Report to Congress Pursuant to Section 104 of the Digital Millenium Copyright Act
Comments to the Copyright Office

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These are comments responding in particular to these specific questions relating to Section 109:

(c) What effect, if any, has the development of electronic commerce and associated technology had on the operation of the first sale doctrine?
(d) What is the relationship between existing and emergent technology, on one hand, and the first sale doctrine, on the other?
(f) To what extent, if any, does the emergence of new technologies alter the technological premises (if any) upon which the first sale doctrine is established?

There are digital materials are not transmitted digitally, such as digitally recorded music on CD, or digitally stored film in DVD format on CD. While these materials are digital, they are fixed in a package that can be resold or loaned without the making of further copies. In this sense, these digital materials follow the traditional "hard copy" format that we are familiar with in terms of applying the first sale doctrine. In these comments I will address the question of digital materials that are transmitted digitally as part of the distribution of copyrighted works.

Digital materials that are transmitted digitally are not placed in a fixed container by the manufacturer or producer or publisher of the item. These materials are transmitted as computer files to a device owned or used by the consumer. There is no physical package that contains the copyrighted work. Digital materials of this type are especially vulnerable to copying because they must be delivered as a computer file of a type that can be received and stored by the operating system of the consumer's device. Any file stored on a general-purpose computer can be copied by simply transferring the exact sequence of digital bits to another place on that computer's hard drive or to another storage device.

Because it is nearly always possible to make a copy of these digitally transmitted materials, the controls put in place by the producers are controls on *access* or *use*, not on copying. These access controls, although focused on copying, have an effect on first sale rights for digital materials.

Access Controls

There are four primary ways that digitally transmitted materials are received, and these correspond to different access controls:

1) *Materials transmitted to a standard Web browser*. Because the Web browser is today a ubiquitous means of receiving viewable files, many works are prepared to be viewed on standard browsers. In the case of works that are openly available on the World Wide Web

and for which no access controls are in place, these are sent in one or more segments using open standard formats such as HTML or PDF. Where access controls are in place they generally consist of two forms, which can be used separately or together:

a) *Access limitations based on Internet address or password.* When the members of an institution such as a university are eligible to access materials, their eligibility is determined by their location on the Internet, which is governed by that institution. For individual access (i.e. that not mediated by an institution), access is usually controlled by a password. Once the materials have been transmitted to the web browser, however, the copyright owner has no means of controlling the disposition of the materials. The received files can be copied and they can be transmitted to others.

b) *Access limitations controlled by the server.* For electronic books or online databases it is possible to send only limited portions of a document or file at a time, such as an individual page or a small number of database records. At no time is the entire copyrighted work available to the user for copying or transmitting to others. Although there are no direct limitations on copying or printing of the transmitted portions, the inconvenience of doing so is similar to that with hard copy materials.

2) *Materials transmitted to a generalized computer as a file.* In this case, the entire copyrighted work or a portion of the copyrighted work (i.e. one chapter) is transmitted. The file can be in a commonly used computer format, but for purposes of access control it may use a computer format that includes access control.

3) *Materials transmitted to a generalized computer as a stream.* Some computer formats such as RealAudio or RealVideo[1] do not send an entire file over the network to the receiving computer but send only small portions of the file which correspond to those sections currently being viewed or played. The receiving computer is never in possession of more than a small segment of the file at any time. The serving computer and the viewing software constantly control the amount of file that is resident on the receiving computer.

4) *Materials transmitted to a specialized device.* The example of this kind of device is an e-book reader, a combination of computer hardware and software that has been developed expressly to receive, store and display electronic books. This type of device can facilitate access controls and can prevent some functions such as transmitting copies to others or connecting to printers.

Different access controls are available to different customers. For example, the types labeled 1 and 3 above are feasible only in situations where users have a constant connection to the network. In areas where that connection is not available, other methods such as 2 and 4 above must be used. Each of these will use different access controls and the effect of these controls in relation to the first sale doctrine will differ.

In the analysis below, I express my own understanding of a number of access control methodologies used in commercially available products. My analysis is based on my reading of the documentation of these products and descriptions of standards, as well as some casual use of some of the products themselves. In the event that I have misunderstood any of these technologies I invite those more familiar with them to provide any corrections to my statements.

Access Controls and First Sale Doctrine

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[1] RealNetworks, http://www.real.com

> "... is entitled, without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy or phonorecord." Title 17, 109 (a)

In evaluating access controls and the first sale doctrine, I take the key portion of the copyright law to be the above quote, especially the phrase: *without the authority of the copyright owner.* To evaluate this I must give some technical details of current and planned access controls. In this area I will refer again to the four types of transmittal, above, and relate these to first sale.

