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Computer Searches and Seizures: Some Unresolved Issues


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COMPUTER SEARCHES AND SEIZURES: SOME UNRESOLVED ISSUES

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INTRODUCTION

[I]n the application of a constitution, . . . our contemplation cannot be only of what has been but of what may be. . . .

. . . .

. . . Ways may some day be developed by which the Government, without removing papers from secret drawers, can reproduce them in court, and by which it will be enabled to expose to a jury the most intimate occurrences of the home. . . . Can it be that the Constitution affords no protection against such invasions of individual security?¹

Society has come a long way toward realizing the scenario Justice Brandeis hypothesized in the dissent in *Olmstead*, especially with regard to computer-generated “papers.” As society moves into the cyberworld,² the novel, distinctive characteristics of electronic information are generating a host of questions as to how traditional Fourth Amendment jurisprudence is, and should be, transposed to this new environment.

The rise of the cyberworld has given us cybercrime, a new variety of unlawful behavior in which computers are used in committing crimes.³ Evidence-gathering by law enforcement officers investigating cyber-crime cases can implicate any of several legal standards, including the Fourth Amendment prohibition on unreasonable searches and seizures,⁴

1. *Olmstead v. United States*, 277 U.S. 438, 473–74 (1928) (Brandeis, J., dissenting).

2. The “cyberworld” is the experience of cyberspace as a distinct reality, a virtual reality. See MARGARET WERTHEIM, *THE PEARLY GATES OF CYBERSPACE: A HISTORY OF SPACE FROM DANTE TO THE INTERNET* 223–252 (1999); John Suler, *Cyberspace as Psychological Space*, at <http://www.rider.edu/users/suler/psycyber/psychspace.html> (last visited Feb. 11, 2002).

3. See Susan W. Brenner, *Is There Such a Thing as “Virtual Crime”?*, 4 CAL. CRIM. L. REV. (2001) at <http://www.boalt.org/CCLR/v4/v4brenner.htm> (last visited Mar. 16, 2002); Marc D. Goodman, *Why the Police Don’t Care About Computer Crime*, 10 HARV. J. L. & TECH. 465 (1997).

4. U.S. CONST. amend. IV (“The right of the people to be secure in their persons, houses, papers and effects, against unreasonable searches and seizures, shall not be violated, . . .”).

the Fifth Amendment privilege against self-incrimination⁵ and statutory guarantees such as those created by the Electronic Communications Privacy Act.⁶ Statutory guarantees like the Electronic Communications Privacy Act were deliberately crafted to deal with technological issues, but constitutional guarantees evolved in a world in which technology was essentially unknown.⁷ It can, therefore, be difficult to translate constitutional guarantees into a technical environment.

The Fourth Amendment is the most troubling provision because applying its guarantees to computer searches and seizures requires extrapolating concepts that were devised to deal with the “real” physical world to the cyberworld.⁸ The Fourth Amendment guarantees citizens the right to be free from “unreasonable searches and seizures”.⁹ A “search” or a “seizure” is reasonable if it meets certain requirements. Officers may conduct a search and/or seizure pursuant to a search warrant that is

5. U.S. CONST. amend. V (“No person . . . shall be compelled in any criminal case to be a witness against himself, . . .”).

6. The Electronic Communications Privacy Act of 1986, 18 U.S.C. §§ 1367, 2521, 2701–2709, 2711, 3117, 3121–3127 (1994).

7. When the Fourth and Fifth Amendments were adopted, ‘the form that evil had theretofore taken,’ had been necessarily simple. Force and violence were then the only means known to man by which a Government could directly effect self-incrimination. It could compel the individual to testify—a compulsion effected, if need be, by torture. It could secure possession of his papers and other articles incident to his private life—a seizure effected, if need be, by breaking and entry. . . . But ‘time works changes, brings into existence new conditions and purposes.’ Subtler and more far-reaching means of invading privacy have become available to the Government. Discovery and invention have made it possible for the Government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet. *Olmstead v. United States*, 277 U.S. 438, 473 (1928) (Brandeis, J., dissenting).

8.

[T]he seizure of a computer raises many issues beyond those that might pertain to mere writings.

For example, seizing a computer may intrude into the privacy interests of individuals other than the intended subjects due to e-mail transmissions to and from a particular computer. Similarly, when a networked computer is subject to a search, it may be possible to examine interactions with computers that are networked to the one being searched. Moreover, the use of a computer to access the internet also raises issues regarding a potential search of that computer, as the hard drive stores information about the internet sites that have been visited by the user. Therefore, the search of a computer could implicate the privacy concerns of many people who did not use a specific computer physically, but in fact used such computer electronically. Furthermore, the seizure of a networked computer may disrupt all or part of a network and interfere with many other users.

People v. Gall, 30 P.3d 145, 162–63 (Colo. 2001) (Martinez, J., dissenting).

9. U.S. CONST. amend. IV.

based on probable cause.¹⁰ The warrant must be issued by a neutral and detached Magistrate Judge and certain other requirements.¹¹ The officers' conduct will be "reasonable," not in violation of the Fourth Amendment, as long as they stay within the scope of that warrant, or, in other words, as long as their actions are calculated to locate evidence for which the warrant authorizes them to search and seize.¹² There are also a number of exceptions to the warrant requirement; if officers carry out a search and/or seizure pursuant to one of these exceptions, their conduct will be deemed to be reasonable even though they acted without a warrant.¹³ If officers carry out a search or seizure that is not authorized by a warrant or by an exception to the warrant requirement, their conduct will be deemed unreasonable, and in violation of the Fourth Amendment.¹⁴

The parameters used to implement Fourth Amendment guarantees in the context of real world searches and seizures are well-established. The cyberworld lacks the real world's unambiguous physical boundaries, therefore it is often difficult to translate these guarantees into the context of computer searches where simply determining when a "search" or "seizure" occurs can be a complicated endeavor, as can differentiating a "search" from a "seizure."¹⁵

The areas of Fourth Amendment difficulty are myriad and seem to increase almost every day, so a comprehensive treatment of these issues is outside the scope of this article. The goal of this article is to illustrate the issues that arise in the context of computer search and seizures by examining several areas in which the application of Fourth Amendment concepts to computer searches and/or seizures can be problematic. In order to illustrate this point, the article will build on a hypothetical. The hypothetical situation assumes law enforcement officers have lawfully

10. See 2 WAYNE R. LAFAVE, *CRIMINAL PROCEDURE* § 3.4(d) (2d ed. 1999); Cf. *State v. Staley*, 548 S.E.2d 26 (Ga. App. 2001) (granting motion to suppress evidence because warrant issued to search defendant's computer for evidence of child pornography was not based on probable cause).

11. See LaFave, *supra* note 10, at § 3.4.

12. See *U.S. v. Heldt*, 668 F.2d 1239, 1256-60 (D.C. Cir. 1981); LaFave, *supra* note 10, at § 3.4(j).

13. LaFave, *supra* note 10, at §§ 3.2, 3.3.

14. See *U.S. v. Richards*, 638 F.2d 765 (5th Cir. 1981); See generally LaFave, *supra* note 10, at § 3.4.

15. See MODEL CODE OF CYBERCRIME INVESTIGATIVE PROCEDURE, art. I § 5(a)-(b) (1998) at <http://www.cybercrimes.net/MCCIP/art1.htm> [hereinafter "MCCIP"] (last visited Feb. 11, 2002) (defining the terms search and seizure separately). The MCCIP is a model rule governing what law enforcement officers can and cannot do when they are investigating cybercrimes. The code addresses issues such as the constraints the Fourth Amendment places on officers when they are searching and seizing computers, the legal rules that govern the use of subpoenas to obtain evidence about someone's Internet Service Provider accounts and gaining access to encrypted files.

obtained a warrant to search for and seize evidence concerning the commission of one or more crimes. It will also be assumed that computer technology played some role in the commission of these crimes, so computer equipment and computer data are legitimate objects of the search. This hypothetical is used to explore three issues, each of which concerns the execution of a computer search and seizure warrant:

Under what circumstances is it reasonable to conduct a search of computers and/or computer files off-site, as opposed to on-site?

What, if any, role should the plain view doctrine play in computer searches and seizures?

Is copying data contained on a hard drive or in some other electronic storage media¹⁶ a search? A seizure?

I. A HYPOTHETICAL¹⁷

Federal agents spent several years investigating the possible commission of insurance fraud involving the submission of false and/or inflated claims for reimbursement of medical expenses. The agents came to believe that attorneys and employees working for the law firm of Doe & Doe were centrally involved in the commission of the fraud, and concluded that a search of the law firm's files was needed for evidence of that involvement.

To that end, agents obtained a warrant authorizing them to search the office of Doe & Doe and to seize specified "computer hardware, software, and peripherals" at that office. The warrant was based on probable cause, was issued by a "neutral and detached" Magistrate Judge, and in every other way satisfied the requirements of the Fourth Amendment. In addition to authorizing the seizure of computer hardware, software and peripherals, the warrant authorized the investigators to search the seized computer system for data concerning individuals who were targets of the investigation, medical appointment logs, accounting records and other evidence itemized in a schedule

16. Storage and computer media denotes devices used to store computer data, which include floppy disks, hard disks, CD-ROM's, DVD's, ZIP drives, and magnetic tapes. See Michael Chappell, Computer Forensics and Litigation Support, at http://www.sinch.com.au/articles/2000/computer_forensics.htm (last visited Jan. 31, 2002).

17. Hypothetical is based on the facts found in two related cases. See *Commonwealth v. Ellis*, No. 97-192, 1999 WL 815818 (Mass. Super. Aug. 27, 1999) (ruling on a motion to suppress electronically stored evidence); *Commonwealth v. Ellis*, No. 97-192, 1999 WL 823741 (Mass. Super. Aug. 18, 1999) (ruling on a motion to suppress evidence).

attached to the warrant application. The warrant required the agents executing the search to make a back-up copy of the information contained in the seized computer hardware, "as soon as reasonably practicable." The judge issuing the warrant ordered that the back-up be sufficient to give Doe & Doe a copy of all the information stored on its seized computer equipment. The warrant also ordered the investigators to make a mirror image¹⁸ of the computer system using the system's own peripherals. The mirror image was to capture all the data on the system to the extent possible, including data purged or deleted from the system. It was also to be used to identify all users who had access to particular data on the system.

The agents charged with executing the warrant entered the Doe & Doe office early one morning, and began by disabling the office's network server. They seized the server and related equipment. The agents then went to each stand-alone computer with independent storage capacity and ran a "key-word" search of its hard drive, using a program called DiskSearch II.¹⁹ If the search produced any key-word "hits," they seized the computer. The agents ultimately seized twenty-two computers, all but four of Doe & Doe's computers. The agents executing the warrant also seized thirteen computer back-up tapes and a printer. The printer was seized to facilitate their off-site searching of the seized computers.

The agents moved the seized computers and computer equipment to an off-site location, where the server and computer were reassembled. Two back-up copies of the data contained on the system were not made until four days after the initial search. One of these copies was then returned to Doe & Doe. The search of the system was not completed for almost two years.

II. OFF-SITE VERSUS ON-SITE COMPUTER SEARCHES

Officers executing an authorized Fourth Amendment intrusion have traditionally searched for and then seized evidence (if, indeed, any was

18. Mirror image backups (also referred to as bit stream backups) involve the backup of all areas of a computer hard disk drive or another type of storage media, e.g., Zip disks, floppy disks, Jazz disks, etc. Such mirror image backups exactly replicate all sectors on a given storage device. Thus, all files and ambient data storage areas are copied. Such backups are sometimes referred to as "evidence grade" backups and they differ substantially from standard file backups and network server backups.

New Technologies, Inc., *Mirror Image Backup—Defined*, at <http://www.forensics-intl.com/def2.html> (last visited Nov. 9, 2001).

19. See New Technologies, Inc., *DiskSearch 32*, at <http://www.forensics-intl.com/dssuite.html> (last visited Nov. 27, 2001) (providing the most current version of the software used in the hypothetical).

to be found), rather than the reverse. Indeed, this essential, but generally unarticulated, Fourth Amendment practice is implicitly recognized when referring to search and seizure warrants.²⁰

A. Off-Site Document Searches

Toward the end of the last century, the practicability of this assumption came into question with regard to certain kinds of Fourth Amendment intrusions. A doctrine was established under which the traditional sequence was reversed, evidence was seized and then searched. This doctrine emerged in the context of “document” searches, cases in which officers executed search warrants requiring them to search through large volumes of paper records and seize specified documents.²¹ Instead of searching through the documents on-site and only seizing those documents which fell within the scope of the warrant, officers began seizing all of the documents and removing them to an off-site location where they searched the entire body of documents, seized those that were within the scope of the warrant and then returned the others.²²

Often, those whose documents were seized challenged the officers’ actions, claiming they were not “reasonable” under the Fourth Amendment.²³ Since the officers acted pursuant to a lawfully-issued warrant, the challengers did not claim that the officers’ conduct was unreasonable from the outset; instead, they argued that the officers acted unreasonably in the way they executed the warrant.²⁴ Specifically, the challengers alleged that it was not reasonable for the officers to seize a large volume of documents and take them away for an off-site search. They pointed out, among other things, that in doing so the officers exceeded the scope of the warrant by seizing both relevant and irrelevant documents, e.g., documents which fell within the scope of the search and

20. See, e.g., *Wilson v. State*, 752 A.2d 1250 (Md. Ct. Spec. App. 2000) (upholding the seizing of defendant’s blood followed by a “search” of the blood).

21. See *United States v. Wuagneux*, 683 F.2d 1343, (11th Cir. 1982); *United States v. Beusch*, 596 F.2d 871 (9th Cir. 1979).

22. See *United States v. Hargus*, 128 F.3d 1358, 1363–1364 (10th Cir. 1997) (holding of officers did not “grossly exceed” a search warrant by removing two filing cabinets from defendant’s residence because “on-site sorting would be impractical and un-duly time consuming.”); *Wuagneux*, 683 F.2d at 1352–1353; *Beusch*, 596 F.2d at 876–877. See also FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § II(C) Step 3 at 47–48 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf> [hereinafter GUIDELINES] (last visited Mar. 16, 2002) (suggesting that when obtaining a warrant the party should alert the court to the possibility of an off-site search).

23. See *Hargus*, 128 F.3d at 1363–1364; *Wuagneux*, 683 F.2d at 1352–1353; *Beusch*, 596 F.2d at 876–877.

24. See *id.*

seizure warrant and those that did not.²⁵ Courts consistently upheld this practice as “reasonable” under the Fourth Amendment relying, in part, on the premise that having officers search through the entire volume of documents on site is more intrusive than having them do so off-site.²⁶ One factor often cited in upholding this practice is that clearly incriminating documents are so often intermingled with other non incriminating documents that it simply is not reasonable to require officers to sort the documents on-site.²⁷

The application of the off-site document search doctrine is not limited to searches conducted on business property, it also applies to the home. Several decisions apply the doctrine to searches conducted at a person’s home, on the premise that it would be even more intrusive to have officers conduct a lengthy sorting and searching process at a home than at a business.²⁸

B. *Off-Site Computer Searches*

Warrants that require officers to search for and seize computer generated evidence can also create a large volume of evidence. The various elements of which are often intermingled with each other. For example, a keyword search may identify many files and file fragments which contain the responsive phrase, but depending on the nature of the investigation, not all of these will be relevant or discoverable. The same

25. *See id.*

26.

The search here was limited to Santarelli’s upstairs bedroom and an adjoining hallway. . . . Given the fact that the search warrant entitled the agents to search for documents, . . . it is clear that the agents were entitled to examine each document in the bedroom or in the filing cabinet to determine whether it constituted evidence they were entitled to seize under the warrant. . . . It follows that Santarelli would have no cause to object if the agents had entered his home to examine the documents and remained there as long as the search required. The district court estimated that a brief examination of each document would have taken several days. Under these circumstances, we believe that the agents acted reasonably when they removed the documents to another location for subsequent examination. Given that the officers were entitled to examine the documents while they remained in the home, we cannot see how Santarelli’s privacy interest was adversely affected by the agents’ examination of the documents off the premises, so long as any items found not to be relevant were promptly returned. . . . We find, therefore, that the search of Santarelli’s residence was reasonable.

United States v. Santarelli, 778 F.2d 609, 615–616 (11th Cir. 1985) (citations omitted); *See Wuagneux*, 683 F.2d at 1352–1353; *Beusch*, 596 F.2d at 876–877. *See also* GUIDELINES § II(C) Step 3 at 47–48.

27. *See* United States v. Wapnick, No. CR-92-419, 1993 WL 86480 (E.D.N.Y. Mar. 16, 1993); *Wuagneux*, 683 F.2d at 1353. *See also* GUIDELINES § II(C) Step 3 at 47–48.

28. *Santarelli*, 778 F.2d at 615–616; *Wapnick* 1993 WL 86480 at *6–7.

search term may yield results that identify text contained in relevant documents and text in documents which are not relevant to the crime under investigation or contain correspondence between the suspect and their attorney. The search results may also include text that is found in deleted files or e-mails. The terms of the search warrant will dictate whether text located in deleted files can be used as evidence. It is therefore not surprising that officers began to deal with these computer “document” in the same way they had become accustomed to dealing with paper documents. The officers seize the containers in which the computer records are stored and take the records off-site²⁹, to be searched and sorted.³⁰

1. Department of Justice Guidelines

In 1994, the Department of Justice issued the *Federal Guidelines for Searching and Seizing Computers* [hereinafter “*Guidelines*”], the purpose of which was to try to “illustrate some of the ways in which searching a computer is different from searching a desk, a file cabinet, or an automobile.”³¹ The authors of the *Guidelines* explained that they had attempted to translate traditional search and seizure principles into the context of computer searches, noting that they “often had to extrapolate

29. For the purposes of this article, “off-site” computer searches consist of the “removal and transportation of electronic evidence to a location not on the premises and location where the electronic evidence is found or in the location of the area to be searched described in the warrant.” MCCIP art. VII § 4(f)(I)(A)(iii). An “on-site” search is a search conducted “on the premises and location where the electronic evidence is found or in the location of the area to be searched described in the warrant”; in an on-site search, the computers, files or related equipment “may be relocated to a place other than its original location in those premises” for the purpose of conducting the search. MCCIP art. VII § 4(f)(I)(A)(ii). “Electronic evidence” is “any computer hardware, computer software, computer generated or derived data, data storage device, data storage media, or computer peripheral device.” MCCIP art. VII § 4(f)(I)(A)(i).

30.

Rather than attempting to “search” the computers at the scene, the officers merely seized the computers and sought further search warrants to inspect their contents. For various policy reasons, the removal of a sealed container . . . is not only authorized but preferred in limited circumstances, including where “the sorting out of the described items from the intermingled undescribed items would take so long that it is less intrusive merely to take that entire group of items to another location and do the sorting there.”

People v. Gall, 30 P.3d 145, 154 (Colo. 2001). See *United States v. Upham*, 168 F.3d 532, 535 (1st Cir. 1999) (“The record shows that the mechanics of the search for images later performed off site could not readily have been done on the spot.”); *Commonwealth v. Ellis*, No. 97-192, 1999 WL 815818 (Mass. Super. Aug. 27, 1999); *United States v. Hunter*, 13 F. Supp. 2d 574, 583–584 (D.Vt. 1998); *United States v. Gurs*, No. 93-30261, 1996 WL 200998, **3 (9th Cir. Apr. 25, 1996).

31. See FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) Introduction at 2025(1994).

from existing law or policies to try to strike old balances in new areas.”³² As to their authoritativeness, the *Preface* to the *Guidelines* explains that, while the *Guidelines* are drafted by an interagency working group:³³

[t]hese *Guidelines* have not been officially adopted by any of the agencies, and are intended only as assistance, not as authority. They have no regulatory effect, and confer no right or remedy on anyone. Moreover, the facts of any particular case may require you to deviate from the methods we generally recommend, or may even demand that you try a completely new approach.³⁴

This caveat notwithstanding, the *Guidelines* became an influential, often-cited source of information on how computer searches and seizures should be conducted.³⁵

Because of changes in technology, the *Guidelines* were updated by Supplements issued in 1997 and 1999 and a revision was issued early in 2001.³⁶ The 2001 revision supersedes the 1994 *Guidelines*, as well as the 1997 and 1999 Supplements to the 1994 *Guidelines*.³⁷ Like the 1994 *Guidelines*, the 2001 revision is not represented as binding authority.³⁸ But like the 1994 *Guidelines*, the 2001 revision will certainly influence how computer searches and seizures are conducted. It is therefore necessary, when examining any issue involving a search or seizure of

32. *Id.*

33. *Id.*, Preface at 2023 (participating agencies included “the Federal Bureau of Investigation; the United States Secret Service; the Internal Revenue Service; the Drug Enforcement Administration; the United States Customs Service; the Bureau of Alcohol, Tobacco, and Firearms; the United States Air Force; the Department of Justice; and United States Attorneys’ offices”).

34. *Id.*

35. See Alex White & Scott Charney, *Search and Seizure of Computers: Key Legal and Practical Issues*, at <http://www.securitymanagement.com/library/000177.html> (last visited Feb. 16, 2002) (stating the 1994 GUIDELINES provided “a comprehensive treatment of the major legal issues likely to be encountered in connection with searches involving computers, and provides policy and practical guidance for Federal law enforcement officials who are involved with such searches”).

