

Essays

FIXING RAM COPIES

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| INTRODUCTION..... | 1067 |
| I. THE RISE OF THE RAM COPY DOCTRINE | 1070 |
| A. MAI v. Peak & Its Progeny..... | 1071 |
| B. <i>The Problems with Peak</i> | 1075 |
| II. REVISITING RAM INSTANTIATIONS | 1080 |
| A. Cartoon Network v. CSC Holdings..... | 1080 |
| B. <i>Evaluating Cartoon Network</i> | 1085 |
| III. DEVELOPING A FRAMEWORK FOR RAM INSTANTIATIONS | 1087 |
| A. <i>The Relevance of Statutory Definitions</i> | 1088 |
| B. <i>The Contours of Transitory Duration</i> | 1092 |
| C. <i>Evaluating RAM Instantiations</i> | 1106 |
| CONCLUSION..... | 1108 |

INTRODUCTION

Unsurprisingly, the copy is a central concept in the copyright system. Copyrights originally conferred control over the creation and disposition of copies by granting exclusive rights to print and publish books.¹ Of course, copyright no longer confines itself to regulating printing and publishing. Modern copyright has grown to embrace exclusive rights to display, per-

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¹ See LYMAN RAY PATTERSON, COPYRIGHT IN HISTORICAL PERSPECTIVE 46–48 (1968) (describing the control the Stationers’ monopoly afforded over publication and disposition of copies in sixteenth and seventeenth century England). In 1710, the Statute of Anne extended to authors the “sole liberty of printing and reprinting” copies of their books and prohibited unauthorized sale and publication of the same. 1710, 8 Ann., c.19 (Eng.). In the United States, the Copyright Act of 1790 provided copyright holders “the sole right and liberty of printing, reprinting, publishing and vending” books, maps, and charts. Copyright Act of 1790, 1 Stat. 124 (1790).

form, and adapt works of authorship of all sorts.² Nonetheless, copies remain crucial to both the establishment and infringement of copyright interests.³

Despite this ongoing significance, copyright law has been slow to resolve the challenges that digital technologies pose for our deeply analog understanding of the copy. For most of the history of copyright law, copies were the exception rather than the rule. But in the digital era, copies are not just prevalent, they are pervasive. As a result, copyright law has expanded from a regulation of the publishing trade to a palpable presence in our daily lives.⁴ More fundamentally, these technologies expose a deeper ontological problem for copyright law. Because copies are no longer capable of simple and uncontroversial definition, copyright law often lacks the facility to determine whether a copy exists.

The use of digital technology typically entails the creation of temporary instantiations of copyrighted works.⁵ Launching a software application, browsing the Internet, or sending an email results in the creation of at least one, and often several, potential copies in the random access memory (RAM) of computing devices. This constant stream of instantiations of copyrighted works has outstripped the traditional conception of the copy, one rooted in the concrete and tangible paradigm of an enduring bound volume. Copyright applies this increasingly anachronistic conception to digital technologies only through significant contortions.

Scholars, courts, and policymakers have struggled for decades to reconcile the traditional understanding of the copy with the technological developments that threaten to undermine it. Yet this central dilemma remains unresolved. Courts, chief among them the Ninth Circuit in *MAI Systems Corp. v. Peak Computer, Inc.*, have largely adopted a broad and inclusive RAM copy doctrine that treats all temporary digital instantiations as copies under the Copyright Act.⁶ Scholars, however, have criticized the logical underpinnings and policy implications of *Peak* with striking consistency.⁷

² 17 U.S.C. § 102 (2006) (enumerating the classes of works protected by copyright); *id.* § 106 (enumerating the exclusive rights granted to copyright holders).

³ See *infra* Part III.A for a discussion of the importance of the definition of “copies” in establishing infringement.

⁴ See John Tehranian, *Infringement Nation: Copyright Reform and the Law/Norm Gap*, 2007 UTAH L. REV. 537, 543–48 (describing the increasing presence of copyright law in the daily activities of average citizens).

⁵ The term “copy” is often used in a nontechnical sense to refer to any representation of a work. But the designation “copy” is a term of art defined by the Copyright Act. See 17 U.S.C. § 101 (2006) (defining “copies”). The central question this Essay addresses is the extent to which data stored in RAM constitutes a copy in this strict sense. To avoid unnecessary confusion in terminology, this Essay uses the term “instantiation” to refer to a representation of a work when its status as a copy is open to debate, and the term “copy” to refer to representations that meet the statutory definition in the Copyright Act.

⁶ 991 F.2d 511, 518 (9th Cir. 1993).

⁷ See *infra* Part I.B.

The Second Circuit's recent decision in *Cartoon Network v. CSC Holdings*, which held that CSC did not create copies when it buffered segments of television programs,⁸ promises not only to reignite the longstanding controversy over the RAM copy doctrine, but also to reframe a debate that has ossified over the past two decades. *Cartoon Network* departs from the dominant trend by insisting that some temporary instantiations are simply too evanescent to qualify as copies.⁹ By rejecting a broad reading of *Peak*, *Cartoon Network* shifts the debate from one that revolves around *Peak*'s propriety to one that squarely acknowledges the difficulty of distinguishing copies from non-copies. But *Cartoon Network* ultimately fails to fully articulate a generalizable approach to analyzing temporary instantiations, carefully limiting its holding to the specific facts before it. Nonetheless, by prompting the debate to move beyond the re-litigation of *Peak*, *Cartoon Network* could reinvigorate the effort to digitize copyright's conception of the copy.

This Essay proceeds in three parts. Part I traces the development of the RAM copy doctrine and the criticisms leveled against it. It begins with *MAI v. Peak*, the case that originated the doctrine and has largely framed subsequent debate. Although *Peak* is susceptible to a more restrained reading, most courts have interpreted the case to stand for a categorical and inflexible rule that all RAM instantiations qualify as copies. As a result, *Peak* has faced sustained criticism for its interpretation of the Copyright Act, its legislative history, and relevant precedent. Further, *Peak*'s critics have consistently warned of the practical implications of a broad treatment of RAM copies, among them the sweeping expansion of copyright holder control over private uses of lawfully acquired copies.

Part II explores the Second Circuit's break from *Peak*'s now dominant approach to temporary instantiations. While rhetorically minimizing its departure, the court in *Cartoon Network* discarded the broad RAM copy doctrine in favor of an inquiry more attuned to specific factual allegations of RAM copying. This approach avoids many of *Peak*'s difficulties, but introduces a new set of concerns. Although *Peak* led courts to an over-inclusive understanding of RAM copies, it offered both clarity and predictability. *Cartoon Network* better reflects the text of the Copyright Act, but offers future courts little guidance and unsettles expectations about the treatment of RAM instantiations without fully outlining a rule to replace *Peak*.

Part III takes up the challenge of developing a set of criteria for reliably identifying RAM copies. It begins by scrutinizing a shared assumption of both *Peak* and *Cartoon Network*—that the statutory definitions of “copies” and “fixed” are the appropriate starting point for analyzing RAM instantiations. Although these definitions were drafted to clarify the scope of

⁸ 536 F.3d 121, 129–30 (2d Cir. 2008).