Materials transmitted to a standard Web browser

Materials delivered to a web browser generally depend on that browser for display or play (in the case of multimedia files) of the content. Many materials that are delivered to a standard web browser contain no access or copy controls. These materials are assumed to be protected by the copyright law, because they are fixed in their expression, but the authors have chosen to make them available without controls. There is no question that these materials can be disposed of as stated in the first sale doctrine.

Access controls can be applied to works available over public networks and directed to a general-purpose Web browser. For example, controls can be applied limiting access to those users with a certain the Internet address[2]. Because internet addresses are assigned in ranges to institutions, this type of control implements a contract that limits use to requests from the local network of that institution. This is commonly used for access contracts with universities and libraries to limit access to their legitimate members. Access can also be granted to individuals using a password that allows the user to view licensed materials. This type of access control does not include any ongoing control of the digital items once they are received on the customer's computer.

For many content providers, however, this type of control is not acceptable because it still leaves the delivered content susceptible to copying. In other words, once the content is delivered to the user it is outside of the control of the provider or copyright owner. Such content can be copied at will and transferred to other computer users. Additional controls are therefore often set in place that limit the amount of the work that is delivered to the user at any given time. This type of control is realistically effective only for large works (like electronic books) or for works where users logically retrieve sections or portions of the overall item, such as encyclopedias and databases. These controls are exercised by the software that sends the content to the user's computer and consists of limiting the amount of content that is delivered at any one time. For example, netLibrary, a digital e-book company that delivers content to the user's desktop, has no controls over copying or printing but delivers only one page to the user at a time[3]. Database vendors also commonly rely on this type of control although it may be less obvious to users: databases deliver only the portion of their file that responds to a particular query, and often limit the total number of entries that can be delivered per query. They may also have limitations on displays, such as allowing only a small number of entries to be displayed at a time. Even though these controls have technical justifications such as limiting the amount of system resources dedicated to individual searches, they also serve to limit the amount of data that a user has in his possession at any given time.

These controls deter unauthorized copying by making copying inconvenient, but they also make it unlikely that the user will exercise first sale rights because of the burden of doing so. If a user

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[2] cf. Testimony of David Mirchin, Silver Platter Information, Copyright Office Hearings on Anticircumvention Measures, May 2, 2000.
http://www.loc.gov/copyright/1201/hearings/index.html#transcripts
[3] http://www.netlibrary.com

does put forth the effort, however, and does dispose of the copy in a way related to first sale, then this is indeed *without the authority of the copyright owner*.

Materials transmitted to a generalized computer as a file

This is the situation that many users characterize as a "file download." The file may or may not be displayed on the screen at the time of delivery, but the entire file is delivered to the user's computer device and is stored on that device. This type of file is highly susceptible to copying because the entire file is delivered in a machine-readable format.

Many of the downloadable files on the Internet are executable programs. These programs can require a license number or customer ID that the user must key in before installing or using the program. Access controls on other types of downloaded files today are rare, but this may become more commonplace through the use of newly-developed technologies. One example of this kind of technology is Adobe's PDF with "Web Buy."[4]

The Adobe corporation has developed and promotes a digital document format called "Portable Document Format," or PDF. One of the purposes of PDF is to produce an online document that has the same look and structure as a printed document, and so it is commonly used to deliver documents as a single file much as they are delivered as a single "unit" in hard copy. Documents presented in PDF are entire articles or reports or even entire books. Adobe provides the reader program for these files, which must be installed on the user's machine, for free. To accommodate access controls for eCommerce, the Adobe PDF Reader version 4.05 includes functions called "Web Buy" and "Adobe PDF Merchant." As stated in their document of September, 1999:

> "The publisher then encrypts the PDF file using Adobe PDF Merchant software and generates the unique encryption key that unlocks the document, ensuring that only authorized users are able to view the document." (p.2)

The unlocking mechanism is contained in a small file that must accompany the file containing the protected content. When the user attempts to open the content file for reading, that file interacts with the "key" file to determine if the conditions have been met for access to be allowed. This key can be based on one or more access control mechanisms, including identifiers for individual computers or storage devices (e.g. hard drives or removable drives), the user's network login name, or time factors.

> "... Once [the customer] finds the book at the online book retailer's Web site, the customer clicks on the button to purchase the book. She is shown a dialog box requesting unique identifying information from her computer. Once she gives permission to the online retailer to access this information, the retailer automatically verifies the CPU ID, user ID (login name), and storage device ID." (p.3)

The identifiers that are related to the CPU (central processor unit, that is the main computer chip) and the storage device ID (fixed disk, network disk or removable disk) are ones that are inextricably linked to that device and cannot be changed or altered by the consumer. That the intention is to limit access to a particular device is clear in this statement:

> "The seller determines what set of computing environment variables are to be requested from the buyer, who then has the option of sending all, none, or some portion of those variables. If the seller does not deem the returned variables sufficient to lock the

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[4] http://www.adobe.com/products/acrobat/webbuy/main.html

document to the buyer's computing environment, the reseller can decline to sell the content to the buyer." (p.6)

This also means that the file cannot be accessed on other devices, so that if it is transferred to a different device the key will not allow the content file to be opened for viewing. In this sense, any access control that limits access to a single device is likely to interfere with the right to exercise the first sale doctrine because no first sale rights are available to the buyer of the content unless the actual device is also transferred. In the case of files that require a password or key but that are not limited to a particular device, the original buyer can transfer the file along with the key and exercise first sale rights, although this is often forbidden by the license agreement for the product.

