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UNITED STATES COPYRIGHT OFFICE

Long Comment Regarding a Proposed Exemption Under 17 U.S.C. § 1201

[ ] Check here if multimedia evidence is being provided in connection with this comment

ITEM A. COMMENTER INFORMATION

OmniQ is a joint venture for the commercial development of a method for non-reproductive substitution of the material object in which a work is fixed. The method is disclosed in a patent application for *Digitally Transferring Content Across Media Without Reproduction*, Patent Application # WO 2016/168832; US 2016028135 (annexed hereto as Exhibit 1, hereafter the "OmniQ Invention"). Although necessarily a for-profit endeavor to attract the needed investment, OmniQ currently plans to incorporate as a public benefit corporation with the aim of restoring the public benefit provided from secondary markets for lawfully made copies of copyrighted works that, although still supported by the first sale doctrine and Sections 109 and 202 of the Copyright Act, is rapidly being lost on account of modern technological advances that allow copyright holders to effectively avoid business models that allow secondary markets to flourish. By use of the OmniQ Invention, OmniQ seeks to restore the public benefit that Sections 109 and 202 used to guarantee. To be clear, although the OmniQ Invention discloses the specific method OmniQ intends to use to space-shift motion pictures and other audiovisual works (as well as literary and pictorial works) from one material object to another without copying, the exemption sought need not be limited to the precise method disclosed in the OmniQ Invention. Rather, it should be permitted for any space-shifting process that does not reproduce the work into another copy. Also, although OmniQ also hopes to make the technology available to libraries, particularly public and academic libraries, as a means of regaining the freedom to "lend" copies without requiring the consent of the copyright holder, and a library use case might include non-reproductive space-shifting of literary works fixed with ink on paper, the proposed exemption is limited to Class 3, given that circumvention is unnecessary for space-shifting copies of literary works printed on paper, as they do not come with TPM.

The OmniQ Invention seeks to, among other things, maintain the viability of, and the public benefit afforded by, secondary markets for the exchange of lawfully made copies of copyrighted works. As technological advances often render copies in certain formats obsolete when the technology needed to access them is going into disuse (for example, a DVD is useless without a DVD player), and as digital dissemination and storage technologies increasingly result in the fixation of lawful copies on material objects that are too cumbersome to redistribute and may share space with thousands or even millions of fixations of other works (as in "downloading"), a new method is needed to preserve important avenues through which those unable to afford new copies in the primary market may continue to obtain access to lower cost second-hand copies notwithstanding the current trend toward digital dissemination that is causing a reduction in the availability of discrete fixations on individually transferable single-

Privacy Act Advisory Statement: Required by the Privacy Act of 1974 (P.L. 93-579)
The authority for requesting this information is 17 U.S.C. §§ 1201(a)(1) and 705. Furnishing the requested information is voluntary. The principal use of the requested information is publication on the Copyright Office Web site and use by Copyright Office staff for purposes of the rulemaking proceeding conducted under 17 U.S.C. § 1201(a)(1). NOTE: No other advisory statement will be given in connection with this submission. Please keep this statement and refer to it if we communicate with you regarding this submission.

work copies.[1]

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ITEM B. PROPOSED CLASS ADDRESSED

Proposed Class 3: Audiovisual Works—Space-shifting

We note that Proposed Class 3, as described in the Notice of Proposed Rulemaking, would consider two very different petitions. The OmniQ petition seeks an exemption for non-reproductive space-shifting where the reproduction right is not implicated at all because no reproduction takes place. In contrast, the De Petris petition seeks an exemption in order to enable "personal" reproductions either as back-up copies or for use on other devices.

This distinction between the OmniQ and De Petris petitions is important for several reasons:

1. The first objective of the De Petris petition – a back-up copy "in the event that something happens to the original, fragile disc" cannot be achieved by using the OmniQ method of non-reproductive space-shifting because no reproduction of the work into copies of any kind – backup or otherwise – takes place.

2. The second De Petris objective, "to play the content on tools that do not play discs (newer computer; iPads; iPhones; etc.)," can be achieved using the OmniQ solution without making a copy. That means that exempting the OmniQ solution lessens the need for the De Petris solution, and vice versa, with respect to personal copies made in order to watch from a more convenient fixation. Both achieve the same objective, except that the De Petris solution achieves it by allowing for the reproduction of the work into a second copy, while the OmniQ solution can only be achieved without reproducing the work into a second copy but, instead, shifting it to a more convenient substrate while destroying the original copy.

3. The De Petris solution presumes that a reproduction of the work on the DVD would be made, resulting in two or more copies (the DVD copy + back-up copy + copy to be played on devices that do not play discs), and would, ostensibly, rely solely upon fair use under Section 107 to establish that such reproductions are not infringing of the reproduction right. The OmniQ solution, in contrast, is by definition non-infringing

[1] Lawfully made copies fixed in hard drives, servers and mobile phones are, of course, redistributable under Section 109. The problem is that to distribute the fixation of one work requires the distribution of the entire library of works fixed on the hard drive, server or mobile phone.

because there is no reproduction. Although a fair use analysis might well result in a finding of non-infringement, and would provide an alternate basis for the exemption, fair use analysis is unnecessary where there is no reproduction.

4. By depending on fair use for the reproduction, the De Petris solution risks harm to the copyright holder's interests insofar as there is a greater chance that the lawfully made copy on DVD would be redistributed while the back-up or convenience copy remains in possession of the person who no longer owns the DVD used to make them. Although the exemption could be granted subject to terms along the lines of Section 117(a), designed to prevent the authorized copy from being in possession of anyone other than the owner of the first copy, it may prove difficult to monitor compliance, particularly with respect to audiovisual works.[2]

For these reasons, although OmniQ is not opposing the De Petris petition, and although there may be some overlap in the result of allowing the enjoyment of a movie on DVD using a device that does not play DVDs, OmniQ wishes to make clear that its petition is radically different, in that no back-up copies or convenience copies are made at all. With the OmniQ solution, the copyright owner continues to sell the DVD at whatever price the market will bear, and the Copyright Act's intent that the copy pass from one person to another unfettered is preserved.

ITEM C. OVERVIEW

The Basic Petition

Because non-reproductive space-shifting implicates none of the exclusive rights of the copyright holder, there is no need to rely solely upon fair use analysis with respect to the reproduction right, as ReDigi is attempting, or cobble together some "virtual" DVD player that, as Zediva and VidAngel learned, required a public performance. Plus, even if the "space-

[2] Motion pictures and other audiovisual works retain their value decades after they are first published, and the copyright holder can anticipate the opportunity to exploit the reproduction and distribution rights for the entire term of the copyright. And although a DVD must be played by use of a device, the DVD is removed after the performance, making way for the next title, whereas computer programs typically are not performed from the DVD, which was one reason why Congress wanted to authorize the reproduction necessary to privately perform ("run") the work. Computer programs, in contrast to motion pictures, are literary works of comparatively short life spans, such that newer versions will soon supplant the older ones. Plus, copies of motion pictures and other audiovisual works can be enjoyed without the need for patches and updates to retain their functionality in the face of newer operating systems or security vulnerabilities. Chances are that once a new version is installed, the old version will have little or no market value. Publishers of computer programs may also employ methods, such as "product keys" to make certain that no copy of a copy can be performed on more than one device. In fact, some major publishers of computer programs, such as Microsoft, allow for unlimited free reproductions by means of a download, and monetize the product keys as a proxy for the copy. That is not the case with motion pictures or other audiovisual works.

shifting" or "format shifting" misnomers are applied to the activity proposed by De Petris, and the reproductions constitute fair use of the reproduction right, there remains the concern that infringing copies may proliferate once a fair use copy is in the wild.[3] In the case of *true* space-shifting, where the fixation of the work is simply moved from one material object to another without reproducing more copies, circumvention does not touch on any of the copyright holder's exclusive rights. As practiced in the OmniQ Invention, not only is lawfulness not dependent on Section 107, but also the potential harm associated with the multiplication of copies is eliminated.

Although OmniQ is not asking for an exemption limited to those who practice the OmniQ Invention, we note that, once shifted using the OmniQ Invention, the copy that has been shifted is protected from unlawful reproduction to a far greater extent than the typical TPM, such as the Copy Scramble System (CSS). That is because CSS must function with mass-produced copies intended for playback in a dizzying array of devices from different manufacturers, leaving it highly vulnerable to casual circumvention.[4] Once the right "key" is found, it opens any copy of the work. In contrast, the OmniQ Invention is more able to vigorously guards against unauthorized reproduction because multiple stronger encryption keys are required to space-shift one copy. As described in Exhibit 1, and in less technical terms in the Declaration of Johann George (annexed hereto as Exhibit 3), instead of 40-bit encryption intended for any factory-made DVD to work with any factory-made DVD player, the encryption on the space-shifted copy is unique to that particular copy. As estimated by Johann George, Exh. 3, the time it would take to break the encryption in order to reproduce a DVD or Blu-ray fixation that has been space-shifted using the OmniQ Invention method would exceed the term of the copyright by a mind-boggling multiple of years.

OmniQ's solution resolves the concerns that were raised with respect to *so-called* space-shifting proposed in the previous triennial (and which may well be renewed in opposition to the De Petris Petition) by addresses the fundamental weakness identified: That this *so-called* space-shifting requires the reproduction of a "fair use copy" of the work. That is, in seeking the exemption, proponents argued that Section 107 provided a right to *reproduce* the work. *True* space-shifting, such as practiced using the OmniQ Invention, is inherently *non-reproductive*. In the absence of any reproduction, there is no need to apply fair use analysis to justify it. Accordingly, the exemption needn't be limited to non-commercial uses in order to enhance its weight on the fair use scales, but may cover commercial space-shifting for purely entertainment

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[3] The concern may be misplaced. Given the relative ease with which the motion picture on an optical disc can be "ripped" and copied onto a hard drive or another optical disc using cheap off-the-shelf software that is readily available to anyone, it is doubtful that anyone wishing to make an infringing copy would bother to add a step of "fair use reproduction" before making an infringing copy. The De Petris Petition seeks a lawful means of circumvention to make fair use, whereas the infringer is not going to worry whether circumvention also violates Section 1201.

[4] *See, e.g.,* Gregory Kesden, Course: 15-412 *Operating Systems: Design and Implementation, Lecture 33* (Wednesday, December 6, 2000) (course at Carnegie Mellon University), available at http://www.cs.cmu.edu/~dst/DeCSS/Kesden/index.html (noting that 40-bit encryption is particularly weak, and describing five methods of attack). Circumvention that may have been a novel concept in 2000 is now available to the masses as a simple installation requiring no particular skill.

purposes, just like DVD movies may be commercially sold or rented without the consent of the copyright holder and for purely entertainment purposes. Non-reproductive space-shifting should be permitted in any instance in which a work is digitally embodied in a material object that cannot, as a practical matter, be re-sold, lent, rented or gifted, solely because it either shares the same recording medium with thousands of other works (such as a large-capacity hard drive), or because the medium (such as a DVD) relies on older technology of increasing obsolescence with respect to playback (private performance).

Non-reproductive space-shifting serves the constitutional purpose of copyright. "The sole interest of the United States and the primary object in conferring the monopoly lie in the general benefits derived by the public from the labors of authors." *Fox Film Corp. v. Doyal*, 286 U.S. 123, 127 (1932). In pursuit of that interest, Congress endorsed the Supreme Court's conclusion that copyright holders could not extend the scope of their copyrights by means of an end-user license agreement that gave them greater control over copies they no longer owned. *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908). The codification of the first sale doctrine (which actually never has required a "first sale") carried with it a strong expression of public policy encouraging secondary markets for re-dissemination of copies, recognizing that copyright owner control over secondary markets would tend to reduce, rather than promote, the progress of science and art: "it would be most unwise to permit the copyright proprietor to exercise any control whatever over the article which is the subject of copyright after said proprietor has made the first sale." H.R. Rep. No. 2222, 60th Cong., 2d Session (1909).

When an end-user license agreement printed on the inside cover of a book in the manner of *Bobbs-Merrill* (and which can legally and practically be ignored) is replaced with TPM to achieve similar ends (but which might not be so easily circumvented and ostensibly carries with it the threat of civil or criminal prosecution), it is important that both the legal means and the practical means of ignoring it are within reach of the public, in order to prevent the copyright holder from exercising "any control whatever" over the transfer of ownership of lawfully made copies. That's what OmniQ's invention aims to do, and with the aid of a sensible exemption from the anti-circumvention prohibition, it can do so more efficiently, reaching a broader segment of the population.

Digits On Plastic = Ink On Paper

We did not abandon basic copyright principles when we developed audio and videotape. Digital media should be no different. It is common to hear a distinction being made between "digital copies" and "physical copies," forgetting that a movie on a DVD is 100% physical *and* digital. The first sale doctrine has always focused on the copy/copyright distinction rather than the technology used for making the copy. Section 202 of the Copyright Act (which was part of the original enactment or the statutory first sale doctrine in 1909) drove home the distinction between the ordinary ownership of "things" (such as paper, shampoo bottles, watches, discs or hard drives) that might contain works of authorship and the intangible exclusive rights conferred with respect to those works. The Copyright Act is replete with definitions that are technology neutral, and in fact, future-proofed to apply to technologies "now know or later developed."

As we shift from ink on paper to bits on something else, we are left with more of a practical problem than a legal one – How do I exercise my right to lend, give away or sell the copy of Work No. 3,476 on my hard drive without also having to part with my hard drive, which

also happens to be a copy of Works Nos. 1-3,475 and 3,477-5,000? There is a legal right to lend Work No 3,476 so long as the entire hard drive is lent.

Of course, on a daily basis, millions of people let friends and family use their smartphones and laptops – technically a redistribution of copies and phonorecords protected by Section 109(a) of the Copyright Act – but those redistributions rarely involve long term lending or transfer of ownership, and to the degree that the hard drive or smart phone contains computer programs or musical works, such lending would not be prohibited by Section 109(b)(1)(A) unless "for the purposes of direct or indirect commercial advantage." But this sets up another quandary, which has yet to reach the courts: Supposed one wants to rent a laptop so that a friend can watch a movie that was lawfully made on the hard drive, but rental of musical works and computer programs residing on the same hard drive would constitute infringement? One legal solution might be for the courts to allow the general rule favoring alienation to trump the specific rule prohibiting it, but a more elegant solution would allow the OmniQ Invention to facilitate non-reproductive space-shifting of the movie from one hard drive to another, and then back, after viewing.[5]

For many years, the public has been enjoying digital copies made in a factory and shipped to their homes through various distribution channels – DVD sales (in retail stores or by mail order), DVD rentals (in retail stores of by mail), and acquisition of second-hand ("used") copies through thrift shops, online sales, or gifts. All of this activity was carried out without needing the consent of the copyright owner. The freedom to alienate a copy meant that a video retailer could rent that copy out as many times as it wished, to as many people as it wished, at whatever price it wished, and for however long it wished, all without the consent of the copyright owner. Unsurprisingly, motion picture studios that wanted to capture a greater share of the added value provided by Section 109 of the Copyright Act (to the owner of the copy, that is), simply charged more for the initial sale. It was not uncommon for VHS copies to cost upward of $75, to be purchased primarily by video rental stores. Eventually, the studios began experimenting with "sell through pricing" intended to allow retail sales to compete with rentals, but the wholesale price to the retailer was the same whether intended for resale or rental. Today, DVD copies are uniformly offered at a "sell-through" price, yet if a VHS copy is made, it is often sold at the higher price, knowing that the primary purchasers are video rental stores. In other words, the copyright holder gets to control the price of each copy it distributes or authorizes; any additional value of that copy as a result of the value of secondary market for it can be captured by the copyright holder when establishing the initial price – just as it is with the purchase price of a new automobile.

Digital delivery puts the consumer into possession of a lawfully made copy by using the home replicator (a download) rather than the factory replicator (a DVD). Both are lawfully made copies of the same work of authorship, and both enjoy the *de jure* freedom to redistribute that copy, but until now, only the owner of the DVD copy could distribute it, as a practical matter, because the owner of the computer copy would have to part with the entire computer. Still, the

[5] This scenario is not within the scope of Class 3. It is offered to illustrate the need for a lawful means to continue enjoying the intent of the right of alienation, even when a hard drive can't be loaned out in discrete slices containing just one work.

law with respect to the rights of the copyright holder and the copy owner remain the same, governed by Sections 109 and 202. (Unfortunately, the owner of the DVD sees the value decrease as playback options are reduced.)

The motion picture industry has long advocated that a copy made by digital delivery should be treated the same as a copy delivered by mail – at least when assessing taxes. As early as 2001, when Congress was grappling with the legal consequences of digital delivery, the Motion Picture Association of America addressed the question of whether the delivery of a movie through e-commerce networks (now known as electronic sell-through, or EST) should be considered trade in goods or trade in services, MPAA's Vice President for Trade & Federal Affairs gave the following example:

> If a consumer were to place a telephone order for a DVD of the film "Finding Forrester" and have a copy of that DVD delivered to his house on a UPS truck, that is a "goods" transaction. Likewise, if the same consumer ordering a copy of the same DVD on his/her computer and had the same content delivered digitally and downloaded from his computer to a write-able DVD – that is still a "goods" transaction. The only difference is that a digital network instead of a delivery van provided the transportation from the retailer to the consumer.

Testimony of Bonnie J.K. Richardson before the House Commerce Committee Subcommittee on Commerce, Trade and Consumer Protection, May 22, 2001, prepared statement at 12. Notably, Ms. Richardson referred to the digital delivery as being "of the same DVD" rather than "the same work that was on the DVD." As early as 2001, the movie industry already saw "the DVD" almost like the literary world sees "a book". There is no "book" in the Copyright Act. The value of the literary work of authorship is in the ability to read it, not in the quality of the paper or whether it is on a Kindle. Likewise, "a DVD" tells the consumer that "the movie" is in digital form, but for all practical purposes, the consumer will get just as much enjoyment from watching the movie from a DVD inserted into a DVD player hooked up to a TV or computer screen as from watching it from an ISO image on a computer hard drive hooked up to the same TV.

In Copyright Act terms, the UPS delivery involves reproduction onto a medium that has not yet been distributed, whereas digital delivery over the Internet involves reproduction onto a medium that has already been distributed to the person receiving the download.[6] The question to be addressed now is whether and how to facilitate the second and third distribution of that digitally delivered copy without the impractical extremes – having to distribute the entire hard drive or other storage medium, on the one hand, or opening up a free-for-all replication (or multiplication) of copies without the copyright holder's consent, on the other.

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[6] *See, e.g., United States v. Cohen*, 946 F.2d 430, 434 (6th Cir. 1991) ("[C]opyright law does not forbid an individual from renting or selling a copy of a copyrighted work which was lawfully obtained *or lawfully manufactured by that individual*." (emphasis added)); *United States v. Sachs*, 801 F.2d 839, 842 (6th Cir. 1986). Copyright law does not forbid it, but the copyright holder's choice of technology may forbid it, as a practical reality.

Given the way courts have been treating reproductions by digital delivery as though they infringe not only the reproduction right, but also, the distribution right, and doing to at the instigation of copyright owners who perceive their distribution rights to have been infringed when only a reproduction technically, took place.[7]

Legally speaking, so-called "digital copies" are substantively evolutionary, not revolutionary. Recording "bits" on a hard drive, USB, or any other tangible medium is the legal equivalent of recording ink on paper, grooves in vinyl, chemical reactions on film, and magnetic impulses on "analog" cassette or 8-track tape. During most of the 160 or more years that the first sale doctrine has existed (over a century since its first codification in 1909), the tangible medium was easier to re-distribute than to replicate. That is, the easiest way to let someone read my copy of a popular book was to lend my particular copy of the book. It became the public policy that copyright owners should exercise no control at all over the copies they put into circulation. The Congressional committee recommending codification of the judicially created first sale doctrine stated, "it would be most unwise to permit the copyright proprietor to exercise any control whatever over the article which is the subject of copyright after said proprietor has made the first sale." H.R. Rep. No. 2222 (1909) (emphasis added). And, instead of codifying it that way as mere passive exhaustion of the distribution right, Congress went further, authorizing the owners (or, initially, mere possessors) to redistribute their copies without the consent of the copyright holder.

Case law since then has shown all manner of gimmicks to avoid Section 109, and though downloads and streaming are not gimmicks, *per se*, by emphasizing streaming and digital delivery of downloads over physical delivery of copies, copyright owners gain *de facto* control, not due to the laws of copyright, but by harnessing the laws of physics – we can't simply cut a sliver out of a hard drive to redistribute the portion in which the work is fixed. With more fixations being delivered as digital download copies, and fewer as individual copies, replication has now caught up with and surpassed distribution as the most efficient way of passing on the content of my copy to someone else. If we do not allow a comparable manifestation of the

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[7] The distribution right is limited to the distribution of "copies and phonorecords," which are both defined as "material objects." While some courts facing the issue squarely have insisted on the distribution of a material object for the right to apply, others, including the Ninth Circuit (see, e.g., *A & M Records, Inc. v. Napster, Inc.*, 239 F. 3d 1004 (9th Cir. 2001), where all parties *and* the court treated digital delivery over the Internet as both a reproduction and a distribution) and the Supreme Court (*see, e.g., Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 US 913, 920 (2005) ("Given these benefits in security, cost, and efficiency, peer-to-peer networks are employed *to store and distribute electronic files* by universities, government agencies, corporations, and libraries, among others," emphasis added), have seemed to simply assume that an electronic delivery encompasses both a reproduction and a distribution, for infringement purposes. The question need not be settled here, but it warrants noting that if electronic delivery does infringe the Section 106(3) distribution right even though the reproduction was made on a material object that the downloader already owned, then *a fortiori*, the Section 106(3) distribution right is exhausted by Section 109, to which it is subject, and the owner of the copy lawfully made by downloading is free to "re-distribute it" by digital delivery, as well – at least using the non-reproductive method taught in the OmniQ Invention.

principles underlying the first sale doctrine to evolve alongside the technological evolution, we risk losing the important benefits of the doctrine. The approach that courts seem to be pointing to (*see* footnote 7, above) is one way. OmniQ's Invention is another – and the two are compatible.

To be clear, OmniQ's petition for an exemption for non-reproductive space-shifting has nothing to do directly with the first sale doctrine. Rather, given the shrinking opportunities to enjoy the benefits of the first sale doctrine, and growing inability to actually act on the redistribution right Congress vested in copy owners, millions of intended beneficiaries are left behind, faced with a more costly choice of having to buy all of their copies "new, and unused" due to a lack of secondary markets.

To understand the harm to the public, we must therefore look at the benefits of protecting our longstanding unlicensed redistribution regime, which benefits are rapidly being lost to a permissions-based system characterized by first sales only. The benefits of unlicensed redistribution made possible by the first sale doctrine and Sections 109 and 202 of the Copyright Act have come to be part of the fabric of our culture. Quite simply, had Abraham Lincoln been unable to borrow the books he studied to practice law, we most likely would never have had a "President Lincoln" to sign the Emancipation Proclamation. Those books could be borrowed one at a time, leaving the rest on the lender's shelf, but our modern massive digital storage capabilities, coupled with digital delivery, effectively mean that the entire bookshelf full of books would have to be loaned in order for the next Lincoln to borrow but one.[8]

Congress had good reason to stand against allowing copyright holders to exercise "any control whatever" over authorized copies placed in the stream of commerce:

a. Intermediaries are ready, willing and able to get the works out into the hands of people that the first seller may consider too marginal. Whether a distributor, such as a "one stop" who services smaller accounts that would overwhelm a major publisher, a retailer that concentrates on smaller markets that might fall below the threshold for major chains, a small, independent retailer willing to do business in less affluent neighborhoods, the used product merchant, the seller of carefully curated collections of copies of rare works that the copyright owner does not wish to promote, or the 99-cent new release video rentals from kiosks with low overhead, it would be impossible for a publisher to directly reach the consumers in all of these markets.

b. Distribution reaches beyond "first consumers" in the commercial marketing sense. Copyright law encourages unlicensed redistribution, advancing the progress of art and science by reaching those unwilling or unable to pay the market price to own a new copy. Rental models, library lending, second-hand stores, and private sales through yard sales or online markets such as eBay and Craigslist, all enable the widespread dissemination intended by the Constitution's copyright clause *and* by Sections 109 and 202 of the Copyright Act. Plus, copies regularly wend their way from one person to another at no

[8] Reference to Lincoln's borrowed books is by analogy, of course. They are in the public domain and can be freely copied. Plus, there is no TPM that must be circumvented in order to gain access to literary works printed on paper, which is why this petition need not encompass them.

cost through gifts, lending and inheritance. First sale doctrine case law includes redistribution even as far as copies intended for the trash heap or retrieved from the recycling bin. *See, e.g., Harrison v. Maynard, Merrill & Co*., 61 F. 689 (2nd Cir. 1894); *Independent News Co. v. Williams*, 293 F. 2d 510 (3rd Cir. 1961). It gives the copyright owner the right to charge what it wants for the copy it owns or authorizes to be made, but prohibits the copyright owner's subsequent control over whether someone else may come to own it or possess it.

c. Market viability of the original publication increases. The value of the original sale is greater because of its redistribution value. Consider how new car sellers trumpet the high resale value of their new cars. In the consumer's mind, the "resale" value need not be cash – the value in giving it to a relative, trading it in on a newer model, or donating it to charity in exchange for a good feeling or a tax deduction, all enhance the market value of the original.[9] Absence of the first sale doctrine would be comparable to an automobile market where new cars could only be disposed of as scrap, or after successfully negotiating a transfer license from the manufacturer. Notably, there is no comparable statutory right of the owner of a lawfully made automobile to redistribute it without the consent of the manufacturer, though the general rule of alienability of chattel may suffice. (Perhaps another reason is that Congress' authority to regulate commerce includes no limitation to the purpose of "advancing the progress of freedom to travel by useful means.")

d. Redistribution cannot be limited. Whether it was Bobbs-Merrill trying to keep the price of THE CASTAWAY above one dollar, or Mark Twain trying to artificially bolster the perceived value of his books, or the major college textbook publishers trying to charge the most the market will bear in different regions of the globe, the right of the owner of a non-infringing copy to redistribute it over the copyright owner's objection has provided an important safety valve against artificial scarcity that would limit access only to those with deepest pockets. Mark Twain learned that the first sale doctrine (along with the copy/copyright distinction) protected from liability such distributors as chose to breach price fixing agreements intended to add luster to the perceived value of his books;[10] the Supreme Court held that Macy's was free to resell THE CASTAWAY for pennies on the dollar notwithstanding an end-user license agreement to the contrary;[11] the Supreme Court held that copyright owners could not escape the Copyright Act's limitation on their

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[9] Automobile makers competitively advertise the value of the first sale doctrine: "The Subaru Legacy retains its value better than any other vehicle in its class for 2017." Subaru advertisement, at https://www.subaru.com/why-subaru/reviews-awards/legacy.html; "Not only does the 2015 Toyota Tacoma have the highest resale value in its class, it's also Kelley Blue Book's #1 Best Resale Value Winner. Out of ALL 2015 cars, trucks, and SUVs, KBB deemed the Toyota Tacoma to have the highest resale value." Toyota advertisement, at https://www.performancetoyotastore.com/blog/2015/august/12/toyota-cars-with-the-best-resale-value.htm.