⁹ *Id.*

copyrightable subject matter, an understanding of the various ways in which copyright concerns itself with “copies” suggests that these definitions are nonetheless relevant in the infringement context. Governed by these definitions, the RAM copy question turns largely on the meaning of “transitory duration,” a concept courts have had few opportunities to interpret. Although precise delineation is difficult, this Part considers three sets of considerations that shed light on the scope of “transitory duration”: its application in the context of copyrightability; qualitative considerations related to the function of RAM instantiations; and the extent to which RAM instantiations serve as functional substitutes for traditional copies from the perspective of the reproduction right. Taken together, these considerations reveal an understanding of RAM instantiations that is at once more defensible than *Peak* and more predictable than *Cartoon Network*.

I. THE RISE OF THE RAM COPY DOCTRINE

For digital works to be displayed, performed, or manipulated by a computing device, they must be rendered in memory. This characterization is equally true of computer programs and digital representations of text, images, and music. Every commonplace interaction with digital information depends on that information being loaded into RAM.¹⁰ When you read *Pride and Prejudice* and *Zombies* on your Kindle, listen to “White Freightliner Blues” on your iPod, or—as is sometimes necessary—launch Microsoft Word, an instantiation of those copyrighted works is created in RAM.

Disputes over the copyright status of these instantiations were inevitable. Copyright holders claim that RAM instantiations are copies within the purview of their exclusive rights and, as a result, can be created only to the extent licensed.¹¹ Users of copyrighted works maintain that RAM instantiations are too impermanent to qualify as copies. As described below, the Ninth Circuit sided with the copyright holders in *MAI v. Peak*, the first case to directly address this debate. In time, *Peak* came to stand for the notion that all RAM instantiations, however fleeting, are copies. As this rule was

¹⁰ RAM differs from more permanent means of digital storage in several ways. RAM relies on electrical impulses to store data, in contrast to more stable magnetic or optical media. See Bradley J. Nicholson, *The Ghost in the Machine: MAI Systems Corp. v. Peak Computer, Inc. and the Problem of Copying in RAM*, 10 HIGH TECH. L.J. 147, 149 (1995). As a result, RAM is volatile. Data stored in RAM is lost when a computer is powered off. *Id.* RAM also tends to be more expensive and less abundant than hard disk space or other media of long-term storage. *Id.*

Modern RAM is dynamic, meaning that its data must be continually refreshed and overwritten in order to remain usable. SCOTT MUELLER, UPGRADING AND REPAIRING PCs 419 (2003) (describing dynamic RAM as the main memory in a modern PC). Static RAM (SRAM) technology, which does not require constant refreshing of data, generally is not used as the primary memory in personal computers or other applications requiring large amounts of memory. *Id.* at 419–20.

¹¹ See 17 U.S.C. § 106(1) (2006) (providing copyright holders the exclusive right, subject to various exceptions and limitations, to reproduce copies of their works).

embraced by a growing majority of courts, *Peak*'s critics took pains to detail its many flaws.

A. MAI v. Peak & Its Progeny

As early as 1961, the copyright system encountered challenges posed by software and computer technology.¹² But rather than directly confronting these challenges in the Copyright Act of 1976, Congress deferred.¹³ It turned to the expertise of the National Commission on New Technological Uses of Copyright Works (CONTU), a body empanelled to study these challenges and offer legislative recommendations.¹⁴ In response to CONTU's final report,¹⁵ Congress enacted the Computer Software Act of 1980, explicitly recognizing computer programs as copyrightable subject matter.¹⁶

Despite this confirmation of computer programs as copyrightable works, courts did not directly confront the question of RAM instantiations until more than a decade later in *MAI v. Peak*.¹⁷ MAI manufactured and serviced a line of computers.¹⁸ Like many computer manufacturers of the time, MAI developed its own operating system software for its machines. It likewise created diagnostic software, used to aid in servicing MAI ma-

¹² See George D. Cary, *Copyright Registration and Computer Programs*, 11 BULL. COPYRIGHT SOC'Y 362, 363 (1964) (noting the first effort to deposit a computer tape for copyright registration in 1961). Despite statutory and constitutional doubts, the Copyright Office began accepting registration applications for computer programs under its "rule of doubt" in 1964. See Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663, 692–94.

¹³ See 17 U.S.C. § 117 (Supp. I 1977). Prior to its amendment in 1980, § 117 provided:

Notwithstanding the provisions of sections 106 through 116 and 118, this title does not afford to the owner of copyright in a work any greater or lesser rights with respect to the use of the work in conjunction with automatic systems capable of storing, processing, retrieving, or transferring information, or in conjunction with any similar device, machine, or process, than those afforded to works under the law, whether title 17 or the common law or statutes of a State, in effect on December 31, 1977, as held applicable and construed by a court in an action brought under this title.

Id.

¹⁴ See National Commission on New Technological Uses of Copyrighted Works, Pub. L. No. 93-573, 88 Stat. 1873, 1873–74 (1974) (authorizing the creation of the Commission and empowering it to study and report on computer-related uses of copyrighted works as well as the use of photocopiers).

¹⁵ See NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT (1979) [hereinafter CONTU].

¹⁶ Patent and Trademark Laws Amendment Act, Pub. L. No. 96-517, § 117, 94 Stat. 3015, 3028 (1980) (codified at 17 U.S.C. §§ 101, 117 (1982)) (adding a statutory definition of "computer program" to § 101 and substituting a new § 117, which permits owners of copies of computer programs to modify them and create archival copies).

¹⁷ See *MAI Sys. Corp. v. Peak Computer, Inc.*, No. CV 92-1654-R, 1992 WL 159803 (C.D. Cal. Apr. 14, 1992), *aff'd* 991 F.2d 511 (9th Cir. 1993). Earlier courts noted the differences between RAM and other forms of memory without reaching the RAM copy question. See *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1243 n.3 (3d Cir. 1983) (contrasting RAM with "permanent memory devices").

¹⁸ *Peak*, 1992 WL 159803, at *1–3.

chines. Peak offered competing repair and maintenance services for MAI computers.¹⁹

MAI filed suit against Peak, alleging copyright infringement premised on Peak's use of MAI's operating system and diagnostic software while servicing customer computers.²⁰ According to MAI, each time a Peak employee loaded the MAI operating system or diagnostic software on a customer's machine, a copy was created in RAM. Because the license agreement that governed the use of MAI software did not permit copying by third parties like Peak, MAI maintained that these copies were unauthorized.²¹ The district court agreed, permanently enjoining Peak from loading MAI software into the "electronic random access memory of the central processing unit of a computer system."²²

On appeal, Peak argued that the RAM instantiations created when its technicians booted MAI computers or launched the diagnostic program did not constitute copies because they were not fixed.²³ The Copyright Act defines copies as "material objects . . . 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."²⁴ An instantiation of a work is a "copy" only to the extent it is "fixed"—that is to say, "when its embodiment . . . is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."²⁵

Acknowledging the governing statutory definitions, the Ninth Circuit reasoned that because the temporary instantiations created by Peak enabled its technicians to view an error log generated by the diagnostic program, those instantiations were fixed, and thus qualified as copies. According to the court, if RAM instantiations can be perceived, reproduced, or communicated, they are copies.²⁶

The Ninth Circuit's decision in *Peak* is susceptible to two interpretations that give rise to two competing variations of its RAM copy doctrine. On one hand, *Peak* could stand for the proposition that instantiations of works in RAM can serve as copies so long as the particular facts at issue demonstrate that the statutory definitions are satisfied. While room remains to take exception to *Peak*'s interpretation of those definitions and their ap-

¹⁹ *Id.* at *7.