Materials transmitted to a generalized computer as a stream

Streaming audio and video techniques have been developed by a small number of software companies to allow a broadcast-like experience over the Internet. Streaming techniques can be used for stored multimedia files, such as audio-video files of past conference events, or for live broadcasts. Live broadcasts, by definition, are not available in a computer file format and may or may not be considered "fixed" for the purposes of copyright, so I will address only those works that are stored on the server for later access. These files are analogous to sound recordings and movies on tape, with the difference that they are delivered digitally over networks at the time of play.

Streaming came about ostensibly because for large files (as is true for most video and for some high quality audio) it has been impractical to download the entire file for viewing. (Note that with the size of currently available hard drives, this rationale for streaming is less convincing than it was just a few years ago when these techniques were first employed.) In streaming technology, only a small segment of the file is transmitted at a time and temporarily stored on the hard drive. As the play of the content progresses, previously played portions are automatically deleted from the hard drive and new portions are downloaded in advance of playing.[5]

Because the entire file is never in the possession of the customer, there is no application of the first sale doctrine for these files.[6]

Materials transmitted to a specialized device

The devices that I will discuss in this section may be implemented in hardware, in software, or in a combination of the two. Specialized electronic book readers are one example of this type of device.[7] There are also readers that are realized in software that contains similar controls.[8]

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[5] Streaming technology has sophisticated algorithms that determine how much advance storage is needed on the hard drive to facilitate uninterrupted play. This depends on the speed of the user's Internet connection as well as on other factors. So the amount of a file that is on a user's hard drive at any given time can vary.

[6] Streamed files can be downloaded as whole files using techniques that are available to users of Internet browsers but which may not be obvious to many users. It requires users to remove the browser plug-in that plays the streamed work and adjusting browser settings so that files of this type will be saved to disk. Whether or not using this technique falls under the anticircumvention language of the DMCA is beyond the scope of this report.

[7] Examples of these are: 1) Rocketbook http://www.rocketbook.com 2) Everybook, http://www.everybook.net

[8] Examples are: 1) Glassbook reader http://www.glassbook.com 2) TK3 http://www.nightkitchen.com

To facilitate the growth of the electronic book industry, at least two sets of standards for access control have been developed to date. An industry consortium called the Electronic Book Exchange Working Group has created the Electronic Book eXchange (EBX) standard.[9] A second standard has been issued as the XrML Specifications for Digital Rights Management[10]. Each of these has controls that have a potential effect on first sale rights.

EBX

The EBX standard has features particularly designed to facilitate lending (first sale) and fair use. Included in the "rights" that are enforced by the software that follows this standards are:

- Lendable (with Lending Timeout which controls the lending period)
- Givable
- Sellable
- Personal Use Copies (maximum number)
- Personal Use time (combines with Personal Use Copies, i.e. 2 copies per year)
- Personal Use Copy Size (i.e. paragraph, page, chapter, whole).

Of these rights, those particular to First Sale are included in an element called "Basic rights:"

> "The basic rights define whether the owner has the right to give, lend and/or sell copies of the voucher."[11]

The "voucher" mentioned above is the file that contains the rights information that is enforced by the rights software. It is the transfer of the voucher that allows access to the protected work.

Note that the standard permits these rights to be included in the contract that accompanies an electronic book purchase but does not require or imply that such rights be turned "on." So, for example, when the Stephen King novella *Riding the Bullet* was made available over the Internet, it came from at least one vendor with the following control set:

> "Copy: No text selections can be copied from this book to the clipboard.
> Print: No printing is permitted for this book.
> Lend: This book cannot be lent to someone else.
> Give: This book cannot be given to someone else."[12]

It is possible that the Lending right will not be the default for items purchased by individuals but will be primarily permitted for institutions like libraries and schools whose contract is specifically designed for use by multiple individuals.

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[9] The EBX working group lists these organizations among its developers: Adobe Systems, Book Industry Study Group, Coalition for Networked Information, Compaq, Glassbook, HarperCollins, Houghton Mifflin Company, Hewlett Packard, Hitachi, Ingram Lightning Print, J-Stream, Microsoft, RSA Labs. Softbook Press, Philips Electronics, Xerox. http://www.ebxwg.org

[10] XrML stands for Extensible rights Markup Language and is based on XML, eXtensible Markup Language which is a general purpose technique for creating data formats. XrML is based on the Digital Property Rights Language (DPRL) that was developed by Mark Stefik at Xerox PARC in 1996. http://www.xrml.com

[11] *EBX System Specification.* Draft 0.5. May 24, 1999. P. 28.

