is removed from the server.

The media files stored for personal use on the Archives II file servers could possibly contain material protected by copyright laws. U.S. copyright law protects books, photographs, videos, movies, sound recordings, software code, and other creative works of expression from unauthorized copying, adaptation, performance, display, or distribution. A copyright gives its owner the exclusive right to reproduce,

distribute, perform, display, or license a work, and the exclusive right to produce or license the production of derivative works.

In addition, valuable disk drive space that could be used to store business-related data is taken up by inappropriate data, possibly resulting in additional expense to the agency to acquire additional storage space for Archives-related material.

Recommendation 1. The Assistant Archivist for Information Services (NH) should:

a. Revise NARA 802, *Appropriate Use of NARA Office Equipment*, to state that music and movie files, non-business photos and pictures, as well as sexually-explicit material, are not to be downloaded and stored on NARA's file servers.

Management Response

Management concurred with this recommendation and agreed to take corrective action.

b. Establish responsibility for regularly monitoring the type of material being stored on NARA's servers; issuing a warning to those users that appear to have downloaded and stored inappropriate material to a server; and deleting any material, i.e., non business-related material, inappropriately stored on the servers.

Management Response

Management nonconcurred with this recommendation, stating that it planned to take no corrective action.

OIG Response to Management Comments

In its comments, management noted that the audit report disclosed that the Archives II file servers are not impacted by "huge volumes" of potentially inappropriate files. Although it is true that the Archives II file servers are not impacted by the storage of "huge volumes" of potentially inappropriate files, there is, however, a significant number of potentially inappropriate files that should be removed from the servers. These inappropriate files violate provisions of NARA 802, *Appropriate Use of NARA Office Equipment*, and they take up valuable disk space that should be used for legitimate, agency business-related data. In addition, some files may contain pornography and/or material protected by copyright laws. Therefore, we continue to believe that system administrators should monitor

the types of material stored on the servers and request users to delete any files that are not business-related.

Another comment was that our review did not "...show any evidence of improper use of NARA file servers that would justify the expense and effort necessary to conduct intrusive content monitoring of the data stored on those systems." We disagree. The audit did not address whether the files were actually inappropriate, i.e., the auditors did not review contents to determine if the files were for government or personal use. However, as stated previously, based on reviewing file names, most of the files in question did not appear to be related to NARA business and may be evidence of network misuse. For example, file names included: (1) my music, (2) my pictures, (3) fun photos, (4) jims gospel music, (5) flowers from keith, (6) wedding, (7) luther vandross, (8) merry christmas, (9) honeymoon photos, (10) Tom's sendoff to Hawaii, (11) icecube, (12) jokes, (13) games, (14) star trek adventure, and (15) lion king.

Further, management stated that the Information Technology Services Division (NHT) monitors disk capacity on an ongoing basis, and automated tools are used to prevent downloading of malware and to block access to websites with offensive content. However, to clarify, our recommendation does not pertain to monitoring disk capacity, i.e., assessing the amount of disk space available and/or the amount of disk space occupied by data. Instead, the recommendation addresses the need for officials to monitor the types of data being stored by users on the server disk drives, to ensure that the data is appropriate and business-related. Also, it should be noted that it is extremely difficult, if not impossible, for web content filters to block all offensive (pornographic, racist, violent, and criminal) content.

c. Through a NARA notice or the NARA @ Work intranet site, remind NARA employees of NARA 802 requirements for the appropriate use of NARA office equipment.

Management Response

Management concurred with this recommendation and agreed to take corrective action.

FILE SERVER DISK SPACE UTILIZATION

SERVER ATTACHMENT	
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The following attachments identify, for each network user who has stored media files on the Novell file servers maintained at Archives II, the office symbol and the amount of server disk space occupied by that user's media files.

ATTACHMENT 1

**NARA SERVER DISK SPACE UTILIZATION
ADAMS SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs) ⁷
NWM	1	1.71
	2	7
	3	10.38
	4	2.78
NWML	5	44.3
	6	79.95
	7	1.98
	8	1.79
	9	17.6
	10	5.28
	11	233.4
	12	9.84
	13	11.4
	14	15.3
	15	1.13
	16	8.73
	17	28.6
NWME	18	10
	19	19.21
	20	1.02
	21	278.61

⁷ A megabyte is equal to 1,024 kilobytes.

ATTACHMENT 1

**NARA SERVER DISK SPACE UTILIZATION
ADAMS SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs)
	22	2.9
	23	1.82
	24	2.2
	25	1.16
	26	2.9
	27	1.82
	28	2.2
	29	1.16
	30	.46
	31	2.18
	32	49
	33	2.93
	34	.43
	35	.085
	36	2.32
	37	1.82
NWMI	38	460
SHARED ⁸		40,582.47
UNKNOWN (?) ⁹		243.56

⁸ Files were stored on the "s" drive and shared among network users.

⁹ Media files stored by network users whose names were not found in the Employee Locator

ATTACHMENT 1

**NARA SERVER DISK SPACE UTILIZATION
ADAMS SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs)
TOTALS		41,353.335
		40.38 GBs

ATTACHMENT 2

**NARA SERVER DISK SPACE UTILIZATION
FEDREG SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs)
NFS	1	59
	2	63.7
	3	.27
NFT	4	10.99
NF	5	.62
	6	2.23
NFL	7	1.69
NRPMO	8	6.48
SHARED		151.2
UNKNOWN (?)		.25
TOTALS		296.43 MBs
		.29 GBs

ATTACHMENT 3

**NARA SERVER DISK SPACE UTILIZATION
JEFFERSON SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs)
NWMD	1	123.92
	2	2.82
	3	79.5
	4	36.79
	5	146.82
	6	1.63
	7	13.59
	8	7.53
	9	8.76
	10	90.4
	11	5.11
	12	681
	13	59
	14	57.1
	15	.18
	16	.04
NWT	17	5.69
	18	64.46
	19	1,539.28
NWCTF	20	15.49
	21	8.23
NWTD	22	776.62
	23	111.79
	24	102.5
	25	3,164.9

ATTACHMENT 3

**NARA SERVER DISK SPACE UTILIZATION
JEFFERSON SERVER**

OFFICE SYMBOL	NO.	SPACE TAKEN (MBs)
	26	507.01
	27	118.49
	28	380.42
	29	19.69
	30	917.32
	31	109.56
	32	125.63
NWCS	33	19.79
	34	109
	35	7
	36	.92
	37	73.59
	38	101.04
	39	127.7
	40	36.51
	41	342.22
	42	45.96
	43	93.29
	44	126.8
	45	272.25
	46	48.16
	47	54.7
	48	129.8
	49	23.1