[10] *Clemens v. Estes*, 22 F. 899 (C.C.D. Mass. 1885).

[11] *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908).

copyrights by making the copies abroad;[12] and ordinary merchants remained free to buy from the "exclusive" retailer and put the product on their own shelves.[13] Restricting the reach of the first sale doctrine, whether by clever distribution agreements, attempts to escape it by manufacturing abroad, by wrapping the fixed work behind various technological measures to impair the usefulness of the redistributed copy,[14] or even the passive collateral effect of CSS on a DVD – a system intended to prevent unauthorized reproduction but with the added "benefit" to the copyright owner that redistribution could be tempered by licensing the equipment needed to work with the encrypted discs, might all be attractive to the copyright holder as a more lucrative approach, but they widen the economic divide in terms of participation in the constitutionally intended progress of science and the useful arts. Without a vibrant first sale doctrine, we would have a legal landscape in which the poor need the copyright owner's permission to play a movie from a fixation that had been first distributed on a DVD, even though the poor do not have a DVD player or, if they do, lack the ability of acquiring the used DVD from dwindling local sources. Abraham Lincoln's lender would have needed a license from the copyright holder before letting him borrow books, an executor of an estate would need to search out the copyright owners for permission before transferring copies by inheritance,[15] the birthday gift shopper would need to be sure the copy came with a re-distribution

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[12] *Kirtsaeng v. John Wiley & Sons, Inc*., 568 US __, 133 S. Ct. 1351 (2013).

[13] Back in 1993, Orion Pictures provided McDonald's with an exclusive video title, and reportedly "attempted to prevent McDonald's from selling tapes to retailers after reports surfaced that Trans World Music, Musicland and other retailers had purchased them at fast-food chain [sic] for resale in their stores." VIDEO WEEK (April 5, 1993), p. 4. There is no indication that Orion's efforts met with any degree of success; nor could they, since any given McDonald's customer buying a sandwich with a premium could happen to be a video store employee doing the boss a favor. Indeed, any customer is free to resell their tapes, whether to video stores or to each other.

[14] About ten years ago, the "EZ-D" DVD was introduced, enticing copyright owners to, for an added cost or reproduction, distribute DVDs that were *less* attractive to consumers, because they would self destruct, *See* Sarah N. Lynch, *This DVD Will Self-Destruct*, TIME.COM, Tuesday, July 01, 2008, at http://content.time.com/time/business/article/0,8599,1817828,00.html. It was (fortunately) a market failure, for it was an attempt to circumvent Section 109 by rendering the DVD unusable – no longer a "copy" – 48 hours after the "first sale" customer opened it. It used technology to obliterate the Section 109 right Congress had intended to be superior to the distribution right. But it also demonstrated Section 109' economic value to the owner of the copy and the value to the subsequent owner to which it might be distributed – value that the self-destructing DVD basically tried to recapture.

[15] Which raises another use case for the OmniQ Invention: When Uncle Tony dies, leaving behind a couple of terabytes worth of lawfully made copies of copyrighted works, and the only choices of the executor who wants to divide them up among the heirs is to either say "sorry, only one of you can have it," or else reproduce them without permission, non-reproductive space-shifting could move the fixations, individually, from Uncle Tony's hard drive to a medium for each of the heirs, according to their selections. But Uncle Tony may need to stick around a few more years before OmniQ can perfect that particular space-shift.

authorization, and a donation of DVDs to the after-school program for underprivileged students would be limited to those DVDs for which permission to donate had been obtained.

The digital marketplace should be no different in that regard, as the most attractive target consumer is the heavy spender with the financial means to purchase new copies, whether on DVD or by licensed download, at whatever "optimal" price the market will bear. But once a movie has been watched, it just takes up space on the bookshelf or the hard drive. The owner of the hard drive is not likely to part with it so that someone else can enjoy the motion picture fixed on it, nor will the offer to sell or lend a DVD be attractive to the consumer who lacks the technology (licensed by the Copy Control Association) to play it. It is perfectly lawful to do so, but it comes with a tremendous practical barrier – the hard drive redistribution is the equivalent of Abraham Lincoln having to cart away the book owner's entire bookshelf full of books just to read one book; the DVD redistribution is the equivalent of Lincoln borrowing the book bound shut, without permission to cut the binding, because his knife was from an unlicensed knife-maker.

As technology has evolved to the point that it can be used to expand the copyright holder's control beyond the limits of the copyright while diminishing access to important secondary markets by the less affluent, just to prevent price competition against the premium prices charged for the first copy, it is imperative that the Librarian of Congress use her authority to provide relief to those being sidelined from the progress of science and useful arts.

There is a failure in the market because, currently, all of the approaches to preserving the benefits of Section 109 and the first sale doctrine have required a "reproduction" or "public performance" step that depends on permission from the copyright holder, or has required permission from the copyright holder to circumvent the TPM system the copyright holder deployed. In either case, the access to copyrighted works via secondary markets that the first sale doctrine and Sections 109 and 202 of the Copyright Act intended to protect is quickly eroding. The public's access to movies is rapidly moving away from the unlicensed retail market (sales, resales and rentals), together with a long tail of informal yard sales, swaps and gifts, and moving just as rapidly toward an environment where licensors serve as gatekeepers to knowledge and entertainment, where only the more privileges licensees or the unlicensed infringers can enjoy the bounty Article I, Section 8 of the Constitution intended.

The problem is exacerbated by a TPM system that pretends to control access to motion pictures and other audiovisual works on optical discs as an adjunct to preventing unauthorized reproduction of the work from them. Books, for example, continue to be widely available without TPM, and no "licensed equipment" is needed to access them. Music on CDs comes with no TPM; to the contrary, it comes with immunity from lawsuit for noncommercial reproduction, 17 U.S.C. § 1008. But there is currently no legal "patch" for a broken first sale doctrine where TPM-protected movies on optical discs are concerned. With books and music CDs, anyone is free to engage in the kind of activity that CSS on DVD prevents. Non-reproductive space-shifting is lawful with all media, as is fair use reproduction, but where CSS serves as a legal barrier to such non-infringing use while providing no barrier at all to infringing use, it effectively enlarges the reach of Section 106 rights as it diminishes the non-exclusive rights Congress

reserved to the public. Given that Congress specifically stated its intent that nothing in Section 1201 be interpreted to alter the balance of exclusive versus non-exclusive rights, it is imperative that this exemption process authorizes circumvention aimed at restoring the balance.

As Section 1201(c)(1) provides that "Nothing in this section [1201] shall affect rights, remedies, limitations, or defenses to copyright infringement, including fair use, under this title," we must not allow any TPM to interfere with non-reproductive space shifting as described in the OmniQ Invention, which involves no infringing reproduction or public performance.

Finally, there is no indication that the market controlled by the major owners of the copyrights in motion pictures is moving in the direction of offering a digital-delivery counterpart to the analog first sale doctrine benefits. To the contrary, the freedom that a retailer had to choose any movie title to stock, including the freedom to purchase copies from an "exclusive retailer" the copyright holder might have chosen, is rapidly giving way to a model in which the bulk of the revenue is coming from a handful of large companies (offering public performances (such as through VOD (video on demand), SVOD (subscription video on demand)) or EST (electronic sell-through, which is to say, copies reproduced by means of an authorized download)), and with which licensing deals are reached, often with exclusivity clauses, and always for a very limited period of time. As explained more fully below, the rapid shift within the movie industry to delivering movies by *licensed* public performance and *licensed* downloads at the expense of *unlicensed* redistributions of lawfully made copies is resulting in fewer motion pictures being available to the masses. Shareholders of the major movie studios may be content to reap higher profits from a vastly reduced viewing public, but that runs counter to the Constitution's Article I, Section 8 authority to secure exclusive rights to authors. The Librarian of Congress should lend her aid to restoring the public benefit, to the fullest extent that Section 1201 allows.

The Long Shot

OmniQ believes that there is arguably no circumvention activity that need to be exempted, because, notwithstanding judicial and Register of Copyrights pronouncements (from years ago) that CSS is a technological measure that effectively controls access to a work, as defined in Section 1201 (a)(3)(B), the reality is that, for all practical purposes, once millions of people have already installed one or more of the many competing "DVD ripping" programs, the "ordinary operation" of the DVD no longer "requires the application of information, or a process or a treatment, with the authority of the copyright owner, to gain access to the work," *id*. Instead, all that is required is the DVD owner's desire to "rip the DVD to my hard drive," and accomplish the task with an innocuous couple of clicks. (In fact, the off-the-shelf software does not care whether the user is the owner, or just the renter or borrower). It is time to accept the fact that we have been in denial about since 1999: CSS is useless as an access control if the purpose is to "protect" any exclusive right of the copyright holder. While it may be true that most people technically gain access in the method authorized by the copyright holder (which is to say, they simply bought a DVD player that was licensed by the DVD Copy Control Association), it is just as true that anyone wishing to reproduce the work from the DVD onto a personal computer may do so with greater ease than answering a "what movie do you want to watch tonight" text

message. The most difficult step is deciding which from among the many competing computer programs is the better deal,[16] and that step need not be repeated to continue ripping away.

Having said that, we are not attempting to persuade the Librarian of Congress to abandon the "alternate reality" that CSS and AACS continue to meet the statutory definition of a TPM. That may be too much of a long shot – at least until the next triennial. Given that the current Notice of Proposed Rulemaking notes the previous treatment of circumvention with respect to DVDs, we must assume that the Register continues to at least presume that, for purposes of this triennial rulemaking, CSS and AACS "effectively controls access to a work." We do, however, believe that it is reasonable for the Librarian of Congress to take into consideration two important facts when considering the Petitions with respect to Class 3:

First, the fact that CSS and AACS don't actually perform the access control function that was intended, and they provide no protection at all (at least not beyond "fig leaf" level) against unauthorized access to the works fixed on the DVD or Blu-ray discs for the purpose of unlicensed reproduction, it is very difficult to fathom any injury to the copyright owner that could come from even the most liberal of exemptions.

Second, many of the "ripping" tools simply reproduce the work to the hard drive along with the entire disc image (ISO file) without actually circumventing anything. They do not gain access to the work, *per se*, and playback may still require the use of an ordinary CSS-compliant DVD player app (or AACS-compliant app).[17] There is, of course, no "exclusive right to do or to authorize access to a work" in Section 106. The sole legitimate interest to be protected is the reproduction right. When it is clear that the emperor has no clothes – that CSS and AACS do nothing to protect the reproduction right – it is time to at least take the reality into consideration when fashioning exemptions, rather than perpetuate the charade of an invisible fig leaf.

ITEM D. TECHNOLOGICAL PROTECTION MEASURE(S) AND METHOD(S) OF CIRCUMVENTION

The OmniQ Petition seeks an exemption to circumvent the TPMs employed on DVD and Blu-ray discs – essentially the same as those identified by the Register during the last triennial rulemaking process:

> The vast majority of DVDs use the Content Scramble System ("CSS") to encrypt audiovisual works on DVDs using a fixed set of decryption keys, and the Copyright Office and courts have found that CSS is an "access control" within the meaning of section 1201(a)(1). The CSS key was decoded in 1999, and decryption

[16] Not only can DVD "ripping" software can be readily purchased or downloaded, but Amazon.com alone offers approximately 30 different choices "in stock" to anyone searching for "dvd ripper" under the "software" category.

[17] *See, e.g.,* Danny Chadwick, "The Best DVD Copy Software of 2017," Top 10 Reviews, latest update March 3, 2017, at http://www.toptenreviews.com/software/multimedia/best-dvd-copy-software/, in which 8 of the "Top 10" works were said to be able to "Copy ISO to Hard Drive," explained in a pop-up: "An ISO file is a type of disc image that serves as the blueprint of a DVD and behaves the same way as a disc when opened with DVD player software. The best DVD copy software allows you to copy these types of files for backup or archiving purposes." *Id.*

> software is now available on the internet, including the programs MactheRipper, DVDDecrypter, and Handbrake.
>
> Blu-ray discs are protected primarily by the Advanced Access Content System ("AACS"), which allows vendors to revoke compromised keys and distribute new keys. In 2012, the Register recognized AACS as a TPM subject to the DMCA. Proponents, including EFF/OTW, attest that Blu-ray circumvention tools are also easily available, including DVDFab and MakeMKV. Another TPM, called BD+, protects some Blu-ray discs.

Section 1201 Rulemaking: Sixth Triennial Proceeding, Recommendation of the Register of Copyrights, October 2015, at 29 (citations omitted).

Although this Petition seeks an exemption to circumvent such TPMs, the OmniQ Invention's method of non-reproductive space-shifting is largely agnostic to the class of works and to the TPM being used.[18]

The OmniQ invention is also largely agnostic to the TPM, at least with respect to the TPM used with DVDs and Blu-ray discs. But the TPM nevertheless presents a barrier to fulfilling the Constitutional objectives.

For example, the OmniQ system can "ingest" a DVD to substitute a hard drive for the plastic medium, keeping intact the entire work together with all TPM surrounding it. But when "the work" of interest is just the motion picture, having to maintain the surrounding TPM is very inefficient, and a useless exercise once the anti-copying function has been replaced with something far more effective; it is akin to forcing consumers to keep the shrink wrap and electronic article surveillance tags together with the DVD long after they have become worthless for their intended purposes of preventing tampering and theft. And, since the DVD of any motion picture often includes other copyrighted works (such as movie previews or "trailers", interviews, or "making of" features), if the person receiving the space-shifted copy only desires the feature film, it is more efficient to only space-shift the primary work on the DVD, and ignore the undesired works. Similarly, a francophone film buff may be happy space-shifting just the original French language film, without the English subtitles (assuming that the subtitles are a separate work in a separate file as opposed to integrated into the movie).

As described in the OmniQ Invention application, OmniQ's method for non-reproductive space-shifting can substitute the hard drive for the plastic, where the entire "disc image" is preserved. But because OmniQ's encryption system is so much more robust than the Copy Scramble System ("CSS") or any other disc-based TPM in preventing reproductions, the TPM no

[18] The OmniQ Invention is not limited to audiovisual works; it can be applied equally to space-shifting of sound recordings, literary works, and visual works – anything work fixed in a manner that can be moved from one material object to another without reproduction, and in which the fixation in the new material object is digital. If the original fixation is in non-digital form, such as ink on paper rather than digits on a disc, the OmniQ Invention can be practiced adding what might be referred to as "format-shifting," in which the fixation of, say, a literary work fixed using words printed with ink on paper is space-shifted and format-shifted into a fixation of the same words fixed in digital form on digital media. But, since there is no TPM surrounding works printed with ink on paper, this Petition does not encompass them.

longer serves any useful function once OmniQ's space-shifting has been completed. Specifically, past technologies have either involved DVD direct reproductions through so-called "rippers" that result in the multiplication of unauthorized reproductions, or more creative efforts to "contain" the reproductions by making the unauthorized reproduction first, and then attempting to delete all other copies (*e.g.*, *Capitol Records, LLC v. ReDigi Inc.*, 934 F. Supp. 2d 640 (S.D.N.Y. 2013)). Before ReDigi's "copy and delete" approach, Congress considered (but did not adopt) the legitimacy of a "forward-and-delete" method of space-shifting advocated by former Congressman Rick Boucher. Introduced during the 105th Congress, he proposed to legalize the reproduction of a copyrighted work from one medium to another so long as the source copy was subsequently destroyed. The "Digital Era Copyright Enhancement Act," provided that Section 109(a) (*i.e.*, the entitlement of owners of lawfully made copies to transfer ownership or possession of them without the consent of the copyright owner)

> applies where the owner of a particular copy or phonorecord in a digital format lawfully made under this title, or any person authorized by such owner, performs, displays or distributes the work by means of transmission to a single recipient, if that person erases or destroys his or her copy or phonorecord at substantially the same time. The reproduction of the work, to the extent necessary for such performance, display, distribution, is not an infringement.

H.R. 3048, 105th Cong., Section 4. The intent was to permit the owner of a lawfully made copy to do the *equivalent* of transferring possession even though the tangible medium itself would not change hands. The drawback was that, for a period of more than a transitory duration, there would be two copies that could simultaneously be perceived or further reproduced. And, the system did not lend itself to containment – "trust me, I deleted the source copy right away" was too tenuous a basis for granting the right, particularly given that typical computer operating systems allow for the recovery of deleted items.

The OmniQ Invention approach resolves all of those concerns. Throughout the entire process, there is never a multiplication of the work into copies. There is never a point in which the work is fixed in two material objects at once. And, the system is so robust that there is no backup: If the material object substitution fails, the copy is lost forever. If the person to whose hard drive the fixation is shifted breaks the hard drive, the copy is gone. The result is just like when a Netflix customer receives a broken DVD in the mail, and Netflix must replace it with an entirely different lawfully made copy – it cannot simply say, "don't worry, we will burn you a new copy."

The OmniQ space-shifting process need not "bypass or disable" the TPM, but the TPM is nevertheless a hindrance. It is far easier to bypass or disable the CSS on a DVD movie, or AACS on a Blu-ray disc than to bypass or disable the OmniQ encryption. (*See* Exhibit 3, Declaration of Johann George, at 2.) With OmniQ, no "back doors" are permitted. Indeed, the OmniQ encryption is so strong that not even the business using it can keep a "back door" to decrypt it in case of loss. In that sense, OmniQ agrees with members of the House Government Oversight and Reform Committee's Information Technology Subcommittee who, at a hearing on April 29, 2015, criticized the inherent weakness of encryption with back-door access:

> "It is clear to me that creating a pathway for decryption only for good guys is technologically stupid," said Rep. Ted Lieu (D-Calif.), who has a bachelor's in computer science from Stanford University. "You just can't do that."

Andrea Peterson, "Congressman with computer science degree: Encryption back-doors are 'technologically stupid'," The Switch, The Washington Post, April 30, 2015, available at http://www.washingtonpost.com/blogs/the-switch/wp/2015/04/30/congressman-with-computer-science-degree-encryption-back-doors-are-technologically-stupid/.

> Rep. Jason Chaffetz (R-Utah), chairman of the Government Oversight and Reform Committee, also expressed concern about back doors.
>
> "It's impossible to build a back-door for just the good guys — if somebody at the Genius Bar could figure it out, so could the nefarious folks in a van down by the river," he said.

Id. OmniQ's method of non-reproductive space-shifting ensures that the person who owns or controls neither the original material object in which the work had been fixed cannot use a back door to regain the fixation – the ability to perceive or reproduce the work from the material object – once the space-shifting occurs. It is a flaw by design, and something that beneficiaries of the secondary market will simply have to live with. *See, e.g.,* the preliminary FAQ (frequently asked questions) OmniQ developed at the time the OmniQ Invention was being invented, designed to explain to potential customers that, unlike an Electronic Sell-Through model (such as downloads from the iTunes store), there would be no way to simply "recover" the movie if your iPhone falls in the toilet. There is no backup copy "in the cloud" that can restore the copy lost.[19]

OmniQ's encryption is sufficiently strong as to ensure that the work will have long entered the public domain by the time a brute force attack succeeds. And for that reason, the independent deployment of such a system is to be preferred over TPM applied by the copyright holder. Any copyright holder that used TPM to prevent reproduction long after the copyright expired might face charges of monopolization or copyright misuse. By independently protecting the work from being reproduced from that copy, the OmniQ method continues to incentivize the copyright holder to reproduce the work into additional copies, or license others to do so. (We realize that, when the copyright term expires, OmniQ's encryption would continue to prevent reproduction, but at least it is not an act of monopolization or misuse, given that OmniQ is not the copyright owner.)

But the ability to lawfully bypass the virtually useless TPM will make space-shifting much more efficient and less costly than having to respect it, thereby making lawful copies more widely accessible to people of all walks of life through low-cost space-shifting.

Looking under the hood: In its most recent triennial rulemaking, the Copyright Office noted that OmniQ did not provide a prototype that would, in effect, allow it to kick the tires and look under the hood, so to speak:

> Commenter OmniQ submitted a patent application that purports to set forth a system of "non-reproductive" space shifting, such that the original instance of a work is destroyed or made unusable when a copy of the work is moved to a new medium. OmniQ asserts that use of such a system would not implicate any of the exclusive rights under section 106 because "[t]here is no 'reproduction or duplication.'" *Although described in written comments, this system was not demonstrated at the hearings, and it is not clear from the record that a product*

[19] The FAQ is attached to Exhibit 2, Declaration of John T. Mitchell.

> *embodying the patent specification has been made available for potential users or even prototyped.*

Section 1201 Rulemaking: Sixth Triennial Proceeding, Recommendation of the Register of Copyrights, October 2015, at 113 (citations omitted, emphasis added). At another point in the Recommendations, the Register similarly noted:

> Proponent OmniQ contends that the "non-reproductive" space-shifting model it describes in its comments is a noninfringing use because the process described does not constitute reproduction under the Copyright Act. *The Register cannot credit OmniQ's arguments in light of its failure to establish that the technology it advocates has actually been developed. The question therefore appears to be a hypothetical one.*

Id. at 123 (citation omitted, emphasis added). OmniQ respectfully disagrees with the notion that a working prototype is necessary or even desirable. This is why:

First, to create a prototype that actually takes a CSS-protected DVD or AACS-protected Blu-ray disc and space-shifts by circumventing the TPM sounds almost like entrapment. Surely that was not the Register's intent, but the problem is that, even if a prototype could satisfy the Register that the non-reproductive space-shifting process actually operated as described, it would be necessary to do an act that is currently prohibited by Section 1201 – or at least that is the contention of the copyright holders who use CSS and AACS, and was the position of the Register in 2015.

Second, the whole point of a patent application is to describe the invention with sufficient clarity that anyone skilled in the art could build it.[20] The degree of clarity required under our patent laws is sufficient as a matter of law. The current OmniQ Invention application (Exhibit 1 hereto) is under consideration by the U.S. Patent Office, which does not require a working prototype before making its determination of patentability. The point of the 1201 process is not to determine whether, if the USPTO grants the patent, the invention will join the ranks of so many other inventions for which a prototype was never made, and the invention was never practiced. Rather, it is enough that the patent examiner believes it could work as described, and it is not unusual for a patent to be granted for something that might appear to work "on paper" but that, in reality, simply don't work.[21] In any event, even if the Patent Office denies the OmniQ Invention patent application (for example, because someone else already invented it, thereby failing the novelty requirement, or because it is too obvious, thereby failing the non-obvious

[20] 35 U.S.C. § 112 provides, "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention."

[21] *See, e.g.*, *Wonderful energy patents that didn't quite work*, THE SOURCE (published by the British Gas Company) at https://www.britishgas.co.uk/the-source/our-world-of-energy/surprising-world-of-energy/energy-patents.

requirement), there is nothing to prevent anyone from practicing the method described in the Exhibit 1 patent application for the OmniQ Invention.

Third, even if a prototype were presented for testing, and assuming, *arguendo*, that the Copyright Office has or can hire the expertise to know whether the split-second computing operations are being carried out precisely in the manner described in the OmniQ Invention patent application, together with the added protection of the OmniQ encryption on each chunk that is read into volatile memory, the Section 1201 task is not for the Librarian of Congress to test each method someone might use to carry out the exemption. The Petition asks for an exemption to carry out non-reproductive space-shifting along the lines of described in Exhibit 1 (the OmniQ Invention patent application), but does not ask that the particular OmniQ Invention method be the only one used. (*See* Declaration of Johann George, Exhibit 3, for a "plain English" description.) Like "building a better mousetrap," if another inventor figures out how to move the authorized fixation of an audiovisual work from a DVD or Blu-ray disc to some other material object, without reproduction, the inventor would also benefit from the proposed exemption. Surely, if the exemption is granted, neither the Register of Copyrights nor the Librarian of Congress have authority to prevent the competitor's entry into the market until it, too, presents a working prototype to be tested. To put it more directly, the OmniQ Petition is not for an exemption "to practice the OmniQ Invention," but an exemption to use any method now known or later developed of moving the fixation from the disc to something else, without reproduction. To be sure, OmniQ would be satisfied if the granted exemption required the level of encryption planned by OmniQ, but it is certainly not necessary for the Register to wait 6.4 quadrillion years[22] to see whether OmniQ can implement the such strong encryption, given that the copyright in a work made for hire only lasts 95 years. Nor do we suggest waiting even 95 years! The Librarian of Congress is free to craft an exemption for non-reproductive space-shifting, including a requirement that at no time may the work be "sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration" on more than one material object "from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device." 17 U.S.C. § 101 (definitions of "fixed and "copies").

Fourth, requiring a functioning prototype would appear to be arbitrary and capricious, Quite simply, if the Librarian of Congress refuses to grant an exemption that would allow circumvention of CSS and AACS in order to practice the *non-infringing* method such as that described in the OmniQ Invention patent application on account of the possibility that no one will actually be able to build it, and no one will actually build it because the Librarian of Congress refuses to grant an exemption for it which would permit the invention to be practiced without risk of being sued for violating Section 1201, we are in a hopeless loop. Indeed, a very significant reason why OmniQ has yet to build a prototype is precisely because potential investors are concerned about whether, without such exemption, Section 1201 would frustrate their efforts to see a return on investment. *See* Declaration of Mark Vrieling, Exhibit 4. Plus, if investment is going to be made to practice the OmniQ Invention by building the device, it is important to know whether the device may be designed to efficiently move just the audiovisual

[22] *See* Declaration of Johann George, Exhibit 3, at 2.

work by circumventing the TPM, or must be designed to move the entire contents of the disc, including the useless TPM.[23]

Fifth, there is absolutely no danger if the OmniQ Invention does not work. Assuming that the Librarian of Congress authorizes circumvention of CSS and AACS for the narrow purpose of non-reproductive space-shifting along the lines described in the OmniQ Invention, and further assuming, *arguendo*, that no one is able to perfect the non-reproductive part of the implementation, or that a court were to rule that the OmniQ Invention process itself, as practiced, in reality infringes the reproduction copyright, then the exemption would simply not apply to such conduct. We are confident that the Librarian of Congress can fashion an exemption that does not apply to non-reproductive space-shifting if the non-reproductive feature does not become a reality.

Finally, the exemptions that the Register has recommended in the past have never required the demonstration of a working model. We concede that the OmniQ invention is novel (as it must be, to qualify for patent protection), but novelty is no reason for putting the brakes on "the progress of science and the useful arts."

Accordingly, OmniQ respectfully requests that the Petition be evaluated on the basis of the written Petition itself, referring, at most, to the OmniQ Invention patent application for all necessary understanding of how the exemption might be applied.