[12] Reported in an e-mail message on CNI-COPYRIGHT discussion list, March 24, 2000. http://www.cni.org/Hforums/cni-copyright/2000-01/0764.html. The message did not indicate if other rights were involved nor if one could ascertain defaults for rights not included here.

Given that the rights of lending, giving and selling of the work are conferred on the buyer by the copyright owner (or middle agent), it seems obvious that this access control technology does not allow the user to dispose of the item *without the authority of the copyright owner.*

XrML

XrML can be described as a more sophisticated standard than EBX in that it has additional features and controls. In the XrML standard, each "right" can be given complex controls of time, fees and incentives. The standard allows metered charges for "play" of works ("play" includes display of text), monetary incentives (per use or metered charges can change based on various factors), and expiration times. Exercise of the options that include fees would necessarily require the user to interact over a network with a point of sale in order to exchange a fee for the use or access.

The rights themselves are also highly complex and are divided into the categories of Transport Rights, Render Rights, Derivative Work Rights, File Management Rights, Configuration Rights. The rights most obviously related to the first sale doctrine are Transfer and Loan, which are categories of Transport Rights.

> "Transport rights govern the creation and movement of persistent copies of a work under the control of trusted repositories. There are three distinct kinds of transport rights: copy, transfer and loan. The interpretation of these rights are similar to familiar operations on physical works: copying an audio tape, transferring (or giving someone) a book, or loaning a compact disc."[13]

There are also rights for Delete and Uninstall that have to do with the disposition of the work by the recipient of a copy. Each of these rights can have conditions relating to time periods, use patterns or limitations, and can have fees associated with them.[14]

In addition, each of these rights can have "next rights." Next rights are those which will be applied when the item is transferred to the next user. The intention of next rights seems mainly intended to distinguish the rights of distributors, such as retailers, from the rights of end users, but could potentially be applied to any license.

> "When a digital work is copied, transferred, or loaned, certain rights become available on the receiving repository. Exactly which rights are available is determined by an optional NextCopyRights specification."[15]

Assuming that the software and hardware that implements an XrML license is working properly, the end user has no right to dispose of the possession of the copyright work *without the authority of the copyright owner.*

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[13] *XrML: Extensible rights Markup Language.* Version 1.0, April 25, 2000. p. 30

[14] The XrML standard itself warns against the use of fees in some of these circumstances. The standard itself would permit the creation of an access control that required payment for the deletion of a file. This would allow an unscrupulous entity to offer a file for free download and then require payment for the user to remove the file from her own hard drive. This points to the need for something that is outside the scope of the XrML standard, and that is clarity of license terms and the development of some consumer protection measures.

[15] *XrML: Extensible rights Markup Language,* op cit., p. 31.

Is the First Sale Doctrine Applicable to Digitally Transmitted Works?

I believe to have shown above that access controls on digitally transmitted works can interfere with the user's right related to the first sale doctrine. The question is whether this is a necessary result of access controls in general or if it is a characteristic of this generation of controls and something that might be overcome in the future. For a control to exist that would allow for first sale, it would need to have some particular characteristics: it would have to encapsulate the work in such a way that the access control is transferred with the work and still maintains its efficacy; it would have to allow transfer without allowing the creation of an additional copy; and it would have to do all of this without requesting authorization from the copyright owner, either at the time of purchase or at the time of disposition.

I cannot say whether such a system of access control could be developed in the future. I do know that the access control systems in development today are not of this type and, although the companies that support them generally are aware of the need to support first sale rights, they are unable to do so because the technology they use maintains control over the reader's right to dispose of the work.

There are other conclusions that I can draw from my reading in this area. One is that the rights of readers, which are poorly understood in the hardcopy world, may be many times more complex when digital rights management systems are applied. Another is that users may be unaware of the rights prior to purchase, and even then may have to exercise diligence to determine their rights once they have obtained the document. [16]

When we rely on copyright law for readers' rights, the law pertains to broad classes of works and the same law applies to all individual items of intellectual property within that class. With digital rights management technology, each work and each sale of each work can carry a vastly different set of rights. So the question becomes not only whether users have first sale rights, but whether they are aware of their rights and know how to exercise them. I have not been able to address this question here, and it may be too early in the life cycle of digital rights management systems and their uses to ascertain this, but hope that the question is answered in the future.

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[16] The person who posted the e-mail (see 12, above) relating to the rights in the version of the Stephen King novella stated that she had to click through three levels of menu items to see the rights, but that these rights were not displayed at any time during the purchase or download process.