²⁰ *Id.* at *8.

²¹ A representative MAI software license provided that "customer[s] may give access to the initial software only to the following: (i) bona fide employees of customers who agree to be bound by these terms and conditions; (ii) representatives of MAI; and (iii) others authorized by MAI in writing." *Id.* at *2 (internal quotation marks omitted).

²² *Peak*, 991 F.2d at 515.

²³ *Id.* at 518.

²⁴ 17 U.S.C. § 101 (2006).

²⁵ *Id.*

²⁶ *Peak*, 991 F.2d at 519.

plication to the facts, this reading suggests only that instantiations of works incidental to digital technologies are as capable of classification as copies as those occurring in any other medium. Considering that the Ninth Circuit was addressing a question of first impression, this fact-dependent variant of the RAM copy doctrine appears relatively benign as a first step towards a general rule. Some courts have embraced this limited treatment of *Peak* and the soft RAM copy doctrine it yields.²⁷

But this context-sensitive RAM copy rule is difficult to square with the text of *Peak*. In two passages, the court appears to couch its rule in fact-dependent terms.²⁸ These statements, however, only marginally cabin the scope of the court's holding. While it recites selected findings of fact, the court failed to connect them to the statutory durational requirement. Elsewhere the court suggested, in sweeping terms, that copying "occurs when a computer program is transferred from a permanent storage device to a computer's RAM"²⁹ and endorsed the district court's generalized conclusion that "the loading of copyrighted computer software from a storage medium (hard disk, floppy disk, or read only memory) into the memory of a central processing unit ('CPU') causes a copy to be made."³⁰ In light of these factually unmoored conclusions, the soft RAM copy doctrine requires future courts to fill in significant factual gaps in the Ninth Circuit's reasoning if they hope to determine whether particular RAM instantiations constitute copies. The necessity of this interpolation invites a less strained and more expansive reading of *Peak*'s RAM copy doctrine.

Not surprisingly, most courts that have applied *Peak* give its core holding a broader thrust. These cases suggest a rule far less concerned with the factual niceties of particular cases, opting instead for clarity and simplicity. This hard RAM copy doctrine holds that all temporary digital instantiations of copyrighted works are copies. It is this unequivocal statement of *Peak*'s

²⁷ See, e.g., *London-Sire Records, Inc. v. Doe 1*, 542 F. Supp. 2d 153, 175 n.29 (D. Mass. 2008) (citing *Peak*, 991 F.2d at 518–19) (recognizing "that electronic copies can be of varying permanence, and it is not clear that all of them should be treated equally under the copyright statutes" (citation omitted)); *Marobie-FL, Inc. v. Nat'l Ass'n of Fire Equip. Distribs. & Nw. Nexus, Inc.*, 983 F. Supp. 1167, 1177 (N.D. Ill. 1997) (stating that *Peak* "found that the . . . program . . . was 'fixed' in RAM because the computer user was able to view a representation of the program's information"); *Advanced Computer Servs. v. MAI Sys. Corp.*, 845 F. Supp. 356, 363 (E.D. Va. 1994) (suggesting that RAM instantiations persisting for "seconds or fractions of a second . . . arguably would be too ephemeral to be considered 'fixed' or a 'copy'" while those persisting for "minutes or longer" are copies); see also *Cartoon Network v. CSC Holdings*, 536 F.3d 121, 128 (2d Cir. 2008) (interpreting *Peak* to be premised on the assumption that RAM instantiations persisted for several minutes).

²⁸ First, the court stated that the RAM instantiations were copies because *Peak* could "view the system error log and diagnose the problem with the computer." *Peak*, 991 F.2d at 518. In another formulation, the court explained that because those instantiations could be "perceived, reproduced, or otherwise communicated, . . . the loading of software into the RAM creates a copy under the Copyright Act." *Id.* at 519 (internal quotation marks omitted).

²⁹ *Id.* at 518.

³⁰ *Id.*

holding that has come to dominate the judicial understanding of temporary instantiations.³¹

Numerous opinions have mechanically applied *Peak*, typically with little regard to their particular facts.³² In a subsequent case dealing with another independent service provider, the Ninth Circuit cast its earlier holding in *Peak* in fact-independent terms.³³ Subsequent decisions have extended *Peak*, with a similar disregard for its facts, to scenarios and legal theories well beyond its original context. Direct and indirect liability for websites and electronic bulletin boards,³⁴ the scanning of copyrighted photographs,³⁵ and the development of interoperable software³⁶ have all fallen within the ambit of *Peak*.

³¹ The Ninth Circuit has implicitly called into question its reasoning in *Peak* on at least one occasion. The Copyright Act does not require that derivative works be fixed in order to infringe. But derivatives must meet a related, if less exacting, standard: they “must incorporate a protected work in some concrete or permanent ‘form.’” *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 964 F.2d 965, 967 (9th Cir. 1992) (holding that a device that altered the gameplay of video games did not give rise to derivative works). Subsequently, the Ninth Circuit distinguished alterations it deemed sufficiently permanent to constitute derivative works from the impermanent displays at issue in *Galoob* on the grounds that those displays “were not incorporated in any permanent form; when the game was over, they were gone.” *Micro Star v. FormGen Inc.*, 154 F.3d 1107, 1111 (9th Cir. 1998). The court’s willingness to rely on the temporary and volatile nature of an instantiation to resolve the derivative work question is difficult to reconcile with *Peak*’s blindness to the similar considerations.

³² *Stenograph L.L.C. v. Bossard Assocs.*, 144 F.3d 96, 102 (D.C. Cir. 1998) (interpreting *Peak* as holding that “RAM reproduction constitutes a copy”); *FM Indus., Inc. v. Citicorp Credit Servs., Inc.*, No. 07 C 1794, 2008 U.S. Dist. LEXIS 20670, at *14 (N.D. Ill. Mar. 17, 2008) (citing *Peak* for the proposition that “a user reproduces a program . . . merely by launching that program, thereby causing the computer to copy it to [RAM]”); *Iconix, Inc. v. Tokuda*, 457 F. Supp. 2d 969, 995 (N.D. Cal. 2006) (interpreting *Peak* as holding that “running copyrighted software, without ownership of the copyright or a license to run the software, constitutes copyright infringement”); *CSU Holdings, Inc. v. Xerox*, 910 F. Supp. 1537, 1541 (D. Kan. 1995) (relying on *Peak* for the notion that transferring a program from storage to RAM creates a copy); *Tricom, Inc. v. Elec. Data Sys. Corp.*, 902 F. Supp. 741, 745 (E.D. Mich. 1995) (citing *Peak* for the proposition that copying occurs any time a computer program is transferred from storage to RAM).