ITEM E. ASSERTED ADVERSE EFFECTS ON NONINFRINGING USES

The Proposed Class Includes More Works Protected By Copyright Than Not

Given the current length of copyright protection in U.S. law, odds are that any audiovisual work in the class, selected at random, is still protected by copyright, and that fact will hold true over the next three years. Although the precise number of motion pictures with expired copyrights is not available, it is certainly a very small number in comparison to the number still under copyright. For example, IMDb has listed 284 movie titles in the public domain in 2011 (and quite surprisingly, only 76 movie titles in the public domain in 2012).[24] In contrast, there are or will be 540 new movies released in December 2017 alone.[25] It is safe to say that even if the IMDb numbers are too low, the vast majority of motion pictures published on TPM-protected DVDs and Blu-rays discs are still copyright protected.

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[23] By analogy, it is as if Redbox were seeking investors to back the designing and building DVD rental kiosks without knowing whether it was legally permitted to discard the clamshell cases along with the EAS (Electronic Article Surveillance) tags, or would be required to build a kiosk that rented DVDs inside the EAS-tagged clamshell case supplied by the studio.

[24] *See* http://www.imdb.com/list/ls003915205; http://www.imdb.com/list/ls055593451. (It is curious that the "New 2012" list is smaller than the "Old 2011" list.) Both lists are dwarfed by the number of new copyrighted movies released every year.

[25] *See,* The Numbers - Movies Released and Planned for Release in 2017, https://www.the-numbers.com/movies/year/2017.

The Uses At Issue Are Non-Infringing Under Title 17

Non-infringing uses are (a) private performances and (b) non-reproductive space-shifting.

(a) Private performances

The private (or, more precisely, non-public) performance of a work is not within the scope of exclusive rights; private performances are *always* non-infringing – even the thief who steals an infringing DVD copy of a motion picture has a right to watch the movie; doing so infringes no one's copyright. There has never been – and never can be – a case where an infringer found guilty of making infringing reproductions and distributing the resulting copies for profit is also found guilty of watching the movie from one of those copies. It is a legal impossibility. The point is not to argue for an exemption for the benefit of a thief who wants to watch a stolen copy of an infringing DVD, but to drive home how much more rightful it is for the owner of a lawfully made copy of a movie on DVD to watch it.

Because private performances are fully protected by the First Amendment to the Constitution, and can never be infringing of any copyright, as a matter of law, it is important that relief be granted against any TPM that serves as gatekeeper for "access" in a manner that effectively usurps the First Amendment-protected non-infringing right to privately perform a work.

The owner of a DVD has just as much a right to watch the movie fixed in the DVD as does the owner of a book have a right to read it. And, just as the owner of the book who has not yet learned to read has the right to have someone else privately perform it for her enjoyment, the owner of a DVD who has no machine or device on which to watch it has a right to use a different machine or device, including one not authorized by the copyright owner. Section 1201 did not create an "exclusive right of access to a work," nor is it intended to give the owners of Section 106 rights leverage over which machines or devices may be used to privately perform a work, which is a non-exclusive right beyond the reach of the copyright holder's realm of exclusivity.

Although one may say, "let's watch a DVD," it is the movie (the copyrighted audiovisual work), and not the DVD, which is being watched.[26] Accordingly, if the owner of the DVD is able to privately perform the work in a manner other than the one that the copyright holder had intended, and can do so without infringing the reproduction right, there should be freedom to circumvent the TPM. And because the OmniQ Invention method facilitates non-reproductive space-shifting, the non-exclusive right to privately perform the work encompasses the right to perform it after having first moved the fixation from the DVD to a laptop, if that is the private viewer's preference.

To the extent that the TPM purports to allow the copyright holder to charge for "access" to the exercise of a Constitutionally protected right that properly belongs to the public, it is abhorrent to the Copyright Act and the Constitution, and the Librarian of Congress must not lend aid to such a scheme even if the perpetrators are able to pull it off unassisted by the government. *Shelley v. Kraemer*, 334 US 1 (1948).

[26] From a Copyright Act perspective, "Let's perform a motion picture or other audiovisual work non-publicly tonight!" is more accurate, but who wants to say that?

(b) Non-Reproductive Space-Shifting[27]

The use at issue is non-infringing for three reasons. First, the proposed exemption relies on the Copyright Act's own expression of what constitutes a "reproduction" of a work into "copies," as well as case law interpreting it. Second, the use is expressly non-reproductive; the exemption need not anticipate all possible implementations or require prototypes to see whether, in fact, they function as the exemption requires. Accordingly, none of the exclusive rights in Section 106 are infringed by non-reproductive space-shifting. Third, assuming, *arguendo*, that the reproduction right is implicated, the use is still non-infringing because it satisfies the "fair use" requirements of Section 107.

1. Non-Reproductive Space-Shifting As Described In The OmniQ Invention Does Not Reproduce The Work Into Copies

The first sale doctrine and its corollary, exhaustion of the distribution right, has for centuries ensured a robust secondary market for the redistribution of lawfully made copies of copyrighted works through resales, gifts, and lending. Such activity has ensured wider dissemination of copyrighted works while stimulating the creation of more works due to increased demand.[28] That elegant arrangement has served us well, enabling Abraham Lincoln to borrow law books when he did not have the means to purchase them at the publisher's first sale price, requiring only the consent of the owner of the books, and not the consent of the copyright owner.[29] The doctrine ensures that secondary distribution, combined with a free market, will enable people from all walks of life to enjoy access.

With the advent of digitally-delivered copies (*i.e.*, downloads from a server to a personal computer or portable device, now referred to as electronic sell-through), the benefits of the first sale doctrine are all but gone, not because the objectives of copyright law are any different, but because the laws of physics applicable to digitally delivered copies have thwarted the statutory intent. One may still lawfully lend or sell the copy created by authorized digital download, as always, but doing so involves parting with a computer or portable device onto which the work was downloaded. That is because the distribution right applies only to the distribution of "copies

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[27] We again stress that OmniQ is solely advocating on behalf of true space-shifting of a non-reproductive nature. Although *Recording Indus. Ass'n of Am. v. Diamond Multimedia Sys., Inc.*, 180 F.3d 1072, 1079 (9th Cir.1999) and *A & M Records, Inc. v. Napster, Inc.*, 239 F. 3d 1004, 1019 (9th Cir. 2001) both used the phrase "space shifting" or "space-shift," in both cases, the facts involved reproduction that resulted in the multiplication of copies. In plain English, neither case involved "*shifting*" the fixation of the work from one medium to another, but rather, "*copying* the fixation of the work from one medium onto an *additional* medium."

[28] *See, e.g.*, Richard Roehl, Hal R. Varian, *Circulating Libraries And Video Rental Stores*, First Monday, Vol. 6, No. 5, May 7, 2001, available at http://firstmonday.org/ojs/index.php/fm/article/view/854/763, which explores the role that unlicensed commercial "circulating libraries" played in increasing demand for more reading material, and lowering the rate of illiteracy.

[29] Although Lincoln's borrowing preceded any legislative codification, it demonstrates that the public enjoyed the benefits of unlicensed redistribution as common law right to alienate chattel.

and phonorecords," which are defined as "material objects" in which the work has been fixed. Both the distribution right and the limitation on that right apply only to material objects that are being distributed. In the case of downloads, the reproduction of a work from one material object (*e.g.*, the copyright owner's Internet-connected server) to another (*e.g.*, a person's laptop computer) supplants the reproduction + distribution process used, until very recently, to deliver copies. Instead of reproducing works onto cheap material objects that are shipped in commerce, making their way to the first new owner and then to any number of subsequent persons by sale, gift, rental or lending, the digitally disseminated work is reproduced directly onto the first owner's comparatively very expensive material object containing myriad other works and with which the owner of the material object will be reluctant to part. As downloads increasingly replace the reproduction and distribution of prerecorded media, such as DVD movies, the public benefits of the first sale doctrine are being lost, as a smaller percentage of copies can be circulated on discrete media.

Meanwhile, what had been a competitive free-for-all in which sales, rentals, resales and trade-ins competed with each other and with gifts and lending, is quickly giving way to a more dominant market of strict licensing, where the copyright owner largely dictates both the availability and the price. Even for streaming services, where the service sets the price, the licensing terms sought by the copyright owner may simply mean that the service prefers not to offer it. Twenty years ago, a video store might purchase fewer copies if the wholesale price was too high, but there was no limit on the number of times it could be rented, and no power of the copyright holder to require that it be removed from the shelf after a term ended.

Los of freedom to continue lending comes at public expense. Libraries, for example, obtain the right to "digitally lend" copies (by offering secure reproductions with a limited lifespan), but this requires permission from (a.k.a. payment to) the copyright holder, which is free to limit the number of patrons who may "check out" the book before another payment is required. The practice of lending a book until it is falling apart, and then rebinding it to give it more life, is too quickly giving way to a system in which libraries need to ask permission from the publisher just to let someone borrow the book or a movie.

The OmniQ Invention is a means of achieving the intended benefits of the first sale doctrine within an Internet-connected digital environment without infringing the copyright or requiring the permission of the copyright holder, and without requiring any amendments to the Copyright Act.

Non-Reproductive Space-Shifting Is True Shifting

The *only* reason so-called "space-shifting" has ever raised copyright infringement concerns is that they are "shifting" in name only. In reality, the controversial attempts to mimic the operation of the first sale doctrine, also referred to as a "digital first sale" equivalent, is that they have required either a reproduction (*e.g.*, ReDigi) or a public performance (*e.g*. Zediva), and then require a fair use determination to establish that the reproduction or public performance are not infringing. (In Zediva's case, it failed in its effort to persuade the court that the performance was not to the public,) These may be well-intended, and there may be a time when ReDigi's "copy-first-and-then-delete-the-originals" approach or Zediva's "remote DVD player" approach

might pass fair use muster, or otherwise avoid infringement, but those approaches are not contemplated by this Petition.

True space-shifting – that is, the substitution of one material object in which the work is fixed for another, and which results in no reproduction anywhere in the process – is well represented in U.S. and Canadian jurisprudence. Because the Canadian experience has reached Canada's highest court, we will begin north of the border to provide a fuller legal framework, just as we did in comments during the last triennial. Because Canadian copyright law is so similar to that of the U.S., and because lower courts in the U.S. have taken the same path, the Supreme Court of Canada has provided useful guidance.

Canadian Space-Shifting Jurisprudence: The leading case, *Théberge v. Galerie d'Art du Petit Champlain inc.*, [2002] 2 S.C.R. 336, 2002 SCC 34 (CanLII), explains the essence of the reproduction right by emphasizing "re". That is, there must be a *multiplication* of copies. Any process that, once complete, has generated no more copies than when the process began, is not a reproduction. As explained by the Court:

> The appellants purchased on the open market a quantity of posters of the respondent's artistic works. They subjected these posters to a technique which involved spreading a special resin or laminating liquid across the face of a poster. The resin is designed to bond with the surface inks. After the applied coating is dried (or cured), the coated poster is submerged in a bath of solvent which loosens the paper substrate but leaves intact the fixed ink/resin layer, thus allowing the latter to be peeled off the former. The rear of the ink/resin layer is then coated with a suitable adhesive resin and transferred to a canvas substrate, which is then smoothed and finished.

Id. at ¶ 35.

> My colleague, Gonthier J., takes the position that if the image were transferred from one piece of paper to a different piece of paper with no other "change", there is a new "fixation" and that would be "reproduction". But in what way has the legitimate economic interest of the copyright holder been infringed? The process began with a single poster and ended with a single poster. The image "fixed" in ink is the subject-matter of the *intellectual* property and it was not reproduced. It was transferred from one display to another. It is difficult to envisage any intellectual content let alone intellectual property embodied in the piece of blank paper peeled away, or in the piece of blank paper substituted for it. When Raphaël's *Madonna di Foligno* was lifted for preservation purposes from its original canvas in 1799 under the direction of the chemist Berthollet and fixed to a new canvas, the resulting work was considered to be no less an original Raphaël. Similarly, when the frescoes of Pompeii were restored by replacement of the underlying plaster, the result was not classified as a "reproduction", even though the old plaster was a constituent physical element of the original frescoes. If a comparable copyright situation arose, I do not think the artist would (or should) have a veto over a purchaser's attempt to preserve the asset. These examples may be more spectacular than the humble swap of substrates of a paper poster, but the principle is the same and applies equally to authorized copies as

well as to the original artistic work. In neither case is there reproduction within the meaning of the Act.

Id. at ¶ 38 (emphasis in original).

> The Quebec Court of Appeal adopted a more restricted view than does my colleague, suggesting that the violation of economic rights lay not simply in "fixation" but in moving the ink film from a paper substrate to a substrate of a more costly material, namely canvas ([2000] Q.J. No. 412 (QL), at paras. 18-23). (This was thought to place the respondent's work for resale in a different market niche, as discussed below.) This too, in my view, goes too far. If the "new" substrate material were made of a smooth sheet of vellum (calf) or papyrus, the result would have the identical appearance to the original paper. How has the copyright holder's interest in the "intellectual" property been harmed by such a change in the material composition of the backing? Does the mischief only emerge in appearances, i.e., if the new piece of paper has a textured finish, or is pebbled to look like canvas? No one would deny the world of difference between the original artistic work and a mechanically produced copy, but we are talking here about moving the same physical layer of inks around different blank substrates.
>
> To allow artists to regulate what can or cannot be done with posters in this way would have the public searching for elusive distinctions. There would be no even reasonably "bright line" between infringing and non-infringing conduct, a deficiency that would be particularly mischievous when dealing with pre-judgment seizure at the instance of a plaintiff without judicial supervision.
>
> I do not foreclose the possibility that a change of substrate could, as part of a more extensive set of changes, amount to reproduction in a new form (perhaps, for example, if the respondent's work were incorporated by the ink transfer method into some other artist's original work) but the present case does not rise to that level.

Id. at ¶¶ 39-41. The Court went on to focus on *re*production: "As one would expect from the very word "copyright", "reproduction" is usually defined as the act of producing additional or new copies of the work in any material form. Multiplication of the copies would be a necessary consequence of this physical concept of "reproduction". *Id.* at ¶ 42 (emphasis in original).

Significantly, the *Théberge* Court actually cited U.S. case law in support of its conclusion, and to that we now turn.

United States Space-Shifting Jurisprudence:

The leading case in the United States is *C. M. Paula Co. v. Logan*, 355 F.Supp. 189 (N.D. Tex. 1973). The court focused on whether the process at issue – using a chemical method for lifting a copyrighted image off on one backing and placing it on another – was an infringement of the reproduction right. It held that it was not:

> The Court notes at the outset that without copying there can be no infringement of copyright. Further, plaintiff has the burden of establishing that there has been a copying—a "reproduction or duplication" of a thing.
>
> The process utilized by defendant that is now in question results in the use of the original image on a ceramic plaque; such process is not a "reproduction or duplication."
>
> The Court believes that plaintiff's characterization of the print thus used as a decal is appropriate. Each ceramic plaque sold by defendant with a Paula print affixed thereto requires the purchase and use of an individual piece of artwork marketed by the plaintiff. For example, should defendant desire to make one hundred ceramic plaques using the identical Paula print, defendant would be required to purchase one hundred separate Paula prints. The Court finds that the process here in question does not constitute copying

Id. at 191 (citation and footnotes omitted). OmniQ's non-reproductive space-shifting is identical in all significant respects. If, for example, a video service using OmniQ's patent-pending invention wished to substitute a customer's hard drive for the plastic disc of a DVD movie for one hundred customers, then one hundred DVDs of the movie would have to be purchased. At the end of the process, the work is no longer fixed in the 100 DVDs, but instead fixed in 100 customer hard drives. There is no "'reproduction or duplication' of a thing."

As Section 202 of the Copyright Act instructs, we must be mindful of the distinction between the intangible work and the tangible copy of a work. The reproduction right attaches to the work, not the copy. Whether the material object in which the work is fixed is substituted for another material object is inconsequential for purposes of the reproduction right. "The court chooses to focus on the art work itself, not on the material on which the work was mounted or the ultimate use to which the tiles 'lend themselves.' The mode of affixation of the art work onto the mat or tile is insignificant." *Lee v. Deck the Walls, Inc.*, 925 F. Supp. 576, 580 (N.D. Ill. 1996), *aff'd sub nom. Lee v. A.R.T. Co.,* 125 F.3d 580 (7th Cir.1997). The court added, in a footnote, "Certainly Congress did not intend that courts look to the type of adhesive, whether it be Elmer's glue, Superglue or tape, to be the fact upon which a copyright infringement issue should be determined." *Id.*, n. 3. When the Seventh Circuit affirmed, Judge Easterbrook observed, "An alteration that includes (or consumes) a complete copy of the original lacks economic significance." 125 F.3d at 581. "The art was bonded to a slab of ceramic, but it was not changed in the process." *Id.* at 582.[30]

As noted above, this is what distinguishes OmniQ's non-reproductive space-shifting from efforts like that of ReDigi. There, reproductions were, in fact made, even if the *next* step involved deletion of duplicates. As the *ReDigi* court explained: "It is beside the point that the original phonorecord no longer exists. It matters only that a new phonorecord has been created." *Capitol Records, LLC v. ReDigi Inc*., 934 F.Supp.2d 640, 560 (S.D.N.Y. 2013). In distinguishing *C.M. Paula* (and, by implication, the OmniQ method), the court explained:

[30] The OmniQ Invention, likewise, removes the fixation from the DVD to the hard drive, no more and no less. The unaltered work of authorship remains intact, but on a different medium.

> "ReDigi's service is distinguishable from the process in that case. There, the copyrighted print, or material object, was lifted from the greeting card and transferred in toto to the ceramic tile; no new material object was created. By contrast, ReDigi's service by necessity creates a new material object when a digital music file is either uploaded to or downloaded from the Cloud Locker."

Id. at 650-51.

In short, there is strong authority in both the United States and Canada that where the owner of a lawfully made copy transfers the fixation of a work from one material object to another, without altering the work or causing more copies to be created, there is no infringement of the exclusive right to reproduce the work into copies and phonorecords. The copyright holder's right remains inviolate, while the public's interests expressed in the "copyright clause" of the Constitution are advanced. Moreover, the ability to substitute one material object for another helps ensure that the Copyright Act's (§ 109) plan for unlimited recirculation of lawfully made copies that have already been placed in circulation by the copyright holder will not be stunted merely because modern digital technology makes it cumbersome to transfer the entire library of works (such as a hard drive) sharing a single material object, or to make use of a DVD when DVD players are no longer readily available.

Legal Precedent For "Analog Copies" Must Be Applied To "Digital Copies"

OmniQ was not a petitioner during the Sixth Section 1201 Triennial Proceeding, but commented on a proposal similar to the De Petris petition here, suggesting that even if the Copyright Office were reluctant to recommend an unfettered exemption for the purpose of making back-up or convenience copies, it should consider allowing non-reproductive space-shifting to that end. The Register noted the legal authority cited in support of *true* space-shifting (*i.e.*, moving the work from one material object to another without increasing the number of copies), but suggested that such precedent did not involve a digital format, pointing to the *ReDigi* case as the "most analogous" case involving the digital format, 2015 Recommendation at 123. But there is no reason to reject pre-digital cases, and instead look solely at a digital case in whish the reproduction step was admitted (even if danced around). We respectfully suggest that the Register reconsider this stance, as that there is no room to doubt the precedential value of the cases that are more factually on point. The only fact in common with *ReDigi* is the word "digital." The Copyright Act establishes no basis for disparate treatment, and judicial precedent confirms this.

As noted above, at 5, there is no legal basis upon which to distinguish "digital copies" from any other copies for purposes of copyrights in audiovisual works, or to treat "digital" as a signal for *sui generis* treatment. In the same way that a "literary work" may appear on a printed paper, microfiche, a USB thumb drive, or a server in the so-called "cloud", the Section 101 definitions of "copies," "fixed," "motion pictures" and "audiovisual works" make no distinction between 16mm film, videocassette tape, a DVD, a laptop hard drive, a smart phone, or a remote server. Accordingly, there is no basis for reluctance in applying established legal precedent developed at a time when space-shifting involved works that were fixed in material objects using so-called "analog" methods to space-shifting that involves works that were fixed using "digital" technology, or speculating as to whether, some day, a federal court might conclude that there is a reason for treating "digital" as *sui generis*.

The U.S. Supreme Court agrees. In his concurring opinion in the 1984 "Betamax" decision, Justice Brennan reminds us that analog versus digital is a distinction without a difference. He summarized the judicial policy of taking the Copyright Act as we find it, without speculating as to whether Congress might desire a different result in the case of newer technology:

> Like so many other problems created by the interaction of copyright law with a new technology, "[t]here can be no really satisfactory solution to the problem presented here, until Congress acts." *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 167 (1975) (dissenting opinion). But in the absence of a congressional solution, courts cannot avoid difficult problems by refusing to apply the law. We must "take the Copyright Act . . . as we find it," *Fortnightly Corp. v. United Artists Television, Inc*., 392 U.S. 390, 401-402 (1968), and "do as little damage as possible to traditional copyright principles . . . until the Congress legislates." *Id*. at 404 (dissenting opinion).

Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 500 (1984), Brennan, J., concurring (full citations added). The Supreme Court of Canada has reached the same conclusion, and established the principle of "technological neutrality" as a fundamental copyright principle. See Cary J. Craig, *Technological Neutrality: (pre)Serving the Purposes of Copyright Law*, in THE COPYRIGHT PENTALOGY, Michael Geist, ed., at 271, discussing *Entertainment Software Association v Society of Composers, Authors and Music Publishers of Canada*, 2012 SCC 34, [2012] 2 SCR 231, in particular. Craig writes:

> Michael Geist is right to suggest that "the biggest long term impact [of the ESA decision] may be felt when courts begin to assess the effect of the new digital lock rules. Those rules are distinctly non-neutral and could face a rough ride if challenged before the courts." Geist explains, "those rules 'impose an additional layer of protections' and create 'a gratuitous cost' for consumers who lose their user rights in the shift to Internet-based technologies"—precisely the kinds of effects that the Court found to be contrary to its substantive version of the technological neutrality principle.

Id. at 296 (citations omitted). We will face the same issue in the United States, eventually, but in the meantime, we can be guided by the Supreme Court's policy, and the Librarian of Congress may freely follow it to the limits of her Section 1201 power.[31] Craig suggests technological neutrality as a "regulatory starting point," and we recommend it here:

> Technological neutrality is an inherently appealing concept for policy makers in the digital age. At its core, the concept implies that regulations can and should be developed in such a way that they are independent of any particular technology, neither favouring nor discriminating against specific technologies as they emerge and evolve. From a principled perspective, neutrality and non-discrimination in the law are almost always laudable goals; from a practical perspective,

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> technologically neutral regulation holds the promise of sustainable laws in a time of rapid technological change.

Id. at 272-73.

2. The Proposed Exemption Itself Is Premised On Genuine Non-Reproduction

In contrast to the De Petris request, which seeks an exemption to reproduce the work into copies to be used as a back-up or for playback on different devices, and in contrast to other nominal space-shifting methods that, in reality, involve the making of a copy first and then going about deleting all but the last,[32] the exemption requested by OmniQ is specifically limited to *non-reproductive* space-shifting, which is to say, space-shifting that does not involve making a copy first, or otherwise creating an additional copy.

Although the Librarian of Congress could grant the exemption limited to space-shifting that does not entail reproduction of the work into copies, and leave it to the courts to decide whether someone practicing the OmniQ Invention method is nevertheless reproducing the work into copies, the plain meaning of the Copyright Act provides all of the information needed to conclude that the OmniQ Invention, as described in Exhibit 1, does not involve a reproduction of the work into copies, and therefore is not infringing.

Section 106(1) of the Copyright Act grants authors audiovisual works the exclusive right, subject to Sections 107-122, to do or to authorize "to *reproduce* the copyrighted work in copies." Although the term "reproduce" is not defined in the Act, it is clear that Congress intended to follow the plain English meaning of the term, which is to say, to "reproduce" is to "produce again" or "produce another." That is, without "re" there would be no "reproduction." Accordingly, non-reproductive space-shifting would require that there never be a second copy, and the method explained in the OmniQ Invention patent application fastidiously adheres to the Copyright Act's provision for what constitutes a reproduction into a copy.

Beginning with the definitions in 17 U.S.C. § 101, it is clear that the reproduction right does not encompass shifting of the work from one material object to another without thereby adding to the number of copies that have been made. Also, it is clear that however the Act has been interpreted with respect to so-called "analog" cases (such as lifting an image off of paper and fixing it on a more durable material object, leaving the paper blank) the entire structure of the Copyright Act's fundamentals (starting with the definitions) contemplates the application of the same rules to new forms, formats, devices and technologies as to the old.

> "Audiovisual works" are works that consist of a series of related images which are intrinsically intended to be *shown by the use of machines, or devices such as projectors, viewers, or electronic equipment*, together with accompanying sounds,

[32] *Capitol Records, LLC v. ReDigi Inc.*, 934 F. Supp. 2d 640 (S.D.N.Y 2013). Although the District Court remarked that ReDigi had changed its position on whether copies were made during the process, *id*. at 650, n.5, the ReDigi patent itself states that a copy is made first, before all others are deleted.

> if any, *regardless of the nature of the material objects, such as films or tapes, in which the works are embodied*.

17 U.S.C. § 101 (emphasis added). The definition of "audiovisual works" is technology neutral, both with respect to the material object constituting the copy and with respect to the machine, device, or electronic equipment used to show the work.

> "Copies" are material objects, other than phonorecords, in which a work is *fixed* by any method now known or later developed, *and* from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. *The term "copies" includes the material object, other than a phonorecord, in which the work is first fixed.*

17 U.S.C. § 101 (emphasis added). As the Second Circuit has explained, the definition of "copies" requires an "embodiment requirement" and a "duration requirement," a point we shall return to below (see discussion of the definition of "fixed"). At this juncture, we draw attention to "any method now known or later developed." There is no way to read "except digital" into that definition.

Also, the last sentence in the definition of "copies" would be unnecessary – superfluous – if "reproduce" in Section 106(1) did not have the ordinary English language meaning of multiplying the number of copies. Clearly, in plain English, the first material object in which a work is fixed would not be a "copy," for it is the original; there was nothing to have copied. Congress therefore had to "tweak" the definition just enough to make sure that the original fixation would be treated in the same manner as any reproduced copy of it, otherwise, the author would have no Section 106(3) distribution right over the original.

> A "device", "machine", or "process" is one now known *or later developed*.

Section 101 (emphasis added). Once again, the Copyright Act is technology neutral unless expressly stated otherwise. To put "digital" devices, machines or processes in perspective, it is important to bear in mind that, with the exception of sound recordings, there is nothing special about "digital" insofar as the Copyright Act is concerned. Digits are to disc as ink is to paper.

> A work is "fixed" in a tangible medium of expression when its *embodiment* in a copy or phonorecord, by or under the authority of the author, is sufficiently *permanent or stable* to permit it to be *perceived, reproduced, or otherwise communicated for a period of more than transitory duration*. A work consisting of sounds, images, or both, that are being transmitted, is "fixed" for purposes of this title if a fixation of the work is being made simultaneously with its transmission.