36. See FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS Preface at I (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

37. *Id.*

38.

This manual is designed to combine an updated version of the Guidelines’ advice on searching and seizing computers with guidance on the statutes that govern obtaining electronic evidence in cases involving computer networks and the Internet. Of course, this manual is intended to offer assistance, not authority. Its analysis and conclusions reflect current thinking on difficult areas of law, and do not represent the official position of the Department of Justice or any other agency. It has no regulatory effect, and confers no rights or remedies.

computers executed by federal agents, to consider the extent to which the positions articulated in the *Guidelines* correctly extrapolate Fourth Amendment principles of reasonableness into this context.

In terms of off-site computer searches, both versions of the *Guidelines* adopt the rationale used to justify off-site document searches. The respective *Guidelines* authors identify as “document” and “computer document” searches as analogous while specifying the factor unique to computer searches.³⁹ The sections below compare the treatment of off-site computer searches received in the original 1994 version of the *Guidelines* with the treatment this issue receives in the 2001 version. The discussion examines both versions of the *Guidelines* for two reasons: the 1994 *Guidelines* influenced the case law that developed in this area from 1994 until 2000, and, as discussion below illustrates, serve as the foundation of the revised 2001 *Guidelines*.

2. 1994 Guidelines

The 1994 version of the *Guidelines* stated that off-site computer searches are justifiable when the following factors are considered:

- (1) A large volume of evidence must be searched, either because the warrant authorized the seizure of a voluminous amount of documents or because the documents that fall within the scope of the warrant are intermingled with an “enormous” number of other documents.
- (2) The warrant is executed in a home, rather than in a business.
- (3) The evidence consists of intermingled files.
- (4) It is necessary to conduct a controlled, off-site search to avoid destroying data.
- (5) It is necessary to seize hardware and related documentation to conduct an off-site search on seized evidence.⁴⁰

The 1994 *Guidelines* acknowledged that factors (1), (2) and (3) simply apply the off-site document search doctrine to computer searches.⁴¹ They also suggested that computer searches involve an additional

39. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H) at 2038 (1994); FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § II(C) Step 3 at 49 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

40. See FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H) at 2038 (1994).

41. *Id.* (“This [document search] rationale has been extended to computers.”).

element which makes off-site searching even more necessary: the difficulty of locating and identifying the evidence sought.

[T]he file-cabinet cases . . . implicitly rely on the premise that “documents” are readily accessible and ascertainable items; that any agent can find them and (unless the subject is quite technical) can read, sort, and copy those covered by warrant. The biggest problem in the paper cases is time, the days it takes to do a painstaking job. But computer searches have added a formidable new barrier, because searching and seizing are no longer as simple as opening a file cabinet drawer. When agents seize data from computer storage devices, they will need technical skill just to get the file drawer open. While some agents will be “computer literate,” only a few will be expert; and none can be expert on every sort of system.⁴²

Continuing this theme, factors (4) and (5) are based on what the 1994 *Guidelines* characterized as unique concerns that can arise when agents are searching for computer-generated evidence. Factor (4) is based on two of these concerns: (a) the possibility that agents unfamiliar with a system’s hardware and/or software will damage or destroy evidence while attempting to recover it; and (b) the possibility that a computer system may include a “booby-trap” which, when triggered by an unwary agent, destroys the evidence it contains.⁴³ Factor (5) does not itself justify a seizure of computer equipment. The factor is a supplemental rule that expands the scope of a seizure when agents have an independent rationale for taking computer hardware to a laboratory for analysis.⁴⁴ Factor (5) is based on the premise that if agents are justified in seizing part of a computer system, they should be allowed to seize all of the hardware that makes up that system plus any related documentation; otherwise, it may not be possible to reconstruct the system and operate it at the laboratory.⁴⁵

3. 2001 Revised Guidelines

The 2001 revision of the *Guidelines* takes a slightly different approach to off-site searches. It begins by pointing out that there are basic four possible ways to execute computer searches:

Search the computer and print out a hard copy of particular files at that time;

42. *Id.* at § IV(H)(1)(d).

43. *Id.* at § IV(H)(2)(a).

44. *Id.* at § IV(H)(2)(b).

45. *Id.*

Search the computer and make an electronic copy of particular files at that time;

Create a mirror-image electronic copy of the entire storage device on-site, and then later recreate a working copy of the storage device off-site for review; and

Seize the equipment, remove it from the premises, and review its contents off-site.⁴⁶

As to the third option, the 2001 *Guidelines* note that making a mirror-image copy of

an entire drive . . . is different from making an electronic copy of individual files. When a computer file is saved to a storage disk, it is saved in randomly scattered sectors on the disk rather than in contiguous, consolidated blocks; when the file is retrieved, the scattered pieces are reassembled from the disk in the computer's memory and presented as a single file. Imaging the disk copies the entire disk exactly as it is, including all the scattered pieces of various files. The image allows a computer technician to recreate (or "mount") the entire storage disk and have an exact copy just like the original. In contrast, an electronic copy (also known as a "logical file copy") merely creates a copy of an individual file by reassembling and then copying the scattered sectors of data associated with the particular file.⁴⁷

Three of the possibilities outlined above involve on-site searches; only the fourth requires that hardware and files be seized and taken off-site to be searched. The 2001 *Guidelines* explain that while many factors will determine which of these options is used for any particular search, the "single most important consideration is the role of the computer hardware in the offense."⁴⁸ This consideration gives rise to the default position set out in the 2001 *Guidelines*, namely, that if computer hardware "is itself evidence, an instrumentality, contraband, or a fruit of crime, agents will usually plan to seize the hardware and search its contents off-site," but if computer hardware "is merely a storage device for evidence, agents generally will only seize the hardware if less disruptive alternatives are not feasible."⁴⁹ According to the *Guidelines*, this default position arises from Rule 41 of the Federal Rules of Criminal Procedure, which lets agents seize computer hardware when that hardware is *itself*

46. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § II(B)(1) at 31 (2001) (footnote omitted) available at <http://www.cybercrime.gov/searchmanual.pdf>.

47. *Id.* at n. 5.

48. *Id.* at § II(B)(1) at 31.

49. *Id.*

contraband, evidence, a fruit of crime or an instrumentality of a crime, but not when it merely *contains* evidence of a crime.⁵⁰

When hardware is contraband, evidence, an instrumentality or a fruit of crime, agents should “obtain a warrant to seize the computer, seize the hardware during the search, and then search through the defendant’s computer for the contraband files back at the police station or computer forensics laboratory.”⁵¹ This approach is unlikely to pose any practical problems when the object of a search is one or more personal computers, but it can become problematic when the object “is not a stand-alone PC but rather part of a complicated network, the collateral damage and practical headaches that would arise from seizing the entire network generally counsels against a wholesale seizure.”⁵² In these situations, the agents will “take a more nuanced approach to obtain the evidence they need.”⁵³ Specifically, the *Guidelines* suggest agents confronting this “situation call the Department of Justice’s Computer Crime and Intellectual Property Section . . . or the Assistant U.S. Attorney designated as a Computer-Telecommunications Coordinator (CTC) in their district for more specific advice”⁵⁴ on how to proceed.

When hardware merely stores evidence of a crime, its seizure is not justified under Rule 41(b).⁵⁵ The 2001 *Guidelines* concede that in this situation “Rule 41(b) authorizes agents to obtain a warrant to seize the electronic evidence, but arguably does not authorize the agents to seize the hardware that happens to contain that evidence.”⁵⁶ Further, Rule 41(b) asserts that “[t]his does not mean that the government cannot seize the equipment: rather, it means that the government generally should only seize the equipment if a less intrusive alternative that permits the

50. *Id.* Rule 41(b) states that a warrant can be issued to search for and seize any “(1) property that constitutes evidence of the commission of a criminal offense; or (2) contraband, the fruits of crime, or things otherwise criminally possessed; or (3) property designed or intended for use or which is or has been used as the means of committing a criminal offense.” Fed. R. Crim. P. 41(b).

51. GUIDELINES, § II(B)(1)(a) at 32.

52. *Id.*

53. *Id.* (“For example, if a system administrator of a computer network stores stolen proprietary information somewhere in the network, the network becomes an instrumentality of the system administrator’s crime. Technically, agents could obtain a warrant to seize the entire network. However, carting off the entire network might cripple a functioning business and disrupt the lives of hundreds of people, as well as subject the government to civil suits under the Privacy Protection Act, 42 U.S.C. § 2000aa and the Electronic Communications Privacy Act, 18 U.S.C. §§ 2701–11.”).

54. *Id.*

55. See *supra* note 49.

56. GUIDELINES, § II(B)(1)(b) at 32. (citing *U.S. v. Tamura*, 694 F.2d 591, 595 (9th Cir. 1982)).

effective recovery of the evidence is infeasible in the particular circumstances of the case.”⁵⁷

The 2001 *Guidelines* explain the circumstances under which a seizure of computer hardware containing evidence is justified:

As a practical matter, circumstances will often require investigators to seize equipment and search its contents off-site. First, it may take days or weeks to find the specific information described in the warrant because computer storage devices can contain extraordinary amounts of information. Agents cannot reasonably be expected to spend more than a few hours searching for materials on-site, and in some circumstances (such as executing a search at a suspect’s home) even a few hours may be unreasonable. Given that personal computers sold in the year 2000 usually can store the equivalent of ten million pages of information and networks can store hundreds of times that (and these capacities double nearly every year), it may be practically impossible for agents to search quickly through a computer for specific data, a particular file, or a broad set of files while on-site. Even if the agents know specific information about the files they seek, the data may be mislabeled, encrypted, stored in hidden directories, or embedded in “slack space” that a simple file listing will ignore. Recovering the evidence may require painstaking analysis by an expert in the controlled environment of a forensics laboratory.

Attempting to search files on-site may even risk damaging the evidence itself in some cases. Agents executing a search may learn on-site that the computer employs an uncommon operating system that the on-site technical specialist does not fully understand. Because an inartful attempt to conduct a search may destroy evidence, the best strategy may be to remove the hardware so that a government expert in that particular operating system can examine the computer later. Off-site searches also may be necessary if agents have reason to believe that the computer has been “booby trapped” by a savvy criminal. Technically adept users may know how to trip-wire their computers with self-destruct programs that could erase vital evidence if the system were examined by anyone other than an expert. For example, a criminal could write a very short program that would cause the computer to demand a password periodically, and if

57. *Id.*

the correct password is not entered within ten seconds, would trigger the automatic destruction of the computer's files. In these cases, it is best to seize the equipment and permit an off-site expert to disarm the program before any search occurs.⁵⁸

This explanation recycles all five factors the 1994 *Guidelines* cited as justifying an off-site search.⁵⁹ The 2001 *Guidelines* do note that agents searching for evidence "stored on the computer network of a functioning business will, in most circumstances, want to make every effort to obtain the information without seizing the business' computers, if possible".⁶⁰ They point out that seizing files and hardware for an off-site search will not be necessary if the agents can either make electronic copies of the files targeted by their search warrant or "mirror a segment of the storage drive based on knowledge that the information exists somewhere within that segment of the drive."⁶¹

Like the 1994 *Guidelines*, the 2001 *Guidelines* encourage agents to have the warrant authorize an off-site search;⁶² the 2001 *Guidelines* also emphasize the importance of developing a search strategy before agents ever apply for a warrant to search a computer or computer system.⁶³ The *Guidelines* also provide sample language to be incorporated in an affidavit seeking authorization of an off-site search.⁶⁴ A computer search and seizure manual issued by the New Jersey Attorney General's office takes a slightly different approach:

First, the affidavit of probable cause should include specific facts justifying the off-site search. These should include facts specific to the computer or business to be searched and general facts related by an investigator trained in computer evidence recovery,

58. *Id.* at 32–33. See *People v. Gall*, 30 P.3d 145, 154 (Colo. 2001) ("In addition to the problems of volume and commingling, the sorting of technological documents may require a search to be performed at another location 'because that action requires a degree of expertise beyond that of the executing officers, . . .').

59. See *supra* note 39 and accompanying text.

60. GUIDELINES, § II(B)(1)(b) at 33.

61. *Id.*

62. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 *Crim. L. Rep. (BNA)* § VI(B)(3) at 2049 (1994); GUIDELINES, § II(B) Step 3 at 47–48.

63. GUIDELINES, § II(A)(3) at 30.

64. *Id.*, app. F at 106. See *United States v. Markey*, 131 F. Supp.2d 316, 322 (D. Conn. 2001) ("Agent Nates' affidavit described in detail the procedure that would be followed if an on-site analysis of the data contained in the computer was not practical or feasible"); see also NEW JERSEY COMPUTER EVIDENCE SEARCH AND SEIZURE MANUAL, app. B, C (2000) available at <http://www.state.nj.us/lps/dcj/pdfs/cmpmanfi.pdf> (last visited Mar. 5, 2002). An example of an application for a search warrant that requests authorization for an off-site search is available at <http://cryptome.org/usa-v-rtf-swa.htm> (last visited Mar. 3, 2002).

regarding the necessity of examining data in a controlled lab. The warrant should authorize seizure and off-site searching. . . .

Second, regardless of whether the warrant specifically permits an off-site search, if evidence is seized for off-site searching, reports must be written detailing the facts and circumstances that necessitated the action.⁶⁵

With regard to the justifications for off-site computer searches, there is really no substantive difference between the 1994 *Guidelines* and the 2001 *Guidelines*. Most state and federal courts have upheld off-site computer seizures and searches, citing the off-site document search doctrine and the additional concerns articulated in the Department of Justice's 1994 *Guidelines*.⁶⁶ The next section considers whether

65. NEW JERSEY COMPUTER EVIDENCE SEARCH AND SEIZURE MANUAL, I(A)(6) at 24 (2000) available at <http://www.state.nj.us/lps/dcj/pdfs/cmpmanfi.pdf> (last visited Mar. 5, 2002). The New Jersey manual identifies the following as the factors that will determine whether an off-site search, not authorized by a warrant, will be "reasonable":

- a. The practicalities of searching voluminous records on-site as opposed to off-site;
- b. The means and methods of executing the search by law enforcement—did the searchers conduct a general search and simply take everything, or were any efforts made to review material, such as non-computerized evidence, and leave behind those materials which were clearly not within the scope of the search warrant?
- c. Whether the affidavit of probable cause offers any factual basis upon which the judge could sanction the seizure and off-premises search?
- d. Whether there is any evidence that the targets intentionally mislabeled files, computer disks, etc., so law enforcement had to examine each one to determine whether it was evidential?
- e. Whether the targets used passwords, codes, etc., that prevented law enforcement from searching on-site?
- f. The amount of time which would be required to conduct the search on-site; and
- g. The quantity of items seized and searched off-site that were returned to the target/defendant and the time that elapsed between the seizure and the return of these items.

Id. at 24–25.

66. See *United States v. Schandl*, 947 F.2d 462, 465–466 (11th Cir. 1998); *United States v. Gurs*, No. 93-30261, 1996 WL 200998 (9th Cir. Apr. 25, 1996) (“[I]t was reasonable for the executing officers to seize the hardware and search the hard drives in a secure location. The only alternative would have been to secure the Gurs’s home and search the computers there. This however, could have taken days, and would have unreasonably intrusive in its own right.”) *United States v. Hunter*, 13 F.Supp. 2d 574, 583–84 (D. Vt. 1998). See also *United States v. Upham*, 168 F.3d 532, 535–36 (1st Cir. 1999); *Commonwealth v. Gousie*, No. BRCR2001-0115-1-6, 2001 WL 1153462 *8 (Mass. Super. Sept. 26, 2001); *Commonwealth v. Ellis*, No. 97-192, 1999 WL 815818 (Mass. Super. Aug. 27, 1999); *United States v. Stewart*,

these principles—as carried forward in the 2001 revision of the *Guidelines*—can justify off-site computer searches in any but the most extraordinary circumstances.

C. *When are Off-Site Computer Searches Reasonable?*

An examination of the merits of the justifications that have been put forth for off-site computer searches can be performed utilizing the hypothetical. Since the rationale for off-site computer searches relies heavily on the rationale for off-site document searches, the Doe & Doe hypothetical will be analyzed from two different perspectives: (1) as an off-site document search; and (2) as an off-site computer search.

D. *Off-Site Document Search*

Assume the Doe & Doe search was conducted some years earlier, at a time when law offices did not use computers to generate and store documents. Also assume that all other events occurred as set out in the original hypothetical, e.g., that the agents obtained a warrant to search the Doe & Doe law office, that they executed the warrant, and that they seized approximately 200,000 documents—the equivalent of 2.7 million pages of printed text or 8 gigabytes of storage space on a computer's hard drive—from the office. In addition to seizing these documents, the agents also seized files, i.e., six file cabinets, complete with contents plus ten boxes of files that were in the offices of lawyers and support staff.

The law firm challenged the agents' actions by filing a motion seeking the return of their property.⁶⁷ The law firm argued that the agents' seizing of the documents was unreasonable and therefore violated the Fourth Amendment for any or all of several reasons. The first reason was that instead of searching for documents that fell within the scope of the warrant and could therefore legitimately be seized, the agents seized essentially all of the documents they found at the firm, intending to search through them later at another location. Doe & Doe argued this was unreasonable because the agents took documents the warrant did not entitle them to take; since the warrant did not justify seizing these unrelated documents, their seizure clearly violated the Fourth Amendment. Doe & Doe also argued that taking the documents away gave the agents more time to review them, and that they could use this opportunity to exploit

No. Crim. A. 96-583, 1997 WL 189381 (E.D. Pa. Apr. 16, 1997); *United States v. Sissler*, No. 1:90-CR-12, 1991 WL 239000 *4 (W.D. Mich. Aug. 30, 1991), *aff'd*, 966 F.2d 1455 (6th Cir. 1992).

67. *See* FED. R. CRIM. P. 41(e).

the plain view doctrine,⁶⁸ reading irrelevant documents in an attempt to find evidence concerning unlawful activities other than those which were the focus of the warrant.⁶⁹ In making this argument, Doe & Doe claimed the agents were using the off-site search to go outside the scope of the warrant and search for evidence of unrelated, as yet undiscovered criminal activity.⁷⁰ Doe & Doe noted that such a search would be unreasonable because it would not be authorized by the warrant nor by a valid exception to the warrant; that is, Doe & Doe argued that this would violate the requirement that a warrant specify the items to be searched for and seized because it gave the agents essentially unfettered discretion to review the documents in an effort to identify evidence of crimes other than those which gave rise to the search warrant.⁷¹ Finally, Doe & Doe argued that the seizure was unnecessary because the agents could simply have sorted through the law firm's documents *in situ*, taking documents that fell within the scope of the warrant and leaving those that did not.

In response, the government argued that it was reasonable for the agents to seize all the documents and take them off-site where they were reviewed and sorted into those that fell within the scope of the warrant. Those documents that fell within the scope of the warrant were seized, those that did not fall within the scope were returned to Doe & Doe. Noting that it took the agents many days to sort and review the documents, the government claimed it would have been unreasonably intrusive to have this process conducted at the law firm's office. The government argued that the presence and activities of the agents would have disrupted all activity at the firm for a similar period of time, and that it was, therefore, more reasonable to have them remove the documents

68. See *infra* Part IV.

69. In dealing with paper records, officers are allowed to conduct a fairly brief review of a record in order to determine if it falls within the scope of the warrant, but this review must cease as soon as it becomes clear that the document does not fall within the scope of the warrant. See *United States v. Heldt*, 668 F.2d 1238, 1267 (D.C. Cir. 1981); *United States v. Ochs*, 595 F.2d 1247, 1258 (2nd Cir. 1979). See also *Andresen v. Maryland*, 427 U.S. 463, 482 n.11 (1976) ("[R]esponsible officials . . . must take care to assure that [document searches] are conducted in a manner that minimizes unwarranted intrusions upon privacy.").

70. Doe & Doe pointed out that by taking the documents off-site, the agents were able to review them without any representative of Doe & Doe's being present to ensure that the agents did not exceed the scope of the warrant by thoroughly reviewing clearly irrelevant documents.

71. See *Lo-Ji Sales, Inc. v. New York*, 442 U.S. 319, 325-26 (1979) (holding a search violated the Fourth Amendment's requirement that a warrant particularly describe the place to be searched and the items to be seized because the warrant essentially gave the parties conducting the search unlimited discretion to expand their search as they went through items on the scene). Doe & Doe would make an argument based on holding in *Lo-Ji Sales* by claiming the officers have taken advantage of the opportunity to seize a large quantity of information which allows the officers to rummage through the information at their leisure in an attempt to identify items that are within and outside the scope of the warrant.

and review them off-site. As to the scope of the seizure, the government explained that the agents were forced to seize a large volume of documents because they believed each of the seized files contained at least some documents encompassed by warrant. The government pointed out that, under the off-site search doctrine, officers are allowed to seize large volumes of records when it appears that relevant and irrelevant documents are so closely intermingled that it is not possible to sort them out quickly,⁷² as long as they return any irrelevant documents within a reasonable period of time.⁷³ With regard to Doe & Doe's claim that the agents impermissibly used the off-site search to exploit the plain view doctrine, the government pointed out that this is an issue which could easily be resolved by a motion to suppress evidence. If Doe & Doe felt the officers unconstitutionally used the plain view doctrine to find evidence of unrelated crimes, Doe & Doe can move to suppress any such evidence, and it will be up to the government to show that the evidence was discovered lawfully.⁷⁴ Finally, as to Doe & Doe's claim that the off-site search was unreasonable because it was conducted without the presence of any representative of the law firm, the government argued that the firm had no constitutional right to be present during the search, and that allowing the firm to have a representative present while the search was conducted would undoubtedly have only lengthened the process.⁷⁵

To resolve the hypothetical, it will be assumed that the court will apply the off-site document search doctrine. The court will therefore reject Doe & Doe's arguments and uphold the constitutionality of the off-site search. It will be assumed that the off-site document search doctrine is a valid Fourth Amendment principle and that the doctrine was correctly applied in this instance. The purpose of this scenario is to illustrate how the doctrine can be applied to paper document searches.