³³ *Triad Sys. Corp. v. Se. Express Co.*, 64 F.3d 1330, 1333–34 (9th Cir. 1995) (reiterating *Peak*’s holding “that the loading of MAI’s operating system software into RAM makes a ‘copy’ under the Copyright Act”).

³⁴ See *Intellectual Reserve, Inc. v. Utah Lighthouse Ministry, Inc.*, 75 F. Supp. 2d 1290, 1294 (D. Utah 1999) (holding that browsing an infringing website created RAM copies sufficient to support a claim of contributory infringement for one who provides links to that site); *Playboy Enters., Inc. v. Webworld Inc.*, 991 F. Supp. 543, 551 (N.D. Tex. 1997) (citing *Peak* as “holding that copying occurs when a computer program is transferred from a permanent storage device to a computer’s random access memory”); *Sega Enters. v. MAPHIA*, 948 F. Supp. 923, 931 (N.D. Cal. 1996) (citing *Peak* to support its conclusion that copying occurs when a program is transferred from storage to RAM); *Religious Tech. Ctr. v. Netcom On-Line Comm’n Servs., Inc.*, 907 F. Supp. 1361, 1368 (N.D. Cal. 1995) (suggesting that under *Peak* “the loading of data from a storage device into RAM constitutes copying because that data stays in RAM long enough for it to be perceived”).

³⁵ See *Tiffany Design, Inc. v. Reno-Tahoe Specialty, Inc.*, 55 F. Supp. 2d 1113, 1120–21 (D. Nev. 1999) (relying on *Peak* in holding that the scanning of a copyrighted image into RAM constituted a reproduction).

Equally importantly, these cases reflect a substantive hardening of *Peak*'s central holding. In its simplest form, the rule that emerges from *Peak*'s progeny is "RAM reproduction constitutes a copy."³⁷ Other courts have explicitly rejected the notion that the duration of temporary instantiations factors into the analysis.³⁸ In perhaps the broadest reading of *Peak*, one court offered this take: "digitization or input of any copyrighted material, whether it be computer code or visual imagery, may support a finding of infringement *notwithstanding only the briefest of existence* in a computer's RAM."³⁹ To the extent the Ninth Circuit's holding in *Peak* was checked by its factual record, most cases have ignored any such restraint. The most probable and prevalent reading of *Peak*, therefore, is one that treats all temporary instantiations incidental to digital technologies as copies. Over time, both courts and policy makers have begun to regard *Peak* as settled law.⁴⁰ Nonetheless, the Ninth Circuit's analysis has proven fertile ground for critiques of both its reasoning and policy implications.

B. The Problems with Peak

Criticism of *Peak* takes two basic forms. First, *Peak*'s detractors have taken aim at its mischaracterization of the text and legislative history of the Copyright Act, as well as the relevant case law. Second, commentators have questioned the policy implications of *Peak*'s treatment of temporary instantiations. These critiques call into question both the logic and the wisdom of *Peak*'s RAM copy doctrine and belie the casual pronouncements by courts and policymakers that *Peak* should be treated as received text.

1. *Peak*'s Interpretive Failings.—Perhaps the most glaring weakness of *Peak*'s reasoning is its inattentiveness to the text of the Copyright Act. By tethering its conclusion solely to the fact that *Peak* technicians could

³⁶ See *MDY Indus., LLC v. Blizzard Entm't, Inc.*, No. CV-06-2555-PHX-DGC, 2008 U.S. Dist. LEXIS 53988, at *19–21 (D. Ariz. July 14, 2008) (granting summary judgment on contributory copyright infringement claim against developer of interoperable software premised on creation of unauthorized RAM copies by end users); *Ticketmaster L.L.C. v. RMG Techs., Inc.*, 507 F. Supp. 2d 1096, 1116–17 (C.D. Cal. 2007) (holding that the plaintiff had demonstrated it would likely succeed on claims for direct and contributory copyright infringement against developer of automated ticket purchasing software for creating unauthorized RAM copies of ticket vendor's website).

³⁷ *Stenograph*, 144 F.3d at 102.

³⁸ As one court opined, "in making a copy, even a temporary one, the person who [did so] infringe[d] the copyright." *Intellectual Reserve*, 75 F. Supp. 2d at 1294; see also *Triad Sys. Corp. v. Se. Express Co.*, 31 U.S.P.Q.2d 1239, 1240 (N.D. Cal. 1994) (citing *Peak* "for the more general proposition that 'a copy made in RAM is 'fixed' and qualifies as a copy under the Copyright Act'").

³⁹ *Tiffany Design*, 55 F. Supp. 2d at 1121 (emphasis added).

⁴⁰ See BRUCE A. LEHMAN, *INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE* 65 (1995) (describing *Peak*'s holding "that booting a PC involves copying" as "unexceptional"). But see James Boyle, *Intellectual Property Policy Online: A Young Person's Guide*, 10 HARV. J.L. & TECH. 47, 68–69 (1996) (disputing Lehman's characterization).

perceive the output of MAI's software, the court ignored the requirement that an instantiation persist "for a period of more than transitory duration."⁴¹ Rather than grappling with the admittedly difficult task of divining the line separating fleeting instantiations from fixed copies, *Peak* simply disregarded the text, effectively reading the independent durational requirement out of the statute altogether. While this approach may simplify the inquiry, it does violence to the text of the Act and the intent of Congress.

The Ninth Circuit's selective approach to the available interpretative tools extended to legislative history as well. To support its holding, the *Peak* court relied on CONTU's assertion that "the introduction of a work into a computer memory would, consistent with the [current] law, be a reproduction."⁴² The court's reliance on this statement is problematic for at least three reasons. First, as *Peak* acknowledged, the CONTU report's reference to memory is ambiguous.⁴³ It could refer to stable and undoubtedly fixed read only memory (ROM) and hard disk storage or to more volatile RAM.⁴⁴ Second, since Congress enacted no legislative changes in response to the report's characterization, this isolated statement lacks authoritative weight.⁴⁵ Third, and most importantly, this statement appears to contradict prior controlling congressional statements on the scope of fixation. As the House Report on the Copyright Act of 1976 explained: "[T]he definition of 'fixation' would exclude from the concept purely evanescent or transient reproduction such as those projected briefly on a screen, shown electronically on television or other cathode ray tube, or captured momentarily in the 'memory' of a computer."⁴⁶ Admittedly, decades-old legislative history from a Congress that, by its own admission, was hesitant to legislate in the nascent realm of digital copyright should not be regarded as dispositive.⁴⁷

⁴¹ 17 U.S.C. § 101 (2006).

⁴² CONTU, *supra* note 15, at 40.

⁴³ MAI Systems Corp. v. Peak Computer, Inc., 991 F.2d 511, 519 (9th Cir. 1993) ("recogniz[ing] that these authorities are somewhat troubling" because they do not distinguish between RAM, hard disks, or ROM).