Section 101 (emphasis added).

Finally, even where the Copyright Act provided special treatment for "digital" reproductions with respect to phonorecords, it did so only to succeed in hammering a square peg

into a round hole. Because the compulsory license in 17 U.S.C. § 115 was only triggered when the phonorecord was made and distributed, and "downloads" only implicated the reproduction right with no distribution of the material object, Congress essentially deemed the reproduction to encompass distribution as well, not in the Section 106(3) meaning, but just for purposes of applying the Section 115 compulsory license to downloads – "digital phonorecord deliveries." This demonstrates that Congress continues to view the distribution right as merely a means of perfecting and protecting the reproduction right. Melville B. Nimmer and David Nimmer, 2 NIMMER ON COPYRIGHT, § 8.12[A] ("granting the distribution right is a necessary supplement to the reproduction right in order to fully protect the copyright owner"). *See, also, C.M. Paula Company v. Logan*, 355 F. Supp. 189, 191-92 (N.D. Texas 1973) (quoting an earlier version of the Nimmer treatise). The distribution right is simply a means of perfecting the right to profit from the reproduction of the work into copies, particularly in the event that one who did not infringe the reproduction right is distributing the infringing copies; but the copies themselves are merely tokens of the fact that the reproduction right was exercised. By analogy, if the author of a haiku poem calls someone on the phone and says "write this down," and proceeds to recite the poem, the author has no claim of ownership over whatever article the licensee may have written it on – be it a napkin, a wall, or a hand, or by digital means, such as typing it on a laptop.

3. Even If Arguably Reproductive, The Use Is Non-Infringing Fair Use That Helps Restore The Lost Benefits Of The First Sale Doctrine

The "first sale doctrine" has been part of the fabric of our nation's copyright laws from their inception. When the Supreme Court decided *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908), there had already been a line of lower court cases establishing the same principle – that once an author relinquishes ownership of a copy of the work, at whatever price it chose, the public interest in unfettered redistribution of that copy takes over. Even Mark Twain learned that lesson. For purposes of this initial comment, we suggest that all of the fair use arguments mustered in support of the De Petris Petition apply here, with two important distinctions: First, the use is intended to restore the benefits of the diminishing world of secondary distributions made possible by Section 109(a) – and would have the effect of doing so. Second, there is no cognizable harm to copyright owners, because (a) Section 109(a) already means that any copy they make can be distributed, and (b) just as with a copy on DVD, the OmniQ Invention means only one person can own the copy at a time, and only one person can privately perform the copy at a time.

Users Are Adversely Affected In Their Ability To Make Such Noninfringing Uses (And Are Likely To Be Adversely Affected In Their Ability To Make Such Noninfringing Uses During The Next Three Years)

(i) Availability for use of copyrighted works

For most of our nation's history with copyright protection, copyrighted works were typically published in discrete copies – material objects in which a single work, or a closely related small collection of works – were embodied. The Copyright Act's sharp distinction between the intangible copyrighted work and the tangible copy of the work (17 U.S.C. § 202) could be given full effect in commerce, together with the Copyright Act's express limitation on the distribution right (17 U.S.C. § 109(a)) which entitles owners of lawfully made copies to

redistribute them without the consent of the copyright holder. (Sections 109 and 202 of the Copyright Act of 1976 were originally codified together in § 41 of the Copyright Act of 1909, and in § 27 of the Copyright Act of 1947. Prior to 1909, these principles were adhered to as part of our common law.)

So-called "digital copies" have been around since the days of the music CD and DAT (digital audio tape). Music CDs have been manufactured commercially in the United States since the September 21, 1984, release of Bruce Springsteen's *Born in the U.S.A.*, dubbed by CBS as "The First CBS Records Compact Disc Made In The U.S.A." *See* http://www.keithhirsch.com/the-very-rare-red-bruce-springsteen-born-in-the-u-s-a-cd. That same day, *The Edison CD Sampler* was issued from the same plant. *See* http://www.keithhirsch.com/the-edison-cd-sampler. Interestingly, even back then *The Edison CD Sampler* betrayed the publisher's attempted to restrict uses that are statutorily placed beyond the copyright owner's control. Rather than TPM, the digital copy (or "digital phonorecord," to be precise) carried a legal warning resembling the one struck down by the Supreme Court in *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908): "FOR EDUCATIONAL USE ONLY – NOT FOR SALE." Obviously, it is perfectly lawful for anyone to use it for non-educational use of the CD, and to sell it. But as modern TPM systems allow copyright owners to use technological locks rather than austere and baseless warnings to suppress lawful uses, thumbing one's nose at legal puffery is not an option.

What is different today, with respect to audiovisual works in Class 3, is that in spite of new ways of watching a movie, the public's access to movies is shrinking dramatically. While there may be enough movies available to find *something* worth watching, the breadth of choice in movies was many times higher 20 years ago than it is today.

From the copyright owner's perspective, that may be perceived as a good thing. Your local video store of 20 years ago may have carried 20,000 titles, but the studios were not making any incremental money on rentals following the sale to the store. When a potential viewer wanted to decide on a movie to watch, the studio naturally preferred that the viewer purchase a new copy, watch it at the theater, or at least stimulate rental store demand so that the video retailer would have to direct more of its revenue toward purchasing new releases. Like consumers satisfied to keep driving a 10-year old car to the chagrin of auto makers, retailers that turned customers into classic film buffs happy to watch a black and white Hitchcock flick were doing Hollywood studios no favors. In the end, however, movie selection at retail was responsive to public demand, regardless of which choices (or lack of choices) were more profitable for the studio. A retailer who saw an increased interest in French comedies could beef up the catalog buying used copies of French comedies from a broker rather than steer customers to a smaller selection of new releases.

Today, relatively few video rental stores remain. Even Netflix, which had been a fierce competitor of local video retailers with its mail order DVD rentals, and used to famously drive increased interest in older movies, has been cutting way back on its selections, not bothering to replace classics on DVD, or license the rights to stream them as public performances. Zach Schonfeld, *Netflix, Streaming Video And The Slow Death Of The Classic Film,* Newsweek (online), Sept. 15, 2017, at 6:10 AM, at http://www.newsweek.com/2017/09/22/netflix-streaming-movies-classics-664512.html. Schonfeld goes on to note that 1960 was the year Alfred Hitchcock's *Psycho* was released, along with Billy Wilder's *The Apartment*, and Stanley Kubrick's *Spartacus*:

> But in the vast world of Netflix streaming, 1960 doesn't exist. There's one movie from 1961 available to watch (the original *Parent Trap*) and one selection from 1959 (*Compulsion*), but not a single film from 1960. It's like it never happened. There aren't any movies from 1963 either. Or 1968, 1955 or 1948. There are no Hitchcock films on Netflix. No classics from Sergio Leone or François Truffaut. When Debbie Reynolds died last Christmas week, grieving fans had to turn to Amazon Video for *Singin' in the Rain* and *Susan Slept Here*. You could fill a large film studies textbook with what's not available on Netflix.

Id. Of course, Amazon Video has its own limited selection, and having to subscribe to multiple services just to try to cobble together a decent choice is costly to the public, whose local video store did not charge a monthly admission fee whether they rented anything or not. Schonfeld describes the selection as "abominable," noting that, at the time he checked on the ever-rotating (due to licensing) steaming platform, there were just 43 movies made before 1970. Only 25 movies from the pre-1950 era were available to the more than 100,000,000 global subscribers.

Stephen Prince, a cinema studies professor at Virginia Tech, observed, "Now we see the danger inherent in this change—an emphasis on mainstream, contemporary movies has replaced what had been a broad archive of world cinema… Convenience biases viewers toward mainstream fare and makes films of the past or from other cultures less visible." *Id*. "My students are heavily biased toward what's new and what can be streamed on portable devices," Prince says. "What isn't available to stream essentially doesn't exist." *Id*. To paraphrase the Swedish film scholar, Jan Olsson, the cost of acquiring streaming rights often exceeded the customer acquisition/retention value.

Librarian (and writer) Rachel Paige King decried the shift to a system based on contractual permissions rather than the operation law:

> So, as the technology to disseminate all kinds of art and information becomes more sophisticated, so too does the means and the motive to restrict access. If entertainment industry executives are smart (and they are) they'll make sure that streaming video turns out to be a whole lot more expensive for consumers than home DVD rental.

Id. And she is right. That is exactly what is happening. "The end result," says Schonfeld, "is a paltry, pathetic catalog of older films shackled by copyright law. It's a strange conundrum: The internet promises a century's worth of multimedia output at your fingertips but ruthlessly privileges whatever got released yesterday. Some films have been left behind in obsolete format hell." *Id*.

As major streaming services become filmmakers, in an effort to both compete using "exclusives" and avoid the need to pay licensing fees, some films do not even get a theatrical release open to everyone, before being confined to an exclusive streaming service. "Frankly, this is why I'm keeping all my DVDs," says film critic, Leonard Maltin. "And it's a pain in the neck, because they take up space. But I don't trust the cloud. And I don't trust the marketplace to maintain titles that are in some cases obscure or not terribly commercial."

"There are some movies you basically have to break the law to see." *Id*. (quoting classic cinema blogger, Nora Fiore). And *that* is what OmniQ seeks to correct. Millions upon millions of movies have already been made, sold, and lawfully distributed, and are currently gathering dust

in warehouses, basements and living room shelves, while the movies that have been fixed on them cannot be watched on streaming services, or can only be seen by paying the "new" price of a download, if available.

(ii) Availability for use of works for nonprofit archival, preservation, and educational purposes

When it comes to using a work for nonprofit archival, preservation and educational purposes, we have already entered into an era in which a permissions-based "extracopyright" system based on technological magic rather than declared exclusive rights is replacing what has historically been an absolute right to watch any movie your could get your hands on, and to if it was yours and not infringing, pass it on to someone else. At its most immediate level, even students of film are stymied. As Professor Stephen Prince observed, "What isn't available to stream essentially doesn't exist. I've had students ask if it is okay to watch *Vertigo* on Youtube."

My wife teaches courses using Latin American films, often online as part of distance learning offered by a local community college servicing a broad rural area. Every semester, her students encounter difficulties meeting homework assignments that require them to watch a movie that they cannot find anywhere – at least not without unreasonable effort, such subscribing to a new monthly subscription service or having to purchase a copy from collectors. Her own copy is loaned to the college library, which is inconvenient to many. Non-reproductive space-shifting would permit all of her students to take turns borrowing the single copy, just as they would from the library, if they could get to it. *See* Declaration of Betty González Mitchell, Exhibit 5.

For most of our history with copyrighted works, the works could be perceived without the aid of technological devices. Literary works could be accessed for as long as the ink was protected from fading and the paper from disintegrating with age. Film projectors could be homemade by anyone with modest skill. Even a vinyl phonorecord could be accessed using a homemade turntable equipped with a sewing needle and a paper cone – even before the more modern pizza box offered a more elegant solution. *See* http://www.instructables.com/id/Makedo-Pizza-Box-Gramophone/. The digital format ushered in an era where access to works fixed in that format required something more – a computer and some specially written computer program – to gain access, and that technological step made it feasible, for the first time, for copyright holders to lace their reproductions with digital access locks which, if used responsibly, might do nothing more than protect against copyright infringement, but might otherwise become tools for intentional or unintentional capturing of non-exclusive rights for exclusive control.

To illustrate, when a library kept an archive of books for use of its patrons, its use was a noninfringing use authorized by law. The library had an absolute right to make the books available to the public, and the public had an absolute right to read the books. But as the format has changed, such that the book is in a file format fixed on the library's server, the library's ability to lend the copy and the patron's ability to read the copy is severely hindered, where reasonable access requires reproduction or public display. Although it is certainly more practical for the library to make a copy for the customer (almost instantly and at marginal cost), doing so involved a reproduction requiring the copyright holder's permission or, if for a use for which permission is not required, may be impossible without circumventing TPM. In effect, then, lawful non-infringing uses beyond the control of the copyright holder as a matter of law

suddenly fall within the *de facto* control of the copyright holder by operation of the laws of physics shielded by anti-circumvention law insufficiently softened by this exemption process.

(iii) Impact that the prohibition on the circumvention of technological measures applied to copyrighted works has on criticism, comment, news reporting, teaching, scholarship, or research

There are two primary ways in which the prohibition on the circumvention of TPM applied to copyrighted works affect criticism, comment, news reporting, teaching, scholarship and research: access to the work and access to a specific copy of the work.

First, all of these activities require some manner of *access to the work*. The private performance of a work is never infringing, of course. Even the private performance by means of an infringing reproduction is constitutionally protected. Accordingly, the only constitutionally permissible prohibition on the circumvention of TPM that controls private performance access must be one that is narrowly tailored to go no farther than necessary to protect a legitimate copyright interest. By analogy, if a copyright holder sells a lawfully made copy of a book the access to which is protected by a padlock, a law that prohibits the owner of the lawfully made copy from breaking the padlock without the copyright holder's permission is illegitimate. The fact that a thief cannot read the copy of a locked un-sold book may be acceptable, whereas the copyright owner's use of the lock to impose a metered access to the lawfully made and distributed copies, or to charge a fee to unlock copies being redistributed pursuant to § 109, would not.

The difficulty with the uses described in this sub-section (iii), which mirror statutory examples of fair use, is that the fair use factors are fact-specific, making it difficult to apply a single rule to all access concerns. It may be that if TPM prevents a movie critic from evaluating my copy of a movie, even if doing so is a non-infringing private performance, the movie critic remains free to access the work by other means, such as buying, borrowing or renting a different copy, or watching a public performance. Even so, restrictions imposed by the copyright holder burden the movie critic's freedom if they go beyond essential copyright protection. If the copyright holder's answer to the fact that its TPM blocks non-infringing access to the work is to say that there are other means of accessing the work, such as paying to download it, paying for a movie theater ticket, or buying a different copy, the solution results in an enlargement of the copyright monopoly beyond the statutory limits. In short, any solution that enlarges the scope of the copyright monopoly should be rejected. If the movie critic wishes to privately perform a work from a lawfully made copy, and cannot, the solution is not that the copyright owner can license or otherwise make available some other access. Rather, the solution is to recognize that Section 1201(c) and the First Amendment require that the movie critic be free to privately perform the work without having to turn to the copyright holder for permission.

This brings us to the second way in which TPM may frustrate these uses. It is crucial that the right to privately perform the work be agnostic to the copy from which the private performance is facilitated, just as the Copyright Act and the First Amendment do not distinguish between a professional film critic who publishes in the New York Times from the 8-year-old film critic who publishes by turning in her homework for Mrs. Doubtfire's second-grade English class. The former may be able to send an assistant, with a budget, to scare up an alternate means of access, whereas the latter may be limited to the copy available from a neighbor or the bargain

bin of a thrift shop. Telling the second-grader that she can open an iTunes account to purchase a reproduction rather than circumvent the TPM on the copy she holds in her hands abridges her rights under the Copyright Act and the First Amendment. *See, also*, Declaration of Betty González Mitchell, Exhibit 5.

In sum, the point is that both the Constitution and the Copyright Act require that the "impact" be judged not as an economist might judge market alternatives, or as a copyright holder might mix and match the exercise of exclusive rights to maximize profit, but rather on whether the non-infringing means of access reserved to members of the public are abridged. Because I have a right, under the Constitution and under the Copyright Act, to watch a movie from a second-hand copy I received from a previous owner of that lawfully made copy, that right is abridged if the copyright holder uses TPM to limit that freedom and force me to find an alternate means of access even if that alternate means is readily available and at a nominal additional cost. A student who subscribes to cable television and has two streaming subscriptions should not have to subscribe to a third subscription service, just because the student does not have a DVD player on which to watch a more inexpensive DVD copy.

(iv) Effect of circumvention of technological measures on the market for or value of copyrighted works

When limited to non-reproductive substitution of the material object in which the work is fixed, the impact on the market for and value of the work likely increases. But in any event, because there is no reliance on "fair use," this fair use factor is immaterial. It is no more relevant than a discussion of whether a second-hand bookstore increases or decreases the value of a copyrighted work, since used book sales are a matter of right without regard to fair use.

To properly analyze the impact, we must segregate each exclusive right identified in § 106. First of all, the circumvention would have no impact on the exclusive right to perform or display the work publicly, nor would it have any impact on the exclusive right to create derivative works. (§§ 106(2), 106(4), 106(5) and 106(6).) Although it is conceivable that, in individual instances, there might be an impact (for example, if a licensed public performance of a motion picture is facilitated or hindered by the particular medium in which the work is embodied), it is inconceivable that there would be an overall impact.

With respect to the reproduction right in § 106(1), the non-reproductive substitution would have no effect at all with respect to any individual authorized copy. After all, it is non-reproductive. But by enabling the non-reproductive substitution of the tangible medium in which the work is fixed, the value of the initial copy is likely to increase (whether that value is expressed in a higher market price or simply a higher demand for more copies). For example, the purchase of a DVD-version of a motion picture has more value if there is a greater secondary market for that copy, and the option of non-reproductive substitution of the DVD plastic for a solid state laptop hard drive increases that secondary market. The EZ-D example, discussed above, at n.14, demonstrates that film producers know that there is greater value in redistributable copies.

(v) Other factors that may be appropriate for the Librarian to consider in evaluating the proposed exemption

The proper operation of the U.S. Copyright Act's anti-circumvention prohibition requires that technological protection measures not serve as thumbs on the scale of the Copyright Act's balance between exclusive rights granted under constitutional authority and the non-exclusive rights enjoyed by the general public. As the Supreme Court instructed, protecting non-exclusive rights is just as important as protecting exclusive rights. *Fogerty v. Fantasy, Inc.*, 510 U.S. 517 (1994). It would be error to allow any TPM to be used in a manner that allows the copyright owner to enlarge the scope of its exclusive rights beyond the limits established by Congress. To borrow from *Fogerty*,

> Because copyright law ultimately serves the purpose of enriching the general public through access to creative works, it is peculiarly important that the boundaries of copyright law be demarcated as clearly as possible. To that end, [members of the public] who seek to advance a variety of [non-infringing uses of copyrighted works] should be encouraged to [circumvent TPM's that encroach upon non-infringing uses] to the same extent that [copyright owners] are encouraged to [deploy TPM to prevent] infringement. In the case before us, the successful [use of non-reproductive space-shifting would result in] increased public exposure to [any digitized] work that could, as a result, lead to further creative pieces. Thus a successful [circumvention of TPM for non-infringing use] may further the policies of the Copyright Act every bit as much as a successful prosecution of [circumvention] claim by the holder of a copyright.

Id., at 527. "It is the right of the public to receive suitable access to social, political, esthetic, moral, and other ideas and experiences which is crucial here." *Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367, 390 (1969). It is incumbent upon the Librarian of Congress to make sure that this right is not abridged by TPM that goes beyond copyright protection by infringing on the public's non-exclusive rights. As the Supreme Court said over 150 years ago, monopolies granted under authority of Article I, Section 8 of the Constitution are not served by use of collateral power to prevent the public from enjoying non-infringing uses of a copyrighted work, for "the benefit to the public or community at large was another and doubtless the primary object in granting and securing that monopoly," *Kendall v. Winsor*, 62 U.S. 322, 328 (1859). In this case, that collateral power is derived from over-broad use of TPM with no safety valve to prevent copyright owner power over non-infringing use.

Such a limitation preventing use of TPM to suppress non-infringing uses is supported by international law. The anti-circumvention provisions were intended to meet the U.S. obligations in the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty. Article 11 of the WIPO Copyright Treaty does not require or encourage any legal protection or remedies against circumvention of TPM used to prevent non-infringing acts:

> Contracting Parties shall provide adequate legal protection and effective legal remedies against the circumvention of effective technological measures that are used by authors in connection with the exercise of their rights under this Treaty or the Berne Convention and that restrict acts, in respect of their works, which are not authorized by the authors concerned ***or permitted by law***.

Although 17 U.S.C. § 1201 does not specifically use the WIPO "or permitted by law" formulation (which is identical in Article 18 of the WIPO Performances and Phonograms Treaty), § 1201(c) specifically requires that this section not be read as altering the copyright

balance, and the courts have required that there be a nexus between a cognizable copyright and the TPM. *See, e.g., Chamberlain Group v. Skylink Tech., Inc.*, 381 F. 3d 1178 (Fed. Cir. 2004). Where "the critical nexus between access and protection" is missing, *id.* at 1204, there can be no liability. Where the Copyright Act authorizes a use, anyone circumventing a TPM to make that authorized use is "immune from § 1201(a)(1) circumvention liability. In the absence of allegations of either copyright infringement or § 1201(a)(1) circumvention, [users of the OmniQ invention] cannot be liable for § 1201(a)(2) trafficking." *Id.* The Chamberlain court and others have read "or permitted by law" into the fabric of U.S. copyright jurisprudence. And it could be no other way, since every use that is not prohibited by the Copyright Act is fully protected by the First Amendment to the U.S. Constitution.

Because non-reproductive space-shifting does not involve any reproduction at all, such activity is beyond the reach of the copyright monopoly, and is fully protected by the First Amendment. Accordingly, circumvention of TPM that interferes with *non-reproductive* space-shifting must be allowed, regardless whether the copyright owner might prefer to suppress non-infringing competition.

The Statutory Prohibition On Circumventing Access Controls Is The Cause Of The Adverse Effects

1. General Principles

The inability to circumvent the technological protection measures at issue has, for purposes of non-reproductive space-shifting, an adverse effect on noninfringing use as a matter of law. Where the space-shifting can be accomplished without infringing the reproduction right (or any other exclusive right of the copyright owner), the interposition of TPMs, even if for an otherwise legitimate intention of preventing infringing reproductions, necessarily results in an expansion of the copyright owner's monopoly into activity that Congress has expressly excluded from the scope of the copyright. For the same reasons that the Supreme Court established that a court's authority to award costs and attorneys' fees to the prevailing party in a copyright infringement lawsuit could not be applied in a manner that tipped the scales in favor of copyright owners, *Fogerty v. Fantasy, Inc.*, 510 U.S. 517 (1994), so, too, must the Librarian of Congress exercise her discretion with respect to exemptions, in order to preserve that same balance between exclusive and non-exclusive rights.[33] This is particularly so in the context of a Section 1201 exemptions proceeding, given that Section 1201 itself states, in subsection 1201(c), that nothing in Section 1201 should empower copyright holders to gain more control over non-infringing conduct, or allow TPM to impede First Amendment rights to use consumer electronics and computing products. The burden must be on the deployer of TPM to prevent such collateral damage and, failing to do so, Congress empowers the Librarian of Congress to restore to the public First Amendment freedom and the full enjoyment of all non-exclusive rights.

In the exercise of its authority under Article I, Section 8 or the Constitution, Congress "may not overreach the restraints imposed by the stated constitutional purpose. Nor may it enlarge the patent monopoly without regard to the innovation, advancement or social benefit

[33] The non-exclusive rights, which is to say, everything that is not granted to authors in Section 106, which rithgs are themselves "subject to" the limitations and exceptions in Sections 107-122.

gained thereby." *Graham v. John Deere Co. of Kansas City*, 383 US 1, 6-7 (1966). Adding "to the sum of useful knowledge" is an inherent requisite of all copyright monopolies, and "may not be ignored." *Id.* at 7. The Librarian of Congress must, therefore, apply her exemption authority with the same adherence to the constitutional imperative.

Accordingly, when the Copyright Act itself authorizes uses of a work without the consent of the copyright owner, it is not enough that there be alternate non-infringing means of access authorized by the copyright owner. For example, where the copyright holder uses TPM to diminish lawful enjoyment of secondary markets, it is not enough that the potential beneficiary of the second-hand market remain free to purchase the product at full price. Similarly, just as the Copyright Act gives the copyright holder the exclusive right to print a literary work in a paperback book, but does not give the copyright owner the power to determine that it can only be read by the light of a G.E. light bulb, or to prohibit magnification or projection onto a wall in order to read it better, the authority to reproduce a movie onto a plastic disc does not come accompanied with the exclusive right to determine the means of privately performing the work that is on the disc.

And, when the market is such that there are fewer DVD players on which to play movie fixed in a DVD, it is no solution for the copyright owner to point to *other* copies of the work available for sale, to invite the DVD owner to go to iTunes to obtain a copy by EST (electronic sell-through, or "download"), or to simply watch a public performance of the work if and when it comes available. And if the owner of a copy of the work fixed on a DVD wishes to lend it to a friend or give it to a charity, it is no solution that one can give the cash value, instead, so that the friend or charity can go out and get their own. The whole point of the Copyright Act is to maximize the creation *and dissemination* of the works for the benefit of all. When TPM works for the sole benefit of the copyright owner by artificially restricting non-infringing uses established by law, directly limiting the reach of knowledge and the useful arts in a profit-maximizing way unrelated to protection or exploitation of exclusive rights, there must be a way of lawfully circumventing it.

2. Technological Solutions To Technology's Damage To Section 109 Rights Are Suppressed[34]

[34] We refer to Section 109 "rights" because we understand them to be exactly that. We are aware of the popularity of relegating the limitations and exceptions in Section s 107 through 122 as mere defenses to a claim of copyright infringement, rather than as affirmative rights, but the fact remains that, in Section 109(a), Congress "authorized" owners to redistribute copies in defiance of the copyright owners' wishes (and Section 106 makes the distribution right "subject to" Section 109); and Section 109(d) refers to the "privileges" described in Section 109(a). Plus, Section 1201(c)(1) recognizes fair use as among "rights, remedies, or defenses … including fair use;" 1201(c)(3) clearly establishes a right *not* to have to design products to respond to any particular TPM; and 1201(c)(4) recognizes rights, such as free speech rights with respect to use of consumer electronics or computing products, the courts have held that Section 107 is intended in great part to protect First Amendment rights. Courts have had no reluctance to refer to "section 109 rights." *See, e.g., DSC Communications Corp. v. Pulse Communications*, 170 F. 3d 1354, 1361 (Fed. Cir. 1999) ("Such a restriction is plainly **at odds with the section 109 right to transfer owned copies** of software to third parties" (emphasis added)). *See, also, Sebastian*

Although the "first sale doctrine," and its amplified codification in the Copyright Act of 1909 (currently 17 U.S.C. §§ 109 and 202), are a longstanding part of the Copyright Act, and *all* of the exclusive rights in Section 106 are "subject to" Section 109, the expression of it in the copyright context has roots that run much deeper into the fabric of our society. To put it bluntly, every single day, millions of Americans depend on the freedom of alienation of previously sold property, including Copies of motion pictures and other audiovisual works. Some families depend upon thrift stores for much of their shopping for clothing, household goods, and, yes, even DVDs containing motion pictures and other audiovisual works. Our national policy means that people are free to buy or rent used DVDs and used cars with equal ease, even though the original manufacturers of DVDs and cars might prefer to be able to regulate the resale and rental markets.