E. *Off-Site Computer Search*

The Doe & Doe scenario illustrates that the off-site document search doctrine is grounded in some characteristics peculiar to paper documents. In order to search the contents of paper documents, an officer has to leaf through each page of a document, reading or at least scanning the text of the document to determine whether the document falls within the

72. *See* *United States v. Hargus*, 128 F.3d 1358, 1363–64 (10th Cir. 1997).

73. *See* *United States v. Tamura*, 694 F.2d 591, 596 (9th Cir. 1982).

74. *See* *Commonwealth v. Ellis*, No. 97-192,, 1999 WL 823741 at *34 (Mass. Super. Aug. 18, 1999) (suppressing documents seized during law firm search, the documents did not fall within the scope of the warrant and could not have legitimately been discovered under the plain view doctrine).

75. *See id.* at *24.

scope of the warrant that authorized this intrusion. This is necessarily a tedious, time-consuming process. In the Doe & Doe scenario, if the documents stored as computer files had been in paper form, searching through them would require officers to review 200,000 documents constituting roughly 2.7 million pages of text, and to determine which of those pages contained information that would permit the documents to be seized under the authority of the warrant. Since the alleged criminal activity that justified the warrant was complex in nature, an officer might, on occasion, have to seek a prosecutor's assistance in making this determination. This consultation will only increase the time required to review the documents and select those that could legitimately be seized. If all this were done on-site, the officers (and any prosecutors assisting them) would be encamped at the Doe & Doe offices for many days.

Another characteristic of a paper document search is the time and effort involved in copying the documents. Assume that instead of either reviewing the Doe & Doe documents on-site or taking them off-site and reviewing them elsewhere, the officers had decided to copy all the documents, take the originals and leave the copies with Doe & Doe. This would not simply entail copying the aggregate 2.7 million pages of text represented by the seized 200,000 documents. The officers would have to copy every document, collate the copied pages of that document and assemble the pages into a duplicate of the document or file. This would be a tedious, time-consuming process. If the officers copied the documents at Doe & Doe, the process could shut down the law firm for many days. If the documents were taken off-site to be copied, there would still be the problem of document seizure.

Finally, paper documents are relatively sturdy. When officers seize paper documents and take them off-site to sort and search, there is very little likelihood that any of the documents will be destroyed, and essentially no chance that the information the documents contain will be altered. Therefore, taking paper documents off-site to sort and process them creates a very minimal risk that evidence will be damaged or lost.

The off-site document search doctrine accurately reflects the practical difficulties involved in conducting a search of a large quantity of documents, especially when the search is intended to locate evidence of complex criminal activity.⁷⁶ However, the analysis must be applied to the off-site computer search doctrine to determine if it accurately reflects the processes involved in searching for computer-generated evidence.

76. The scenario we are using involves business premises instead of a home. The considerations discussed above would apply with equal force when a large quantity of documents are discovered at a home.

F. *Off-Site Document Search Rationale Inapplicable to Off-Site Computer Searches*

While the officers, in the original hypothetical, undoubtedly seized a quantity of paper documents, the primary focus of their efforts was the Doe & Doe computers. As the hypothetical in § I explains, the officers seized Doe & Doe's network server, twenty-two stand-alone computers, thirteen computer back-up tapes and a printer. The seized computers and computer equipment were taken to an off-site location, where the officers reassembled the server. When the officers had reassembled the system, they made back-up copies of the data it contained and then began searching the computer system and storage media.

In the previous section, it was assumed the off-site search would have been reasonable under the Fourth Amendment if the officers had seized only paper documents. This assumption must be reconsidered when officers seize computer-generated evidence.

The primary justification given for off-site searching of paper documents is the time and effort involved in reviewing large quantities of documents to determine which, if any, contain evidence that falls within the scope of the warrant.⁷⁷ As the previous section notes, this process necessarily requires that each document be reviewed by one or more officers; there is no way to automate the review.

G. *Automated Search Techniques*

With computer-generated evidence it is possible to perform certain limited searches using automation. The officers in the original hypothetical used a program to run a key-word search on all of Doe & Doe's stand-alone computers. The officers used the key-word search to determine which of the stand-alone computers to seize and search more thoroughly off-site. The fact that a search was conducted demonstrates one basic difference between paper documents and computer-generated evidence. Officers using search software could search for specific words or phrases in the Doe & Doe computer files in a small fraction of the time it would take their hypothesized counterparts to review the same information contained in paper documents.

From the technical viewpoint, automated search techniques have inherent strengths and weaknesses that distinguish the search from conventional document review. Automated keyword searches have the advantage of being both fast and accurate. The usefulness is limited to situations where there is some precise textual identifier that can be used

77. See *supra* Part II(A).

as the search argument. Keyword searches are context insensitive, and cannot employ the discrimination used by a human investigator. If either the data encoding or the alleged criminal activity is complex in nature, human judgment will be required to determine the evidentiary value of specific electronic documents and whether the documents fall within the scope of the warrant.

The benefits of electronic search techniques are that they are fast, accurate, and within the narrow scope of their capabilities. If the officers are searching for very specific information and know one or two exact phrases or words to search for, a comprehensive electronic search can be conducted in a matter of hours. For example, if the officers were searching for a copy of specific insurance claims or accounting records, and the officers knew with certainty that these records would contain specific phrases, numbers, or names, these records could be located very quickly. Once the appropriate electronic records were located, they could be copied on a file-by-file basis, in effect allowing seizure of only the files that fall within the scope of the warrant.

By contrast, if the officers conducting the search do not have specific information (names, numbers, phrases) sufficient to allow an accurate identification of *all* relevant documents, electronic searches are far less useful. The use of common words or phrases as keywords may still help locate relevant evidence, but such searches yield a high number of false hits. False hits are documents that contain the searched—for term, but have no evidentiary value and are beyond the scope of the warrant.

The usefulness of keyword searches is further diminished by the fact that such searches are context insensitive. Computer data is encoded. Many computerized documents require specialized software to read or render their contents comprehensible. Such software provides the *context* required to interpret electronic data. For example, the medical records, accounting data, and medical appointment logs in our hypothetical would most probably contain many abbreviations or coded values representing various medical procedures and associated charges. A record containing a patient's name, a numeric value of 1, a procedure code of 346 and a charge of 740000 might not seem suspicious. But if the numeric value 1 is a code that indicates that the patient is a male, and the medical procedure code of 346 identifies the operation as a hysterectomy, then the legitimacy of the \$7400.00 charge is suspect. Without knowing the context of the numbers 1, 346, and 740000, the data represented cannot be evaluated for relevance.

The manner in which computer data is represented also limits the effective scope of automated search techniques. Many automated search tools are based on the detection of textual character strings embedded in

documents. These techniques can only be applied to textual data, and not for pictures, diagrams, or scanned images. For example, a search for the word "submarine" would locate text that contained those characters, but it would fail to locate the scanned image of a submarine, a digital photo of the control tower, or even a scanned image or photo of the original document. The textual search would also fail to locate the desired document if it had been compressed, encrypted, or password protected. Depending on the software used for the search, it might or might not detect the word "submarine" in files that had been deleted.

Other types of searches depend on properly identifying documents by either document type or by file name. Searches by file *name* are unreliable because a user is free to name (or rename) files without regard to their content. Searches by file *type*, can be accomplished using specialized tools that identify files based on the "signature" associated with the program used to create the file. This technique can be used to identify or group files based on how data is represented. These tools can identify file *format*, but are not able to search *content*. Searches based on file type are not normally effective against files which have been encrypted, compressed, or password protected.

H. *Technical Considerations*

The feasibility of conducting an on-site search should be influenced by three primary technical considerations: the configuration of the software and hardware, the overall size and complexity of the computer system, and the technical demands of the search.

The configuration of the software and hardware is an issue because specialized knowledge is required to avoid damaging the evidence while performing even simple tasks such as starting up the computer, examining a directory listing, or opening a file to inspect the contents. On most computer systems all of these acts will result in damage to the evidence. The specific remedy to avoid damage will depend on the technology of both the computer system and the tools to be used.

Software and hardware configuration will also determine the skills (and tools) that the examining officer must possess in order to conduct a successful search. Different tools and techniques are required for different operating systems, and also for different software products. For example, some common e-mail systems save messages in a simple textual format that can be readily searched using keyword searches. Other common e-mail products save messages in a compressed format, in order to save disk space. E-mail systems that use compression cannot be searched with the normal tools used for keyword searches. The examin-

ing officer must use the e-mail system itself, or specialized utilities, to examine the contents of messages.

The size and complexity of the computer system is also a factor in the feasibility of conducting an on-site search. On large-scale computer systems the feasibility of off-site searches breaks down under the sheer weight of system size, but even without the size consideration, an off-site search is often infeasible due to the system complexity.

The core of the problem is that these “big-iron” systems possess a far more complex hardware and software profile than a personal computer. The problem of seizure is similar to the task of disassembling and assembling an analog watch. There are a vast number of interconnected pieces, which are related to each other in very specific ways, and the interactions between the pieces is both precise and delicate. A large support staff, each with specialized skills and knowledge, maintains most mainframe systems. The costs to care for and maintain a mainframe are high. It is common that the annual budget for mainframe hardware, maintenance, support, and software exceeds several million dollars. An additional problem is presented by the amount of time that would be required to seize a copy of a mainframe system due to the amount of storage involved. In a typical large system, there might be thousands of gigabytes of active disk storage to back up. Such a system might also have tens of thousands of backup tapes.

The technical demands of the search may determine whether an on-site search is feasible. Some of the factors to consider include whether or not appropriate search tools exist for the specific configuration, whether the tools are already installed on the computer to be searched, whether the tools available on-site can be used without destroying evidence, whether the searching officer has sufficient information about the format and encoding of the electronic evidence to conduct a meaningful search, whether deleted files are to be searched, and whether the computer system is protected by passwords, encryption, or other security that might thwart attempts to conduct an on-site search in a timely fashion.

The number of terms to be searched for is also a factor. As the list of search terms grows, so does the time required to accomplish the search. A ten-gigabyte hard disk can be searched, using a single search term, in less than an hour. If the list of search terms is increased to 50, the search will take 15–20 hours to complete.

I. Back-Up Copies Made on-Site for Off-Site Search

Even if we assume that an automated search of the Doe & Doe computer files would consume enough time that the officers’ presence at the law firm would be sufficiently intrusive to justify letting them conduct

their search off-site, there is another alternative. As the previous section explained, copying paper documents is not a realistic alternative to searching off-site because the process of making the copies is time-consuming, costly, and intrusive. This is not true in regards to computer-generated evidence. Officers can generate back-up copies on-site and then search the back-ups off-site.⁷⁸ The time required to make the back-up copies would be only a small fraction of the time that would be required to copy a corresponding volume of paper documents. Therefore, generating the back-up copy would not rise to the level of intrusiveness of copying paper documents.

The act of making back-up copies normally will require that the agents or technicians generating the copies be given unfettered access to the computer system, a requirement which may disrupt a law firm's (or a business') ability to continue its operations. In some cases, making the necessary back-up copies may require days of dedicated access to the computer system, but, even so, the process of making such copies is less disruptive than seizing the system hardware.

Another virtue of the officers creating back-up copies is that the law firm is not deprived of the information it needs to conduct business. When the officers seize Doe & Doe's computers (or Doe & Doe's paper documents, in the variant hypothetical), they completely deprive Doe & Doe of the information stored on those computers (or contained in the paper documents). This makes it difficult, if not impossible, for Doe & Doe to conduct its professional activities. A generally unacknowledged side effect of seizing information for an off-site search is that the seizure can effectively prevent the owner of the seized information from continuing to conduct regular business or professional activities.⁷⁹ (This effect is, of course, only compounded if the officers also seize the computer equipment belonging to the person or business that is the object of the scenario; this issue is discussed below). The disruption of business does not occur if the officers copy the information stored on the owner's computer systems. The officers can conduct their searches and the owner of the information can proceed with business.⁸⁰

78. See *infra* Part III(D), IV (discussing the scope of the off-site search). See also DIBS Computer Forensics: Portable Evidence Recovery Unit at <http://www.computer-forensics.com/products/peru.html>. (last visited Oct. 2, 2001).

79. See *Steve Jackson Games, Inc. vs. United States Secret Service*, 816 F.Supp 432, 437-39 (W.D. Tex. 1993), *aff'd* 36 F.3d 457 (5th Cir. 1994) <http://www.sjgames.com/SS/>; *infra* Part II(K).

80. See *id.* (determining the agents who executed the warrant had experts available who could have copied the information contained on the stored hardware within hours and therefore awarded damages against the agency responsible for seizure of business' computers and data).

From the technical perspective, the preferred course of action is *always* to preserve a forensic copy⁸¹ of the evidence first, before any search is performed, to provide insurance against any possible contamination or damage to evidence by either the search process or any subsequent seizure. In many cases, production of a forensic copy will obviate the need for seizure. Preserving a forensic copy of the evidence should be the first step regardless of whether the computer system is to be searched on-site or off-site. Special backup software provides the capability of creating accurate backups that contain all of the evidence from the original media, including information contained in deleted files and space on the hard disk that is not allocated to any file.

J. Spoliation—Inadvertent

Having the officers make back-up copies of the information stored on computers, like the Doe & Doe computers, reduces the possibility that evidence will be altered or destroyed. As the previous section noted, paper documents are relatively impervious to inadvertent alteration and are sufficiently sturdy so that they are unlikely to be destroyed, absent some unanticipated accident or cataclysm. That is not true of computer-generated evidence. Computer-generated evidence can be very vulnerable. Even without deliberate spoliation attempts, normal use of a computer system will result in the inadvertent obliteration of large quantities of evidence.⁸²

During the normal use of a computer, the computer's operating system and programs record information that can be used to reconstruct the actions of the human operator. This information, which is invisible to the average computer user, can reveal when the system was used, when files were created, modified, or accessed, what Internet sites were visited, what searches were performed, what files were downloaded, what

81. Forensic copy, for the purposes of this article, is defined as a copy of the computer system or media which contains an accurate copy of all of the active files, deleted files and unallocated space on the computer media. The copy must have sufficient information to identify the system from which the back-up copy was made, along with the date, time and technology used in making the back-up copy. A forensic back-up should, if possible, be accompanied by a checksum for both the original media and any back-up copy. This checksum can be used both to authenticate the copy and to determine whether the evidence contained in the copy has been the subject of any tampering or contamination.

82. Many forms of forensic examination run the risk of contamination. Biological samples from a subject can be inter-mingled with those of the examiner. But the problems with some computer-derived material are intense—the very act of opening an application or file, even if there is no intention to alter anything, often in fact creates changes although they may not be immediately visible. See Peter Sommer, *Downloads, Logs and Captures: Evidence From Cyberspace*, 5 J. FIN. CRIME 138, 142 (2000).

documents were edited, and what e-mails were sent and received. The information may also reveal what files were deleted, when they were deleted, and even the contents of e-mail, documents, and images that the user has attempted to destroy.

The information is automatically generated by the operating system and programs and is revised constantly as the computer system is used. During normal computer use, many temporary files are created and deleted by the operating system. Additional files are created, deleted, or modified by the specific actions of the user. If the computer system is in continual use, older information will be overwritten with newer information. The more the system is used, the more evidence will be lost. The simple act of starting a Microsoft Windows system will destroy more than 4,000,000 characters of evidence, and the spoliation will be far greater if the system is used to run any programs.

The spoliation that results from casual use takes several forms. Normal use destroys evidence in the form of system data, which records information about recently used files and user actions such as Internet access. This destruction of evidence occurs as information recording system activity is overlaid by new user activity. File use, both deliberate and incidental to the system operation, will result in contamination of the date information that records when files were created, accessed, or modified.

When a computer is used, the system and programs used create and, subsequently, discard many temporary files. Human users create, modify, or delete additional files. Creation of new files results in the overlay and obliteration of information that remains in deleted files, rendering the contents of deleted files unrecoverable.

In addition to the spoliation that occurs as a result of casual use, there are additional threats to the electronic evidence. These include automated housekeeping tasks, virus corruption, hardware failure, software failures, mishandling, and deliberate actions taken to alter or destroy evidence.

The computer performs various housekeeping tasks that are required to allow the system to function optimally. These tasks include activities such as flushing the Internet cache file and overlaying the information recorded about Internet activity, deleting temporary files to free up disk space, defragmenting disk space (which overlays the contents of deleted files), and compressing mail boxes (which overlays the contents of deleted e-mail messages).

When a computer system is used, the electronic evidence it contains is vulnerable to damage by a computer virus. After infecting a computer system, many destructive viruses will remain dormant and undetected

until some specific event triggers their activation. Triggering events can include innocent actions such as use of a program to open or save a file, reading an e-mail message,⁸³ visiting an unfriendly web site, or simply having the computer turned on when a certain calendar date occurs.

Hardware and software failures occur unpredictably and can damage or completely destroy electronic evidence. Software failures can result in corrupted documents, accidental overlays of information, malformed data, or accidental deletion of files. Hardware or media failures can result in partial or complete obliteration of electronic and optically recorded information. There is not a form of computer readable media or hardware that can be used to read and write to a medium that is not subject to the possibility of failure. Over time, all computer media degrades, even if handled carefully. Attempts to read good media in faulty or dirty drives can also result in data destruction.

Accidental mishandling or trauma can also destroy electronic evidence. Media can be damaged by electrical spikes that occur while the system is used, shocks from falling, electro-magnetic fields, or physical extremes in heat, moisture, or cold. Computers and media can be easily damaged if they are improperly handled when transported.

K. *Spoilation—Advertent*

Electronic evidence may also be altered or destroyed in any number of deliberate ways. There are utility programs available to shred electronic e-mail and documents, alter the invisible system dates, and overwrite deleted files or entire disks. Even without any special tools, most of the deleted files on a computer system can be rendered effectively irrecoverable by overwriting them with benign files.

The discussion so far has focused on whether it is reasonable to extrapolate the justifications for conducting off-site searches of documents to off-site searches of computer-generated evidence. This does not exhaust the rationales given for off-site computer searches. Both versions of the *Guidelines*⁸⁴ also justify off-site searches on the basis of two factors that are unique to computer searches: (a) the need to conduct a controlled search to prevent the destruction of evidence, and (b) the need to seize computer hardware and use it to search seized files.⁸⁵

83. Until recently, the act of merely reading an e-mail message could not, by itself, launch a virus attack. Many new e-mail systems are both more sophisticated and more vulnerable than their predecessors. The vulnerability stems from the automatic execution of invisible commands embedded in the messages.

84. *See infra* Part II(B).

85. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2) at 2040 (1994); FEDERAL GUIDELINES FOR SEARCHING AND SEIZING

This standard makes no mention of the specialized software that may be needed to render data comprehensible—even though such software may present a greater technical challenge than the hardware. This standard also omits any clear guidelines for situations that involve specialized hardware or software residing on a separate computer system—i.e. software that runs on a client, which is required to access data on a separate server.

The Department of Justice bases its contention that off-site searches are necessary to prevent the destruction of evidence on two different premises, the first of which is a variation on a traditional exception to the warrant requirement. The exception is for actions which would otherwise be unreasonable under the Fourth Amendment but the actions can be justified by the need to prevent the destruction of essential evidence.⁸⁶ This is certainly a valid point, as long as there is probable cause to believe that the destruction of evidence is, in fact, imminent.⁸⁷ For an off-site search to be justifiable under this theory, the government should have to show, at a minimum, that there is reasonable suspicion to believe evidence will be destroyed if officers attempt to conduct an on-site search.⁸⁸ Reasonable suspicion for such a belief might be established, for example, if the government adduced evidence showing the search was to be conducted of equipment owned or used by a “hacker” or computer terrorist, and if the government could show there was specific reason to believe this person might have “booby-trapped” his or her computer so that evidence could easily be destroyed by someone unfamiliar with the system.⁸⁹ On the surface, it would seem highly improbable that this rationale could be used to justify an off-site search of business computers such as those owned and operated by Doe & Doe.⁹⁰ Aside from anything

COMPUTERS § II(B)(1)(b) at 32–33 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

86. See WAYNE R. LAFAVE, 3 SEARCH AND SEIZURE § 6.5(b) (3d ed. 1996).

87. *Id.*

88. This is analogous to the showing officers have to make to justify a no-knock entry when executing a search warrant. No-knock entries are an exception to the Fourth Amendment’s requirement that officers knock and announce their presence before entering to make an arrest or execute a search warrant. See *Richards v. Wisconsin*, 520 U.S. 385, 394–95 (1997).