⁴⁴ See Boyle, *supra* note 40, at 93–94; Niva Elkin-Koren, *Copyright Law and Social Dialogue on the Information Superhighway: The Case Against Copyright Liability of Bulletin Board Operators*, 13 CARDOZO ARTS & ENT. L.J. 345, 354 n.47 (1995).

⁴⁵ See Joseph P. Liu, *Owning Digital Copies: Copyright Law and the Incidents of Copy Ownership*, 42 WM. & MARY L. REV. 1245, 1259–60 (2001).

⁴⁶ H.R. REP. NO. 94-1476, at 53 (1976), as reprinted in 1976 U.S.C.C.A.N. 5659, 5666 (emphasis added). This conclusion is consistent with the prior opinion expressed by the Register of Copyrights a decade earlier. *Copyright Law Revision: Hearings Before Subcomm. No. 3 of the Comm. on the Judiciary on H.R. 4347, H.R. 5680, H.R. 6831, H.R. 6835, Part 3*, 89th Cong. 1861 (1966) (statement of Bella Linden) (stating "I do not believe that the transitory image of a copyrighted work, taken from an authorized reproduction stored in a computer and consulted at the computer site, should be treated as different from the consultation of a book in a library").

⁴⁷ Two post-*Peak* legislative changes could suggest that Congress embraced its RAM copy doctrine. The Digital Millennium Copyright Act (DMCA) revised the existing § 117 exception, sanctioning computer maintenance and repair to the extent those activities result in the creation of copies of programs. 17 U.S.C. § 117(c) (2006). This provision, while rebuking *Peak*, assumes that courts could consider in-

Nonetheless, the Ninth Circuit's willingness to rely on the CONTU report's nonauthoritative interpretation of existing law while ignoring the words of Congress does little to bolster confidence in *Peak*'s analysis.

With respect to precedent, the court acknowledged that it could find no cases specifically holding that RAM instantiations are copies.⁴⁸ But it forged ahead with the limited precedent it could muster, citing only two cases, neither of which directly addressed the RAM copy question. The first of these cases, *Vault Corp. v. Quaid Software Ltd.*, only addressed copies created in memory tangentially⁴⁹ and suffers from the same ambiguity found in the CONTU report, potentially not referring to RAM at all.⁵⁰

The *Peak* court also relied on *Apple Computer, Inc. v. Formula Int'l Inc.*⁵¹ Unlike *Vault*, *Apple* embraced a clear distinction between RAM and more permanent varieties of memory. The *Apple* court considered whether Formula infringed Apple's copyright by reproducing its software in ROM chipsets.⁵² Formula argued that its reproduction was protected under Section 117 of the Copyright Act, which permits copies created as an essential step in using a computer program.⁵³ The court rejected this defense on the grounds that ROM copies were unnecessary since the software could be represented in RAM. The court described RAM instantiations as "tempo-

stantiations in RAM to be copies. Likewise, the DMCA added a new § 512 creating a number of safe harbors for providers who transmit, store, and locate information over digital networks. Congress enacted the transmission safe harbor in § 512(a) because "in the course of moving packets of information across digital online networks, many intermediate and transient copies of the information may be made in routers and servers along the way." S. REP. NO. 105-190, at 41 (1998). Again, unless these instantiations could be treated as copies, this limitation on liability would be unnecessary.

Congress's sensitivity to potential liability could suggest an underlying endorsement of *Peak*. See Jane C. Ginsburg, *Copyright Legislation for the "Digital Millennium"*, 23 COLUM. J.L. & ARTS 137, 141 n.14 (1999) (suggesting that § 117(c) confirms *Peak*'s RAM holding). Such an argument overstates Congress's response. Congress enacted two narrow limitations intended to target specific consequences of the RAM copy doctrine. But Congress never signaled agreement with that doctrine, only recognition of its common law development. The legislative history carefully avoids any endorsement of *Peak*. See S. REP. NO. 105-190, at 56-57 (referring to § 117(c) as "a minor, yet important clarification . . . necessary in light of judicial decisions"); *id.* at 19 (noting that "Section 512 is not intended to imply that a service provider is or is not liable as an infringer either for conduct that qualifies for a limitation of liability or for conduct that fails to so qualify"); see also Jonathan Band & Jeny Marcinko, *A New Perspective on Temporary Copies: The Fourth Circuit's Opinion in Costar v. Loopnet*, 2005 STAN. TECH. L. REV. P1, ¶ 18 (noting that Congress declined to "endorse[] the decisions that determined a RAM copy was a copy for copyright purposes" but "simply acknowledged that the courts had so found").

⁴⁸ *Peak*, 991 F.2d at 519.

⁴⁹ 847 F.2d 255, 261 (5th Cir. 1988); see also Nicholson, *supra* note 10, at 149 (discussing the volatile nature of information stored in RAM).

⁵⁰ Elkin-Koren, *supra* note 44, at 354.

⁵¹ *Peak*, 991 F.2d at 518 (citing *Apple Computer, Inc. v. Formula Int'l, Inc.*, 594 F. Supp. 617, 621 (C.D. Cal. 1984)).

⁵² ROM, or read only memory, is a nonvolatile form of memory that stores data permanently or semi-permanently even if power is lost. MUELLER, *supra* note 10, at 424.

⁵³ See 17 U.S.C. § 117 (2006).

rary fixation[s]” because once the “computer is turned off, the copy of the programs recorded in RAM is lost.”⁵⁴

The *Peak* court insisted that *Apple*’s use of the terms “copy” and “fixation” to describe RAM instantiations supported its holding.⁵⁵ But the *Apple* court’s choice of terminology is at best ambiguous. *Apple* appears to have used “copy” and “fixation” in their nontechnical sense, as opposed to the strict definitions of the Copyright Act. What is clear is that the *Apple* court deemed RAM instantiations temporary in comparison to fixed ROM copies.⁵⁶ Rather than bolstering the *Peak* court’s reading, this conclusion undercuts it.

The doctrinal foundation for *Peak*’s conclusion that all RAM instantiations are copies consists of two nested statutory definitions, two judicial opinions, and one quasi-legislative report.⁵⁷ Neither the nonauthoritative CONTU report nor the *Vault* opinion unambiguously refers to RAM instantiations at all. Moreover, *Peak* misinterpreted both the *Apple* decision and the text of the Copyright Act. Given this tottering foundation, the hard RAM copy doctrine *Peak* conceived, even if not entirely indefensible, is far from unassailable.

2. *Peak*’s Policy Consequences.—*Peak* is equally vulnerable to policy-based critiques. A long line of scholars has ably described the troubling implications of a rule that extends control over the creation of temporary digital instantiations to copyright holders. If *Peak* accurately reflects the law, every use of a digital work necessarily implicates the exclusive rights of the copyright holder, affording new power over reading, viewing, or otherwise using lawfully acquired works.⁵⁸ This expansion of the reach of the copyright grant marks a significant departure from its traditional scope.

⁵⁴ *Apple Computer, Inc.*, 594 F. Supp. at 622.