> The first sale rule is statutory, but finds its origins in the common law aversion to limiting the alienation of personal property. *See Burke & Van Heusen, Inc. v. Arrow Drug, Inc*., 233 F.Supp. 881, 883 (E.D.Pa.1964); Colby, *The First Sale Doctrine — The Defense That Never Was?*, 32 J. Copyright Soc'y U.S.A. 77, 89 (1984). *See also* H.R.Rep. No. 987, 98th Cong., 2d Sess. 2, reprinted in 1984 U.S. Code Cong. & Admin. News 2898, 2899 ("the first sale doctrine has its roots in the English common law rule against restraints on alienation of property"); 2 M. Nimmer, THE LAW OF COPYRIGHT § 8.12 (1987).

Intern., Inc. v. Consumer Contacts (PTY) Ltd., 847 F. 2d 1093, 1097 (3rd Cir. 1988) ("the **first sale right of section 109(a)**"); *Softman Prods. Co., LLC v. Adobe Systems, Inc.*, 171 F. Supp. 2d 1075, 1090 n.19 ("Scholars have suggested that Congress contemplated that parties might **attempt to contract out of a first sale right**."); *Lantern Press, Inc. v. American Publishers Co.*, 419 F. Supp. 1267, 1373 (E.D.N.Y. 1976) ("the **rights of those who purchase paperbacks** in the regular course of trade and elect to rebind them" and sell them); *Vernor v. Autodesk, Inc*., 555 F. Supp. 2d 1164, n.10 (W.D. Wash. 2008) ("an 'owner' with a right to resell his copy under § 109"); Vernor v. Autodesk, Inc., No. C07-1189RAJ, (W.D. Wash. Sept. 30, 2009 (uses a section heading "A. **Rights Belonging to an "Owner" of a Copy** of Copyrighted Material: The First Sale Doctrine of § 109 and the Reproduction Exception of § 117," and goes on to say that Section 109 is "commonly known as **the 'first sale' right**"); *Brilliance Audio v. Haights Cross Communications*, 474 F.3d 365, 373 (6th Cir. 2007) (noting "the traditional bargain between the rights of copyright owners and the personal property **rights** of an individual who owns a particular copy"). "The first sale doctrine ensures that the copyright monopoly does not intrude on the personal property **rights** of the individual owner, given that the law generally disfavors restraints of trade and restraints on alienation." *Id*. at 374. (Subsequent history, is any, is omitted from these examples, as it is of no relevance to the reason cited.) In any case, all semantics aside, it is unassailable that the owner of a copy has an ownership "right" in it, and that the Copyright Act, in granting certain limited exclusive rights, leaves everything else as a non-exclusive right to be enjoyed by all. Moreover, all activity involving copyrighted works that falls outside of the reach of the exclusive right is fully protected by the First Amendment, which provides all the "right" necessary for legal recognition as such. The courts will not lend their aid to a private party wishing to do what would be unconstitutional for the government to do directly, *Shelley v. Kraemer*, 334 US 1 (1948), and neither should the Register of Copyrights.

> There is, however, an economic reason for the rule as well. As the district court said in *Burke & Van Heusen*, "the ultimate question under the `first sale' doctrine is whether or not there has been such a disposition of the copyrighted article that it may fairly be said that the copyright proprietor has received his reward for its use." 233 F.Supp. at 884. *See Platt & Munk Co. v. Republic Graphics, Inc*., 315 F.2d 847, 854 (2d Cir.1963). *See also Cosmair, Inc. v. Dynamite Enters., Corp*., No. 85-0651, slip op. (S.D.Fla. Apr. 9, 1985) (1985 WL 2209).

Sebastian Intern., Inc. v. Consumer Contacts (PTY) Ltd., 847 F. 2d 1093, 1096-97 (3rd Cir. 1988). The Supreme Court has long recognized the importance of this right to alienate one's own property, both within and without the context of copies of copyrighted works:

> But because a manufacturer is not bound to make or sell, it does not follow that in case of sales actually made he may impose upon purchasers every sort of restriction. Thus a general restraint upon alienation is ordinarily invalid. "The right of alienation is one of the essential incidents of a right of general property in movables, and restraints upon alienation have been generally regarded as obnoxious to public policy, which is best subserved by great freedom of traffic in such things as pass from hand to hand. General restraint in the alienation of articles, things, chattels, except when a very special kind of property is involved, such as a slave or an heirloom, have been generally held void. `If a man,' says Lord Coke, in COKE ON LITTLETON, section 360, `be possessed of a horse or any other chattel, real or personal, and give his whole interest or property therein, upon condition that the donee or vendee shall not alien the same, the same is void, because his whole interest and property is out of him, so as he hath no possibility of reverter; and it is against trade and traffic and bargaining and contracting between man and man.'" *Park v. Hartman, supra*. *See also* GRAY ON RESTRAINTS ON ALIENATION, §§ 27, 28.
>
> Nor can the manufacturer by rule and notice, in the absence of contract or statutory right, even though the restriction be known to purchasers, fix prices for future sales. It has been held by this court that no such privilege exists under the copyright statutes, although the owner of the copyright has the sole right to vend copies of the copyrighted production. *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339. There the court said (p. 351): "The owner of the copyright in this case did sell copies of the book in quantities and at a price satisfactory to it. It has exercised the right to vend. What the complainant contends for embraces not only the right to sell the copies, but to qualify the title of a future purchaser by the reservation of the right to have the remedies of the statute against an infringer because of the printed notice of its purpose so to do unless the purchaser sells at a price fixed in the notice. To add to the right of exclusive sale the authority to control all future retail sales, by a notice that such sales must be made at a fixed sum, would give a right not included in the terms of the statute, and, in our view, extend its operation, by construction, beyond its meaning, when interpreted with a view to ascertaining the legislative intent in its enactment." It will hardly be contended,

> with respect to such a matter, that the manufacturer of an article of commerce, not protected by any statutory grant, is in any better case.

Dr. Miles Medical Co. v. John D. Park & Sons Co., 220 US 373, 404-05 (1911) (emphasis added). But although this "right of alienation is one of the essential incidents of a right of general property in movables, and restraints upon alienation have been generally regarded as obnoxious to public policy," *id.*, and that policy is best advanced "by great freedom of traffic in such things as pass from hand to hand," *id*., the very same modern technology that has enabled more efficient reproduction and wider dissemination of "first" sales is making it much harder to exercise that freedom to traffic in lawfully made copies that the Copyright Act has, for well over a century, intended pass from hand to hand without restraint. (This is particularly true in the case of licensed downloads – reproductions, authorized by the copyright holder, in which the owner of the computer or mobile phone onto which the work is reproduced becomes the "owner of a lawfully made copy" with the legal right to redistribute it, but no practical way of doing so.) And, unlike a printed copy of a literary work that can be read for generations to come, lasting as long as the book or magazine is protected from destruction, an audiovisual work on DVD suffers from two threats to alienability.

First, sales of playback devices are in a downward trend,[35] and less likely to be included with a personal use computer.[36] In fact, Lifewire reports,

> Probably the biggest factor that will lead to the demise of the optical drive in PCs is Microsoft dropping support for DVD playback. In one of their developer blogs, they state that the base versions of the Windows 8 operating system will not include the software necessary for playing back DVD videos. This decision carried over to the latest Windows 10. This is a major development as it was a standard feature in previous versions of the operating system. Now, users will either have to purchase the Media Center pack for the OS or will need a separate playback software on top of the OS.[37]

The Lifewire article goes on to note the explain the impact on consumers:

> The end result is that it can be a major headache for the consumers who wish to have the new optical formats in their computers. In fact, users of the Apple software have it even worse as the company refuses to support the technology within the Mac OS X software. This makes the Blu-ray format all but irrelevant for the platform.[38]

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[35] DVD players/recorder unit shipments in the United States have been in year-to-year decline every year since 2014. See https://www.statista.com/statistics/220729/forecast-in-dvd-player-shipments-in-the-us/.

[36] *See, e.g.*, Mark Kyrnin, *Death of the Computer Optical Drive Why Most Moderns PCs Do Not Feature CD, DVD or Blu-ray Drives*, Lifewire, August 12, 2017, at https://www.lifewire.com/death-of-the-computer-optical-drive-832403.

[37] *Id*.

[38] *Id*.

Kyrnin's conclusion speaks directly to one substantial reason – completely independent of the secondary markets being lost – why consumers must be able to migrate their DVD and Blu-ray copies to their hard drives:

> Now optical storage is not going to completely disappear from computers any time soon. It is just very clear that their primary usage is changing and is not a requirement for computers like they once were. Instead of being used for storing data, loading software or watching movies, the drives will likely be there to convert the physical media into the digital files for playback on computers and mobile devices. It is almost certain that the drives will be completely removed from most mobile computers in the near future. There is little use for the drives when it is so much easier to view them off a digital file than the disc. Desktops will still pack them for a while as the technology is so inexpensive to include and there are not the space issue of mobile computers. Of course, the market for external peripheral optical drives will survive for a while for anyone that still wants to have the capability that will be dropped from their future computers.[39]

Accordingly, the millions upon millions of lawfully made copies of motion pictures on DVD and Blu-ray discs, made and distributed as intended by the Copyright Act, will soon be "a major headache" to watch. Having to find a third party optical disc drive compatible with one's latest laptop, find the correct connectors, and then have to purchase and install playback software because your operating system does not provide it natively, just to be able to watch that movie fixed on a DVD or Blu-ray disc, is comparable to, but an exponentially higher burden than, rummaging for your reading glasses because your eyesight no longer lets you enjoy that book like you once could. As for people of more modest means, who may not have the luxury of being able to purchase a third party optical drive or purchase playback software, the mere fact that they can buy a used DVD or Blu-ray disc at an affordable price does not necessarily mean that they can watch the movie fixed on it.

Second, the DVDs themselves have such a short lifespan in relation to the typical 95-year length of the copyright term, that they may become unplayable long before the copyright expires on the work fixed in them.[40]

The statutory prohibition on circumventing access controls is impeding the solution to the loss of non-infringing secondary distributions that Section 109 and the common law "first sale

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[39] *Id*.

[40] According to the Optical Storage Technology Association, for example, manufactures of writable DVDs claim life spans ranging from 30 to 100 years. See http://www.osta.org/technology/dvdqa/dvdqa11.htm. The same source suggests that a short lifespan is not a problem, because the work fixed on the DVD is in a digital form, such that "contents may be transferred to future storage systems as becomes necessary to preserve whatever has been stored on the discs." The Optical Storage Technology Association has obviously not met TPMs of 17 U.S.C. § 1201. It's straightforward solution to the problem runs directly into the prohibition.

doctrine" intended to foster. Existing long before we had a Copyright Act, the right to alienate the copies one owns has been an integral part of the fabric of copyright law. When Congress legislatively endorsed the Supreme Court's holding in *Bobbs-Merrill*, it went a big step further by than declaring that the copyright holder's exclusive rights do not extend so far as to allow control over copies it no longer owns. Agreeing "it would be most unwise to permit the copyright proprietor to exercise any control whatever over the article which is the subject of copyright after said proprietor has made the first sale." H.R. Rep. No. 2222, 60th Cong., 2d Session (1909), Congress made clear that copy ownership is separate for copyright ownership, and transfers with respect to one do not control the other, and that all of the rights and incidents of ownership of ordinary chattel apply with respect to non-infringing copies that have been lawfully acquired. Plus, while Section 106 makes all copyrights "subject to sections 107-122," Section 109(a) is uniquely set out as a specific authority of the owner of the copy, which is superior to that of the copyright's distribution right.

Closing comment:

The OmniQ Invention method of non-reproductive space-shifting need not be the only way to engage in non-reproductive space-shifting. We are not suggesting that the exemption should be patent-specific. Nor are we suggesting that "fair use" alone is an insufficient justification for an exemption when the fair use standard is met. Rather, OmniQ's Patent method demonstrates that space-shifting can be carried out without reproduction and in a manner that is more protective of the reproduction right than any TPM in use today, and without the collateral damage when well-intended TPM infringes upon non-exclusive rights. Consequently, non-reproductive space-shifting fully protects the integrity of the reproduction right and, when OmniQ's method is followed, makes it unnecessary for the user to rely on fair use analysis or for the copyright owner to rely on its own TPM.

DOCUMENTARY EVIDENCE

Commenters are encouraged to submit documentary evidence to support their arguments or illustrate pertinent points concerning the proposed exemption. Any such documentary evidence should be attached to this form and uploaded as one document through regulations.gov.

In addition to the evidence cited, the following documentary evidence is included with this submission:

Exh. 1. *Digitally Transferring Content Across Media Without Reproduction*, Patent Application # WO 2016/168832; US 2016028135.

Exh. 2. Declaration of John Mitchell (and attached OmniQ FAQ).

Exh. 3. Declaration of Johann George.

Exh. 4. Declaration of Mark Vrieling.

Exh. 5. Declaration of Betty González Mitchell.

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(54) **Title**: DIGITALLY TRANSFERRING CONTENT ACROSS MEDIA WITHOUT REPRODUCTION

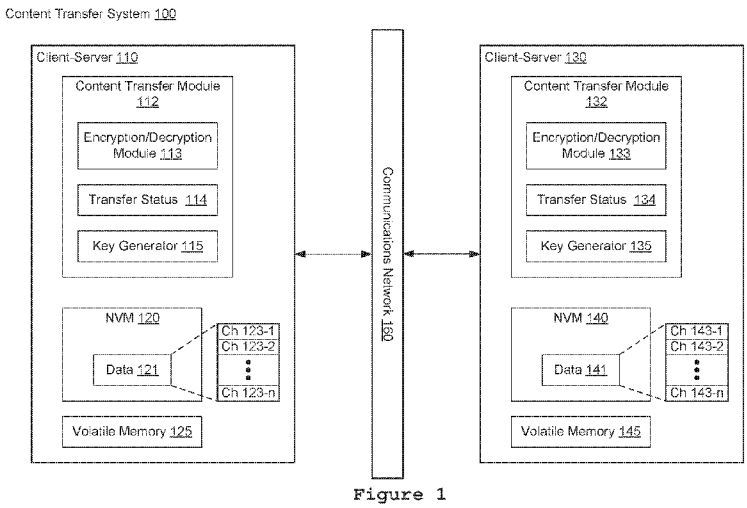

Figure 1

(57) **Abstract**: Content is transferred from a first non-volatile storage medium to a second non-volatile storage medium without reproduction. This is accomplished by reading first data stored in the first non-volatile storage medium from the first non-volatile storage medium to volatile memory, erasing the first data from the first non-volatile storage medium, and after erasing the first data from the first non-volatile storage medium, storing corresponding data in a second non-volatile storage medium. And after storing the corresponding data in the second non-volatile storage medium, the first data is erased from the volatile memory. The first data is not concurrently stored in the first non-volatile storage medium and the second non-volatile storage medium.

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Digitally Transferring Content Across Media Without Reproduction

TECHNICAL FIELD

[0001] The disclosed embodiments relate generally to content transfer systems and clients and the transferring of media content across separate media without reproduction.

BACKGROUND

[0002] Transferring content from one medium to another may involve making a copy of the content. It is thus difficult for the owner of a lawfully made digital copy to transfer copyrighted works from one medium to another because copyright law generally prohibits reproduction of a copyrighted work into another copy. Therefore, it would be desirable to have a system and method of transferring content from one medium to another without reproduction of the copyrighted content. It would also be desirable to have a system and method of efficiently lending and returning content between distinct media without reproduction.

SUMMARY

[0003] (A1) In accordance with some embodiments, a method of transferring data includes: reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory; erasing the first data from the first non-volatile storage medium; after erasing the first data from the first non-volatile storage medium, storing corresponding data in a second non-volatile storage medium; and after storing the corresponding data in the second non-volatile storage medium, erasing the first data from the volatile memory. The first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

[0004] In accordance with some embodiments, a computer system includes one or more processors, memory, one or more programs stored in the memory, the one or more programs including instructions for reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory, erasing the first data from the first non-volatile storage medium, and after erasing the first data from the first non-volatile storage medium, storing corresponding data in a second non-volatile storage medium. The one or more programs further includes instructions for erasing the first data from the

volatile memory after storing the corresponding data in the second non-volatile storage medium. The first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

[0005] In some embodiments, the one or more programs of the aforementioned computer system including instructions for performing any of the methods described herein.

[0006] In accordance with some embodiments, a non-transitory computer readable storage medium stores one or more programs configured for execution by a computer system, the one or more programs including instructions that when executed by one or more processors of the computer system cause the computer system to: read first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory; erase the first data from the first non-volatile storage medium; after erasing the first data from the first non-volatile storage medium, store corresponding data in a second non-volatile storage medium; and erase the first data from the volatile memory, after storing the corresponding data in the second non-volatile storage medium. The first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

[0007] (B1) In accordance with some embodiments, a method of transferring data includes: reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory; transmitting corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium. The method also includes, after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erasing at least a portion of the first data from the first non-volatile storage medium; and after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erasing the first data from the first volatile memory. The corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

[0008] (C1) In accordance with some embodiments, the method of B1 further includes: receiving, in the first volatile memory, data (e.g., one or more keys for decrypting

one or more data segments) from the second volatile memory including at least a portion of the corresponding data, wherein the received data was read from the second non-volatile storage medium to the second volatile memory; after the corresponding data is erased from the second non-volatile storage medium, storing the received data in the first non-volatile storage medium; and after storing the received data in the first non-volatile storage medium, erasing the received data from the first volatile memory. The received data is erased from the second volatile memory after the received data is received in the first volatile memory or after the received data is stored in the first non-volatile storage medium, and the corresponding data stored in the second non-volatile storage medium and the received data stored in the first non-volatile storage medium are not concurrently stored.

[0009] In accordance with some embodiments, a computer system includes one or more processors, memory, one or more programs stored in the memory, the one or more programs including instructions for reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory; transmitting corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium; after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erasing at least a portion of the first data from the first non-volatile storage medium; and after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erasing the first data from the first volatile memory. The corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

[0010] In accordance with some embodiments, a non-transitory computer readable storage medium stores one or more programs configured for execution by a computer system, the one or more programs including instructions that when executed by one or more processors of the computer system cause the computer system to: read first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory; transmit corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium; after the corresponding data is read from the first non-volatile storage

medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erase at least a portion of the first data from the first non-volatile storage medium; and after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erase the first data from the first volatile memory. The corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Figure 1 is a block diagram illustrating an implementation of a content transfer system, in accordance with some embodiments.

[0012] Figure 2 is a block diagram illustrating a client-server of a content transfer system, in accordance with some embodiments.

[0013] Figure 3 illustrates a conceptual flowchart representation of a method of content transfer across separate media without reproduction, in accordance with some embodiments.

[0014] Figure 4A illustrates a conceptual flowchart representation of a method of content transfer across a network without reproduction, in accordance with some embodiments.

[0015] Figure 4B illustrates a conceptual flowchart representation of a method of content return across a network without reproduction, in accordance with some embodiments.

[0016] Figures 5A-5B illustrate a flowchart representation of a method of content transfer without reproduction, in accordance with some embodiments.

[0017] Like reference numerals refer to corresponding parts throughout the drawings.

DESCRIPTION OF EMBODIMENTS

[0018] The various implementations described herein include systems, methods, and/or devices used to enable content transfer across separate media without reproduction.

[0019] It will also be understood that, although the terms “first,” “second,” etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a

first contact could be termed a second contact, and, similarly, a second contact could be termed a first contact, without changing the meaning of the description, so long as all occurrences of the "first contact" are renamed consistently and all occurrences of the second contact are renamed consistently. The first contact and the second contact are both contacts, but they are not the same contact.

[0020] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the claims. As used in the description of the embodiments and the appended claims, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will also be understood that the term "and/or" as used herein refers to and encompasses any and all possible combinations of one or more of the associated listed items. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0021] As used herein, the phrase "at least one of A, B and C" is to be construed to require one or more of the listed items, and this phase reads on a single instance of A alone, a single instance of B alone, or a single instance of C alone, while also encompassing combinations of the listed items such as "one or more of A and one or more of B without any of C," and the like.

[0022] As used herein, the term "if" may be construed to mean "when" or "upon" or "in response to determining" or "in accordance with a determination" or "in response to detecting," that a stated condition precedent is true, depending on the context. Similarly, the phrase "if it is determined [that a stated condition precedent is true]" or "if [a stated condition precedent is true]" or "when [a stated condition precedent is true]" may be construed to mean "upon determining" or "in response to determining" or "in accordance with a determination" or "upon detecting" or "in response to detecting" that the stated condition precedent is true, depending on the context.

[0023] Reference will now be made in detail to various embodiments, examples of which are illustrated in the accompanying drawings. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention and the described embodiments. However, the invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and

circuits have not been described in detail so as not to unnecessarily obscure aspects of the embodiments.

[0024] Figure 1 is a block diagram illustrating an implementation of a content transfer system 100, in accordance with some embodiments. The content transfer system 100 includes a communications network 160 and a plurality of client-servers, including a first client-server 110 and a second client-server 130.

[0025] In some embodiments, client-server 110 includes content transfer module 112, non-volatile memory (NVM, also referred to as non-volatile storage or a non-volatile storage medium) 120, and volatile memory 125. In some embodiments, each of the non-volatile memories, such as NVM 120 and NVM 140, as well as NVM 220 (Figure 2), in system 100 is a flash memory device, CD (compact disc), DVD ("digital versatile disc" or "digital video disc"), Blu-Ray Disc™ (a trademark of Blu-Ray Disc Association), audio tape or video tape, or other media in which data is durably stored. Furthermore, in some embodiments, each of the volatile memories, such as volatile memory 125 and volatile memory 145, in system 100 comprises DRAM, SRAM, or other memory medium in which data is not durably stored, and more generally in which data is stored for a period of not more than transitory duration.

[0026] In some embodiments, content transfer module 112 includes encryption/decryption module 113, transfer status module 114, and key generator 115. In some embodiments, non-volatile memory NVM 120 stores data 121, which in some embodiments includes any number (i.e., one or more) of data chunks (e.g., Ch 123-1, Ch 123-2, through Ch 123-n). Similarly, client-server 130 includes content transfer module 132, non-volatile memory NVM 140, and volatile memory 145. In some embodiments, content transfer module 132 includes encryption/decryption module 133, transfer status module 134, and key generator 135, and non-volatile memory NVM 140 stores data 141, which in some embodiments includes any number of data chunks (e.g., Ch 143-1, Ch 143-2, through Ch 143-n). More detailed discussion about the implementation of client-server 110 and/or client-server 130 is provided below with respect to Figures 2 and 4A-4B.

[0027] Communication network 160 may be any suitable communication network or connection, such as the Internet, also referred to as the World Wide Web (WWW), a wired local area network, a direct wired connection (sometimes called a communications bus or cable or the like) between client-server 110 and client-server 130, an intranet and/or a wireless network, such as a cellular telephone network, a wireless local area network (LAN) and/or a metropolitan area network (MAN), a wireless connection (e.g., a Bluetooth™

connection), or any other communication network or connection suitable for transferring a content file or data set between devices, or any combination of such communication networks and/or connections. Thus, client-server 110 and client-server 130 may be positioned near each other, for example within 1 millimeter, 1 meter, or 10 meters, or 100 meters of each other, or may be remotely located relative to each other, when a content file or data set is transferred from a first non-volatile memory, in or coupled to client-server 110 to a second non-volatile memory, in or coupled to client-server 130.

[0028] Figure 2 is a block diagram illustrating client-server 110 (and similarly, client-server 130) of a content transfer system 100, in accordance with some embodiments. Client-server 110 typically includes one or more processing units 222-1 (sometimes herein called CPUs, processors, or hardware processors, and sometimes implemented using microprocessors, microcontrollers, or the like) for executing modules, programs and/or instructions stored in memory 206 and thereby performing processing operations; memory 206; non-volatile memory NVM 120; volatile memory 125; and one or more communication buses 208 for interconnecting these components. In some embodiments, non-volatile memory NVM 120 is a removable non-volatile memory device, such as a flash drive. In some embodiments, client-server 120 further includes a second non-volatile memory NVM 220 (e.g., a removable non-volatile memory device, such as flash memory drive), in which case the second NVM 220 is coupled to other components of client-server by communication buses 208. Communication buses 208 optionally include circuitry (sometimes called a chipset) that interconnects and controls communications between system components. Memory 206 includes high-speed random access memory, such as DRAM, SRAM, DDR RAM or other random access solid state memory devices, and may include non-volatile memory, such as one or more magnetic disk storage devices, optical disk storage devices, flash memory devices, or other non-volatile solid state storage devices. Memory 206 optionally includes one or more storage devices remotely located from processor(s) 222-1. Memory 206, or alternately the non-volatile memory device(s) within memory 206, comprises a non-transitory computer readable storage medium. In some embodiments, memory 206, or the computer readable storage medium of memory 206 stores the following programs, modules, and data structures, or a subset or superset thereof:

- a content transfer module 210 that is used for managing content transfer between separate media and/or between separate client-servers 110 and 130, and that may include one or more of the following:

- encryption/decryption module 212 that is used for encrypting and/or decrypting content in conjunction with its transfer, and that may use keys generated by key generator 216 as described herein;
- transfer status module 214 that is used for monitoring the status of content transfer, and that may monitor the status of one or more chunks of content being transferred;
- key generator 216 that is used for generating encryption/decryption keys for one or more portions of content.

[0029] Each of the above identified elements may be stored in one or more of the previously mentioned memory devices that together form memory 206, and corresponds to a set of instructions, executable by the one or more processors of client-server 110, for performing a function described above. The above identified modules or programs (i.e., sets of instructions) need not be implemented as separate software programs, procedures or modules, and thus various subsets of these modules may be combined or otherwise re-arranged in various embodiments. In some embodiments, memory 206 may store a subset of the modules and data structures identified above. Furthermore, memory 206 may store additional modules and data structures not described above. In some embodiments, the programs, modules, and data structures stored in memory 206, or the computer readable storage medium of memory 206, provide instructions for implementing respective operations in the methods described below with reference to Figures 5A-5B.

[0030] Although Figure 2 shows client-server 110, Figure 2 is intended more as a functional description of the various features which may be present in a client-server than as a structural schematic of the embodiments described herein. In practice, and as recognized by those of ordinary skill in the art, items shown separately could be combined and some items could be separated.

[0031] Client-server 110 may be any suitable computer device, such as a computer server, a laptop computer, a tablet device, a netbook, an internet kiosk, a personal digital assistant, a mobile phone, a smart phone, a gaming device, custom-built hardware, or any other computing device. Similarly, client-server 130 may be any suitable computer device, and may, but need not be, the same type of computer device as client-server 110.