89. See *Mahlberg v. Mentzer*, 968 F.2d 772, 775–76 (8th Cir. 1992) (holding it was reasonable for officer executing computer search warrant to seize disks when he had been warned by suspect’s former employer, from whom suspect had stolen software, that the suspect might booby-trap his computer so it would erase files when agents tried to search it on site). See also FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2)(a) at 2040 (1994).

90. See *Steve Jackson Games, Inc. v. United States Secret Service*, 816 F. Supp. 432 (W.D. Tex. 1993), *aff’d* 36 F.3d 457 (5th Cir. 1994) (finding failure in an agent who obtained and executed business search warrant for not taking time to determine that the business was a legitimate operation that would have cooperated with the agent’s investigation).

else, it stretches credibility to the breaking point to imagine that a law office would “booby-trap” its computer system, so that its files, billing records and other documents might be destroyed by the inadvertent actions of a clerk. In reality, no such deliberate “booby-trap” would be required for evidence to be destroyed. As explained above, the normal use of a computer system will result in the destruction and contamination of evidence. Even the act of inspecting file contents will alter the evidence unless the inspection is performed using specialized tools, or against a copy of the original.

The second premise the Department of Justice relies on as supporting its contention that off-site searches are necessary to prevent the destruction of evidence is the need to have searches conducted by persons with the requisite computer expertise.⁹¹ As the *Guidelines* explain,

[t]he computer expert who searches a target’s computer system for information may need to know about specialized hardware, operating systems, or applications software just to get to the information. For example, an agent who has never used Lotus 1-2-3 (a spreadsheet program) will not be able to safely retrieve and print Lotus 1-2-3 files. If the agent entered the wrong computer command, he could unwittingly alter or destroy the data on the system.⁹²

Computer searches should be conducted by qualified personnel, but it is difficult to see why the need for off-site searches becomes part of this proposition. Would it not be far more reasonable to bring the qualified personnel to the scene and have them conduct the search on-site, instead of disassembling the computer equipment, seizing it, taking it to an off-site location, reassembling it and then having the experts run their analyses?

From the technical viewpoint, this question cannot be answered with a simple yes or no. In order to avoid contaminating the evidence, the tools used to perform searches and analyze electronic evidence can not be installed on the target computer until after a complete forensic backup has been secured. Installing such tools on the target computer would overwrite deleted files, create new files, and reduce the possibility that tampering will be detected. Installing search and analysis tools also causes changes to certain of the system files and dates that would be examined in the normal course of an investigation, thereby damaging the

91. See FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2)(a) at 2040 (1994); GUIDELINES, app. F at 106.

92. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2)(a) at 2040 (1994).

evidence further. In practice, these limitations can be overcome by searching the computer systems media from a separate computer system that is specially configured for this purpose. Depending on the nature of the hardware involved on both the search and target computers it may not be practical, or in some cases even possible, to conduct such searches on-site.

L. General Affidavit Language not Sufficient

Another, less convincing argument is illustrated by this excerpt from an agent's affidavit, submitted to obtain a warrant to seize and search computer equipment as part of a child pornography investigation:

Computer storage devices . . . can store the equivalent of thousands of pages of information. Especially when the user wants to conceal criminal evidence, he often stores it in random order with deceptive file names. This requires searching authorities to examine all the stored data to determine whether it is included in the warrant. This sorting process can take weeks or months, depending on the volume of data stored, and it would be impractical to attempt this kind of data search on site; and searching computer systems for criminal evidence is a highly technical process requiring expert skill and a properly controlled environment. The wide variety of computer hardware and software available requires even computer experts to specialize in some systems and applications, so it is difficult to know before a search which expert should analyze the system and its data. . . .⁹³

There are several problems with allowing computer equipment to be seized and searched off-site based on assertions such as these. Some of the problems are technical; one is not. As to the latter, the language above is an example of form language that is often included in computer search warrants. There is nothing in the above paragraph that provides any idiosyncratic information about the specific individual/suspect whose computer equipment is to be seized or why it is not feasible to search that particular equipment on-site. Just because searching "can take weeks or months" does not mean it will take weeks or months to search this particular suspect's computers on-site.

The technical objections also present problems of specificity. The above language fails to articulate a specific technical basis for seizure. The language does not identify whether the scope of the search is limited to images, e-mail, documents, or if other computer records are also to be

93. *United States v. Campos*, 221 F.3d 1143, 1147 (10th Cir. 2000).

searched. Assuming for a moment that the scope of the search is to locate only graphic images, the language above does not state why any of the techniques to be used for the search would require the search activity to be conducted against all files, or why it must be conducted off-site. This affidavit implies that file names are relevant to the search, but does not state why. Since file names are not constrained, a search based on file names would be a poor way to proceed. Better tools exist which would allow the officers to search for (and copy) files belonging to specific categories of information (text, graphic images, movies, etc.) The above language fails to specify which types of file are within the scope of the search warrant, and why appropriate techniques will not be used to isolate relevant materials from those outside the scope of the warrant. The above language also fails to specify any situation specific hurdles that would render an on-site search unfeasible. By way of example, if the system to be searched was expected to be so large that an on-site search was impractical, the officers should provide an estimate of the system size and the amount of time the search was expected to take, in order to allow the court the opportunity to decide the feasibility on those case-specific merits. The above language fails to consider on-site backup/off-site search of the copy, which would be a less intrusive alternative to most seizures.

Taking these technical issues into account, an affidavit submitted to secure a warrant should include identification of what specific systems or portions of systems are to be preserved, how many copies will be produced, how such copies will be made and verified, and who should receive copies of the media contents and checksum information. Once these issues are addressed, the affidavit should proceed to determination of the scope of any subsequent search, whether any allowed search should be conducted on-site or off-site, what will happen to any backup copies after the search is complete and, finally, to determine whether there is any legal or technical basis for seizing the actual hardware and software.

M. *On-Site Search May be Reasonable*

On-site searches are not inherently impossible or impracticable. In certain situations an on-site search is the most reasonable course of action. Situations in which an on-site search should be considered include those where the computer system is sufficiently small to allow a forensically accurate copy of the system to be preserved *in situ* and where the scope of the search is sufficiently narrow that automated tools could effectively be deployed to locate the relevant evidence in a reasonable period of time. Examples where this might be true include situations

where the scope of the search is limited to one or few computers with finite domains of electronic evidence such as e-mail or graphic images, and where appropriate tools exist to conduct the search without requiring manual access to individual documents. In those cases, files that fall within the scope of the warrant can be copied and searched on-site, or copied and the copy seized for off-site search.

Other situations in which an on-site search might reasonably be required include systems of sufficient size or complexity that it is impractical to search them off-site. For instance, as the *Guidelines* note, searching is necessarily done on-site whenever a mainframe computer system is involved.⁹⁴ In the case of mainframe computers, both the volume of evidence and the complexity of the computer system may render creating a copy or seizing the entire computer system impractical.

Consideration must also be given to the potential harm that might be caused by seizure of a computer system that is used for legitimate business purposes or which are used by third parties who are not subject to the warrant. Creating a complete forensic backup of a computer system requires unfettered access to the system, and prohibits the use of the system by other users for the entire period of time required to secure the copy. This could mean that users of very large computer systems could be denied access to the computer for a number of days, or possibly even weeks.

The final factor cited in the *Guidelines* as justifying off-site searches is the need to seize computer equipment (and documentation)⁹⁵ so experts can use the suspect's equipment to analyze his or her data at the law enforcement laboratory.⁹⁶

With an ever-increasing array of computer components on the market—and with existing hardware and software becoming obsolete—it may be impossible to seize parts of a computer system . . . and operate them at the laboratory. In fact, there may be times when agents will need to seize every component in the computer system. . . . Many hardware incompatibilities exist . . .

94. See FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2)(a) at 2040 (1994). As a point of technical accuracy, it is possible to search a mainframe off-site, but the costs and technical hurdles that must be overcome are both formidable.

95. This does not appear to provide for seizing computer software that is needed to conduct the search, which may be a more problematic element from the technical viewpoint.

96. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS 56 Crim. L. Rep. (BNA) § IV(H)(2)(b) at 2040 (1994).

and the laboratory experts may need to properly re-configure the system back at the lab in order to read data from it.⁹⁷

This rationale is valid only if there is an independent justification for conducting an off-site search. If law enforcement experts can conduct their searches on-site, there is no need to seize all or part of a suspect's computer system and take it off-site.

If officers seize a business or professional suspect's computer system and data files, they have effectively shut down the suspect's operations. (If they give the suspect a back-up copy of the data, a back-up is of little use with no computers.) This happened to Steve Jackson Games, a company that publishes role-playing games, along with books and magazines about games.⁹⁸ On March 1, 1990, the Secret Service executed a search warrant at the company's offices; the warrant was issued as part of an investigation of data piracy, and authorized the seizure of computers and computer data.⁹⁹ The agents seized three computers, over 300 computer disks, a book and other documents intended for publication, a bulletin board system, and other materials.¹⁰⁰

The seizure of this equipment and information caused great business and financial hardship for Steve Jackson Games.¹⁰¹ No charges were ever brought against Steve Jackson Games or any of its employees and, indeed, the company recovered damages in a civil suit it brought against the Secret Service.¹⁰²

All of these issues should be considered in determining whether an on-site search is feasible. If the warrant requests seizure and an off-site search, it should provide specific reasons why an on-site search cannot be performed.

N. On-Site Copy with Off-Site Review

From the technical viewpoint, there are many situations where on-site searches are either impractical or impossible. In these cases on-site preservation, followed by off-site analysis, is a more reasonable course of action. Having experts preserve the evidence first minimizes the possibility that evidence would be altered or destroyed by either subsequent use of the computer system, deliberate tampering, or the search itself.

97. *Id.*

98. See Welcome to Steve Jackson Games!, at <http://www.sjgames.com/general/about-sjg.html> (last visited Feb. 8, 2002).

99. See *Steve Jackson Games, Inc. v. United States Secret Service*, 816 F.Supp 432, 436-37 (W.D. Tex. 1993), *aff'd* 36 F.3d 457 (5th Cir. 1994).

100. *Id.* at 434-37.

101. See *Steve Jackson*, 816 F. Supp at 438-39 .

102. See *id.* at 435, 438-39.

Creating backups of the system before any extensive examination takes place also minimizes the possibility that evidence will be contaminated or destroyed in the event of any mishap when computer equipment is moved off-site, physically examined, re-assembled, or restarted.

Once a proper forensic backup is secured, having the expert conduct the actual search off-site is the best technical alternative. Off-site search allows the expert to employ techniques that minimize the possibility that the search process will contaminate the evidence. Due to the availability of both additional tools and additional time a more thorough search can be conducted off-site, ensuring that relevant evidence will not be overlooked. Off-site search of a forensic copy minimizes the intrusion of the search process and reduces the potential for mistakes induced by the pressure of attempting complex and delicate analysis on an expedited timeline in a hostile environment.

In situations that involve on-site preparation of a forensic copy, and subsequent off-site search, the application for the warrant should state specifically what search techniques will be used, and what specific precautions will be taken to ensure that the scope of the search is consistent with the scope of the warrant. If keyword searches are to be used, the warrant should describe the specific topics that will be searched for in as much detail as possible. By way of example, an affidavit for a warrant to search e-mail for evidence of drug trafficking activity might expressly state that e-mail files would be identified based on file signature and inclusion of to/from headers, and that a subsequent key-word search would be used to identify e-mail in these files which was to or from the suspect and which also contained any reference to drugs or drug-related activity.¹⁰³ Any e-mail identified by the keyword search would be reviewed to see if it contained reference specifically to drug trafficking activities, and if so a copy of the e-mail would be seized as evidence.

Based on the specific technical and legal fact pattern, off-site search of a forensic copy is probably the most practical scenario for most cases. Even so, there are situations where there may be no alternative to seizing the entire computer system for off-site search. In such cases, the application for a warrant to seize should explicitly state both the legal basis for the seizure and the specific technical reasons why on-site search or off-site search of a forensic copy is impractical.¹⁰⁴

103. FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS app. F(C) at 111 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf> (providing sample language for warrant application including use of key-word search).

104. See MODEL CODE OF CYBERCRIME INVESTIGATIVE PROCEDURE, art. VII § 7(f)(i) (1998) at <http://www.cybercrimes.net/MCCIP/art7.html> (last visited Feb. 16, 2002).

O. Off-Site Searches: A Proposal

There should not be a blanket prohibition against off-site computer searches under the Fourth Amendment. However, because of the direct and consequent intrusiveness which can result from seizing someone's computer data and equipment,¹⁰⁵ off-site searches must be specifically authorized by a Magistrate Judge in a warrant.¹⁰⁶ Also, no warrant should be issued authorizing the seizure of computer hardware, instead of making a forensic back-up copy of the data, unless the warrant affidavit provides a specific explanation of the technical reasons why the search cannot be conducted on-site or conducted off-site using forensic back-up copies of data.

The authorization can be contained in an original warrant or in a supplemental warrant. Warrant officers obtain supplemental warrant after they have begun to execute an original warrant and discover that an on-site search is simply not feasible.¹⁰⁷ It must not be based on generic, conclusory assertions about the time needed to copy and analyze the data on the computer system and/or about the need to seize data and equipment to prevent its destruction by "booby-traps" that could be installed on the system.¹⁰⁸ Conclusory allegations offered to obtain an authorization for an off-site search are analogous to conclusory allegations included in an application for a search warrant; in neither instance can the Magistrate

105. See *People v. Gall*, 30 P.3d 145, 160 (Colo. 2001) ("[T]he nature of the property seized under this warrant is particularly important, since computers, by their unique nature, raise special privacy concerns. Because computers process personal information and effects, they require heightened protection under the Fourth Amendment against unreasonable searches or seizures.").

106. See *infra* Part IV; Raphael Winick, *Searches and Seizures of Computers and Computer Data*, 8 HARV. J.L. & TECH. 75, 107 (1994). See also *United States v. Tamura*, 694 F.2d 591, 595-596 (9th Cir. 1982) ("In the comparatively rare instances where documents are so intermingled that they cannot feasibly be sorted on site, we suggest that the Government and law enforcement officials generally can avoid violating Fourth amendment rights by sealing and holding the documents pending approval by a Magistrate Judge of a further search, in accordance with the procedures set forth in the American Law Institute's Model Code of Pre-Arrest Procedure. If the need for transporting the documents is known to the officers prior to the search, they may apply for specific authorization for large-scale removal of material, which should be granted by the Magistrate Judge issuing the warrant only where on-site sorting is infeasible and no other practical alternative exists . . . The essential safeguard required is that wholesale removal must be monitored by the judgment of a neutral, detached Magistrate. In the absence of an exercise of such judgment prior to the seizure in the present case, it appears to us that the seizure, even though convenient under the circumstances, was unreasonable."); A MODEL CODE OF PRE-ARREST PROCEDURE § 220.5 (1975) (requiring a special procedure where documents that are to be searched contain additional material not specified in the warrant).

107. See *infra* Part IV.

108. See *supra* Part II(C); *Gall*, 30 P.3d at 154 (officers seized computers and sought further warrants to authorize searching their contents).

Judge rely on general allegations without abrogating his or her duty to find facts and draw inferences independently.¹⁰⁹ The Magistrate Judge, not the officer, must make the determination that a seizure of computers and computer storage media is necessary, and, to do that, the Magistrate Judge must have specific facts from which he or she can make that determination.¹¹⁰

The officer applying for an off-site search authorization must, therefore, provide the Magistrate Judge with specific, detailed information about the suspect and the computer system at issue; information sufficient to allow the Magistrate Judge to make his or her own independent assessment as to whether an off-site search is reasonable under the circumstances.¹¹¹ An off-site computer search should be treated as an unusual measure, just as (but not for the same reasons) no-knock entries are treated as extraordinary measures.¹¹² Any requirement to seize computer hardware, software, or documentation must be addressed

109. *See* *Aguilar v. Texas*, 378 U.S. 108, 111 (1964); *Nathanson v. United States*, 290 U.S. 41, 47 (1933).

110. *See Aguilar*, 378 U.S. at 112.

111.

[I]f agents expect that they may need to seize a personal computer and search it off-site to recover the relevant evidence, the affidavit should explain this expectation and its basis to the magistrate judge. The affidavit should inform the court of the practical limitations of conducting an on-site search, and should articulate the plan to remove the entire computer from the site if it becomes necessary. The affidavit should also explain what techniques the agents expect to use to search the computer for the specific files that represent evidence of crime and may be intermingled with entirely innocuous documents. . . .

. . . .

. . . [T]he affidavit should explain the techniques that the agents plan to use to distinguish incriminating documents from commingled documents.

FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § II(C)(3) at 47–50 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

The *Guidelines* do not require enough. The affidavit should be required to (a) specify the information they are searching for and the techniques they intend to use in an effort to find the evidence in as much detail as possible; and (b) return to the Magistrate Judge to obtain a supplemental warrant if their original search strategy proves unsuccessful. The requirement that the agents obtain a supplemental warrant is the best way of implementing Fourth Amendment policies in this context, since it ensures that the decision to broaden the scope of a search is made by the Magistrate Judge, not by the agents alone.

See MODEL CODE OF CYBERCRIMES INVESTIGATIVE PROCEDURE, art. VII § 4(f)(I) (1998) at <http://www.cybercrimes.net/MCCIP/art7.htm>.

112. *See* *Richards v. Wisconsin*, 520 U.S. 385, 394–95 (1997) (officers must have reasonable suspicion of danger or destruction of evidence to make no-knock entry); *United States v. Tavarez*, 995 F. Supp. 443, 446–47 (S.D.N.Y. 1998) (affidavit for warrant provided specific facts justifying no-knock entry).

separately in the application. Any such requirement for seizure must clearly describe both the basis for the seizure and the reason(s) the search and subsequent analysis cannot be conducted against a forensic copy of the computer system.¹¹³ The decision to seize and to search off-site must be made by the Magistrate Judge issuing the warrant, and this requires that the Magistrate Judge be given specific information about what evidence the officers will be searching for.¹¹⁴ The affidavit should

113. The United Kingdom recently adopted legislation that lets an officer seize an item if he has “reasonable grounds” to believe it may contain something for which he is authorized to search pursuant to a warrant. Criminal Justice and Police Act, 2001, c. 16 § 50 (Eng.), at <http://www.hmso.gov.uk/acts/acts2001/20010016.htm> (last visited Jan. 31, 2002). The act of copying property, including computer disks or files, constitutes a seizure. *Id.* at c. 63(1)(a). The officer can only seize the item if “in all the circumstances, it is not reasonably practicable for it to be determined” on the premises where the property was found, “whether what he has found is something that he is entitled to seize,” or “the extent to which what he has found contains something that he is entitled to seize”. *Id.* at c. § 50(1)(c). If the officer decides it is not reasonably practicable to make either determination on the premises where the property was found, the officer is allowed to “seize so much of what he has found as it is necessary to remove from the premises to enable that to be determined.” *Id.* The officer is limited to the following factors to make the determination if it is reasonably practicable to seize the property:

- (a) how long it would take to carry out the determination or separation on those premises;
- (b) the number of persons that would be required to carry out that determination or separation on those premises within a reasonable period;
- (c) whether the determination or separation would (or would if carried out on those premises) involve damage to property;
- (d) the apparatus or equipment that it would be necessary or appropriate to use for the carrying out of the determination or separation; and
- (e) in the case of separation, whether the separation—would be likely, or if carried out by the only means that are reasonably practicable on those premises, would be likely, to prejudice the use of some or all of the separated seizable property for a purpose for which something seized under the power in question is capable of being used.

Id. at c. § 50(3).

114. The *Guidelines* suggest that agents seeking a warrant to search for and seize computer-generated evidence ask that the Magistrate Judge authorize the decision whether the search should be conducted off-site after the search has begun:

Based upon your affiant’s knowledge, training and experience, your affiant knows that searching and seizing information from computers often requires agents to seize most or all electronic storage devices (along with related peripherals) to be searched later by a qualified computer expert in a laboratory or other controlled environment. This is true because of the following:

- (1) The volume of evidence. Computer storage devices (like hard disks, diskettes, tapes, laser disks) can store the equivalent of millions of information. Additionally, a suspect may try to conceal criminal evidence; he or she might store it in random order with deceptive file names. This may require searching authorities to examine all the stored data to determine which par-

describe the computer systems that will be searched, the types of files that fall within the scope of the warrant (e.g., text files, data files, deleted files, images and video files), the methods (software and hardware) that will be used to search for this evidence,¹¹⁵ the number of computers and

ticular files are evidence or instrumentalities of crime. This sorting process can take weeks or months, depending on the volume of data stored, and it would be impractical and invasive to attempt this kind of data search on-site.

- (2) **Technical Requirements.** Searching computer systems for criminal evidence is a highly technical process requiring expert skill and a properly controlled environment. The vast array of computer hardware and software available requires even computer experts to specialize in some systems and applications, so it is difficult to know before a search which expert is qualified to analyze the system and its data. In any event, however, data search protocols are exacting scientific procedures designed to protect the integrity of the evidence and to recover even “hidden,” erased, compressed, password-protected, or encrypted files. Because computer evidence is vulnerable to inadvertent or intentional modification or destruction (both from external sources or from destructive code imbedded in the system as a “booby trap”), a controlled environment may be necessary to complete an accurate analysis. Further, such searches often require the seizure of most or all of a computer system’s input/output peripheral devices, related software, documentation, and data security devices (including passwords) so that a qualified computer expert can accurately retrieve the system’s data in a laboratory or other controlled environment.