⁵⁵ *Peak*, 991 F.2d at 518–19 (citing *Apple Computer, Inc.*, 594 F. Supp. at 621).

⁵⁶ See also *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1243 n.3 (3d Cir. 1983) (explaining that “RAM . . . is a chip on which volatile internal memory is stored which is erased when the computer’s power is turned off” in contrast to “permanent memory devices”).

⁵⁷ The court also relied on a leading treatise authored by a commissioner of CONTU. See *Peak*, 991 F.2d at 519 (citing MELVILLE B. NIMMER, 2 NIMMER ON COPYRIGHT § 8.08 at 8-105 (1983)). However, the proposition for which the court relied on Nimmer—that “inputting a computer program entails the preparation of a copy”—does not refer on its face to RAM instantiations and, like the CONTU report and *Vault*, may embrace only more permanent forms of memory. See *id.*

⁵⁸ See Jessica Litman, *The Exclusive Right to Read*, 13 CARDOZO ARTS & ENT. L.J. 29, 31–32 (1994). Of course, even if a RAM copy establishes a prima facie violation of a copyright holder’s exclusive rights, infringement is not a foregone conclusion. Defenses including fair use and implied license would, in some cases, protect readers from liability. See Mark Lemley, *Dealing with Overlapping Copyrights on the Internet*, 22 U. DAYTON L. REV. 547, 567 (1997) (suggesting that implied license provides a defense, but it does so “precisely . . . where . . . least needed”); Jule L. Sigall, Comment, *Copyright Infringement Was Never This Easy: RAM Copies and Their Impact on the Scope of Copyright Protection for Computer Programs*, 45 CATH. U. L. REV. 181, 217–19 (1995) (arguing that RAM copies

Moreover, judicial expansion of the scope of the reproduction right makes a hash of the statutory scheme crafted by Congress, one characterized by enumerated and distinct exclusive rights.⁵⁹ To the extent copyright law has regulated use historically, it has done so through its display and performance rights. In the digital realm, the RAM copy doctrine supplants these rights by rendering every instantiation of a work a copy.⁶⁰ Aside from diluting the coherence of the statutory system, the RAM copy doctrine razes a crucial distinction between private and public uses.⁶¹ While the display and performance rights granted by the Copyright Act extend only to public use,⁶² the RAM copy doctrine permits the reproduction right to regulate private use as well.

The overlap of exclusive rights triggered by RAM copies creates another set of concerns. Overlapping rights undermine existing license arrangements.⁶³ Consider an exhibitor licensed to publicly perform a motion picture. Regardless of that license, the use of digital projection to exhibit the film could still result in a violation of the reproduction right since the performance entails creation of RAM instantiations.⁶⁴

Consumers too feel the effect of the expansion of the reproduction right into territory previously occupied solely by other exclusive rights. The first sale doctrine, for example, permits the lawful owner of a copy of a work to dispose of that copy as she sees fit without risking a violation of the distribution right.⁶⁵ But while you may be free to give your dog-eared paperback to a friend, sharing an eBook is a riskier proposition. Even if the distribution of an eBook is permitted by the first sale doctrine, reading the document, under *Peak*, entails the creation of one or more RAM copies, reproductions beyond the limited protection of first sale.

Each of these critiques demonstrates that *Peak* disturbs settled expectations about the purpose and operation of copyright law. Nonetheless, *Peak*'s RAM copy doctrine remains the prevailing approach among courts. But as the next Part details, the Second Circuit has recently undertaken an

should be considered fair uses). The degree of insulation these defenses offer in practice remains far from certain.

⁵⁹ See 17 U.S.C. § 106 (2006) (listing the exclusive rights of copyright holders).

⁶⁰ See R. Anthony Reese, *The Public Display Right: The Copyright Act's Neglected Solution to the Controversy Over RAM "Copies"*, 2001 U. ILL. L. REV. 83, 141.

⁶¹ See *id.* at 143–45.

⁶² See 17 U.S.C. § 106.

⁶³ See Lemley, *supra* note 58, at 568.

⁶⁴ Similarly, overlapping rights create unanticipated difficulties in litigation. Because copyright interests are divisible, the display and reproduction rights in a particular work, for example, might be controlled by two different parties. An accused infringer who digitally displays a work, creating an incidental RAM instantiation in the process, could face two separate lawsuits filed by the respective rights holders for a single act of infringement.

⁶⁵ 17 U.S.C. § 109; see Lemley, *supra* note 58, at 575–76; Liu, *supra* note 45, at 1249–50.

independent analysis of the status of temporary instantiations that led to very different results.

II. REVISITING RAM INSTANTIATIONS

Although *Peak* continues to represent the dominant approach, the Second Circuit's decision in *Cartoon Network v. CSC Holdings* suggests that courts remain willing to consider claims of infringement based on temporary instantiations with sensitivity to the unique facts of particular cases. This Part begins by examining the *Cartoon Network* decision and its departure from the rigid mode of analysis defined by *Peak*. In many respects, *Cartoon Network* represents a notable progression in the judicial treatment of temporary instantiations. But *Cartoon Network* leaves a number of key questions unanswered and gives rise to its own set of problems.

A. *Cartoon Network v. CSC Holdings*

In the past decade, the digital video recorder (DVR) has taken its rightful place next to the microwave oven in the pantheon of essential household electronics.⁶⁶ DVRs record television programming to hard disks, enabling time-shifted viewing and allowing users to pause and rewind live broadcasts.⁶⁷ Companies like Tivo market standalone set-top DVRs to consumers, while cable and satellite providers offer similar boxes that integrate with their services.⁶⁸

Cablevision, a major cable television provider, has offered traditional set-top DVRs to its customers since 2004.⁶⁹ In 2006, it announced a plan to introduce a new DVR offering to its customers, the Remote Storage DVR (RS-DVR). From the perspective of the end user, the RS-DVR is virtually indistinguishable from its more traditional counterpart. RS-DVR users

⁶⁶ See Press Release, NDS Group Ltd., 7 Out of 10 People Who Own a DVR Say They Can't Live Without It According to NDS Survey, http://nds.com/press_releases/NDS_DVR_Survey_030908.html (last visited Aug. 9, 2010) (noting that DVR owners ranked the device as the third most indispensable item after the washing machine and microwave oven).

⁶⁷ In many respects the DVR represents a linear technological progression from an earlier innovation in home recording, the videocassette recorder, or VCR. In *Sony Corp. of America v. Universal City Studios, Inc.*, the Supreme Court held that the manufacturer of early video recorder technology could not be held contributorily liable for infringement committed by the users of that technology because it was capable of substantial noninfringing use. 464 U.S. 417, 456 (1984). Despite the *Sony* safe harbor, early DVR developers faced similar allegations of indirect infringement. See Complaint, *Paramount Pictures Corp. v. ReplayTV*, Civ. No. 01-09358 (C.D. Cal. Oct. 31, 2001), 2001 WL 35823747, available at http://w2.eff.org/IP/Video/Paramount_v_ReplayTV/20011031_complaint.html. The legal costs associated with this suit contributed to the eventual bankruptcy of SonicBlue, the company behind the pioneering DVR ReplayTV. See Mary Hodder, *SonicBlue Declares Bankruptcy: Another Point for the Incumbents*, BILOG (Mar. 21, 2003, 4:54 PM), <http://journalism.berkeley.edu/projects/biplog/archive/000751.html>.