[0032] Figure 3 illustrates a conceptual flowchart representation of a method of content (also referred to herein as "content data") transfer across separate media without

reproduction 300, in accordance with some embodiments. In some embodiments, method 300 is performed by a content transfer system, such as by content transfer system 100 or a component thereof such as client-server 110 (Figure 1). In some embodiments, method 300 is performed within client-server 110 across internal communication buses (e.g., communication buses 208, Figure 2) to transfer content between a first non-volatile storage medium (e.g., NVM 120, Figure 2) and a second non-volatile storage medium (e.g., NVM 220, Figure 2), which in some such embodiments are both included in client-server 110. In some embodiments, method 300 is performed by client-server 110 and client-server 130 communicating via a network (e.g., communications network 160) to transfer content between non-volatile memory in client-server 110 (e.g., NVM 120, Figure 1) and non-volatile memory in client-server 130 (e.g., NVM 140, Figure 1).

[0033] The method begins, in some embodiments, with content (e.g., data 121, Figure 1) being stored (302) in a first non-volatile storage medium NVM A (e.g., NVM 120, Figure 1). In some embodiments, the content is stored in NVM A as a content file (also referred to herein as a "data set"). In some embodiments, the entire content file is transferred all at once. In some embodiments, the content file or data set includes a plurality of data segments (e.g., data chunks 123-1, 123-2 through 123-n, Figure 1), and the content file is transferred one or more segments at a time.

[0034] In some embodiments in which a content file is transferred in segments, the content transfer system selects (304) a next data segment of the content data (e.g., a respective chunk 123-i of data 121, Figure 1) to be transferred. In some embodiments, the content transfer system selects a next subset of a plurality of data segments to be transferred.

[0035] Next, the content transfer system reads (306) the selected data (or data segment) into volatile memory (e.g., volatile memory 125, Figure 1).

[0036] After the selected data is read into volatile memory, the content transfer system erases (308) the selected data from NVM A. In some embodiments, how the selected data is erased depends on the memory medium in which NVM A is implemented. In various embodiments, erasing the selected data (308) includes permanent erasure of either the selected data in its entirety, or permanent erasure of a sufficient portion of the selected data, such that the selected data cannot be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. For example, if the selected data is a portion of a content file (e.g., an audio file or program, video file or program, multimedia document, or textual document), the result of erasing operation 308 is that the portion of the

content file in the selected data can no longer be played, viewed, perceived, reproduced or otherwise communicated from NVM A, either directly or with the aid of a machine. In some embodiments, the content transfer system erases (308) the selected data from NVM A by means of physical destruction of the storage medium (e.g., NVM A), or physical destruction of at least the portion of the storage medium in which the selected data, or a portion of the selected data, was stored. For example, in embodiments in which NVM A is a CD or DVD, erasing operation 308 may include physical destruction (e.g., using a laser) of one or more sectors of the CD or DVD in which the selected data is stored.

[0037] Erasing the selected data from NVM A prior to the selected data being written to another non-volatile memory or persistent storage thereby erases the "copy" of the selected data in NVM A. The term "copy" is used with its present meaning as assigned in the U.S. Copyright Act, 17, U.S.C. § 101, and accordingly refers to a material object in which a work is fixed and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

[0038] It is noted that the definition of "copy" in the U.S. Copyright Act includes the term "fixed." The term "fixed" is also defined in the U.S. Copyright Act, as follows. "A work is 'fixed' in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. A work consisting of sounds, images, or both, that are being transmitted, is 'fixed' for purposes of this title if a fixation of the work is being made simultaneously with its transmission." It is further noted that, in accordance with this definition, data temporarily stored in a volatile memory is not "fixed" so long as it is stored in the volatile memory "for a period of not more than transitory duration." As noted above, in some embodiments, each of the volatile memories, such as volatile memory 125 and volatile memory 145, in system 100 comprises DRAM, SRAM, or other memory medium in which data is not durably stored, and more generally in which data is stored for a period of not more than transitory duration.

[0039] In some embodiments, during performance of any of the methods (e.g., method 300, Figure 3; method 400a, Figure 4A; method 400b, Figure 4B; and method 500, Figures 5A-5B) described herein, the selected data, as well as any other data segments or other data copied to volatile memory (e.g., volatile memory 125 or volatile memory 145, Figure 1) is stored in that volatile memory for a period of not more than transitory duration.

[0040] Optionally, in some embodiments, the content transfer system converts (310) a format of the selected data. In some embodiments, the format conversion is performed on the selected data that has been read into volatile memory. In some embodiments, format conversion includes encryption or decryption of content using keys. In some embodiments, format conversion includes conversion of content into a format required for playback on an output device, such as a stereo system, television, or monitor. In some embodiments, format conversion is performed independently of the erase operation. In other words, format conversion of data that has been read into volatile memory from a first non-volatile memory need not be done in any particular order with respect to erasing the corresponding data from the first non-volatile memory.

[0041] In some embodiments, the selected data is transferred across a network (e.g., from a first client-server such as client-server 110 to a second client-server such as client-server 130 across communications network 160, Figure 1). In some such embodiments, reading selected data into volatile memory includes reading the selected data from a first non-volatile memory NVM A (e.g., NVM 120, Figure 1) into a first volatile memory A (e.g., volatile memory 125, Figure 1) at the first client-server, and then transmitting the selected data from the first volatile memory A to a second volatile memory B (e.g., volatile memory 145, Figure 1) at the second client-server. In such embodiments, format conversion may be performed at the first volatile memory or at the second volatile memory. In some embodiments, format conversion may be performed in part at the first volatile memory and in part at the second volatile memory. More detail regarding content data transfer across a network is provided herein with reference to Figures 4A and 4B.

[0042] Next, the content transfer system stores (312) the selected data in a second non-volatile storage medium NVM B (e.g., a second NVM 220 of client-server 110, Figure 2, or NVM 140 of client-server 130, Figure 1). Because the selected data is stored in the second NVM B after the copy of the selected data was erased from the first NVM A (308), at no point does more than one copy (i.e., persistent fixation in a tangible medium) of the selected data exist between NVM A and NVM B.

[0043] After the selected data is stored in NVM B, the content transfer system erases (314) the selected data from volatile memory.

[0044] Optionally, in some embodiments in which content (e.g., a content file) is transferred in segments, the content transfer system repeats operation 304 and subsequent operations of method 300 for a next data segment or set of segments. As Figure 3 shows an

example embodiment in which operation 304 is repeated for a next data segment after operation 308 is performed on a prior data segment, those of ordinary skill in the art will recognize that a respective segment or set of segments may but need not be fully processed and transferred before processing is begun for a subsequent segment or set of segments. Thus, processing may be performed in a pipelined manner, and a plurality of segments may be in various stages of the transfer process at any given time.

[0045] In some embodiments, when the content transfer system completes respective operations of method 300, such as (but without limitation) reading data into volatile memory (306), erasing (308) the selected data from NVM A, storing (312) data in NVM B, and erasing data from volatile memory, a status table or log (e.g., stored in or by the content transfer system) is updated to reflect the completion of each respective operation and, optionally, the time at which the respective operation was performed. In some embodiments, such updating is performed by transfer status module 114, transfer status module 134 (Figure 1), or transfer status module 214 (Figure 2).

[0046] Figures 4A and 4B illustrate conceptual flowchart representations of methods of content transfer and return across a network without reproduction, in accordance with some embodiments. In particular, Figure 4A illustrates a conceptual flowchart representation of a method of content transfer in accordance with some embodiments, and Figure 4B illustrates a conceptual flowchart representation of a method of content return, in accordance with some embodiments.

[0047] With respect to Figure 4A, in some embodiments, method 400a is performed by a content transfer system, such as by content transfer system 100. In some embodiments, method 400a is performed by a plurality of client-servers (e.g., client-server 110 and client-server 130, Figure 1) communicating via a network (e.g., communications network 160) to transfer content between non-volatile memory in a first client-server (e.g., NVM 120 of client-server 110, Figure 1) and non-volatile memory in a second client-server (e.g., NVM 140 of client-server 130, Figure 1).

[0048] The method begins, in some embodiments, with content (e.g., data 121, Figure 1) being stored (402) in a first non-volatile storage medium NVM A in a first client-server A (e.g., NVM 120 of client-server 110, Figure 1). As shown in Figure 4A, in some embodiments, the content is stored as encrypted data. In some embodiments, a respective portion of encrypted data has a respective corresponding key that is used to encrypt and/or decrypt the data. In some embodiments, transferring data includes transferring both the data

and its corresponding key(s). As shown in Figure 4A, in some embodiments, the content stored in NVM A includes encrypted data and one or more corresponding keys.

[0049] In some embodiments, as described above with reference to Figure 3, the content is stored as a content file, optionally including a plurality of data segments (e.g., chunks 123-1, 123-2 through 123-n), and in some embodiments the content is transferred all at once or one or more segments at a time. Thus, in some embodiments in which a content file is optionally transferred in segments, the content transfer system selects (404) a next data segment, or a next subset of a plurality of data segments, of the content data to be transferred. In addition, in some embodiments, each respective segment of a content file has a respective corresponding key.

[0050] Next, the content transfer system reads (406) the selected data (or data segment) and its corresponding key from NVM A into a first volatile memory A (e.g., volatile memory 125, Figure 1).

[0051] After the selected data and key is read into volatile memory A, in some embodiments, the content transfer system optionally converts (408) a format of the selected data, as described above with reference to Figure 3. In some embodiments, if the selected data that has been read into volatile memory A is encrypted, format conversion includes decrypting the selected data using its corresponding key. One or more forms of format conversion may be performed on the selected data either at volatile memory A or after the selected data is transferred to a second volatile memory B, as described herein with reference to operation 410. In some embodiments, format conversion may be performed in part at volatile memory A and in part at volatile memory B.

[0052] In some embodiments, operation 404, 406 or 408 includes generating a key for the selected data, for example using key generator 115 (Figure 1), or accessing a key for the selected data previously generated using a key generator such as key generator 115, and encrypting the selected data using that key.

[0053] Next, the content transfer system transmits (410) the selected data and its corresponding key from volatile memory A in client-server A (e.g., volatile memory 125 of client-server 110, Figure 1) to a second volatile memory B in a second client-server B (e.g., volatile memory 145 of client-server 130, Figure 1). In some embodiments, the selected data and its corresponding key are transmitted via a network (e.g., communications network 160, Figure 1). In conjunction with the transmission, the selected data and its corresponding key

are received and stored (412) in volatile memory B. In some embodiments, such as those in which one or more forms of format conversion were performed on the selected data, the data transmitted from the first volatile memory A to the second volatile memory B is corresponding data, in that it corresponds to the selected data but is in a different format, for example.

[0054] Next, the content transfer system erases (414) at least the corresponding key for the selected data from NVM A. More generally, after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory B, the content transfer system erases at least a portion of the selected data (e.g., the corresponding key for the selected data) from the first non-volatile storage medium. Thus, even if the selected data continues to be stored in an encrypted format in NVM A after its corresponding key is erased, the encrypted selected data cannot be decrypted without its corresponding key, and as such cannot be perceived or reproduced or otherwise communicated or played back on an output device. Erasing the corresponding key for the selected data from NVM A prior to the corresponding key being stored in another non-volatile memory or persistent storage thereby erases the "copy" in NVM A of the content (or portion thereof) corresponding to the selected data.

[0055] After at least the corresponding key for the selected data is erased from NVM A (414), the content transfer system stores (416) the corresponding data (corresponding to the selected data and its corresponding key) in a second non-volatile storage medium NVM B in client-server B (e.g., NVM 140 of client-server 130, Figure 1). Because the corresponding data, corresponding to the selected data and its corresponding key, are stored in the second NVM B after erasing at least the corresponding key from the first NVM A, at no point does more than one copy (i.e., persistent fixation in a tangible medium) of the content corresponding to the selected data exist between NVM A and NVM B. More generally, the portion of the content data (e.g., the corresponding key for the selected data) in the first non-volatile storage medium is not concurrently stored with the selected data and its corresponding key in the second non-volatile storage medium.

[0056] Next, after the corresponding data, corresponding to selected data and its corresponding key, are stored in the second NVM B, the content transfer system erases the selected data and its corresponding key from the first volatile memory A (418) and the second volatile memory B (420). Alternatively, the content transfer system erases the selected data and its corresponding key from the first volatile memory A (418) after the

corresponding data, corresponding to the selected data and its corresponding key, have been transmitted to the second volatile memory B (410), and erases the corresponding data from the second volatile memory B (420) after the corresponding data are stored in the second NVM B. Thus, the selected data and its corresponding key are erased from the first volatile memory A after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium. Erasing the selected data and its corresponding key from volatile memory A and volatile memory B need not be done in any particular order with respect to each other and may be done concurrently.

[0057] Optionally, in some embodiments in which content is transferred in segments, the content transfer system repeats operation 404 and subsequent operations of method 400a for a next data segment or set of segments. More generally, in some embodiments operations 404 to 420 are repeated for successive segments of a data set or content file until the entire data set or content file has been transferred from NVM A to NVM B. Furthermore, as Figure 4A shows an example embodiment in which operation 404 is repeated for a next data segment after operation 410 is performed on a prior data segment, those of ordinary skill in the art will recognize that a respective segment or set of segments may but need not be fully processed and transferred before processing is begun for a subsequent segment or set of segments, as discussed above with reference to Figure 3.

[0058] In some embodiments, after method 400a is performed a first time, thereby transferring a content file or data set from a first non-volatile memory to a second non-volatile memory, method 400a is repeated or performed a second time so as to transfer the same content file or data set from the second non-volatile memory to a third non-volatile memory distinct from the first and second non-volatile memory. For example, after the content file has been transferred to the second non-volatile memory, a user of the second non-volatile memory may play, view or otherwise utilize the content file in the second non-volatile memory. Sometime after that, the user of the second non-volatile memory initiates performance of method 400a so as to transfer the content file from the second non-volatile memory to the third non-volatile memory. After the content file has been transferred to the third non-volatile memory, a user of the third non-volatile memory may play, view or otherwise utilize the content file in the third non-volatile memory.

[0059] Figure 4B illustrates a conceptual flowchart representation of a method 400b of content return, in which content is returned from a second non-volatile memory to a first non-volatile memory, in accordance with some embodiments. In some embodiments, method

400b is performed by a content transfer system (e.g., content transfer system 100, Figure 1). In some embodiments, method 400b is performed by a plurality of client-servers (e.g., client-server 110 and client-server 130, Figure 1) communicating via a network (e.g., communications network 160) to return content from non-volatile memory in a second client-server (e.g., NVM 140 of client-server 130, Figure 1) to non-volatile memory in a first client-server (e.g., NVM 120 of client-server 110, Figure 1).

[0060] The method begins, in some embodiments, with content being stored (422) in (i.e., already stored or "resident" in) a second non-volatile storage medium NVM B in a second client-server B (e.g., NVM 140 of client-server 130, Figure 1). As shown in Figure 4B, and as described above with reference to Figure 4A, in some embodiments, the content is stored as encrypted data and one or more corresponding keys, wherein a respective portion of encrypted data has a respective corresponding key.

[0061] In some embodiments, as described above with reference to Figures 3 and 4A, the content is stored as a content file including a plurality of data segments. In some such embodiments, the content transfer system selects (424) a next data segment of the content data to be transferred, wherein the selected next data segment has a respective corresponding key. In some embodiments, a next set of data segments is selected to be transferred, where each respective data segment is encrypted and has a respective corresponding key for decrypting the respective data segment.

[0062] Next, the content transfer system reads (426) the corresponding key for the selected data from NVM B to a second volatile memory B in client-server B (e.g., volatile memory 145 of client-server 130, Figure 1).

[0063] Next, the content transfer system transmits (428) the corresponding key for the selected data from volatile memory B in client-server B (e.g., volatile memory 145 of client-server 130, Figure 1) to a first volatile memory A in a first client-server A (e.g., volatile memory 125 of client-server 110, Figure 1). In some embodiments, the corresponding key is transmitted via a network (e.g., communications network 160, Figure 1). In conjunction with the transmission, the corresponding key is received and stored (430) in volatile memory A. More generally, the first volatile memory A receives data from the second volatile memory B including at least a portion of the content data corresponding to the selected data. In some embodiments, the "portion" is or includes the corresponding key for the selected data.

[0064] Next, in some embodiments, after the corresponding key is received and stored in volatile memory A (e.g., returned to volatile memory A) (430), the content transfer system erases (432) the at least the key corresponding to the selected data from NVM B. Optionally, the selected data is also erased (432) after the corresponding key is received and stored in volatile memory A. However, in embodiments in which the selected data is retained in NVM B in client-server B in an encrypted format that requires the corresponding key for decryption, erasing the corresponding key for the selected data from NVM B prior to the corresponding key being stored in another non-volatile memory or persistent storage device erases the "copy" in NVM B, on client-server B, of the content corresponding to the selected data.

[0065] In some circumstances, or some embodiments, retaining the selected data in NVM B in an encrypted format that requires the corresponding key for decryption, without retaining the corresponding key in NVM B, can be useful because it facilitates transfer of a "copy" of the selected data back to client-server B. In particular, if the selected data in encrypted format is retained in NVM B, a "copy" of the selected data can be transferred back to NVM B by transferring the corresponding key from a current holder (e.g., NVM A in client-server A) of that key to NVM B.

[0066] In some embodiments in which the selected data is stored in NVM B in a format that is unencrypted and/or playable on an output device, the "copy" of the content corresponding to the selected data is erased (432) by erasing both the selected data and its corresponding key.

[0067] After the selected data and its corresponding key are erased from NVM B (432), the content transfer system stores (434) the corresponding key in a first non-volatile memory NVM A in the first client-server A (e.g., NVM 120 of client-server 110, Figure 1) from the first volatile memory A. In some embodiments, storing the corresponding key in NVM A returns the corresponding key to client-server A, which in some embodiments restores the "copy" of the content corresponding to the selected data back to client-server A after the "copy" is erased from client-server B. As noted above, returning the corresponding key to client-server A without also returning the selected data allows the content to be returned quickly and reduces the amount of data that needs to be transferred between client-server B and client-server A. Moreover, because the corresponding key is stored in the first NVM A after erasing the corresponding key (and optionally the selected data) from the second NVM B, at no point does more than one copy of the content corresponding to the

selected data exist between NVM A and NVM B. More generally, the corresponding data (e.g., the content corresponding to the selected data) is not stored in the second non-volatile storage medium concurrently with the portion (e.g., the corresponding key) being stored in the first non-volatile storage medium.

[0068] Next, the content transfer system erases the corresponding key from the second volatile memory B (436) and erases the corresponding key from the first volatile memory A (438). Alternatively, the content transfer system erases the corresponding key from the second volatile memory B (436) after the corresponding key has been transmitted to the first volatile memory A (428), or the corresponding key has been received and stored in the first volatile memory (430), and erases the corresponding key from the first volatile memory A (438) after the corresponding key is stored in the first NVM A (434). Optionally, erase operation 436 includes erasing the selected data, if present in the second volatile memory B, from the second volatile memory B. These operations, 436 and 438, may be done in either order or concurrently.

[0069] In some embodiments, the first non-volatile storage medium and the first volatile memory (e.g., NVM 120 and volatile memory 125, respectively, Figure 1) are located at a host device (e.g., client-server 110, Figure 1), and the second non-volatile storage medium and the second volatile memory (e.g., NVM 140 and volatile memory 145, Figure 1) are located at a client device distinct from the host device (e.g., client-server 130, distinct from client-server 110, Figure 1).

[0070] It is noted that, while Figure 4B shows the respective key for the selected data segment being transmitted, in some embodiments, the selected data segment may also be transmitted in addition to its respective key. However, those skilled in the art will recognize that, in some embodiments in which the selected data, without its respective key, is already stored in an encrypted format in NVM A, as described above with reference to Figure 4A, the content transfer system need only transmit the respective key, and that transmitting the respective key would be sufficient to restore the "copy" of the content corresponding to the selected data to NVM A after the NVM B "copy" no longer exists.

[0071] Optionally, in some embodiments in which content is transferred in segments, the content transfer system repeats operation 424 and subsequent operations of method 400b for a next data segment or set of segments. More generally, in some embodiments operations 424 to 438 are repeated for successive segments of a data set or content file until the entire data set or content file has been transferred from NVM A to NVM B, or all the keys

corresponding to the entire data set or content file have been transferred from NVM A to NVM B. As Figure 4B shows an example embodiment in which operation 424 is repeated for a next data segment after operation 428 is performed on a prior data segment, and as discussed above with reference to Figures 3 and 4A, those of ordinary skill in the art will recognize that a respective segment or set of segments may but need not be fully processed and transferred before processing is begun for a subsequent segment or set of segments.

[0072] In some embodiments, when the content transfer system completes respective operations of method 400a and/or method 400b, such as any of the operations described above, a status table or log (e.g., stored in or by the content transfer system) is updated to reflect the completion of each respective operation and, optionally, the time at which the respective operation was performed. In some embodiments, such updating is performed by transfer status module 114, transfer status module 134 (Figure 1), or transfer status module 214 (Figure 2).

[0073] Figures 5A-5B illustrate a flowchart representation of a method 500 of content transfer without reproduction, in accordance with some embodiments. With reference to Figure 1, in some embodiments, method 500 is performed by a content transfer system, such as content transfer system 100, or a component thereof such as client-server 110 (Figure 1). In some embodiments, some of the operations (or alternatively, steps) of method 500 are performed at a first client-server (e.g., client-server 110, Figure 1) that is operatively coupled with a second client-server (e.g., client-server 130, Figure 1), such as via a communications network (e.g., communications network 160, Figure 1). In some embodiments, the method 500 is governed by instructions that are stored in a non-transitory computer readable storage medium and that are executed by one or more processors of a device, such as the one or more processing units (CPUs) 222-1 of client-server 110 (Figure 2) and/or one or more processing units of client-server 130 (not shown).

[0074] With reference to Figure 2, in some embodiments, the operations of method 500 are performed, at least in part, by a client-server (e.g., client-server 110, Figure 2) including a content transfer module (e.g., content transfer module 210, including an encryption/decryption module 212, transfer status 214, and key generator 216, Figure 2) and using volatile memory (e.g., volatile memory 125, Figure 2) and one or more non-volatile memories (e.g., NVM 120 and/or NVM 220, Figure 2). For ease of explanation, the following describes method 500 as performed by a content transfer system.

[0075] With reference to Figure 5A, in some embodiments, the content transfer system (e.g., content transfer system 100, Figure 1) reads (502) first data (e.g., data 121, or a respective chunk 123-i thereof, Figure 1) stored in a first non-volatile storage medium (e.g., NVM 120 of client-server 110, Figure 1) from the first non-volatile storage medium to volatile memory (e.g., volatile memory 125 and/or volatile memory 145, Figure 1). In some embodiments, the non-volatile storage medium is a flash memory device, CD (compact disc), DVD ("digital versatile disc" or "digital video disc"), Blu-Ray Disc™ (a trademark of Blu-Ray Disc Association), audio tape or video tape. In some embodiments, the non-volatile storage medium may be an analog medium, such as a book or photograph, wherein reading the first data may include an analog-to-digital data conversion.

[0076] Next, in some embodiments, the content transfer system erases (504) the first data from the first non-volatile storage medium.

[0077] Next, in some embodiments, after erasing the first data from the first non-volatile storage medium, the content transfer system stores (506) corresponding data (e.g., data 141, or a respective chunk 143-i thereof, Figure 1) in a second non-volatile storage medium (e.g., NVM 220 of client-server 110, Figure 2, or NVM 140 of client-server 130, Figure 1). In some embodiments, the corresponding data includes (508) the first data.

[0078] In some embodiments, after reading the first data from the first non-volatile storage medium to the volatile memory, the content transfer system decrypts (510) the first data. In some such embodiments, the corresponding data stored in the second non-volatile storage medium includes the decrypted first data.

[0079] In some embodiments, after reading the first data from the first non-volatile storage medium to the volatile memory, the content transfer system decrypts (512) the first data to produce a plurality of decrypted data chunks and, for each data chunk, encrypts the respective data chunk using a respective key associated with the respective data chunk. In some such embodiments, the corresponding data stored in the second non-volatile storage medium includes the encrypted data chunks and the respective keys.

[0080] In some embodiments, a key is generated for each data chunk using key generator 115 or 135 (Figure 1), key generator 216 (Figure 2), or any suitable key generating mechanism, such as a pseudo-random number generator. In some embodiments, if the first data is not initially encrypted when read from the first non-volatile storage medium, a distinct key is generated for each data segment of the first data, using a suitable key generator. This

can be done in conjunction with operation 404 or 406 of method 400a, or operation 502 or 506 of method 500. Furthermore, in some embodiments, if the first data is initially encrypted, and is decrypted by operation 512 using a previously obtained key, a new key can be generated for the first data or any segment of the first data, using any of the aforementioned key generators, and that new key is used to encrypt the first data, or a segment of the first data, during operation 512.

[0081] Next, in some embodiments, after storing the corresponding data (e.g., data 141, or a respective chunk 143-i thereof, Figure 1) in the second non-volatile storage medium, the content transfer system erases (514) the first data (e.g., data 121, or a respective chunk 123-i thereof, Figure 1) from the volatile memory. The first data, or any segment of the first data, stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored (516) at any point in time during the data transfer process. In some embodiments, the first non-volatile storage medium is located at a first physical medium, and the second non-volatile storage medium is located at a second physical medium (518), such as those described above with respect to operation 502. Similarly, in some embodiments, the first non-volatile storage medium is located at a first client-server (e.g., client-server 110, Figure 1), and the second non-volatile storage medium is located at a second client-server (e.g., client-server 130, Figure 1).

[0082] With reference to Figure 5B, in some embodiments, the first data stored in the first non-volatile storage medium corresponds (520) to a segment (e.g., a respective chunk 123-i of data 121, Figure 1) of a data set (e.g., content file) stored in the first non-volatile storage medium, the data set includes a plurality of segments (e.g., chunks 123-1, 123-2 through 123-n of data 121, Figure 1), and the method includes repeating the method for each of the plurality of segments of the data set. In some embodiments, and as discussed above with reference to Figures 3 and 4A-4B, an entire data set may be transferred all at once, or a data set may be transferred one or more segments at a time.

[0083] In some embodiments, a rate at which method 500 is repeated is limited in accordance with a predefined limit on an amount of data concurrently in transit between two non-volatile storage media or two computer systems. For example, the amount of data in transit at any one time may be limited to a predefined percentage (e.g., 10% or 20%) of a data set, or alternatively, the amount of data in transit at any one time may be limited to a

predefined quantity of data, such as 10 megabytes, 100 megabytes, or other appropriate quantity.

[0084] As those skilled in the art will recognize, in some embodiments, the methods described herein to transfer content from a first non-volatile storage medium to a second non-volatile storage medium may be repeated to transfer the content from the second non-volatile storage medium to a third non-volatile storage medium. In some embodiments, after content is transferred from a first client-server to a second client-server, the method may be repeated to transfer the content from the second client-server to a third client-server, and so on, and, in some embodiments, the content may eventually be returned to the first client-server.