In light of these concerns, your affiant hereby requests the Court’s permission to seize the computer hardware (and associated peripherals) that are believed to contain some or all of the evidence described in the warrant, and to conduct an off-site search of the hardware for the evidence described, *if, upon arriving at the scene, the agents executing the search conclude that it would be impractical to search the computer hardware on-site for this evidence.*

GUIDELINES, app. F at 112 (emphasis added). This decision should not be left to the discretion of the agents executing the search but should be made by the Magistrate Judge because it is an essential part of describing the place to be searched and the items to be seized. *See* U.S. CONST. amend. IV; *See also* FED. R. CRIM. P. 41(c)(1).

This requirement does not impose an onerous obligation on the agents. The agents can seek a supplemental warrant authorizing an off-site search (and defining the scope of that search) if they find searching on-site to be impracticable. However, the agents have probable cause to believe that circumstances at the search site make it dangerous to delay the search while seeking such a warrant, they can proceed with the search under the authority of an exception. *See* LAFAYE, *supra* note 86, § 6.5(b).

115.

Paragraph 42 of the affidavit and application for the second warrant contained the following:

The search procedure of the electronic data contained in computer operating software, hardware or memory devices will be performed in a controlled environment and may include the following techniques:

- (a) Surveying various file ‘directories’ and the individual files they contain (analogous to looking at the outside of a file cabinet for the markings it contains and opening a drawer believed to contain pertinent files);

storage media the officers expect to search, the time they expect the search to consume, and any other facts unique to the execution of this warrant that support the issuance of an off-site authorization.¹¹⁶ As to the standard for issuing such an authorization, reasonable suspicion to believe an off-site search is necessary is a logical choice, both because reasonable suspicion is the standard used to justify no-knock entries¹¹⁷ and because one could analogize an off-site search to a stop authorized by *Terry v. Ohio*¹¹⁸, in that the equipment is being detained for a limited period of time to let officers locate evidence of a crime.

When a court issues a seizure and an off-site search authorization, it should require that the officers create at least one back-up copy of the information on the seized equipment and give this back-up copy to the owner of that equipment. If the contents of the disk are such that the materials can not reasonably be left in possession of the owner, for example, agents seize child pornography, then a second sealed backup copy should be produced, and retained for use by defendant's counsel and experts. The sealed copy can be used to demonstrate whether the evidence was contaminated or tampered with after leaving the suspect's possession.

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- (b) "Opening" or reading the first few "pages of such files in order to determine their precise contents;
 - (c) "Scanning" storage areas to discover and possibly recover deleted data;
 - (d) "Scanning" storage areas for deliberately hidden files; and/or
 - (e) Performing keyword searches through all electronic storage areas to determine whether recurrences of language contained in such storage areas exist that are related to the subject matter of the investigation.

State v. Fink, No. 0005008005, 2001 WL 660105, at *4 (Del. Super. Mar. 30, 2001). *See* *People v. Gall*, 30 P.3d 145, 160 (Colo. 2001) (Martinez, J., dissenting) ("[A] warrant must include measures to direct the subsequent search of a computer's data.").

116. As the note above illustrates, one of the primary justifications for conducting searches off-site is the time required to analyze large amounts of data. *See supra* Part II(B). This is an issue that will only become more problematic, given the ever-increasing storage capacities of computer systems, so it is imperative that the legal system develop standards for determining when an off-site search is reasonable simply because of the amount of data that has to be processed. From the technical perspective, the least intrusive option is to prepare backups of the system on-site, and to perform the search and analysis off-site. In such instances it is vitally important that the warrant authorizing search of the computer(s) be specific as to the scope of the files to be searched, and the nature of the searches to be performed.

117. *See Richards v. Wisconsin*, 520 U.S. 385, 394 (1997) ("In order to justify a 'no-knock' entry, the police must have a reasonable suspicion that knocking and announcing their presence, under the particular circumstances, . . . would inhibit the effective investigation of the crime by, for example, allowing the destruction of evidence."). There is no equivalent constitutional guarantee for on-site computer searches, the reasonable suspicion standard would be adequate protection.

118. 392 U.S. 1, 30 (1968) (allowing a limited search of a person if the officer has a reasonable and articulate suspicion of danger).

The court should also require that the suspect be given a detailed inventory of the hardware that is seized and of the data and files that are seized. These inventories should be supplied in addition to the back-up copies of any seized data. The inventories are not substitutes for back-up copies. For hardware, the inventory should include the quantity, description, and serial number(s) for any devices seized. For computer media or seized files the inventory should describe the type of media, capacity (if known), number seized, and a listing of the files contained on the media. This listing of files should detail, at a minimum, the file name, creation date, access date, file size, and the location of the file on the disk (either the full path of the file, or its absolute address on the disk). For any copy of media produced on-site, the defendant should be left with a CRC or MD5 hash value for the media so copied.¹¹⁹

The combination of the hash count and specific file information will serve to provide a detailed record of the property seized, and also to allow detection of any tampering or evidence contamination. The production of such file listings should not be burdensome, since these listings can easily be produced using the same tools that are used to preserve and examine computer based evidence. The CRC or MD5 hash sums can be produced using readily available software tools, and these checksums are built in to most backup software used by law-enforcement.

Regardless of whether the officers take the suspect's equipment with the "original" stored data contained thereon or satisfy themselves with a copy of that information, the court must set some parameters for what they can, and cannot, do in searching these data files. In the Doe & Doe hypothetical, for example, the officers searched for evidence that employees of the law firm were involved in perpetrating a complex insurance fraud scheme. The evidence, if any, of their involvement in these activities would consist of text files, alpha-numeric files, not graphics files. Therefore, the warrant should explicitly limit the scope of the officers' search of the Doe & Doe computer system and computer data files to text files. This should be done regardless of whether the search is conducted on-site, off-site using a back-up copy of data from the Doe & Doe computer files or is done off-site using seized Doe & Doe computer equipment.

119. Cyclic Redundancy Check (CRC) and Message Digest 5 (MD5) are techniques that use an algorithm to generate a unique digital signature called a hash value based on the contents of a computer file. The act of changing a single character in a file would result in the generation of a different hash value. Therefore, comparing CRC or MD5 hash values of the original file and a purported copy of that file is a quick and reliable way to detect whether the copy has been altered or tampered.

To ensure that the search does not go beyond permissible bounds, the warrant should specify that the officers are allowed to search for text files. The affidavit should include a description of exactly what text files means in this particular instance, and specify the software programs and analytical techniques the officers can employ in conducting this search.¹²⁰ If generalized tools are to be used, the warrant should describe what specific actions will be taken to limit the search to those files within the scope of the warrant. One way this can be accomplished is to stipulate that only files of the types specified within the warrant will be examined. This can be accomplished by using appropriate computer forensic tools to identify and isolate files based on the file type, and to exclude files that are outside the scope of the warrant from manual examination. These tools determine file types based on invisible character strings that are embedded in the file header, so they are not in any way dependent on the name of the file. Section IV discusses this issue in more detail, because it is really a matter of ensuring that officers do not impermissibly use the plain view doctrine to expand the scope of their search beyond reasonable limits.¹²¹

If the officers conducting an off-site search pursuant to a validly-issued warrant unexpectedly discover that they are confronted with intermingled files, some of which may be within the scope of the warrant and others of which may fall outside the scope of the warrant, they should not continue with their search.¹²² Instead, the officers should return to the Magistrate Judge to seek a second, more specific warrant that specifies the scope and the methods the officers are to use in conducting a search of the intermingled files.¹²³

120. See *State v. Fink*, No. 0005008005, 2001 WL 660105 at *4 (Del. Super. Mar. 30, 2001); *People v. Gall*, 30 P.3d 145, 160 (Colo. 2001) (Martinez, J., dissenting).

121. See *infra* Part IV.

122. See *United States v. Campos*, 221 F.3d 1143, 1147–1148 (10th Cir. 2000); *United States v. Carey*, 172 F.3d 1268, 1275 (10th Cir. 1999); *United States v. Barbuto*, No. 2:00CR197K, 2001 WL 670930 *5 (C.D. Utah Apr. 12, 2001).

123.

Because the agents who testified at the evidentiary hearing on Defendant's motion to suppress had no knowledge of the search methods or criteria used by the agents who searched the computers, the United States has offered to provide additional testimony regarding such methods. However, this court concludes such methods or criteria should have been presented to the magistrate before the issuance of the warrants or to support the issuance of a second, more specific warrant once intermingled documents were discovered.

Barbuto, 2001 WL 670930 at *5. The *Barbuto* court suppressed documents seized from the defendant's computers, including his personal journal, because it found that when the agents were faced with intermingled documents, such as Defendant's personal journal, the agents did not return for further instructions or a more specific warrant from the magistrate. The

The warrant should also specify a time frame for conducting the search. Magistrate Judges have imposed time limits on computer searches.¹²⁴ This is the correct approach as the Supreme Court has held that the length of time in which property is seized for the purposes of being searched is a factor that bears directly on the reasonableness of that seizure.¹²⁵ The Department of Justice, on the other hand, takes issue with this approach, arguing that “[t]he law does not expressly authorize magistrate judges to issue warrants that impose time limits on law enforcement’s examination of seized evidence.”¹²⁶

This argument erroneously equates off-site computer searches to conventional searches and seizures. In conventional searches and seizures, the execution of a warrant typically involves two stages: a “search” for evidence that is followed by the “seizure” of evidence once it has been found. Absent a court’s granting a motion for the return of property lawfully seized pursuant to this process, law enforcement will be allowed to retain and analyze that property as long as is necessary. This may last until after a trial and conviction, until after a plea of guilty, until after a plea or conviction has been upheld on appeal or for an indeterminate period. If the property is contraband, it will never be returned. If the seized property is mere evidence, then the property can be retained, absent a successful motion for its return, for as long as the legitimate needs of law enforcement require. But this is property that has been lawfully seized pursuant to the authority of a warrant that was completely executed. A Magistrate Judge’s authority ends once the execution of a warrant is complete.

In off-site computer searches, the execution of a warrant involves four stages, not two: a *search* designed to locate computer equipment; the *seizure* of that equipment and its removal to another location; a thorough *search* of the contents of the equipment which is conducted at that location; and a *seizure* of relevant evidence located in the course of that search. Here, the initial *seizure* of the equipment is simply a preliminary

document displayed on the computer screen at Defendant’s home that led the agents to seek warrants to search the computers was an intermingled “To Do” list of Defendant’s daily activities. The agents should have known that the warrant needed to specify what types of files were sought in searching the two computers so that personal files would not be searched.

124. *United States v. Brunette*, 76 F. Supp. 2d 30, 42 (D. Me. 1999) (suppressing evidence not reviewed within the time period set forth in the warrant and extension granted). *See* FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS S II(D)(2) at 52 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

125. *See United States v. Place*, 462 U.S. 696, 709–10 (1983).

126. *See* GUIDELINES, § II(D)(2) at 52 <http://www.cybercrime.gov/searchmanual.htm>. *See also United States v. Hernandez*, ___ F. Supp. 2d ___, 2002 WL 32702, No. CRIM. 01-635 (SEC), at * 10 (D.P.R. Jan. 4, 2002) (“Neither Fed. R. Crim. P. 41 nor the Fourth Amendment provides for a specific time limit in which a computer may undergo a government forensic examination after it has been seized pursuant to a search warrant.”).

stage in the execution of the warrant; the execution of the warrant is not completed until the equipment has been *searched* off-site and identified evidence seized from the property. The Magistrate Judge who issued the warrant has the authority to set conditions governing the execution of the warrant—including the *search* which will be conducted off-site. The Magistrate Judge can, therefore, impose time limits and other constraints on the conduct of the off-site search. The Magistrate Judge’s authority to do so derives from Rule 41 of the Federal Rules of Criminal Procedure¹²⁷ and from the court’s inherent power to issue a warrant whenever the requirements of the Fourth Amendment are met.¹²⁸ The imposition of time limits is required because “[i]f the police were allowed to execute the warrant at leisure, the safeguard of judicial control over the search which the fourth amendment is intended to accomplish would be eviscerated.”¹²⁹

In addition to specifying a time frame for conducting an off-site computer search, the warrant should require that officers examine the seized equipment as soon as possible to determine if all or part of the equipment can be returned to its rightful owner.¹³⁰ This is especially

127. Fed. R. Crim. P. 41(c)(1) (Warrant “shall command the officer to search, within a specified period of time not to exceed 10 days . . .”). *But see* United States v. Koelling, 992 F.2d 817, 823 (8th Cir. 1993) (upholding the practice of issuing an anticipatory warrant which ties the execution of the warrant to a specific event); United States v. Garcia, 882 F.2d 699, 702–703 (2nd Cir. 1989) (upholding anticipatory warrants). Therefore, a Magistrate Judge can also exercise this authority to set time limits governing the off-site search of seized computer equipment.

128. *See* United States v. Villegas, 899 F.2d 1324, 1334 (2nd Cir. 1990) (“Obviously the Fourth Amendment long antedated the Federal Rules of Criminal Procedure . . . Given the Fourth Amendment’s warrant requirements, and assuming no statutory prohibition, the courts must be deemed to have inherent power to issue warrant when the requirements of that Amendment are met.”); Therefore, even if one assumed that Rule 41 does not authorize a Magistrate Judge to set time limits for the process of conducting an off-site search of seized computer equipment, the reservoir of inherent power identified by the *Villegas* court does confer such authority.

129. United States v. Bedford, 519 F.2d 650, 655 (3rd Cir. 1975). *See* United States v. Shegog, 787 F.2d 420, 422 (8th Cir. 1986). *See also* United States v. Rowland, 145 F.3d 1194, 1201–1202 (10th Cir. 1998) (holding that a condition precedent is necessary for an anticipatory warrant because it “not only insures against premature execution of the warrant, but also maintains judicial control over the probable cause determination and over the circumstances of the warrant’s execution.” (citations omitted)); United States v. Ricciardelli, 998 F.2d 8, 12 (1st Cir. 1993) (noting the need to place limits on anticipatory warrants to prevent possible abuse); United States v. Garcia, 882 F.2d 699, 703–704 (2nd Cir. 1989) (stating a warrant needs to be explicit, clear, and narrowly drawn to avoid potential abuse); State v. Womack, 967 P.2d 536, 543–544 (Utah App. 1998).

130.

It shall be the duty of the person for the time being in possession of the seized property in consequence of the exercise of that power to secure that there are arrangements in force which . . . ensure—

appropriate when the justification for the seizure is that the equipment contains commingled evidence and, therefore, it is not possible to determine, on-site, which files fall within the scope of the warrant and which do not. It is also appropriate when the possibility exists that the seized equipment contains evidence that is encompassed by a valid privilege; absent countervailing considerations, the privileged material should be returned to the rightful owner as soon as possible.¹³¹ The Magistrate Judge may want to give the owner of the seized property the opportunity to be present at, or have a representative present at, this examination.¹³²

Finally, when executing computer searches officers may give the owner of the equipment/data the option of (a) having the officers search on-site or (b) letting the officers make back-up copies of the information contained on the system which will then be searched off-site. The option is offered in the interest of expediting the searching and seizing of evidence as authorized by the search warrant. The second option comes with a condition, namely, that the owner¹³³ of the equipment/data must execute a stipulation in which he or she (a) concedes that the back-up copies are complete and accurate copies of the file contents of the systems searched as of the date in question and (b) agrees not to challenge the accuracy or reliability of the back-ups or of any evidence retrieved

(a) that an initial examination of the property is carried out as soon as reasonably practicable after the seizure;

(b) that that examination is confined to whatever is necessary for determining how much of the property falls within subsection (3);

(c) that anything which is found, on that examination, not to fall within subsection (3) is separated from the rest of the seized property and is returned as soon as reasonably practicable after the examination of all the seized property has been completed; and

(d) that, until the initial examination of all the seized property has been completed and anything which does not fall within subsection (3) has been returned, the seized property is kept separate from anything seized under any other power.

Criminal Justice and Police Act, 2001, c. 16 § 53(2) (Eng.), at <http://www.hmso.gov.uk/acts/acts2001/20010016.htm> (last visited Jan. 31, 2002) (Clause (3) provides for the retention of property that was properly seized as falling within the scope of the original warrant or that property that is not reasonably practicable to separate from property falling within the scope of the warrant).

131. *See id.* at c. 16 § 54(1) (establishing a duty to return items subject to legal privilege to the owner as soon as reasonably practicable after the seizure).

132. *See id.* at c. 16 § 53(4) (“due regard shall be had to the desirability of allowing the person from whom [the equipment] was seized, or a person with an interest in that property, an opportunity of being present or (if he chooses) of being represented at the examination”). *See also infra* Part IV *See generally* *United States v. Abbell*, 914 F. Supp. 519 (S.D. Fla. 1995).

133. For businesses, the stipulation can be executed by an authorized agent.

from them.¹³⁴ The use of these stipulations needs to be analyzed very carefully, since someone executing such a stipulation waives any and all rights to challenge the admissibility of evidence obtained from the back-ups. Such waivers can be problematic for various reasons, some technical, some legal.

Technically speaking, a stipulation such as this is inadvisable because it is necessarily made on incomplete information. The person executing the stipulation probably has no idea what techniques the officers will use to create the back-ups; this person certainly has no way of knowing what techniques will be used to retrieve and analyze the data once it arrives at the police laboratory and no way of monitoring that process. There is no easy way that the person executing the stipulation can ascertain that the backup is either complete or accurate. Allowing the suspect to observe the copy operation and examine any resultant reports is only helpful if they are familiar with the software used to create the backup. Depending on how files or media are copied, the resultant copy might not include all files from the original media, or might misrepresent the original organization of the files. Media read errors, which might prevent the backup copy from being complete, would not be readily evident until the media is actually read during subsequent copy or search activity. Even assuming the backup copy was complete, the copy might still be inaccurate. Depending on how files are copied important forensic evidence may be lost. At a minimum, improper copying may fail to preserve deleted files and file creation and access dates.

The suspect is generally not in a position to verify that the copy is an accurate, and even if the copy is accurate at the time it is created, it may not reflect the contents of the computer at the point in time when the search began. This is especially true when the investigating officers have made any attempt to access individual files before the computer system was backed up. By way of example, if the officers conducting the search have opened files to review their contents, the officers will have altered the record of when those files were last accessed and may even have altered the contents of the file. If one of the files opened was infected with a destructive virus, the act of opening the file might also result in the deletion of files or destruction of data. Subsequent examination of the computer system might lead one to erroneously conclude that the system had been deliberately "booby-trapped" or sanitized by the suspect, even though no such suspicious activity actually occurred.

134. Cf. *United States v. Orefice*, No. 98 CR. 1295(DLC) 1999 WL 349701 (S.D.N.Y. May 27, 1999).

Other situations may also cause the contents of a computer to change while a search is in progress. Changes may be caused by activity on the part of other users who have access to the computer via a network or modem connection, changes that are induced by programs running on the computer, and changes caused by automated tasks (such as house-keeping tasks) that are triggered by time-of-day or system events. Given these technical considerations, such stipulations to accept the accuracy or reliability of the copy are inadvisable.

A stipulation to search also has serious legal ramifications. These stipulations resemble a consent to search. When someone consents to a search, they agree to let officers enter an identified area and search for evidence, until the suspect withdraws his or her consent.¹³⁵ The off-site search stipulations superficially resemble consents to search because an owner of computer equipment who executes a stipulation enters into an agreement with officers that facilitates the officers carrying out a search. But these stipulations differ from consents to search in two ways. First, rather than authorizing a search from the outset, the suspect simply approves a change in the way the search is carried out (off-site as opposed to on-site). Second, someone who consents to search still retains the ability to challenge the validity or accuracy of evidence discovered during that search, but when someone executes one of these stipulations, he or she is waiving any right to object to having evidence retrieved from the back-ups used against him or her.

Therefore, these computer search stipulations can be analogized to a consent to search or to a stipulation allowing incriminating evidence to be admitted. To be valid, a consent to search must be made voluntarily.¹³⁶ An individual's execution of a stipulation allowing the use of incriminating evidence must be made voluntarily and knowingly.¹³⁷

Either alternative would therefore require that an off-site computer search stipulation be executed voluntarily for the stipulation to be enforceable. Both alternatives use the same test for determining voluntariness, borrowing a test developed to decide whether confessions can be used without violating due process.¹³⁸ Due process requires that a confession cannot be used if it was given involuntarily. A confession will

135. See LAFAVE, *supra* note 86, § 8.1.

136. See *Ohio v. Robinette*, 519 U.S. 33, 40 (1996); *Schneekloth v. Bustamonte*, 412 U.S. 218, 222–27 (1973). See also MODEL CODE OF CYBERCRIME INVESTIGATIVE PROCEDURE, art. VII § 6(b)(I) (1998) at <http://www.cybercrimes.net/MCCIP/art7.htm>.