⁶⁸ *Twentieth Century Fox Film Corp. v. Cablevision Sys. Corp.*, 478 F. Supp. 2d 607, 611 (S.D.N.Y. 2007), *aff'd sub nom. Cartoon Network v. CSC Holdings*, 536 F.3d 121 (2d Cir. 2008).

⁶⁹ *Id.* at 612.

schedule recordings and initiate playback through onscreen menus controlled via remote control, and they can record the same lineup of programs available to set-top DVR users.⁷⁰

But the design of the RS-DVR differs from older set-top models in some important respects. Whereas traditional DVRs store recorded programming on hard disks located within the set-top box itself, the RS-DVR stores recordings on dedicated hard disk space in computer servers centrally located in Cablevision facilities. When a user plays back a show on a RS-DVR, the recording is transmitted from Cablevision's servers to the user's television.⁷¹ This networked design offers Cablevision a number of benefits, including reduced hardware, installation, and maintenance costs.⁷²

Apprised of Cablevision's plans, a collection of television networks and movie studios, including Cartoon Network, filed suit against Cablevision and its operating company, CSC Holdings (collectively "CSC").⁷³ Plaintiffs alleged CSC would directly infringe its rights of reproduction and public performance by offering the RS-DVR.⁷⁴ These claims were based on a number of alleged acts of infringement, only some of which bear on the RAM copy controversy.⁷⁵

A brief discussion of the relevant technical details will help place these allegations in context. Again, while Cablevision customers control the RS-DVR from the comfort of their sofas, the back end of the system is located in Cablevision's own facilities. The operation of the RS-DVR system begins when a data stream containing all of the television programming offered by Cablevision enters a device called the Broadband Multimedia Router (BMR). The BMR divides that single data stream into separate streams for each television channel.⁷⁶ This conversion requires the BMR to

⁷⁰ *Id.*

⁷¹ *Id.* at 615.

⁷² However, the efficiencies of the RS-DVR were limited to some extent by legal worries. Rather than storing a single copy of recorded programs that could be transmitted to each user, Cablevision chose to store a separate copy of each program for each subscriber who chose to record it. *Id.* Presumably this more resource intensive design decision was made to minimize potential liability for publicly performing the programs in question. For further discussion of the relationship between copyright law and technological efficiency, see Ed Felten, *Cablevision and Anti-Efficiency Policy*, FREEDOM TO TINKER (Apr. 18, 2007, 5:24 AM), <http://www.freedom-to-tinker.com/blog/felten/cablevision-and-anti-efficiency-policy>.

⁷³ *Twentieth Century Fox*, 478 F. Supp. 2d at 609–10.

⁷⁴ Claims for contributory and vicarious liability were conspicuously absent from the complaint. As a strategic matter, the plaintiffs agreed to forego any claims premised on indirect infringement in exchange for Cablevision's agreement not to raise a fair use defense to the direct infringement claims. *Id.* at 616.

⁷⁵ The plaintiffs also alleged that their rights were infringed by the creation of copies of programming on Cablevision's centrally located hard disk and the display of recorded programs to Cablevision subscribers. The district court agreed that these acts constituted infringement despite Cablevision's argument that its customers initiate both recording and playback. *Id.* at 624.

⁷⁶ The BMR also altered the bitrate of the incoming data stream and assigned port numbers to each individual data stream to identify the channel it contained. *Id.* at 613.

load the data stream into its buffer memory, a form of RAM,⁷⁷ for no more than 1.2 seconds.⁷⁸

The BMR then relays these data streams to one of many servers containing hard drives on which recorded programs are stored.⁷⁹ The server buffers these streams in its primary ingest buffer, which retains no more than three frames—or one tenth of a second—of video for each channel at any one time.⁸⁰ These streams are buffered by the primary ingest buffer automatically, regardless of whether a customer requests a recording of any particular program.⁸¹

If a customer initiates a recording, the server moves data for the selected channel from the primary ingest buffer to its secondary ingest buffer.⁸² From the secondary ingest buffer, data is written to the server's hard drive, where the program is stored for later viewing. When a customer chooses to view that recording, the copy on the hard drive passes through a streaming buffer that contains as much as two seconds of video.⁸³ In total, recording and play back of a single television recording requires the creation of at least four buffer instantiations.

Cartoon Network argued that each of these buffer instantiations is a copy that violates its reproduction right. CSC maintained that data passing through the buffer memory of the BMR and its servers are not fixed and thus not copies. After reciting the appropriate definitions from the Copyright Act, the district court, relying on the *Peak* line of cases⁸⁴ and the Cop-

⁷⁷ *Id.* at 614.

⁷⁸ *Cartoon Network v. CSC Holdings*, 536 F.3d 121, at 124–25 (2d Cir. 2008).

⁷⁹ *Twentieth Century Fox*, 478 F. Supp. 2d at 614.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.* at 615.

⁸³ *Id.* at 615–16.

⁸⁴ The district court, in keeping with the bulk of the case law, adopted the hard variant of *Peak*'s RAM copy doctrine. *Id.* at 621 (noting that “numerous courts have held that the transmission of information through a computer’s random access memory . . . creates a ‘copy’”).

yright Office's Section 104 Report,⁸⁵ concluded that buffer instantiations are copies because they can be reproduced on hard disk in a permanent form.⁸⁶

Like the sources upon which it relied, the district court ignored the statutory requirement that a fixation persist for a period of more than transitory duration. Moreover, as the court's own description of the RS-DVR establishes, only the secondary ingest buffer is capable of being copied to the server hard disk drives. Nonetheless, the court offered the ability to create a downstream reproduction as the sole justification for classifying all four buffers as copies. But the district court's analysis, even if flawed, is simply a workaday application of the rigid analytical approach developed by *Peak* and its progeny.

On appeal, the Second Circuit showed considerably less deference to the orthodox RAM copy analysis. Rather than simply reciting the definitions of "copies" and "fixed" before embarking on a rote application of the RAM copy doctrine, the court noted that together those definitions impose two distinct requirements any putative copy must satisfy.⁸⁷ First, the alleged copy must be sufficiently embodied to be perceived, reproduced, and communicated.⁸⁸ Second, that embodiment must persist for more than a transitory duration.⁸⁹ According to the Second Circuit, the district court erred by focusing on embodiment to the exclusion of the durational requirement.