[0085] The foregoing description, for purpose of explanation, has been described with reference to specific embodiments. However, the illustrative discussions above are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated.

What is claimed is:

1. A method of transferring data, comprising:

reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory;

erasing the first data from the first non-volatile storage medium;

after erasing the first data from the first non-volatile storage medium, storing corresponding data in a second non-volatile storage medium; and

after storing the corresponding data in the second non-volatile storage medium, erasing the first data from the volatile memory;

wherein the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

2. The method of claim 1, wherein the corresponding data includes the first data.

3. The method of claim 1, including, after reading the first data from the first non-volatile storage medium to the volatile memory, decrypting the first data, wherein the corresponding data stored in the second non-volatile storage medium includes the decrypted first data.

4. The method of claim 1, including:

after reading the first data from the first non-volatile storage medium to the volatile memory, decrypting the first data to produce a plurality of decrypted data chunks; and

for each data chunk, encrypting the respective data chunk using a respective key associated with the respective data chunk;

wherein the corresponding data stored in the second non-volatile storage medium includes the encrypted data chunks and the respective keys.

5. The method of any of claims 1-4, wherein the first data stored in the first non-volatile storage medium corresponds to a segment of a data set stored in the first non-volatile storage medium, the data set includes a plurality of segments, and the method includes repeating the method for each of the plurality of segments of the data set.

6. The method of any of claims 1-5, wherein the first non-volatile storage medium is located at a first physical medium, and the second non-volatile storage medium is located at a second physical medium.

7. A computer system, comprising:

one or more processors;

memory; and

one or more programs stored in the memory, the one or more programs including instructions for:

reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory;

erasing the first data from the first non-volatile storage medium;

after erasing the first data from the first non-volatile storage medium, storing corresponding data in a second non-volatile storage medium; and

after storing the corresponding data in the second non-volatile storage medium, erasing the first data from the volatile memory;

wherein the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

8. The system of claim 7, wherein the corresponding data includes the first data.

9. The system of claim 7, including instructions for, after reading the first data from the first non-volatile storage medium to the volatile memory, decrypting the first data, wherein the corresponding data stored in the second non-volatile storage medium includes the decrypted first data.

10. The system of claim 7, including instructions for:

after reading the first data from the first non-volatile storage medium to the volatile memory, decrypting the first data to produce a plurality of decrypted data chunks; and

for each data chunk, encrypting the respective data chunk using a respective key associated with the respective data chunk;

wherein the corresponding data stored in the second non-volatile storage medium includes the encrypted data chunks and the respective keys.

11. The system of any of claims 7-10, wherein the first data stored in the first non-volatile storage medium corresponds to a segment of a data set stored in the first non-volatile storage medium, the data set includes a plurality of segments, and the system includes instructions for repeating the reading, erasing, storing, and erasing operations with respect to each of the plurality of segments of the data set.

12. The system of any of claims 7-11, wherein the first non-volatile storage medium is located at a first physical medium, and the second non-volatile storage medium is located at a second physical medium.

13. A computer system, comprising:

means for reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory;

means for erasing the first data from the first non-volatile storage medium;

means for storing corresponding data in a second non-volatile storage medium after erasing the first data from the first non-volatile storage medium; and

means for erasing the first data from the volatile memory after storing the corresponding data in the second non-volatile storage medium;

wherein the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

14. The computer system of claim 13, including means for performing the method of any of claims 1-6.

15. A non-transitory computer readable storage medium storing one or more programs configured for execution by a computer system, the one or more programs including instructions that when executed by one or more processors of the computer system cause the computer system to:

read first data stored in a first non-volatile storage medium from the first non-volatile storage medium to volatile memory;

erase the first data from the first non-volatile storage medium;

after erasing the first data from the first non-volatile storage medium, store corresponding data in a second non-volatile storage medium; and

after storing the corresponding data in the second non-volatile storage medium, erase the first data from the volatile memory;

wherein the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

16. The non-transitory computer readable storage medium of claim 15, wherein the corresponding data includes the first data.

17. The non-transitory computer readable storage medium of claim 15, wherein the one or more programs include instructions to, after reading the first data from the first non-volatile storage medium to the volatile memory, decrypt the first data, wherein the corresponding data stored in the second non-volatile storage medium includes the decrypted first data.

18. The non-transitory computer readable storage medium of claim 15, wherein the one or more programs include instructions to:

after reading the first data from the first non-volatile storage medium to the volatile memory, decrypt the first data to produce a plurality of decrypted data chunks; and

for each data chunk, encrypt the respective data chunk using a respective key associated with the respective data chunk;

wherein the corresponding data stored in the second non-volatile storage medium includes the encrypted data chunks and the respective keys.

19. The non-transitory computer readable storage medium of any of claims 15-18, wherein the first data stored in the first non-volatile storage medium corresponds to a segment of a data set stored in the first non-volatile storage medium, the data set includes a plurality of segments, and the one or more programs include instructions to repeat the reading, erasing, storing, and erasing operations with respect to each of the plurality of segments of the data set.

20. The non-transitory computer readable storage medium of any of claims 15-19, wherein the first non-volatile storage medium is located at a first physical medium, and the second non-volatile storage medium is located at a second physical medium.

21. A method of transferring data, comprising:

reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory;

transmitting corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium;

after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erasing at least a portion of the first data from the first non-volatile storage medium; and

after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erasing the first data from the first volatile memory;

wherein the corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and wherein the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

22. The method of claim 21, including:

receiving, in the first volatile memory, data from the second volatile memory including at least a portion of the corresponding data, wherein the received data was read from the second non-volatile storage medium to the second volatile memory;

after the corresponding data is erased from the second non-volatile storage medium, storing the received data in the first non-volatile storage medium; and

after storing the received data in the first non-volatile storage medium, erasing the received data from the first volatile memory;

wherein the received data is erased from the second volatile memory after the received data is received in the first volatile memory or after the received data is stored in the first non-volatile storage medium, and wherein the corresponding data stored in the second non-volatile storage medium and the received data stored in the first non-volatile storage medium are not concurrently stored.

23. The method of any of claims 21-22, wherein the first non-volatile storage medium and first volatile memory are located at a host device, and the second non-volatile storage

medium and second volatile memory are located at a client device distinct from the host device.

24. The method of any of claims 21-23, wherein the first data includes one or more respective keys, each key for decrypting a respective encrypted data chunk stored in at least the first non-volatile storage medium.

25. The method of any of claims 21-23, wherein the first data includes one or more encrypted data chunks, and for each respective data chunk of the one or more encrypted data chunks, a respective key associated with the respective data chunk, and the portion of the first data erased from the first non-volatile storage medium includes the associated keys.

26. The method of claim 25, including:

after reading the first data from the first non-volatile storage medium to the first volatile memory, decrypting each data chunk, wherein the corresponding data includes the decrypted data chunks and the associated keys.

27. The method of any of claims 21-26, wherein the first data stored in the first non-volatile storage medium corresponds to a segment of a data set stored in the first non-volatile storage medium, the data set includes a plurality of segments, and the method includes repeating the method for each of the plurality of segments of the data set.

28. The method of claim 27, wherein a rate at which the method is repeated is limited in accordance with a predefined limit on an amount of data concurrently in transit between the second non-volatile storage medium and the first non-volatile storage medium.

29. The method of any of claims 21-28, including:

repeating said method so as to transfer said corresponding data from the second non-volatile memory to a third non-volatile memory, wherein, during said transfer, no portion of the corresponding data is concurrently stored in both the second non-volatile memory and the third non-volatile memory.

30. A computer system, comprising:

one or more processors;

memory; and

one or more programs stored in the memory, the one or more programs including instructions for:

reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory;

transmitting corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium;

after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erasing at least a portion of the first data from the first non-volatile storage medium; and

after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erasing the first data from the first volatile memory;

wherein the corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and wherein the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

31. The computer system of claim 30, wherein the one or more programs include instructions for performing the method of any of claims 22-29.

32. A computer system, comprising:

means for reading first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory;

means for transmitting corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium;

means for erasing at least a portion of the first data from the first non-volatile storage medium after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory; and

means for erasing the first data from the first volatile memory after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium;

wherein the corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and wherein the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

33. The computer system of claim 32, including means for performing the method of any of claims 22-29.

34. A non-transitory computer readable storage medium storing one or more programs configured for execution by a computer, the one or more programs including instructions that when executed by one or more processors of the computer system cause the computer system to:

read first data stored in a first non-volatile storage medium from the first non-volatile storage medium to a first volatile memory;

transmit corresponding data from the first volatile memory to a second volatile memory, wherein the corresponding data is configured to be stored in a second non-volatile storage medium;

after the corresponding data is read from the first non-volatile storage medium to the first volatile memory, or after the corresponding data is transmitted to the second volatile memory, erase at least a portion of the first data from the first non-volatile storage medium; and

after the corresponding data is transmitted to the second volatile memory, or after the corresponding data is stored in the second non-volatile storage medium, erase the first data from the first volatile memory;

wherein the corresponding data is erased from the second volatile memory after the corresponding data is stored in the second non-volatile storage medium, and wherein the portion of the first data stored in the first non-volatile storage medium and the corresponding data stored in the second non-volatile storage medium are not concurrently stored.

35. The non-transitory computer readable storage medium of claim 34, wherein the one or more programs include instructions that when executed by the one or more processors of the computer system cause the computer system to perform the method of any of claims 22-29.

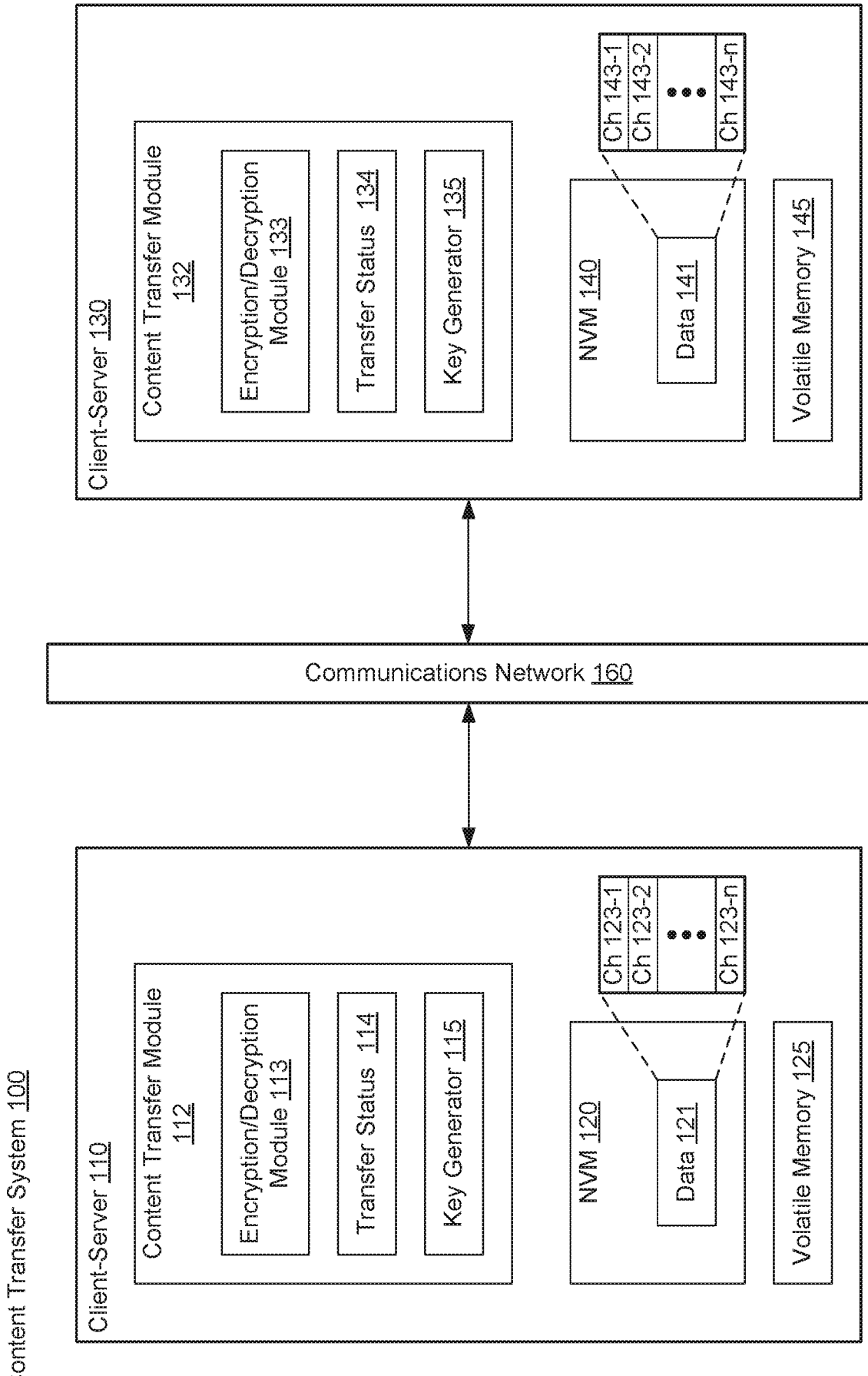
Content Transfer System 100
Client-Server 110
Content Transfer Module 112
Encryption/Decryption Module 113
Transfer Status 114
Key Generator 115
NVM 120
Data 121
Ch 123-1
Ch 123-2
Ch 123-n
Volatile Memory 125
Communications Network 160
Client-Server 130
Content Transfer Module 132
Encryption/Decryption Module 133
Transfer Status 134
Key Generator 135
NVM 140
Data 141
Ch 143-1
Ch 143-2
Ch 143-n
Volatile Memory 145

Figure 1

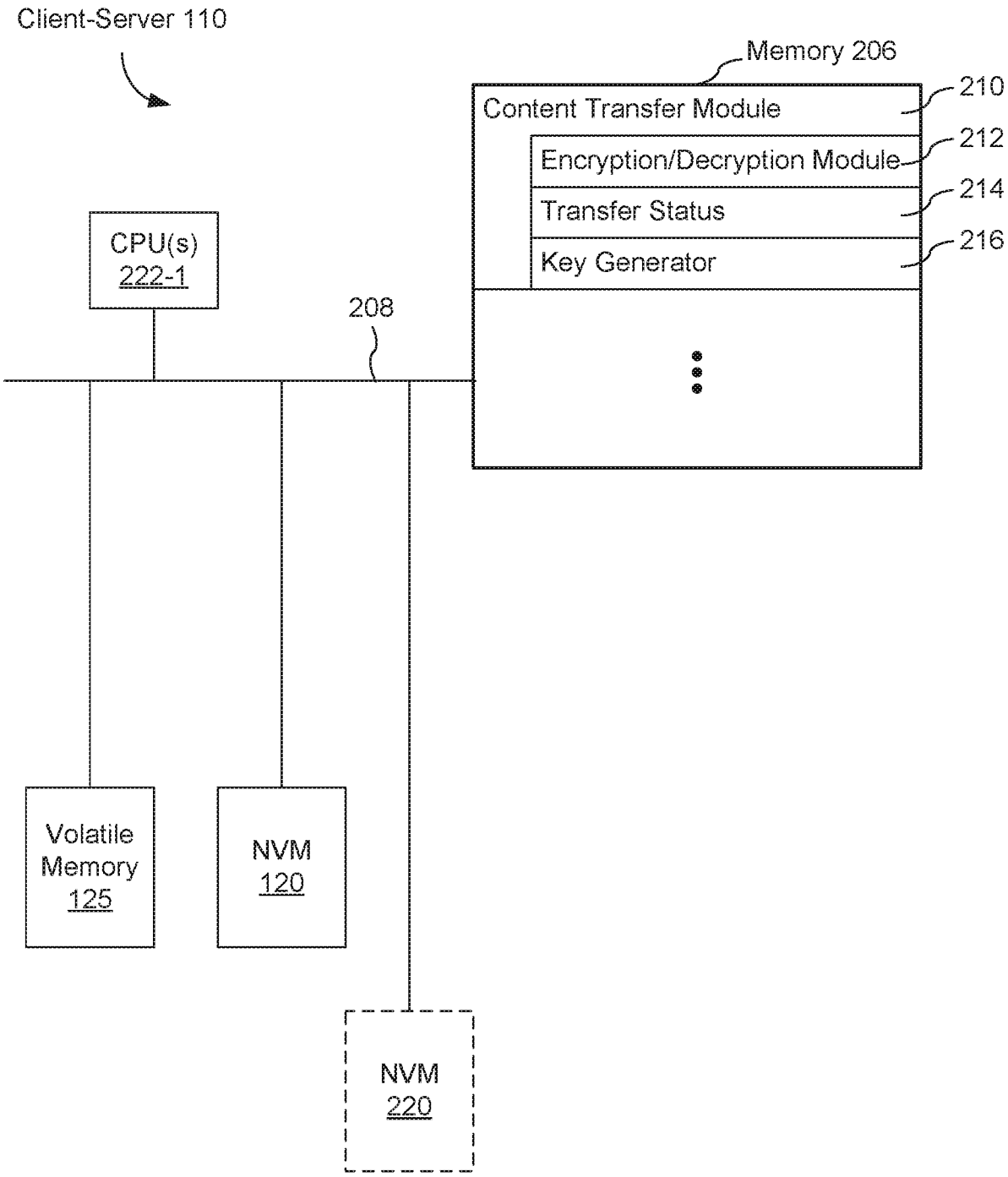
Client-Server 110
Memory 206
Content Transfer Module
210
Encryption/Decryption Module
212
Transfer Status
214
Key Generator
216
CPU(s)
222-1
208
Volatile
Memory
125
NVM
120
NVM
220

Figure 2

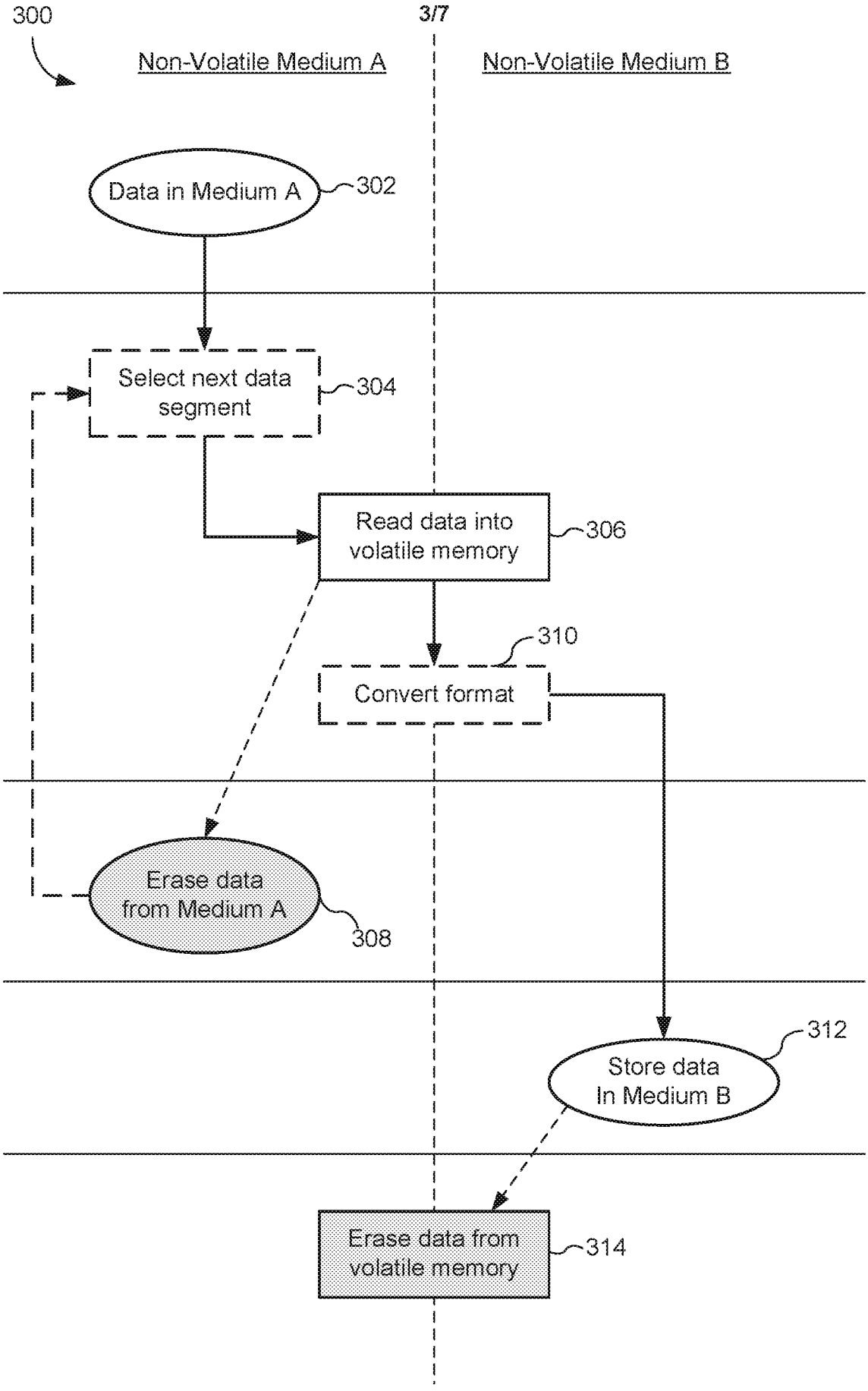
300
Non-Volatile Medium A
Non-Volatile Medium B
Data in Medium A
302
Select next data segment
304
Read data into volatile memory
306
310
Convert format
Erase data from Medium A
308
312
Store data In Medium B
Erase data from volatile memory
314

Figure 3

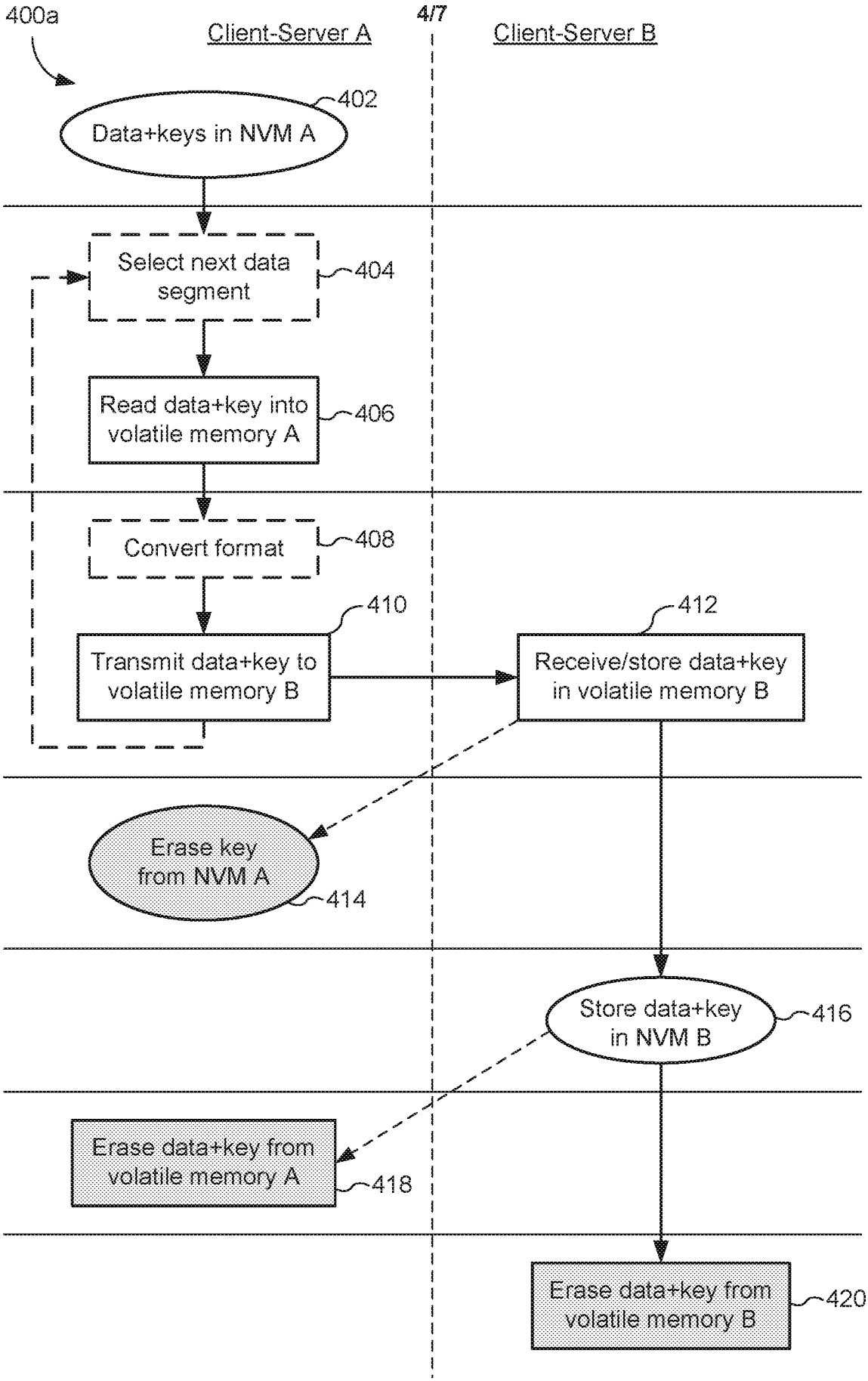
400a
4/7
Client-Server A
Client-Server B
Data+keys in NVM A
402
Select next data segment
404
Read data+key into volatile memory A
406
Convert format
408
410
Transmit data+key to volatile memory B
412
Receive/store data+key in volatile memory B
Erase key from NVM A
414
Store data+key in NVM B
416
Erase data+key from volatile memory A
418
Erase data+key from volatile memory B
420