137. See *Bonilla-Romero v. United States*, 933 F.2d 86, 88 (1st Cir. 1991); *United States v. Cozine*, 21 M.J. 581, 584 (A.C.M.R. 1985).

138. See *Schneekloth*, 412 U.S. at 227; *Cozine*, 21 M.J. at 584; LAFAVE, *supra* note 86, § 8.2.

be deemed to have been given voluntarily if it was the product of the suspect's free will, uncoerced by the actions of law enforcement officers.¹³⁹ A confession will, on the other hand, be deemed to have been given involuntarily if the officers offered the suspect a *quid pro quo*, such as the opportunity to avoid physical harm or a promise of leniency, in exchange for confessing.¹⁴⁰

Consent searches arise in varied contexts, but the most precise analogy to the off-site computer search stipulation is to the situation in which officers give a suspect a choice. The suspect can choose to consent to the officers' search without a warrant or to wait until the officers obtain a warrant. Courts have held that consents given in this situation are voluntary, absent the presence of some other coercive factor(s).¹⁴¹ The stipulation used in computer searches presents an analogous situation. In stipulating to an off-site computer search the owner of the property to be searched chooses between having the search conducted on-site or having it conducted off-site (incrementally surrendering the chance to challenge the admissibility of the evidence recovered). This argument implicitly assumes that in both instances the owner of the property surrenders some legal protection in exchange for convenience. In the pure consent scenario, the person surrenders his or her right to have the search conducted pursuant to a warrant in exchange for not waiting while the officers obtain the warrant. While in the computer search scenario, the person surrenders his or her rights (a) to have the search conducted on-site¹⁴² and (b) to challenge the use of the evidence in exchange for not having the officers conduct their search on-site.

The problem is that while the situations are superficially similar, they are not precise analogues. In the pure consent search scenario, the person consenting is choosing between two equivalents (a search conducted under the aegis of consent or a search conducted under the aegis of a warrant). In the computer search scenario, however, the person executing the stipulation is not choosing between equivalents. The choice is between two different kinds of Fourth Amendment intrusions while striking a different, less advantageous bargain. For the two situations to be precise analogues, in the computer search context, the owner of the property would have to be given the alternatives of consenting to have the officers conduct the search off-site or waiting until they obtain a

139. See *Colorado v. Connelly*, 479 U.S. 157, 167 (1986); LAFAYE, *supra* note 86, § 8.2.

140. See *Dickerson v. United States*, 530 U.S. 428, 433-35 (2000); *United States v. Dillon*, 150 F.3d 754, 757-758 (7th Cir. 1998).

141. See LAFAYE, *supra* note 86, § 8.2.

142. Assuming the officers need the owner's consent to search off-site because the officers' warrant does not authorize an off-site search.

warrant authorizing an off-site search. This is not the bargain someone executing one of these stipulations confronts. The bargain the stipulations offer is to either have the officers conduct the search on-site or consent to an off-site search surrendering one's right to challenge the admissibility of any evidence discovered during the off-site search.

Due to the lack of equivalence, the latter situation is problematic. It is a voluntariness problem. Instead of exchanging equivalents, the owner of the property is engaging in a one-sided bargain with the officers, from which it might be inferred that the officers (may) exploit the intrusiveness and inconvenience of searching on-site to coerce the property owner into executing the stipulation. The permissibility of this inference is significantly enhanced if the officers obtain such a stipulation when the warrant already authorizes an off-site search. If it does authorize an off-site search, the owners are trading something for nothing. The owner is trading the right not to object to the admissibility of recovered evidence for something the officers already have permission to do. It is, to a lesser extent, enhanced if the warrant does not authorize an off-site search. For the reasons explained in the previous section the officers may very well find it easy to obtain a supplemental warrant authorizing an off-site search but may not want to go to the trouble of obtaining a supplemental warrant, and may exploit this opportunity to persuade the owner to waive the right to challenge the admissibility of any evidence the officers recover.

The stipulations raise another issue, one which implicates the consequences of the choice, rather than the voluntariness of the choice. It is likely that the person who executes a stipulations does not fully understand what he or she surrenders when agreeing not to challenge the admissibility of evidence discovered during the off-site search. Therefore, the stipulation raises the issue of whether or not the decision to execute the stipulation was made knowingly. As noted above, courts have held that an individual's execution of a stipulation allowing the use of incriminating evidence must be made voluntarily and knowingly.¹⁴³ The person executing the stipulation acts knowingly in that he or she realizes there is a choice. The choice is between the execution of the stipulation or having to endure an on-site search. But the owner may not act knowingly in terms of realizing the consequences of his or her actions.

The owner's failure to realize the consequence of his or her actions has two elements. First, there is a failure to realize the consequences surrendering evidentiary objections can have at a trial based on evidence discovered during the search. Second, there is a failure to realize that the

143. *See supra* note 136.

methods used to conduct the off-site search could provide the factual predicate for objections to the admissibility of the evidence. While the consequences of a stipulation of this type may not be sufficiently weighty to require an inquiry analogous to that conducted under Fed. R. Crim. P. Rule 11(c)(3),¹⁴⁴ the stipulations do raise potential due process concerns about fairness and overreaching.¹⁴⁵

These stipulations are sufficiently problematic for the technical and legal reasons set out above that they should not be used. Only a Magistrate Judge should be allowed to authorize an off-site search, such authorization to be contained either in the original search warrant or in a supplemental warrant. Until this alternative is implemented, courts dealing with a challenge to one of these stipulations should inquire closely into the circumstances under which the off-site search was executed.

III. THE PLAIN VIEW DOCTRINE AND COMPUTER SEARCHES

The plain view doctrine is an exception to the general rule that a warrant is required to make a seizure reasonable under the Fourth Amendment.¹⁴⁶ The doctrine allows evidence to be used even though it was seized by an officer who acted without the authorization of a search warrant.¹⁴⁷ Under the plain view doctrine, an officer can lawfully seize evidence of a crime without a warrant if three conditions are met:

The officer was lawfully in a position from which to view the object seized. The officer did not violate the Fourth Amendment interest in privacy by observing the object.

The object's incriminating character was immediately apparent. By simply viewing the object the officer had probable cause to believe it was evidence of a crime; and

The officer had a lawful right of access to the object. The officer could approach the object and seize it without violating a Fourth Amendment interest in privacy or possession.¹⁴⁸

144. See Fed. R. Crim. P. Rule 11(c)(3) (requiring that the person executing a stipulation acted voluntarily and knowingly). See also *United States v. Lyons*, 898 F.2d 210, 214-215 (1st Cir. 1990).

145. See *Brookhart v. Janis*, 384 U.S. 1, 8-9 (1966) (separate opinion of Harlan, J.).

146. See WAYNE R. LAFAYE, 1 SEARCH AND SEIZURE § 2.2 (3d ed. 1996).

147. *Id.*

148. See *Horton v. California*, 496 U.S. 128, 134 (1990); *Coolidge v. New Hampshire*, 403 U.S. 443, 465 (1971). See also LAFAYE, *supra* note 146, § 2.2.

The plain view doctrine only justifies the seizure of an object. The doctrine does not justify a search, however minimal.¹⁴⁹

The plain view doctrine, predicated on aspects of physical reality,¹⁵⁰ has been invoked to justify searches involving the cyberworld. The plain view doctrine has been used as a justification for officers searching a computer hard drive or other computer media for specific evidence and seizing evidence that was not encompassed by the warrant.¹⁵¹

In *United States v. Carey*,¹⁵² officers were searching the hard drives of two computers pursuant to a warrant that authorized a search for “names, telephone numbers, ledger receipts, addresses, and other documentary evidence pertaining to the sale and distribution of controlled substances.”¹⁵³ While conducting a key-word search of text files that was designed to locate the information identified in the warrant, one officer—Detective Lewis—discovered JPEG or image files.¹⁵⁴ He copied the JPEG files and used different software to view the images and found child pornography.¹⁵⁵ Carey challenged the search, arguing that it exceeded the scope of the warrant.¹⁵⁶

149. See *Arizona v. Hicks*, 480 U.S. 321 (1987).

150. See generally LAFAVE, *supra* note 146, § 2.2.

151. See *United States v. Gray*, 78 F. Supp. 2d 524, 529 (E.D. Va. 1999) (finding subdirectories in suspect’s computer which contained child pornography were within plain view of agent who was executing warrant authorizing search for evidence of hacking and who opened subdirectories in the course of searching for such evidence); *State v. Fink*, No. 0005008005, 2001 WL 660105 (Del. Super. Mar. 30, 2001) (denying a motion to suppress in finding that the officer’s opening of computer files was done to search for evidence described in the warrant, therefore the discovery of child pornography was inadvertent and lawful under the plain view doctrine); *State v. Schroeder*, 613 N.W.2d 911 (Wis. App. 2000) (finding that images of child pornography found while searching defendant’s computer that was seized pursuant to warrant for evidence of online harassment were in plain view). *But see* *United States v. Turner*, 169 F.3d 84, 88–89 (1st Cir. 1999) (rejecting the government’s attempt to use the plain view doctrine to justify a search for JPEG file conducted after the suspect consented to a search of his apartment for evidence of an intruder and/or a sexual assault); *United States v. Maxwell*, 45 M.J. 406, 422 (C.A.A.F. 1996) (plain view doctrine did not apply to search of computer files under a screen-name not listed in warrant).

152. 172 F.3d 1268 (10th Cir. 1999).

153. *Id.* at 1270.

154. *Id.* at 1271 (“[The officer’s] method was to enter key words such as, ‘money, accounts, people, so forth’ into the computer’s explorer to find ‘text-based’ files containing those words. This search produced no files ‘related to drugs.’”).

155. *Id.* at 1270–1271.

156.

Mr. Carey moved to suppress the computer files containing child pornography. During the hearing on the motion, Detective Lewis stated although the discovery of the JPG [sic] files was completely inadvertent, when he saw the first picture containing child pornography, he developed probable cause to believe the same kind of material was present on the other image files. . . .

Detective Lewis admitted at the suppression hearing that he had no idea what the JPEG files contained until he opened the files.¹⁵⁷ The government claimed the detective's actions were authorized by the plain view doctrine.¹⁵⁸ The government maintained that a computer search such as the one undertaken in this case is tantamount to looking for documents in a file cabinet pursuant to a valid search warrant. The seizure of the pornographic computer images was permissible because officers had a valid warrant, the pornographic images were in plain view, and the incriminating nature was readily apparent as the photographs depicted children under the age of twelve engaged in sexual acts. The warrant authorized the officer to search any file because “‘any file might well have contained information relating to drug crimes and the fact that some files might have appeared to have been graphics files would not necessarily preclude them from containing such information.’”¹⁵⁹

The Tenth Circuit disagreed, explaining that:

[t]he government's argument the files were in plain view is unavailing because it is the contents of the files and not the files themselves which were seized. Detective Lewis could not at first distinguish between the text files and the JPG files upon which he did an unsuccessful word search. Indeed, he had to open the first JPG file and examine its contents to determine what the file contained. Thus, until he opened the first JPG file, he stated he did not suspect he would find child pornography. At best, he says he suspected the files might contain pictures of some activity relating to drug dealing.

Upon further questioning by the government, Detective Lewis retrenched and stated until he opened each file, he really did not know its contents. Thus, he said, he did not believe he was restricted by the search warrant from opening each JPG [sic] file. Yet, after viewing a copy of the hard disk directory, the detective admitted there was a ‘phalanx’ of JPG [sic] files listed on the directory of the hard drive. He downloaded and viewed these files knowing each of them contained pictures. He claimed, however, ‘I wasn’t conducting a search for child pornography, that happened to be what these turned out to be.’

Id. at 1271.

157.

Detective Lewis later testified at the time he discovered the first JPG [sic] or image file, he did not know what it was nor had he ever experienced an occasion in which the label ‘JPG’ [sic] was used by drug dealers to disguise text files. He stated, however, image files could contain evidence pertinent to a drug investigation such as pictures of ‘a hydroponic growth system and how it’s set up to operate.’

Id. at 1270 n.2.

158. *Id.* at 1272.

159. *Id.* at 1272 (quoting *Erickson v. Commissioner of Internal Revenue*, 937 F.2d 1548, 1554 (10th Cir. 1991)).

In his own words, however, his suspicions changed immediately upon opening the first JPG file. After viewing the contents of the first file, he then had “probable cause” to believe the remaining JPG files contained similar erotic material. Thus, because of the officer’s own admission, it is plainly evident each time he opened a subsequent JPG file, he expected to find child pornography and not material related to drugs. Armed with this knowledge, he still continued to open every JPG file to confirm his expectations. Under these circumstances, we cannot say the contents of each of those files were inadvertently discovered. Moreover, Detective Lewis made clear as he opened each of the JPG files he was not looking for evidence of drug trafficking. He had temporarily abandoned that search to look for more child pornography, and only “went back” to searching for drug-related documents after conducting a five-hour search of the child pornography files.

We infer from his testimony Detective Lewis knew he was expanding the scope of his search when he sought to open the JPG files. Moreover, at that point, he was in the same position as the officers had been when they first wanted to search the contents of the computers for drug related evidence. They were aware they had to obtain a search warrant and did so. These circumstances suggest Detective Lewis knew clearly he was acting without judicial authority when he abandoned his search for evidence of drug dealing.¹⁶⁰

Other courts have reached the opposite conclusion in cases with almost identical facts.¹⁶¹ In *State v. Schroeder*,¹⁶² officers were investigating a case on online harassment and obtained a warrant to seize Schroeder’s computer and search it for evidence that he had posted the harassing messages.¹⁶³ While searching for evidence showing Schroeder was the harasser, the officer conducting the search, Marty Koch, found pornographic pictures of children.¹⁶⁴ These pictures, and other pornographic

160. *Id.* at 1273. *But see* *United States v. Wolfe*, No. 00-5045, 2000 WL 1862667 at *1 n.2 (10th Cir. Dec. 20, 2000) (“*Carey* does not foreclose an argument that agents searching pursuant to a warrant for counterfeit currency templates, some of which could conceivably have computer graphics-type file extensions such as .GIF or .JPG, would inevitably have uncovered computer graphics files of the type at issue in this case during the course of the search.”).

161. *See supra* note 150.

162. 613 N.W.2d 911 (Wis. App. 2000).

163. *Id.* at 913.

164. *Id.* at 913–14.

pictures discovered in Schroeder's computer, were used to charge him with possessing child pornography. Schroder moved to suppress the pornographic images, arguing that Koch's search exceeded the scope of the original warrant.¹⁶⁵ The Wisconsin court rejected his argument, finding that Koch's activities fell within the plain view doctrine.

Koch testified that when he searches a computer he systematically goes through and opens user-created files, regardless of their names. This makes sense, as the user is free to name a file anything. Were Koch to limit his search to files whose names suggested the type of evidence he seeks, it would be all too easy for defendants to hide computer evidence: name your porn file '1986.taxreturn' and no one can open it. While systematically opening all user-created files, Koch opened one that contained images that he considered child pornography. At that point, he stopped his search. . . . He did not resume his search and find the rest of the nude images of children until after a second search warrant had been issued. Thus, his initial discovery of child pornography was when he opened a file and saw a nude picture of a child pop up on the screen. It was in plain view. This was no different than an investigator opening a drawer while searching for drugs and seeing a nude picture of a child on top of a pile of socks. The first element of the plain view test is satisfied. Regarding the second and third prongs, it is undisputed that Koch had a warrant to search the computer for evidence of harassment and that the first image Koch found could reasonably be viewed, on its face, as child pornography. The plain view doctrine applies.¹⁶⁶

As these two cases illustrate, trying to apply the plain view doctrine to computer searches is not a simple matter. In rejecting the government's attempt to rely on the plain view doctrine, the *Carey* court noted that "the question of what constitutes 'plain view' in the context of computer files is intriguing and appears to be an issue of first impression for this court, and many others . . ." ¹⁶⁷ Because the applicability of the plain

165. *Id.* at 915–16.

166. *Id.* at 916. *See supra* note 150. *See also* State v. Fink, No. 0005008005, 2001 WL 660105, at *3 (Del. Super. Mar. 30, 2001) (denying a motion to suppress evidence of child pornography, the incriminating nature of which was immediately apparent, an officer inadvertently discovered while conducting search of computer files authorized by warrant).

167. *Carey*, 172 F.3d at 1273. The court also stated that analogizing the information contained on computers and computer storage media to "closed containers or file cabinets may lead courts to 'oversimplify a complex area of Fourth Amendment doctrines and ignore the realities of massive modern computer storage.'" *Id.* at 1275 (citations omitted).

view doctrine to computer searches presents a variety of complex and generally unexplored issues, courts need to consider whether the doctrine can reasonably be transposed to the cyberworld, and there used to expand the scope of a search conducted pursuant to a search warrant or pursuant to an exception to the warrant requirement.¹⁶⁸

The plain view doctrine is predicated on the empirical concept of visual observation, of sight, as it functions in the physical world. In the physical world, sight is essentially a zero sum phenomenon. When an officer steps into a room for the purpose of executing a search warrant, the items in that room are either in sight or out of sight. Sight in the physical world is an unambiguous phenomenon, one that neither requires nor lends itself to the development of guidelines stating how it is to be employed. It would be absurd and impossible for a warrant to specify what officers can and cannot observe when they enter premises to execute the warrant. Items that are sitting on a table, for example, are in the officer's sight. It would be neither reasonable nor practicable to require the officer to pretend he or she did not see those items. In this context, the plain view doctrine is both eminently reasonable, given the concerns underlying the Fourth Amendment's prohibitions, and easily implemented.

In the cyberworld, on the other hand, there is no analogue of real world sight. As the facts in *Carey* illustrate, searches of computer-files are method-specific.¹⁶⁹ As long as the officer is using a text-based search program, the contents of non-textual files, such as JPEG files, will be opaque to him, clearly not in plain view. To use the example given in the previous paragraph, it is as if the officer had entered a room containing a series of computer files. As the officer uses the software program to search text files, the contents of all text files on the computer's hard drive are in the officer's sight, but the contents of the non-textual files, the JPEG files, are not. The JPEG files are of course visible to the officer, but they are analogous to a closed and locked box. In order to view the contents of the locked box, an officer would have to obtain the implements to unlock and then open the box. Unlocking and opening the box would, for the reasons noted earlier, be a search, and so, outside the scope of the plain view doctrine.¹⁷⁰

Due to the encoded nature of computer data, textual and visual information stored in computer files can only be viewed through the

168. See *supra* note 150.

169. See New Technologies, Inc., *TextSearch Plus*, at <http://www.secure-data.com/txtsrchp.html> (last visited Oct. 3, 2001) (detailing a program used for such searches).

170. See *Arizona v. Hicks*, 480 U.S. 321 (1987).

intermediary of computer software. When the officer enters a computer to be searched, the only information that is truly visible is displayed on the computer screen when the search begins. To examine the other contents of the computer, the officer must first look in file directories and sub-directories, commonly represented as a series of nested folders (analogous to a series of store-rooms) to locate specific files of interest. The officer must then open the individual files (analogous to opening individual boxes contained within the store-rooms) to inspect the contents of the files.

The contents of a typical desktop computer are poorly organized. A single computer may contain thousands of files, which are stored in a hierarchy within hundreds of nested directories. A single directory can contain hundreds of individual files, with textual and graphic images intermingled. File names, and even file-type suffixes, are not a reliable indicator of file contents, so the officer entering the computer is faced with the choice of examining thousands of individual files, or using some form of search technique to locate the specific files most likely to contain evidence.¹⁷¹

In common practice, some form of systematic approach, such as the use of software that allows an officer to search for specific textual words or names, or to identify specific file types, helps the officer to identify files of interest. In the field of computer forensics, the systematic identification of files of interest based on some particular content or characteristic is commonly termed a *search*.

Keyword searches differ from their physical counterpart in one very important way, the officer using a keyword search does not inspect the contents of a file himself. The officers merely use a software program to identify files that might be relevant to inspect. From the technical view point, the closest physical-world analogy to these computer searches are the searches officers conduct using the assistance of a trained dog. Just as a trained dog may identify boxes that *potentially* contain contraband, the software searches identify files that *potentially* contain textual evidence of a particular crime. In order to determine the actual contents of a box (or file), it must be opened, and the contents examined. In the field of computer forensics, this examination is commonly termed a *review* or *assessment*.

In the case of computer files, the box must be opened with a program that can render its contents comprehensible. The review of textual files requires that they must be opened with programs that can format

171. See *State v. Fink*, No. 005008005, 2001 WL 660105 at *3 (Del. Super. Mar. 30, 2001).

and display text. Files containing visual images must be opened with software that can render the image visible on the user's screen. Some content, such as web pages or PowerPoint presentations, require special software that can properly represent data containing both text and images.

Even assuming files buried in nested sub-directories are in plain view, it is difficult to apply the plain view doctrine to files that must receive special treatment before the files can be searched. Files stored on a computer may be compressed, encrypted, or password protected. Such files do not lend themselves to simple automated searches. Special steps or tools may be required to render their contents visible to the search tool. Files containing images, video, or sound also present special problems. There is no search software to search for specific visual or audio data content. (It is possible to identify files that contain visual or audio data, but not to do content specific searches. Files containing child pornography cannot be distinguished from photos of a family pet unless the files are opened and viewed.)

Deleted files also present an additional layer of technical complexity. The normal use of a computer results in a wealth of deleted files and e-mails, many of which are created without the knowledge of the computer user. Some of these files can be observed by simply opening the appropriate recycle or trash directory. Others may only be observed after special software or processes are used to recover them. It is unclear what the status of such files should have, with respect to the plain view doctrine.

One way of preserving the concept of the plain view doctrine for computer searches while maintaining the integrity of the Fourth Amendment's right to privacy implication, is to tie "cyberplain view" to specific search methods which are set out in warrants authorizing computer searches.¹⁷² This principle can be applied to the facts in *Carey*. The warrant in *Carey* authorized the officer to search files on Carey's computer that could contain evidence of his involvement in drug-dealing. Evidence such as "names, telephone numbers, ledger receipts, addresses, and other documentary evidence pertaining to the sale and distribution of controlled substances."¹⁷³ Files containing this type of evidence would be textual files, so the method the officer could use for the search would be limited to software that lets him search and review the contents of text files, and only text files. This would prevent the officer from doing what

172. See *United States v. Abbell*, 914 F. Supp. 519, 521 (S.D. Fla. 1995) (ordering a specified method to be used in searching computer files seized from law office).

173. 172 F.3d at 1270.

Detective Lewis did in *Carey*, namely, broadening the scope of his search by using different software. Software designed to open non-text files are clearly not encompassed by the scope of the officer's warrant.

Using the analogy developed above, the text-search software program would define the scope of the officer's sight when he was inside the computer's hard drive. Those files in plain view of that circumscribed variety of sight would be encompassed by the plain view doctrine, and the officer could seize those files without a warrant. Assume that while the officer was using the software program to search Carey's textual files for evidence of drug-dealing he discovered a text file containing Carey's detailed plan to rob a local bank. Depending on how immediately apparent the incriminating nature of the plan was, the information contained in that file could be encompassed by the plain view doctrine, since the officer was occupying a lawful Fourth Amendment vantage point when he/she observed the information. The information would not be in plain view if the officer had to scroll through the file, reading most of it to ascertain its incriminating nature, but would be in plain view if its incriminating nature was immediately apparent, or apparent as soon as the officer viewed an initial portion of the file.

The practice of limited reviews is not circumscribed to text files. Other techniques could be used to limit the scope of review to files of certain types (based on the invisible file signature), files created or modified within certain date ranges, (based on dates maintained by the operating system), or files controlled by a certain individual or department (based on access privileges defined by the computer's security system.) For instance, if the intent of the warrant was to permit only a review of graphics images, then file type could be used to block textual files from review.

What happens if an officer, while executing a warrant authorizing a search of text-based files, discovers evidence that gives her probable cause to believe other files, files that do not fall within the scope of her warrant, contain evidence of criminal activity? The plain view doctrine will not let her proceed because she cannot confirm or deny that belief without opening the files to search them, and the plain view doctrine only justifies seizures, not searches.¹⁷⁴

174. See *Hicks*, 480 U.S. at 325–29. See also FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § I(C)(3) at 18 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf> (“[T]he plain view exception cannot justify violations of an individual’s reasonable expectation of privacy. The exception merely permits the seizure of evidence that has already been viewed in accordance with the Fourth Amendment. In computer cases, this means that the government cannot rely on the plain view doctrine to justify opening a closed computer file.”(footnote omitted)). Accord NEW JERSEY COMPUTER EVIDENCE SEARCH AND

Must the officer simply ignore those files? If she has probable cause to believe the files at issue contain evidence of criminal activity, she should use that probable cause to apply for a second, supplemental warrant, which authorizes a search of those files.¹⁷⁵

The officer should do exactly the same thing if she discovers that the method(s) her warrant authorizes to be used in executing the search is insufficient for the stated purpose. Assume that the officer has a valid warrant to search for textual data using a special program that searches for specific words and phrases. While conducting the initial examination, the officer discovers that the computer to be searched has many compressed files, and evidence that suggests that the computer might also contain images of scanned documents. Since neither compressed files nor scanned documents can be searched with text-based tools, the officer should seek a separate supplemental warrant to review these files using the appropriate software.

The scenarios above are based on *Carey* and, therefore, address the more limited issues that arise when officers search only one or two computers. The application of the plain view doctrine is not, of course, limited to small computers. The doctrine has also been invoked when officers search a large number of computers and a large volume of files on computer storage media.¹⁷⁶

Such systems can introduce distinct challenges for the law, since officers must deal with specifying the computers, storage media, or directories in a shared environment that will be searched. For example, Network Technologies, World Wide Web Hosts, and Internet-based storage providers such as Xdrive, allow users to store data on remote computers. Such data may be stored on a computer and hard drive that is owned by a third party and shared by many unrelated users. A search for one particular user's data should not become a *carte blanche* to allow searches that would violate the privacy of others.

SEIZURE MANUAL, I(B)(1) at 36 (2000) available at <http://www.state.nj.us/lps/dcj/pdfs/cmpmanfi.pdf> (last visited Mar. 5, 2002). Cf. *United States v. Lemmons*, ___ F.3d ___, 2002 WL 272742, No. 00-3809, at *4, n.5 (7th Cir. Feb. 27, 2002) (stating, in dicta, that plain view doctrine did not apply to computer files because searching officer "had to access them by opening a program and looking on the hard drive for pornographic images").

175. See *United States v. Gray*, 78 F. Supp. 2d 524, 530-31 (E.D. Va. 1999); *State v. Schroeder*, 613 N.W.2d 911 916 (Wis. App. 2000). See also GUIDELINES, § II(D)(1) at 51 ("If investigators seize computer equipment for the evidence it contains and later decide to search the equipment for different evidence, . . . they should obtain a second warrant.").

176. Cf. *Commonwealth v. Ellis*, No. 97-192, 1999 WL 823741 *34 (Mass. Super. Aug. 18, 1999) (suppressing large volume of documents seized during law firm search because court found the documents did not fall within the scope of the warrant and could not have legitimately been discovered under the plain view doctrine).

As the Doe & Doe hypothetical illustrates, these large-scale searches can occur either on-site, at the suspect's home or place of business, or off-site, at a police computer laboratory.¹⁷⁷ One issue that arises in large-scale computer searches, and one of the justifications for conducting them off-site, is the problem of intermingled files.¹⁷⁸ As Part II explains, the premise is that officers are confronted with such a large number of incriminating and non-incriminating files, that it is simply not reasonable to expect them to sort and review the files on-site.

Part II deals with the issue of where such a review should be conducted. If the review is conducted on-site, the officers will probably use back-up copies of the files to preserve the originals; the same is true if the review is conducted off-site.¹⁷⁹ The back-ups will not consist of a subset of the files owned by the person or entity on whom the warrant is served; the back-ups will be mirror images of all the data on that system. Therefore, it is likely that the back-ups will contain files with information irrelevant to the scope of the search authorized by the warrant. In some instances, such as the Doe & Doe hypothetical, the back-ups may contain files which include privileged information. The presence of non-incriminating and/or privileged files requires the implementation of some technique to focus the officers' file review on files that are at least likely to fall within the scope of the warrant. This will prevent the officers from using the plain view doctrine impermissibly to conduct a general search of all the files on the back-up copy of that computer system.

Large-file searches tend to involve only text files.¹⁸⁰ The technique set out above for minimizing the scope of the plain view doctrine when officers are confronted with text files and non-text files cannot provide the solution for this problem. There is no simple technology that can be used to minimize the scope of a search of text files, other than a prudent selection of search terms. Electronic search tools are designed to search for information whose precise location is not known, and so the tools generally operate against entire disks or directories, searching all files within the target location. Limiting the scope of a keyword search can only be accomplished if the user of the search software manually isolates

177. *See supra* Part II.

178. *See supra* Part II(D).

179. On very large systems, it may not be possible to create a copy of the entire system in a timely fashion. It is beyond the scope of this paper to deal with the special problems inherent in the search of very large computer systems.

180. Large-file searches usually are conducted pursuant to investigations into large-scale criminal activity, such as drug-dealing or white-collar crimes, and are usually concerned with locating records of that criminal activity.

the files to be searched before the search begins. For example, the user might select files to be searched based on the dates the files were modified, copy all files of interest to a specific location, and then search the files in the new location, thereby excluding all files that were outside the scope of the relevant dates. The inspection of the text files identified by the search is a manual process, and can be limited quite easily. It can be limited based on factors such as the context in which a keyword is found, the creation date of the files, the file location, owner, or other similar criteria.

Another alternative is to let the officers assume the risk of exceeding the scope of their warrant. The officers would perform the search and if the search yields evidence that is to be used against the owner of the searched files, the owner should move to suppress that evidence. The motion should be based on the grounds that the evidence was discovered during an unauthorized search, a search that exceeded the scope of the warrant.¹⁸¹ If the owner showed that the officers did exceed the scope of the warrant, the court would suppress the evidence.¹⁸²

This solution is unacceptable for two reasons. First, the solution does not protect innocent property owners, who are never charged with crime, from having their files subjected to an unconstitutionally broad search.¹⁸³ Second, the solution undercuts one premise of the preference for warrants. The premise that officers are to be perceived as acting within constraints established by the Fourth Amendment.¹⁸⁴

Instead, the better solution is based on procedures set out in the American Law Institute's ("ALI") Model Code of Pre-Arrest Procedure.¹⁸⁵ A quarter of a century ago, the ALI suggested a set of procedures for handling large-document searches, an alternative to the off-site document searches discussed above.¹⁸⁶ Section 220.5 of the ALI's Model Code of Pre-Arrest Procedure suggested the following:

181. See *Ellis*, 1999 WL 823741 *34.

182. See *id.*

183. See *Steve Jackson Games, Inc. vs. United States Secret Service*, 816 F.Supp 432 (W.D. Tex. 1993), *aff'd* 36 F.3d 457 (5th Cir. 1994)

184. See, e.g., *Illinois v. Gates*, 462 U.S. 213, 236 (1983) ("[T]he possession of a warrant by officers conducting an arrest or search warrant greatly reduces the perception of unlawful or intrusive police conduct, by assuring 'the individual whose property is searched or seized of the lawful authority of the executing officer, his need to search, and the limits of his power to search.'" (citing *United State v. Chadwick*, 433 U.S. 1, 9 (1977)).

185. A MODEL CODE OF PRE-ARREST PROCEDURE § 220.5 (1975). See also MODEL CODE OF CYBERCRIME INVESTIGATIVE PROCEDURE, art. VII § 4(f)(j)(2) (1998) at <http://www.cybercrimes.net/MCCIP/artI.htm>.

186. See *supra* Part II(O).

(1) Identification of Documents to Be Seized. If the warrant authorizes documentary seizure . . . , the executing officer shall endeavor by all appropriate means to search for and identify the documents to be seized without examining the contents of documents not covered by the warrant. . . .

(2) Intermingled Documents. If the documents to be seized cannot be searched for or identified without examining the contents of other documents, or if they constitute items or entries in account books, diaries, or other documents containing matter not specified in the warrant, the executing officer shall not examine the documents but shall either impound them under appropriate protection where found, or seal and remove them for safekeeping pending further proceedings pursuant to Subsection (3) of this Section.

(3) Return of Intermingled Documents. An executing officer who has impounded or removed documents pursuant to Subsection (2) of this Section shall, as promptly as practicable, report the fact and circumstances of the impounding or removal to the issuing official. As soon thereafter as the interests of justice permit, and upon due and reasonable notice to all interested persons, a hearing shall be held before the issuing official, or, if he [has] no jurisdiction, before a judicial officer having such jurisdiction, at which the person from whose possession or control the documents were taken, and any other person asserting any right or interest in the document, may appear, in person or by counsel, and move (a) for the return of the documents under Article 280 hereof, in whole or in part, or (b) for specification of such conditions and limitations on the further search for the documents to be seized as may be appropriate to prevent unnecessary or unreasonable invasion of privacy. If the motion for the return of the documents is granted, in whole or in part, the documents covered by the granting order shall forthwith be returned or released from impoundment. If the motion is not granted, the search shall proceed under such conditions and limitations as the order shall prescribe, and at the conclusion of the search all documents other than those covered by the warrant, or otherwise subject to seizure, shall be returned or released from impoundment.¹⁸⁷

187. A MODEL CODE OF PRE-ARRAIGNMENT PROCEDURE § 220.5 (1975).

The following procedures shall be utilized whenever officers execute a warrant authorizing the officers to search computer files or data:

On-site or off-site search: The default assumption is that a computer search will be executed on-site.¹⁸⁸ An off-site search must be authorized by a search warrant. To authorize an off-site search, the Magistrate Judge must find there is reasonable suspicion to believe an on-site search is not feasible.¹⁸⁹ An off-site search authorization can be contained in an original warrant, e.g., the warrant used to initiate a search, or in a supplemental warrant, a warrant officers obtain after they realize an on-site search is not practicable.

Scope of search: An application for a warrant to search text files must include a specification of the method(s) to be used in the search, including the search terms that are to be used.¹⁹⁰ When a Magistrate Judge issues a warrant based on such an application, the warrant must specify the method(s) and search terms to be used in conducting the search.¹⁹¹ In executing the warrant, the officers are limited to the method(s) and search terms specified in the warrant.

Intermingled files: If the officer(s) executing a warrant to search and seize computer files can identify the files that fall within the scope of the warrant without having to review the contents of files that may not fall within its scope, they can proceed as authorized by the warrant.¹⁹² If the

188. Search and seizure must adhere to the requirements of the Fourth Amendment. U.S. CONST. amend. IV. The presumption of on-site search forces law enforcement to treat electronic evidence as it would other forms of evidence. The mere fact that evidence is in electronic format should not condone wholesale seizure. There must be a compelling need to treat electronic evidence differently from more traditional evidence. There is no justification for favoring those who are capable of storing their records on computer over those who keep hard copies of their records. *See United States v. Abbell*, 963 F. Supp. 1178 (S.D. Fla. 1997). However, unless a compelling need to seize hardware is found, there is no reason to punish those who do store their records on computer by strictly seizing their hardware and conducting an off-site search. Citizens have a right to expect that their possessions will not be subject to government seizure except upon showing of probable cause. *See Roderick T. McCarvel, Taking the Fourth Amendment to Bits: The Department of Justice Guidelines for Computer Searches and Seizures*, (1996) available at http://www.seanet.com/~rod/comp_4a.html (last visited Feb. 1, 2002). Law enforcement officials and agents must overcome this basic presumption and be able to seize computer hardware only upon showing a compelling need to search off-site. *See* MCCIP, art. VII § 4(f)(I) Commentary.

189. For more on the showing required to authorize an off-site search, *see supra* Part II(D).

190. *See* FEDERAL GUIDELINES FOR SEARCHING AND SEIZING COMPUTERS § II(C) Step 3 at 47–48 (2001) available at <http://www.cybercrime.gov/searchmanual.pdf>.

191. *See id.* § II(C)(1) at 42–43.

192. This alternative will apply when officers are executing a warrant calling for a relatively limited search, such as searching the text-based files on an individual's computer to

officer(s) executing a warrant reasonably believe they cannot identify the files that fall within its scope without having to review the contents of files that may not fall within its scope, they shall not review the contents of any files but shall seek a supplemental warrant which authorizes them to make back-up copies of the files. If the officers reasonably believe they cannot identify and/or analyze the files that fall within the scope of the original warrant without having access to the computer equipment on which those files were generated and/or stored, the officers can seek a supplemental warrant which authorizes the officers to seize the computer equipment in which the files were stored. If a seizure of computer equipment is authorized, the equipment is to be taken to an off-site location and impounded pending further proceedings. One of the back-up copies of the files is to be given to the person on whom the warrant was served; the remaining back-up copies are to be sealed and remanded to the custody of a special master pending further proceedings under subsection (5), below.

Return of seized property and execution of search: An officer who has impounded computer equipment and/or made back-up copies of computer files under subsection (3), above, shall, as soon as possible, report what he or she has done to the Magistrate Judge issuing the original warrant. As soon thereafter as the interests of justice permit, and upon due and reasonable notice to all interested persons, a hearing shall be held before the Magistrate Judge at which the person whose computer equipment was taken and/or whose files were copied, and any other person asserting a right or interest in those files, can appear in person or by counsel and move (a) for the return of the seized equipment or files or (b) for the imposition of such specified limitations on any search to be conducted of the files as are needed to limit the search to items that are reasonably likely to fall within the scope of the warrant. If the motion to return seized equipment is granted, the equipment is to be returned to the movant as soon as possible; if the motion is not granted, the equipment is to remain impounded and cannot be searched or otherwise accessed except in accordance with an order issued by the Magistrate Judge, specifying the conditions under which the equipment can be searched and/or can be reassembled and used to conduct a search of seized files,¹⁹³ in accordance with the provisions of subsection (5), below. If the motion for the return of the files is granted, in whole or in part, the files covered by the granting order, including the originals and all copies made of

determine if he has sent harassing email messages to another person or searching the files on someone's computer to locate child pornography.

193. See New Technologies, Inc., *Seized*, at <http://www.forensics-intl.com/seized.html> (last visited Feb. 21, 2002) (advertising a software program that can be used to limit the access to a seized computer).

those files, shall immediately be returned to their rightful owner. If the motion is not granted, the files are to be searched in accordance with the limitations prescribed by the Magistrate Judge, one of which shall be the appointment of a special master in accordance with the provisions of subsection (5), and after the search has been completed, all files not covered by the warrant or otherwise subject to seizure shall be returned to their rightful owner.

Special master: Whenever original or back-up copies of intermingled computer files are to be searched, the court must appoint a special master who will supervise the conduct of the search in accordance with substantive and technical limitations set out by the court.¹⁹⁴ The officers charged with executing the search of the computer files shall provide the special master with copies of all the files seized pursuant to the warrant, while retaining a complete back-up copy of those files under seal. The special master will review the files provided to him or her and will determine (a) whether each file is encompassed by the provisions of the search warrant or, if not, falls within some valid exception to the search warrant which would justify the file's review by the officers executing the warrant and (b) whether each file is protected by an applicable evidentiary or constitutional privilege and, if so, if any exception to that privilege defeats its application and allows the file to be reviewed by the officers executing the warrant.¹⁹⁵ If no claim of privilege is raised as to the files at issue, the special master can allow the officers charged with executing the warrant to review the files using a search process and search terms approved by, and monitored by, the special master. After the files have been reviewed,¹⁹⁶ the special master shall issue a report which lists the files that are encompassed by the provisions of the warrant, and/or by an exception to the warrant requirement, and that are not protected by any valid privilege. The officers charged with executing the warrant shall be allowed to review these files. The remaining files, if any, are not to be reviewed by the officers executing the warrant. The costs of these procedures are to be paid by the government.¹⁹⁷

194. See *United States v. Abbell*, 914 F. Supp. 519 (S.D. Fla. 1995) (appointing a special master to supervise review of documents and computer files seized from law office); *People ex rel. Lockyer v. Superior Court*, 392, 99 Cal. Rptr. 2d 646, 649 (Cal. App. 2000) (reappointing a special master to review backup tapes seized in execution of warrant authorizing search of district attorney's office and attorney's home).

195. See *id.*

196. See *United States v. Abbell*, 963 F. Supp. 1178, 1184 (S.D. Fla. 1997) (noting the efforts of special master who conducted a document by document review of computer data seized from law office).

197. See *People v. Superior Court*, 23 P.3d 563, 589 (Cal. 2001) ("[I]n the absence of an applicable statute, the services of a special master, appointed (pursuant to the court's inherent

The only effective way to limit the advertent or inadvertent exploitation of the plain view doctrine when officers must search large quantities of computer files is through the intercession of a special Magistrate Judge. The special Magistrate Judge will (a) screen all of the files at issue and determine their respective responsiveness to the warrant as well as determine whether any of the files are protected by valid privileges or (b) allow the officers charged with executing the warrant to conduct a carefully monitored process designed to identify the files which are encompassed by the scope of the warrant.¹⁹⁸ Under the procedure set forth above, once the special Magistrate Judge determines that a file is encompassed by the provisions of the search warrant or some applicable exception to the warrant requirement, the officers executing the search will be given access to the entirety of that file. Such a file may not only contain information about the crimes currently being investigated, the file may also contain information about other criminal activity. Since the officers have been given lawful access to the entire file, the plain view doctrine comes into play and lets the officers observe, and seize, information falling into the second category.

It is neither practicable nor reasonable to have the special master excise portions of the files that are provided to the officers. It is not practicable because redacting portions of a file could result in the officers' receiving fragmentary and essentially useless evidence, which would hamper, if not obstruct, the officers investigation. It is not unreasonable (in the sense of preventing an "unreasonable" search or seizure) to give the officers access to the entirety of a file because, as the Supreme Court stated in *Katz v. United States*, "[w]hat a person knowingly exposes to the public . . . is not a subject of Fourth Amendment protection."¹⁹⁹ For computer searches, the *Katz* principle means that when a person puts incriminating information of the commission of multiple crimes, into one computer file, that person cannot complain if an officer who has lawful access to that file observes all of the information.²⁰⁰

authority) to perform subordinate judicial duties . . . constitute an aspect of the court's operations that must be paid for by the court from public funds provided for such operations. Because statutory provisions . . . authorizing courts to impose certain court-related costs upon parties, do not apply in criminal proceedings, and because we find no statutory or common law basis for requiring the parties to subsidize the cost of the court's operations in such proceedings, we hold that the superior court possesses neither statutory nor inherent authority to require the parties, to pay any portion of the cost of a private special master . . .").