Figure 4A

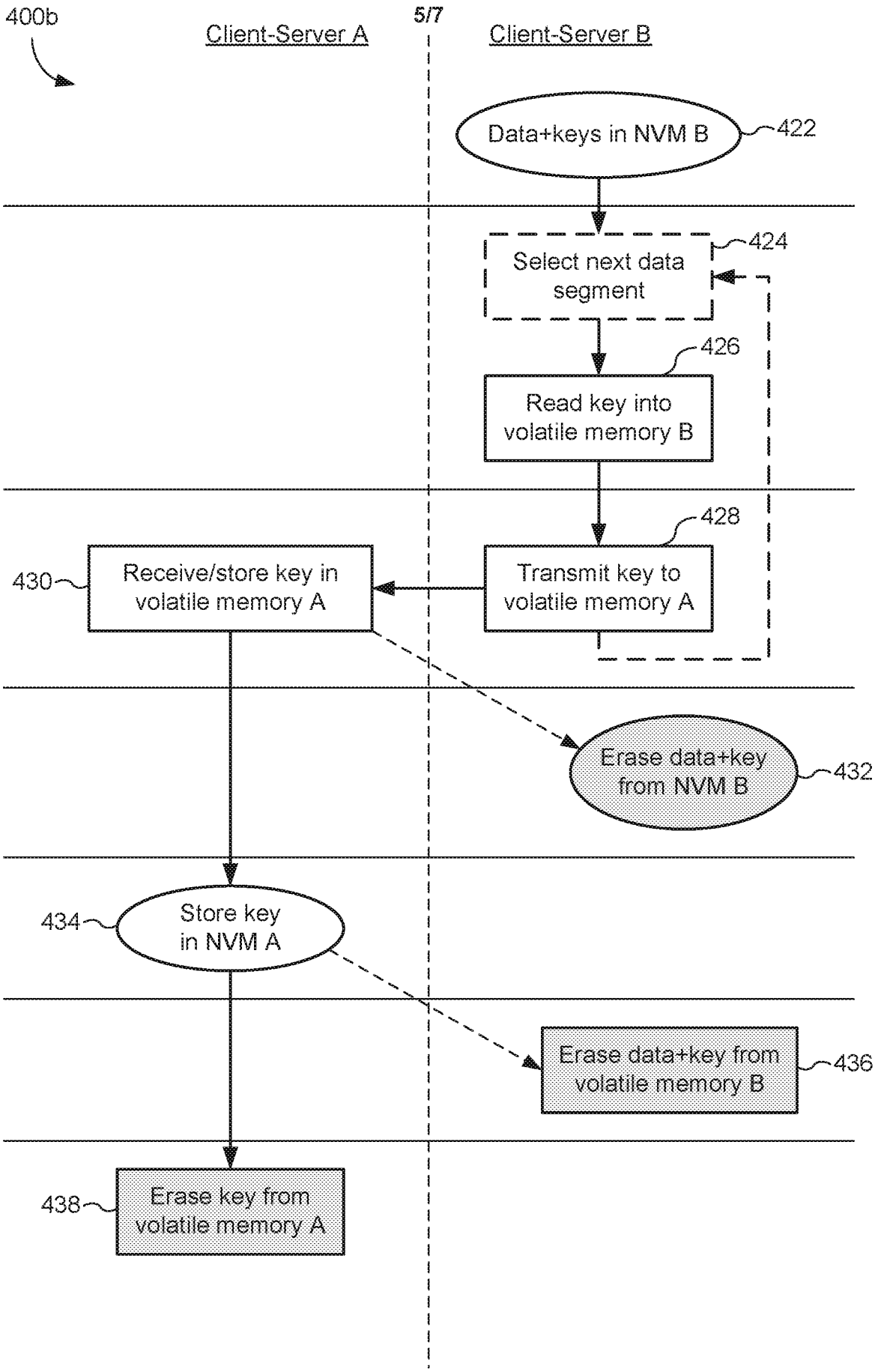
400b
Client-Server A
Client-Server B
Data+keys in NVM B
422
Select next data segment
424
Read key into volatile memory B
426
Transmit key to volatile memory A
428
Receive/store key in volatile memory A
430
Erase data+key from NVM B
432
Store key in NVM A
434
Erase data+key from volatile memory B
436
Erase key from volatile memory A
438

Figure 4B

500

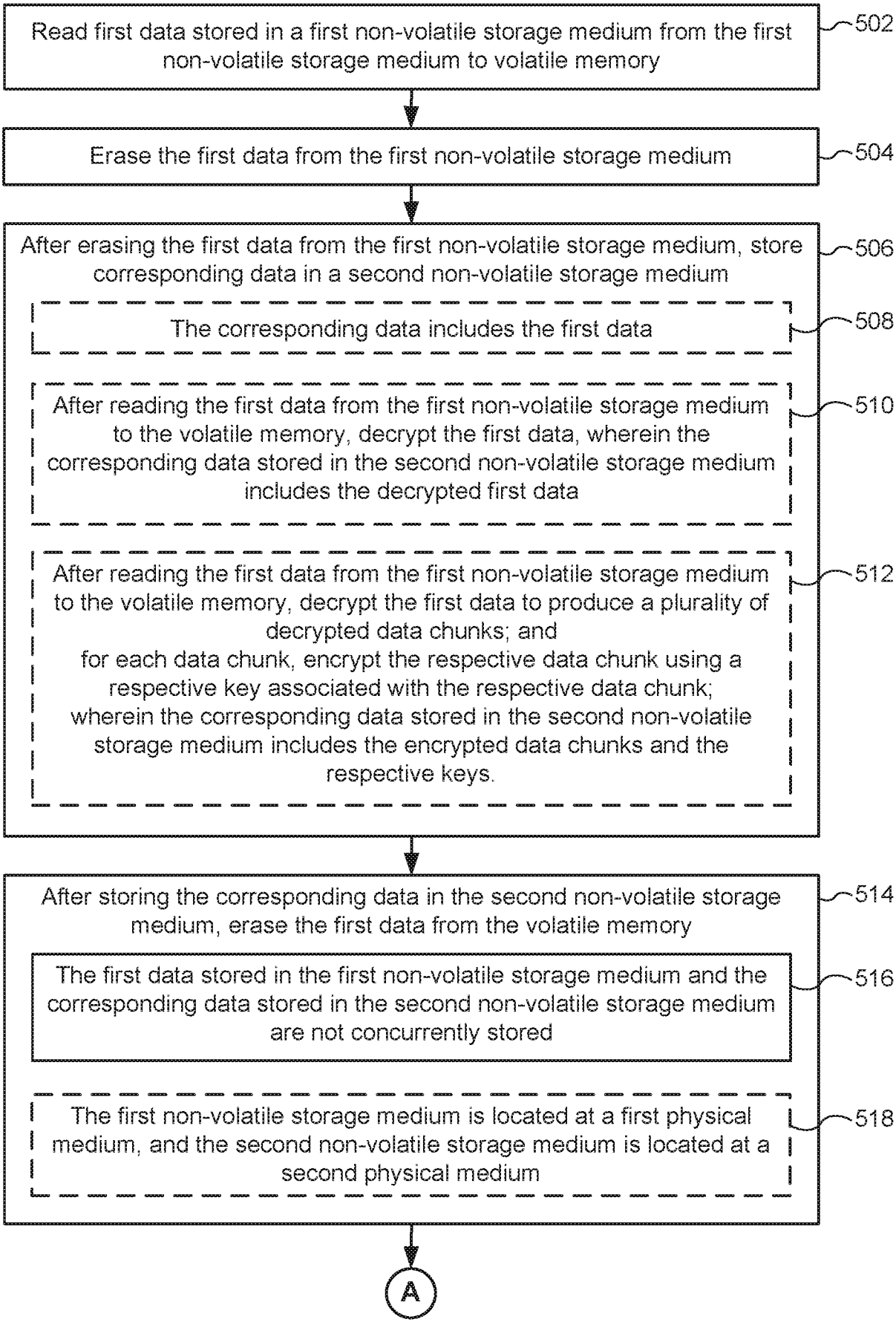

Figure 5A

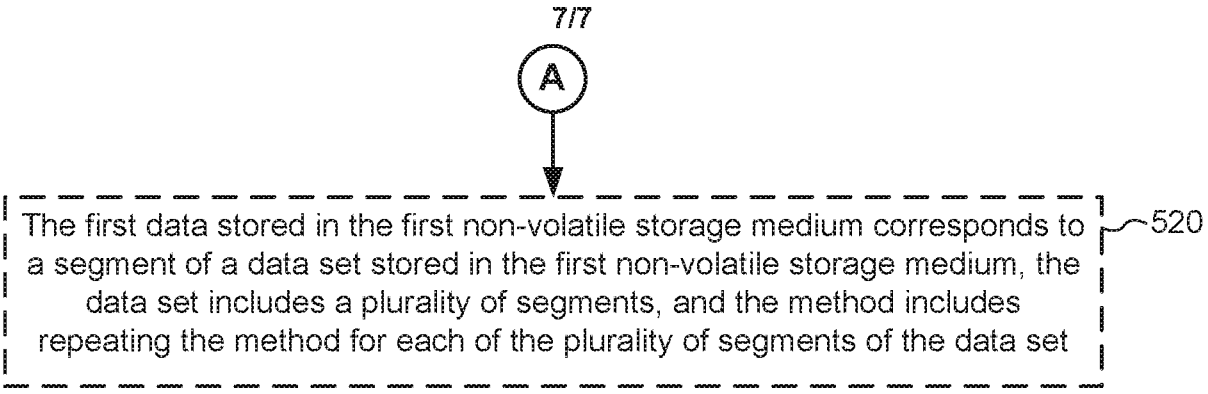
A
The first data stored in the first non-volatile storage medium corresponds to a segment of a data set stored in the first non-volatile storage medium, the data set includes a plurality of segments, and the method includes repeating the method for each of the plurality of segments of the data set
520

Figure 5B

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/028135

A. CLASSIFICATION OF SUBJECT MATTER
INV. G11B20/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04N G11B G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 742 206 A1 (RICOH KK [JP]) 10 January 2007 (2007-01-10) paragraph [0008] - paragraph [0178] -----	1-35
A	US 2012/166737 A1 (FURUICHI SANEHIRO [JP] ET AL) 28 June 2012 (2012-06-28) paragraph [0017] - paragraph [0084] -----	1-35
A	US 2007/113723 A1 (MIZUNO SHIGEHIKO [JP]) 24 May 2007 (2007-05-24) paragraph [0032] - paragraph [0105] -----	1-35

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 July 2016	05/08/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Horn, Ralph

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2016/028135

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1742206 A1	10-01-2007	EP 1742206 A1	10-01-2007
		US 2007223337 A1	27-09-2007
		WO 2005104097 A1	03-11-2005
US 2012166737 A1	28-06-2012	JP 5785390 B2	30-09-2015
		JP 2012133620 A	12-07-2012
		US 2012166737 A1	28-06-2012
US 2007113723 A1	24-05-2007	CN 1967655 A	23-05-2007
		JP 4572816 B2	04-11-2010
		JP 2007140208 A	07-06-2007
		US 2007113723 A1	24-05-2007

DECLARATION OF JOHN T. MITCHELL
Regarding
OmniQ Proposed Exemption Under 17 U.S.C. § 1201

My name is John T. Mitchell. I am one of the founding partners of OmniQ, and co-inventor of a method for *Digitally Transferring Content Across Media Without Reproduction*, Patent Application # WO 2016/168832; US 2016028135 (the "OmniQ Invention").

At about the same time as we were inventing, I worked with entire OmniQ partnership in developing a potential online video store business that would practice the OmniQ Invention. In the course of doing so, we thought it might be helpful to express our plans from the standpoint of explaining the service to a new customer, in the form of a FAQ (frequently asked questions).

Attached is a DRAFT FAQ developed from September 24, 2014, through May 25, 2015. Although it is a draft, and subject to change before launch, it is a fair and accurate representation of how we currently anticipate that our method for non-reproductive space-shifting would work, from a layperson's perspective as prospective customer, in relation to shifting motion pictures and other audiovisual works from lawfully made DVD copies.

Although the DRAFT FAQ is stamped as "CONFIDENTIAL," my partners and I have agreed to release it at this time, as an aide to understanding how a business might practice the OmniQ Invention if the exemption requested by OmniQ is granted.

If the OmniQ invention were practiced with respect to other works, such as a public library, or a university or research library, lending literary works space-shifted from a printed copy, the implementation would be identical, except for the fact that there is no TPM associated with copies of literary works printed on paper, and therefore, no need to seek an exemption.

I declare under penalty of perjury of the laws of the United States of America that the foregoing is true and correct. Executed this 18th day of December 2017 in the State of Maryland.

/s/ John T. Mitchell
John T. Mitchell

OmniQ FAQ

Legality

Q: Is it legal?

A: Yes. It is novel, and some copyright owners may want to take a closer look, but it is really no different than giving your DVD away, or selling it. Once the copyright owner makes and sells the DVD, there is no longer any right to control who gets to own it, or watch the movie that is on it. The only difference is that with OmniQ, instead of passing the movie around on a DVD, you can pass it from a DVD to a hard drive, and from one hard drive to another. But just like with a DVD (except more secure from copying), the copyright owner gets paid for the right to make that first copy and place it in circulation.

Q: How is this different from ReDigi, that was allowing resale of digital music files?

A: ReDigi was found to have been infringing the reproduction right by making copies. Even though it deleted the extra copies and tried to imitate the results of a resale market in which the seller loses ownership of the copy, the court found that it had infringed the reproduction right. In other words, nothing was being resold. Instead, copies were being made. OmniQ does not reproduce the work into copies. It just exchanges one material object for another, also known as non-reproductive space-shifting.

Q: I'm a nerd. I know that the "bits" making up a movie have to somehow make it from your hard drive to mine. Don't you have to make a copy onto my hard drive before deleting it from yours?

A: No; not at all. There is a beautiful blend of copyright law and laws of physics that allows us to move the work from one hard drive to another without making a copy first, or destroying one later. Under federal law, a movie does not become "a copy of a movie" until it is fixed in a tangible medium long enough to be perceived or reproduced. Imagine the digital bits are like ink on paper: no matter how much ink there is on the page, if the written work can be neither perceived (e.g., read) or reproduced (e.g., photocopied) from that blob of ink on the page, it is not a copy until the ink is rearranged into a way that allows one to read or reproduce the work. OmniQ is like that: If the bits can't be perceived (e.g., watching the movie) or reproduced (e.g., making a copy of the movie), then there is no copy, no matter how many bits there are.

Q: When you space-shift, don't you have to verify that the copy is complete before deleting anything from the original?

A: No. The system we use carries a risk of loss for us, but it is the equivalent of the risk that a DVD will be lost or broken if delivered by mail.

Rental

Q: When I rent a movie, can I watch it more than once before I return it?

A: Sure. It is just like when you rent a DVD that you can play as many times as you like during the rental period.

Q: May I send it to someone else to watch?

A: Not unless you send them your laptop, too. If you own a DVD, the plastic disc contains the movie, so you must send the disc to someone else in order for him or her to watch it. It is the same with OmniQ: you have to send whatever the movie is on, whether it is on your desktop computer, tablet or laptop.

Q: What if I don't return the rental movie?

A: Then it's yours. You agree to pay the normal rental fee for as long as you have it out, up to the stated replacement cost. If, at that point, you still have not returned it, then no more charges will be made, and it is yours to keep.

Q: What if my hard drive crashes and I lose everything on it?

A: Wow, bummer. We don't wish that on anyone, but if you can't return it, you bought it, just as if your dog ate the DVD. You will end up paying the replacement cost.

Q: But if my hard drive crashed, can't you just send another copy of the movie?

A: No, because we don't send copies. The U.S. Copyright Act defines "copies" as the tangible objects in which the movie ("the work") is fixed. So if you want a replacement, you either need to go to a video retailer and buy a replacement DVD, or go back to the OmniQ store to buy a replacement space-shifted DVD. In both cases we have to start with a copy made under authority of the copyright owner before we can space-shift it. We can't just make more copies.

Q: But when you send me the movie, don't you keep a copy on your server as a back-up?

A: No; of course not. We don't have the right to reproduce the movie into copies. We may have other copies of the same movie, but not the one you lost. Just like with a DVD, the copy can't be in two places at the same time. If you have it, we don't. If we

have it, you don't. So if we send it to you and you lose it, we have to go buy another one.

Q: Once I return the movie, does it take up space on my hard drive?

A: No. Once the work is space-shifted from your hard drive back to ours, the space it occupied on your hard drive is freed up – just like the space a book took up on a library shelf.

Purchase

Q: When I buy a movie, is there any limit on how many times I can watch it?

No. Just like when you buy a DVD, you can watch the space-shifted movie as often as you like for as long as you like.

Q: What happens if I quit my account, or OmniQ goes out of business?

A: No worries. You can continue to watch the movie, even when offline, when you have a closed account, or if OmniQ disappeared. You just have to keep the OmniQ app and the original drive onto which the movie was space-shifted.

Q: When I own a DVD, I can sell it, lend it, or give it away. What about a space-shifted movie?

A: You can do the same with OmniQ. The only difference is that the person you sell it to, lend it to, or give it to must also have the OmniQ app installed.

Q: Does OmniQ take a cut from my sales?

A: No. You can sell for whatever price you want. But OmniQ does charge a service fee for space-shifting to someone else. Just like the Post Office charges for delivery, space-shifting over the Internet involves someone paying for the bandwidth to space-shift, so we can't just do it for free. The service fee is the same whether you sell it, lend it or give it away.

General

Q: Can I make a copy of the movie, just like I can rip a DVD?

A: No. First off, you have less reason to rip it, since it is already on your computer. Second, DVD ripping may be illegal if you don't have the copyright owner's permission. Finally, unlike the largely ineffective CSS ("Copy Scramble System") on the typical DVD, we provide much stronger protection against unauthorized

reproduction. We do it that way so that not even OmniQ can access the movie when it is out on rental to you, just like if we had rented you the DVD.

Q: My hard drive is full. Can I space-shift to an external drive instead?

A: Yes. You may designate the drive to which you want to space-shift the movie, and can play back from any computer or tablet that has the OmniQ player app installed on it.

DECLARATION OF JOHANN GEORGE
Regarding
OmniQ Proposed Exemption Under 17 U.S.C. § 1201

My name is Johann George. I am one of the founding partners of OmniQ.

I entered the University of Waterloo at the age of 13, majoring in mathematics and had much exposure to computers during that time. As a teenager in 1979, I co-founded the company that developed Coherent, which was the first Unix-compatible operating system that ran on the x86 architecture. I worked briefly with Steve Jobs at Apple Computer and also at NeXT Inc., was co-founder and CEO of both Pattern Recognition Systems and Sourcelight Technologies, CTO of Commodore International, served as an executive of Tecmar, PathScale (purchased by QLogic) and Schooner Information Technology (purchased by SanDisk), and most recently was the Senior Principal Strategist for SanDisk.

In the course of co-inventing a method of *Digitally Transferring Content Across Media Without Reproduction*, Patent Application # WO 2016/168832; US 2016028135, I was struck by the ineffectiveness of CSS (Copy Scrambling System) and similar TPM's (Technical Protection Measures) for audiovisual works on optical discs. Because such TPMs are designed to work with an infinite number of copies using myriad different players from many different manufacturers, they are vulnerable to being defeated using relatively unsophisticated methods. In my professional judgment, the current technologies intended to protect audiovisual works on optical discs are completely ineffective against unauthorized reproduction – a conclusion born out by the many competing "ripping" programs currently on the market. CSS and similar TPMs may generate revenue from technology licensing but offer negligible protection from copyright infringement of the works to which they are applied. That is because anyone who succeeds in circumventing the TPM will, in effect, have the equivalent of a "master key" to all copies of the works "protected" by the same TPM.

In designing the method for *Digitally Transferring Content Across Media Without Reproduction*, it was crucial that we devise a much stronger method of preventing reproduction, because the whole point is to perform a space-shift in which no reproduction takes place. And, while the studios who publish works on DVD and other optical discs might be comfortable balancing the risk of reproduction against cost and convenience, we wanted to build a solution that was much more secure. The studios might accommodate room for fair use copying or tolerate some amount of infringing reproduction, but we needed to prevent any reproduction at all. Our method for *Digitally Transferring Content Across Media Without Reproduction* required a much more robust copy protection, in order to ensure that our space-shifting solution would never result in any unauthorized reproduction of the work.

The space-shifting process we devised makes it impossible for the fixation to constitute a "copy" (as defined in the Copyright Act) in two places at once. It achieves that, first, by space-shifting small "chunks" of the work, wrapping each with its own robust encryption, such that even if someone managed to break it, they would only have access to a small snippet of a work. Second, the space-shifting process reads these chunks into volatile memory that is insufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. During this brief moment, and before the small chunk is fixed in the new medium, the original fixation on the disc is removed. Thus, it is physically impossible to perceive, reproduce or otherwise communicate the work from two places at once. In fact, the solution is engineered such that, if anything goes wrong during the place-shifting process, the result is the same as if a mail-order Netflix DVD rental was broken while the Post Office transported it from the warehouse to the customer. The customer might be able to request a "free" replacement from the retailer, but the retailer has to actually go out and buy (or have already bought) the replacement from the copyright owner. Likewise, our solution carries the risk that if a space-shift fails, one must purchase (or have already purchased) a replacement DVD with which to try the space-shifting process anew. If a mistake is made during space-shifting of any "chunk" of the work, it is too late – there will no copy of that chunk that one can go back to and try again.

DigiCert claims that when using 2048 bit keys, it would take 6.4 quadrillion years to break with a single modern desktop computer using an algorithm that utilizes public and private keys (https://www.digicert.com/TimeTravel/math.htm). In the case of a movie that was space-shifted using the method described in the OmniQ Patent using 2048 bit keys, once the keys are removed, there isn't even a public key to start an attack with and the methods will need to be even more brute-force. Note that CSS only uses 40 bit keys and AACS uses 128 bit keys. Also, unlike CSS and AACS where the keys are fixed for the life of the content, with OmniQ's method, the keys are changing constantly, creating a moving target for any attacker.

I declare under penalty of perjury of the laws of the United States of America that the foregoing is true and correct. Executed this 18th day of December 2017 in the State of California.

/s/ Johann George
Johann George

DECLARATION OF MARK VRIELING
Regarding
OmniQ Proposed Exemption Under 17 U.S.C. § 1201

My name is Mark Vrieling. I am one of the founding partners of OmniQ, having recruited the team we currently have.

I entered the home video business during the 1980s, building Rain City Video, one of the most successful video stores in Seattle, Washington. For decades, I have served on the Board of Directors of the Entertainment Merchant's Association (previously named the Video Software Dealers Association), including a term as Chairman and of the Board.

Even as the home video rental industry matured, major national chains became brand names, and studios began focusing on "sell-through" in conjunction with efforts to drive up the price of a rental (such as by leasing videos to "rentailers" in exchange for profit-sharing with minimum prices), my store performed very well, primarily because our selection of approximately 30,000 movie titles contained so many movies that were simply not available through the distribution channels that the studios preferred, which focused on new releases, included "moratoriums" intended to keep titles off of shelves for a while, and "exclusives" offered to favored retailers, which forced me to purchase from the exclusive retailer at the a retail price instead of wholesale. In fact, there were often times when Wal-Mart became the de facto distributor because the studios' "rentailer" distributors could not beat Wal-Mart's prices.

Having weathered such storms, it frustrated me to see the dramatic shrinking of available titles on account of the studios' efforts to grow the permissions-based delivery that avoided the need to compete with secondary markets (rentals and sales of "previously viewed" copies) once their distribution right was exhausted.

OmniQ began as an initiative to build a user-friendly movie viewing "queue" that would allow a viewer to select a movie without regard to who offered it, or even whether it was offered in a streaming services, cable pay-per-view, electronic sell-through (download), or video on demand (VOD). In fact, the plan was to also include local availability for rental or borrowing at the customer's most convenient video store or public library. Hence the name "OmniQ." The viewer "settings" would enable preference for watching a movie from monthly subscription service or subscribed cable channel before selecting an incrementally more costly option.

The longer we discussed the features that consumers would want from our queue, the more we began to realize that the most pressing problem was that even adding up the various subscription, VOD and EST services, the selection of movies to watch on any given day was but a small fraction of what a store like Rain City Video could offer. We decided then that the best approach was to build the world's biggest video store, drawing on the millions upon millions of DVDs that sit idle on peoples'

shelves because the shrinking number of video stores makes turning on the DVD player an afterthought, reserved for movies one has already watched, and because the dwindling number of DVD and Blu-ray players being sold translates to lessened demand for used DVDs.

As we began to see a market in which the very same first sale doctrine that had driven billions of dollars in new revenue for the studios (over their initial vigorous objection) was being taken over by restrictive models that increased the cost of viewing while reducing the number of choices, we began looking for a solution that would mimic the heyday of video rentals on VHS and DVD, but taking advantage of the more rapid delivery times promised by a networked world. We rejected the notion of copying the movie from the DVD to a hard drive and then breaking the DVD, figuring that a "copy first and then delete" approach relied too heavily on Section 107 for its legality. (The ReDigi experience proved us right.) We also considered and rejected the idea of offering a remote bank of DVD players that a remote viewer could operate, as if it were in their home but with a longer wire. Again, when others tried it and hit a litigation buzz saw, we were proven right in not risking hat a court would consider it to be a public performance.

Cabined between two meritorious but legally problematic solutions, one of which might infringe the reproduction right, and the other which might infringe the public performance right, but with both a copyright lawyer and an experienced engineer on our team, we came up with the solution that is explained in Exhibit 1 to the OmniQ petition – the OmniQ Invention – to shift the work from one material object to another without reproduction, such that a viewer could privately perform the work with the copy residing on their own device rather than on a less useful plastic disc.

Next came the effort to solicit investment. The invention was well received. Our business plans looked good. But then would come the question: But wont' you run into trouble with Section 1201 if you circumvent CSS or AACS?" An unsatisfactory answer to that question (from the investor point of view) was that we could space-shift everything, including the advertisements, fluff and yes, even the TPM, intact, and allow the customer to view it using any of the many players on the market that virtually ignore the TPM. From an engineering and financial standpoint, that solution makes little sense. The CSS and AACS encryption is totally unnecessary, given the fact that our encryption method is demonstrably stronger. CSS and AACS would be completely superfluous after the copy is space-shifted using the OmniQ Patent, but the need to preserve it simply takes up more time, bandwidth, dollars and storage space, ultimately reducing the number of space-shifted movies a person could reasonable store at any one time.

The more satisfactory solution was to attempt to persuade the Librarian of Congress to allow the circumvention of the TPM, but the Sixth Triennial Rulemaking was already underway. The best we could do at the time was to suggest that the Class 8 exemption under consideration at least be granted to meet the narrow non-

reproductive space-shifting we advocated, but we were unable to do so as Petitioners, and had to simply get a word as a non-petitioning Commenter in during the Reply phase.

But I or another member of the Partnership have heard potential investors raise the Section 1201 concern countless times. While we are hopeful that we can offer the technology for libraries currently struggling financially to keep paying for the right to "lend" books electronically instead of lending so long as the book lasted, we believe that there is insufficient investor interest in a solution for libraries, even though there is no TPM concern with respect to printed books. The more attractive investor proposition is the video rental store model, using technology to reinvigorate the market for access to movies that the roaring '80s of totally unlicensed rentals driven by retailer response to actual consumer demand rather than heavily promoted "exclusives" that capitalize on artificial scarcity. We are hopeful that, once we succeed in exponentially increasing consumer choice of movie to watch, and at an affordable price, we will then be in a position to roll out similar solutions for colleges, universities, and libraries, and covering other works, such as books, photographs, and even an online means of offering "limited edition" unique copies of digital art online that can be exchanged in a free market.

I declare under penalty of perjury of the laws of the United States of America that the foregoing is true and correct. Executed this 18th day of December 2017 in the State of California.

/s/ Mark Vrieling_____
Mark Vrieling