198. See *Discussion Paper from Computer Forensics UK Ltd. On the Judicial Review Relating to Search Warrants*, at <http://www.computer-forensics.com/articles/judicial.html> (last visited Feb. 21, 2002).

199. *Katz v. United States*, 389 U.S. 347, 351 (1967).

200. See *United States v. Isaacs*, 708 F.2d 1365, 1370 (9th Cir. 1983) (holding that when officer is authorized to examine a book, the plain view doctrine allows the officer peruse the book's contents).

The owner of the seized files (and computer equipment) and anyone else who claims a valid Fourth Amendment interest in the files should be allowed to have the files returned to their rightful owner.²⁰¹ This essentially reiterates the provisions of Rule 41(e) of the Federal Rules of Criminal Procedure. It should not include a proviso that if the court grants a motion for the return of seized property, the court can impose reasonable conditions to ensure access and use of the property in subsequent proceedings.²⁰² Given the relative fragility and mutability of computer files, a court should deny a motion to have computer files returned if the court wants to ensure that the files will be available, in substantially unaltered form, for use in further proceedings.

If the owner of the seized files or anyone else who claims a valid Fourth Amendment interest in the files lose the motion for return of the files, that person should be allowed to move for the imposition of specific limitations on the searches to be performed on the files. The initiator of such a motion might, for example, request that the officers be limited to searches using the search terms specified in the original warrant.

IV. IS COPYING DATA A SEARCH? A SEIZURE?

The final issue to be addressed is whether the making of copies of recovered data is a search or a seizure under the Fourth Amendment. As Part II explains, when officers search for computer information, the officers can conduct the search on-site or off-site. When the officers search on-site, they will conduct at least part of their search of the data stored on the computer system at its original location, instead of at a police laboratory. The officers may take copies of the files and/or the original files to the laboratory for a more thorough search. When officers search off-site, they will copy the files stored on the computer system and take (a) the copies or (b) the copies plus the originals of the files back to the laboratory, where the search will be conducted.²⁰³ When officers take the original files, they usually provide the owner of that property with a copy of those files, though the owner may have to wait a few days to receive the copy.²⁰⁴ Because the primary focus of all this activity is on reviewing

201. See Fed. R. Crim. P. Rule 41(e).

202. See *id.*

203. See *supra* Part II.

204. See *Commonwealth v. Ellis*, No. 97-192, 1999 WL 815818 (Mass. Super. Aug. 27, 1999) (ruling on a motion to suppress electronically stored evidence); *Commonwealth v. Ellis*, No. 97-192, 1999 WL 823741 (Mass. Super. Aug. 18, 1999) (ruling on a motion to suppress evidence). See also *supra* Part II.

the contents of the data contained in these files, the case law that has evolved from challenges brought to computer file searches focuses primarily on the propriety of that review, i.e., on whether or not the search of the files was reasonable.²⁰⁵

As noted before, the terms search and copy, as used with regard to electronic evidence, have different implications than the terms have in the physical world. When a copy is made of a computer file, the software used to create the copy does not disclose the contents of the copied file. The program merely creates a duplicate of the original. When a file is searched electronically, the entire contents of the file are not revealed to the searcher. Instead, the search will reveal whether or not the file contains a particular word or phrase, thus identifying the file as potentially relevant. It is only when the file is actually opened and read that an inspecting officer can determine the actual contents of the file.

Because of these differences, it is possible for an officer to copy files without having any opportunity to examine the files' contents. Likewise, the officer can search files without gaining full disclosure of the files' contents. Both copying and searching of a large number of files can be accomplished with a few key strokes, it is important to identify the exact scope of what can be copied or searched, within the reasonable scope of the warrant.

The question that arises is whether the simple act of copying computer files or computer data, without more, is an act encompassed by the Fourth Amendment. The focus of this inquiry is whether the related acts of making copies of computer files and taking the information contained in those files is a search or a seizure.

The Fourth Amendment prohibits unreasonable searches and/or seizures carried out by government agents while reasonable searches and seizures are permissible.²⁰⁶ To be reasonable, a search or seizure must be conducted pursuant to a lawfully-issued warrant or an exception to the warrant requirement.²⁰⁷ If there is no search or seizure, it is not necessary to consider whether the government action at issue was reasonable, since the existence of a search or a seizure is a threshold requirement for applying the Fourth Amendment's standards of reasonableness.

A search is a government action conducted in violation of someone's legitimate expectation of privacy.²⁰⁸ A legitimate Fourth Amendment

205. *See supra* Part II.

206. U.S. CONST. amend. IV.

207. *See supra* Introduction, notes 9, 10.

208. The Fifth Amendment privilege against self-incrimination is not available to corporate and other artificial entities. However, it appears that the Fourth Amendment provides at least some protection to corporations. *See General Motors Leasing Corp. v. United States*, 429

expectation of privacy requires (a) that the person have manifested a subjective expectation of privacy in the area to be searched and (b) that this expectation be one society regards as reasonable.²⁰⁹ Examples of a search include an officer walking into someone's home,²¹⁰ or peering through a hole in a window curtain to observe the activities inside a home.²¹¹ A search does not include an officer observing someone's movements in a public place, or noting the license plate number on a vehicle. A person may claim to have a subjective expectation of privacy in his or her movements or license plate information. However, the expectation is not one that society is prepared to regard as reasonable.²¹²

A seizure "of property occurs when there is some meaningful interference with an individual's possessory interest in that property."²¹³ Examples of a seizure include a law enforcement officer who detains someone's luggage,²¹⁴ a police officer who padlocks a suspect's storage unit to prevent him from gaining access to the unit while a warrant is obtained.²¹⁵ However, a reasonable seizure does not violate the Fourth Amendment, but an unreasonable seizure of property does, even though the seized property was not searched.²¹⁶

Is the act of copying computer files a search or a seizure? If it is neither, then copying data falls entirely outside the Fourth Amendment and is not subject to the constraints of reasonableness. The lack of constraint would allow an officer to copy files without having to show the files fell within the scope of the warrant the officer was executing or within the scope of a valid exception to that warrant.²¹⁷

U.S. 338, 353 (1977) (holding corporations have some Fourth Amendment rights); Carl J. Mayer, *Personalizing the Impersonal: Corporations and the Bill of Rights*, 41 HASTINGS LAW JOURNAL 577 (1990).

209. See *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring) ("[T]here is a twofold requirement, first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as 'reasonable.'").

210. See *State v. Norris*, No. 17689, 1999 WL 1000034 at *2 (Ohio App. Nov. 5, 1999) (citing *Payton v. New York*, 445 U.S. 573 (1980)).

211. See *State v. Vogel*, 428 N.W.2d 272, 274 (S.D. 1988).

212. See *State v. Donis*, 723 A.2d 35, 38-39 (N.J. 1998). See also *Smith v. Maryland*, 442 U.S. 735, 742-44 (1979) (holding no reasonable expectation of privacy in telephone numbers dialed); *United States v. Miller*, 425 U.S. 435, 442 (1976) (holding no reasonable expectation of privacy in bank records conveyed to bank); *United States v. Butler*, 151 F. Supp. 2d 82, 84 (D. Me. 2001) (holding no reasonable expectation of privacy in "session logs or hard drive of . . . University owned computers").

213. *Soldal v. Cook County*, 506 U.S. 56, 63 (1992) (quoting *United States v. Jacobsen*, 466 U.S. 109, 113 (1984)).

214. See *United States v. Ward*, 144 F.3d 1024 (7th Cir. 1998).

215. See *State v. Smith*, 963 P.2d 642, 648 (Ore. 1998).

216. See *Soldal*, 506 U.S. at 63.

217. See LAFAVE, *supra* note 146, § 2.2.

As noted above, a search occurs when officers violate a legitimate expectation of privacy. Assume the contents of the copied computer files are protected under the Fourth Amendment because the owner of the files has an expressed subjective expectation of privacy as to the content of the files and society regards this expectation as reasonable.²¹⁸ Arguably, when officers conduct a keyword search of a file, some information about the files contents is disclosed, and so this action is properly termed a search even though the officer does not actually see the contents of the file.

But what about copies? The officers do not observe the contents of the computer files when the files are copied.²¹⁹ Therefore, it seems copying is not considered a search under the law.²²⁰

When copying files, officers physically remove files from the owner's possession. Therefore, it seems the act of copying should be a seizure. The officers are taking the owner's property—the information contained in the files. The difficulty with characterizing the copying of files as a seizure is that in the physical world a seizure is a zero sum concept. When officers seize property from its owner, the officers physically remove and possess the property in its entirety.²²¹ The owner is deprived of the possession and use of the property. When officers copy computer files, the officers take away the copies and/or the originals, but will usually leave the owner with a version of the files (either a copy or the originals). Therefore, no seizure has occurred because the owner is not deprived of the possession and use of the information contained in the files.²²²

There is little guidance available in current case law as to whether the act of copying computer data is a seizure. Only one reported decision squarely addresses this issue. In *United States v. Gorshkov*, the defendant argued that FBI agents' copying data from his computer in Russia

218. See *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring).

219. See *Discussion Paper*, *supra* note 198 (information contained in computer files “is not disclosed during copying”).

220. See *Soldal*, 506 U.S. at 63–64. *But see* *United States v. Hall*, 142 F.3d 988, 993 (7th Cir. 1998) (“The Government conceded that the copying files . . . constituted a warrantless search.”).

221. See *Discussion Paper*, *supra* note 198 (stating the “original definition” of seizure was the “literal one”, meaning “to confiscate, impound, or take possession of”).

222. A seizure occurs while the copies of the files are being made. See *United States v. Place*, 462 U.S. 696, 707 (1983) (finding a seizure had occurred when officers detained person's property while obtaining a warrant because of an interference with person's possession and use of property). To the extent that the process of copying computer files deprives the owner of the files of his/her ability to use them while the copies are being made, it results in a transient seizure of the files, a period of interference with their possession and use.

constituted a seizure in violation of the Fourth Amendment.²²³ The district court disagreed, holding that the

agents' act of copying the data on the Russian computers was not a seizure under the Fourth Amendment because it did not interfere with Defendant's or anyone else's possessory interest in the data. The data remained intact and unaltered. It remained accessible to Defendant and any co-conspirators or partners with whom he had shared access. The copying of the data had absolutely no impact on his possessory rights. Therefore it was not a seizure under the Fourth Amendment.²²⁴

The computer which the agents accessed and from which they copied the data was located in Russia, and the Fourth Amendment does not apply outside the territorial United States.²²⁵ It is therefore useful to consider how the Fourth Amendment might apply to domestic copying.

Lower federal and state courts have disagreed as to whether copying other kinds of information is a seizure.²²⁶ In *Arizona v. Hicks*, the Supreme Court held that it was not a seizure for an officer to write down the serial numbers of stereo components that were in plain view because recording this information did not meaningfully interfere with the suspect's possessory interest in "either the serial numbers or the equipment."²²⁷ While this observation might seem dispositive on the

223. *United States v. Gorshkov*, 2001 WL 1024026, No. CR)))-550C (W.D. Wash. May 23, 2001).

224. *Id.* at *3 (footnote omitted).

225.

[T]he Fourth Amendment does not apply to a search or seizure of a non-resident alien's property outside the territory of the United States. In this case, the computers accessed by the agents were located in Russia, as was the data contained on those computers that the agents copied. Until the copied data was transmitted to the United States, it was outside the territory of this country and not subject to the protections of the Fourth Amendment.

Id. at *3.

226. Compare *United States v. Perry*, 2001 WL 1230586, No. 00-6238, at * 8-9 (10th Cir. Oct. 16, 2001) (copying numbers displayed on caller identification unit was a seizure); *United States v. Gray*, 484 F.2d 352, 356 (6th Cir. 1973) (holding officer's copying serial numbers of rifles was a seizure); *United States v. Sokolow*, 450 F.2d 324, 326 (5th Cir. 1971) (copying serial numbers of air conditioning units was a seizure); *United States v. Boswell*, 347 A.2d 270, 273 (D.C. App. 1975) (copying television serial number was a seizure), with *Basham v. Commonwealth*, 675 S.W.2d 376, 384 (Ky. 1984) (holding "mere act" of copying down serial numbers is not a seizure); *State ex rel. Eckstein v. Video Express*, 695 N.E.2d 38, 43 (Ohio App. 1997) (holding officer's making copy of videotape was not a seizure).

227. 480 U.S. 321, 324 (1987); see *supra* Part IV. See also *Gorshkov* 2001 WL 1024026 at *3 (citing *Hicks* in holding that it was not a seizure for federal agents to copy data from a Russian computer).

question as to whether copying computer files is a seizure, further analysis will reveal that it is not dispositive.

Lower federal and state courts have also disagreed as to whether it is a seizure to photograph or videotape property.²²⁸ Lower courts have applied the Supreme Court's reasoning in *Hicks* and held that recording a visual image of property is not a seizure because the recording does not meaningfully interfere with the owner's use and possession of that property.²²⁹ While other lower courts have analogized the recording of visual images to the recording of conversations, and held that photographing or videotaping property is a seizure.²³⁰ The analogy to a conversation is derived from the Supreme Court's holding in *Katz v. United States*.²³¹ In *Katz* the Court held that the Fourth Amendment encompasses the seizure of intangible items, including the recording of oral statements, as well as tangible property.²³² One circuit has cited *Katz* for supporting the proposition that when officers use a visual observation to collect information the officers are seizing that information.²³³

The Court's observation in *Katz* provides the correct approach for dealing with copying computer files. The Court's apparently inconsistent comment in *Hicks* can be distinguished for the holding in *Katz*.

One critical difference between writing down serial numbers in *Hicks* and the act of copying computer files is the nature of the information. The officer did not record information that belonged to Hicks. Serial numbers are not property in the sense that the number belong to one person, but are more analogous to license plates or other public records. Serial numbers are assigned by the manufacturer of a product and are used to track and identify that product. Hicks had no interest in these serial numbers because the stereo equipment was stolen from its rightful owners. Hicks had no lawful possessory interest in the equipment or in the serial numbers on the equipment.²³⁴

Unlike the serial numbers in *Hicks*, the information contained in computer files clearly belongs to the owner of the files. The ownership of information is similar to the contents of a private conversation in which the information belongs to the parties to the conversation.

228. Compare *United States v. Ludwig*, 902 F. Supp. 121, 125 (W.D. Tex. 1995) (holding videotaping was not a seizure) with *People v. Matteo*, 485 N.Y.S. 2d 446, 447 (N.Y. Sup. Ct. 1985) (holding photographing was a seizure) and *Ayeni v. Mottola*, 35 F.3d 680, 688 (2nd Cir. 1994) (holding videotaping was a seizure).

229. See, e.g., *Bills v. Aseltine*, 958 F.2d 697, 707 (6th Cir. 1992).

230. See *United States v. Villegas*, 899 F.2d 1324, 1335 (2nd Cir. 1990).

231. 389 U.S. 347 (1967).

232. See *id.*

233. See *United States v. Freitas*, 800 F.2d 1451, 1455 (9th Cir. 1986).

234. *Hicks*, 480 U.S. at 323–324.

Copying computer data is analogous to recording a conversation in several ways. First, the object of both activities is the collection of information. The only difference is that the information is the data stored in the computer files while in a conversation the information is the content of the recorded conversation. Both use a collection process that duplicates the information at issue, the owner of the information is not deprived of possession or use of the information.²³⁵ Both activities result in the creation of a body of inchoate, yet unrealized, evidence. Officers cannot ascertain whether the copy of a computer file or the tape recording of a conversation actually contain relevant evidence until the officers access and search the contents of the file or tape. Therefore, copying computer files should be treated as a seizure.²³⁶

A second difference between the officer's writing down the serial numbers in *Hicks* and the act of copying computer files is the fact that the process of copying computer files can be shown to interfere with the ability to access the files' contents. The more common forms of copying require dedicated access to the media in order for a copy to be created. No one may access the contents of a file or disk, while the file is copied. The more benign types of copy, which can permit access to files during the copy operation, will impact the responsiveness of the entire system. For these reasons copying should be considered a seizure because the act of copying interferes, however briefly, with the owner's use of the system.²³⁷

Documents filed in at least one federal case implicitly recognize that copying data is a seizure. In 1999, federal prosecutors sought a search

235. *But see* Randolph S. Sargent, *A Fourth Amendment Model for Computer Networks and Data Privacy*, 81 VA. L. REV. 1181, 1186 (1995) (arguing that copying computer files is a seizure because the possessory interest in a computer file encompasses the ability to control the dissemination and use of the information contained therein and copying the information contained in a file interferes with the ability to exercise this control interferes with the owner's possessory interest in the file).

236. Arguably copying computer files is not a seizure in the traditional, zero sum exchange. But, copying should be treated as a seizure for the same reason that copying data can be treated as theft. Theft in the physical world is a zero sum exchange. The thief takes the physical property from the original owner, thereby completely depriving the owner of the property. The thief in the cyberworld can copy the owner's property and take the copy, leaving the owner with the possession and use of the property. But the act is theft on the premise that the owner has been deprived of something of value, namely, the right to the exclusive use and possession of that information. *See* Brenner, *supra* note 3. *See* State v. Schwartz, 21 P.3d 1128, 1136–1137 (Or. App. 2001). *But see* Miragaya v. State, 654 So.2d 262 (Fla. App. 1995) (copying suspect's video tape constituted a seizure).

237. *See* Criminal Justice and Police Act, 2001, c. 62 § 1(a) (Eng.), at <http://www.hmso.gov.uk/acts/acts2001/20010016.htm> (last visited Jan. 31, 2002) (“‘seize’ includes ‘take a copy’”); MODEL CODE OF CYBERCRIME INVESTIGATIVE PROCEDURE, art. I § 5(b) (1998) at <http://www.cybercrimes.net/MCCIP/art1.htm> (last visited Feb. 11, 2002).

warrant authorizing the installation of a keystroke logger on a computer belonging to Nicodemo Scarfo, whom they believed to be involved in illegal gambling and loan-sharking.²³⁸ The warrant application sought permission to install a program to track the keystrokes of Scarfo in order to seize passwords to allow the agents access to the computer.²³⁹ The government needed the passwords to access a file agents had copied from Scarfo's computer some months before, in the course of executing a search warrant at the office.²⁴⁰

The law remains ambiguous as to whether copying data is a seizure. The warrant application filed in *Scarfo* concedes that copying is a seizure while *Gorshkov* concludes that it is not. If copying data is not a seizure, then copying cannot logically be regarded as a search and it does not violate an expectation of privacy. It is possible to copy files without examining the files. Therefore, if copying is not a seizure, it is outside the scope of the Fourth Amendment's reasonableness requirements and is an activity which can be conducted at will, requiring neither the justification of a warrant nor an exception to the warrant requirement. This is not a satisfactory result. Copying has an effect upon the "ownership" rights of the party whose information is copied. For policy reasons, the copying of data should be defined as a seizure. Doing so does not prohibit law enforcement from copying files; it merely ensures that officers comply with the standards of reasonableness set out in the Fourth Amendment.

CONCLUSION

To paraphrase Professor Lessig, cyberspace "in its nature shocks real-space law."²⁴¹ This article analyzed some of the respects in which cyberspace, in the form of searches and seizures involving computers and computer-related evidence, "shocks real-space law" in terms of the Fourth Amendment.

The Fourth Amendment evolved to deal with activities in the real-world or "real-space." The challenge that faces law in the twenty-first century is how to translate concepts that were devised to deal with real-world conduct into the virtual world of cyberspace. This article deals

238. *United States v. Scarfo*, 180 F.Supp. 2d 572 (D.N.J. 2001).

239. *Id.* at 574.

240. *See id.*; *see also* Convention on Cybercrime, Sept. 23, 2001, Europ. T.S. No. 185, Title 4, art 19 available at <http://conventions.coe.int/Treaty/en/Treaties/Html/185.htm> (last visited Mar. 16, 2002) (recognizing that copying data is a seizure).

241. LAWRENCE LESSIG, *THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD* 199 (2001).

with a subset of that challenge—how to translate Fourth Amendment guarantees, originally designed to deal with law enforcement officers' forceful entry into real-space buildings and ransacking their contents, so that the concepts encompass the fragile realm of computer searches and seizures.

The Fourth Amendment is about privacy and the sanctity of personal possessions. While the Fourth Amendment was concededly devised to deal with transgressions against the strictures that protect real-world privacy, against doors and walls and other physical barriers, and to prohibit invasions of one's exclusive right to the possession of physical property, it is really about individual rights. The Fourth Amendment is about what Louis Brandeis and Samuel Warren called "the right to be let alone."²⁴² This article, in its modest way, argues that the "right to be let alone" must accompany individuals as they move into the virtual world of cyberspace. The purpose of the Fourth Amendment is to protect individuals, to protect the privacy of their activities, and the sanctity of their property. In the context of cyberspace, individuals' property often records private activities. Unless the Fourth Amendment is applied with this purpose in mind, the movement of American life into cyberspace may be accompanied by a corresponding diminution in the values that the Fourth Amendment was intended to protect.

242. See Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 193 (1890) (defining privacy as "the right to be let alone").