This blunt assessment of the shortcomings of the opinion below contrasts sharply with the court's charitable reading of *Peak*.⁹⁰ The Second Circuit took great pains to rhetorically minimize its departure from the Ninth Circuit's approach to temporary instantiations. The *Cartoon Network*

⁸⁵ The Copyright Office's Section 104 Report, while offering a considerably more detailed analysis, largely reiterates the central holding of *Peak*. According to the Copyright Office, if an instantiation of a work persists long enough to be copied, perceived, or communicated, it is fixed. COPYRIGHT OFFICE, DMCA SECTION 104 REPORT 110–12 (2001) [hereinafter 104 REPORT]. This reading, however, collapses the two requirements of fixation imposed by the Copyright Act, essentially eliminating any independent role for the statute's "transitory duration" language. *See id.*

The 104 Report suggests that a transitory duration is necessarily less than an ephemeral one since the Copyright Act provides an exemption to liability for the creation of ephemeral copies by certain broadcasting organizations. *See* 17 U.S.C. § 112 (2006); 104 REPORT at 111. The Copyright Office's assertion is correct as far as it goes. But the term "ephemeral," as defined by the Copyright Act, bears little connection to its common English usage. Such ephemeral copies created under § 112 can persist for as long as six months, 17 U.S.C. § 112(a)(1)(C), one year, *id.* § 112(c)(3), or seven years, *id.* § 112(b)(2). Section 112 simply offers no valuable insight into the proper understanding of transitory duration.

⁸⁶ *Twentieth Century Fox*, 478 F. Supp. 2d at 621–22.

⁸⁷ *Cartoon Network v. CSC Holdings*, 536 F.3d 121, 127 (2d Cir. 2008).

⁸⁸ *Id.* (citing 17 U.S.C. § 101).

⁸⁹ *Id.*

⁹⁰ The Second Circuit also openly criticized the Section 104 Report for reading the durational requirement out of the statute. *Id.* at 129. The court deemed the report's conclusion that an instantiation in RAM is a copy unless it "manifests itself so fleetingly that it cannot be copied, perceived or communicated" unpersuasive. *Id.* (internal quotation marks omitted).

court explained away *Peak*'s failure to address the durational requirement by presuming that the RAM instantiations at issue in *Peak* lasted "for at least several minutes."⁹¹ According to the Second Circuit, *Peak* did not read the durational requirement out of the statute, but implicitly found that it had been satisfied. But *Peak* contains no factual findings concerning the duration of the RAM instantiations, nor does it hint at any conclusions drawn on the basis of such facts. Instead it offers a holding that is entirely devoid of references to duration. Nonetheless, the Second Circuit conspicuously rejected the notion that *Peak* stands for an inflexible RAM copy doctrine deaf to the durational requirement. *Peak*, the Second Circuit maintained, did not hold that all RAM instantiations are necessarily copies, only that they may be copies if that classification is borne out by the facts. Any other reading, the court suggested, would accuse the Ninth Circuit of ignoring the text of the Copyright Act.⁹²

The Second Circuit's effort to reconcile its fact-based inquiry with *Peak*'s perfunctory rule, even if transparent, is understandable. Rather than announce an inter-circuit dispute that situates *Peak* at center stage and potentially lessens *Cartoon Network*'s precedential impact, the Second Circuit ushered *Peak* into the wings, leaving the *Cartoon Network* reasoning to stand on its own merit. But the Second Circuit's careful positioning cannot mask the lingering circuit split its rejection of *Peak* creates.⁹³

After endeavoring to minimize its departure from *Peak*, the Second Circuit offered a straightforward analysis of the RS-DVR buffers. Because the embodiment prong was not genuinely disputed, the question turned on whether the buffer instantiations were transitory. Importantly, the court limited the scope of its inquiry to the primary ingest and BMR buffers, both of which contained data regardless of user requests.⁹⁴ The court noted that

⁹¹ *Id.* at 128.

⁹² *Id.*

⁹³ Although the Supreme Court ultimately declined to grant the copyright holders' petition for certiorari, it invited the Solicitor General to weigh in on the RAM instantiation controversy. See *CNN, Inc. v. CSC Holdings*, 129 S. Ct. 985, 985–86 (U.S. 2009). The Solicitor General, much like the Second Circuit, attempted to minimize the gulf between the *Peak* line of cases and *Cartoon Network*. According to the Solicitor General, the Second Circuit merely "distinguished, rather than disagreed with" *Peak*. Brief for the United States as Amicus Curiae at 9, *CNN, Inc. v. CSC Holdings*, 129 S. Ct. 985 (U.S. 2009) [hereinafter CSC Brief]. Under this reading, *Peak* simply neglected to address the transitory duration requirement rather than affirmatively reading it out of the statute. *Id.* Again, this charitable reading of *Peak* is inconsistent with the sweeping statements of its holding in both subsequent cases and *Peak* itself.

Another rationale offered by the Solicitor General for not granting certiorari is more persuasive. Because the parties agreed to take questions of indirect liability and fair use off of the table, *Cartoon Network* offered the Court an inopportune record to fully address the issues raised by the RS-DVR technology. See *id.* at 11–14. But this argument is unrelated to the claim that *Cartoon Network* and *Peak* are reconcilable.

⁹⁴ CSC argued that copies resulting from subscriber commands to record and play back content were made, if at all, by the subscriber rather than Cablevision. This argument extended to the secondary ingest and streaming buffers, prompting the court to focus its analysis on the buffers CSC admittedly

data in these buffers persists for only 0.1 to 1.2 seconds and are automatically overwritten.⁹⁵ Stressing the fact-specific nature of inquiry, the court was satisfied that the RS-DVR buffers contained unfixed transitory instantiations, not copies.⁹⁶

B. Evaluating Cartoon Network

Despite its claims to the contrary, *Cartoon Network* signals a major shift away from the prevailing judicial treatment of temporary digital instantiations. Rejecting the hard RAM copy doctrine and its manifest misreading of the statute, *Cartoon Network* clears the initial hurdle of lending independent meaning to each element of fixation. Further, *Cartoon Network* displays a degree of sensitivity to the wide range of facts that give rise to RAM instantiations, recognizing that a rule that paints all alleged copies with the same broad brush likely oversimplifies the inquiry.

These virtues aside, *Cartoon Network* is wanting in some important respects. Although the Second Circuit underscored the necessity of satisfying the durational requirement, it teaches precious little about the substantive obligations imposed by that requirement. The court offers no test for transitory duration, and provides no transparent set of criteria for its evaluation of the RS-DVR buffers. The court's holding has intuitive appeal, but the reasoning that produced it remains shrouded in something of a black box.

Because the court's logic is not revealed on the face of its opinion, fundamental questions about the nature of its analysis remain unanswered. On one reading, the *Cartoon Network* approach to RAM instantiations may be reducible to a matter of pure durational line drawing. The court repeatedly stresses the brief existence of these would-be copies.⁹⁷ But if temporal considerations alone drive the court's analysis, *Cartoon Network* does little to help future courts, developers, or copyright holders locate the durational threshold.⁹⁸ Rather than identifying the location of the line separating fixed copies from unfixed instantiations, the Second Circuit simply announced

created. With respect to the secondary ingest buffer, the court held that any copies created in response to requests to record a program were created by subscribers. *Cartoon Network*, 536 F.3d at 132. The performance of recorded programs, presumably encompassing the streaming buffer, were according to the court private rather than public, and thus beyond the scope of the copyrights holders' exclusive rights. *Id.* at 138.

⁹⁵ *Id.* at 124–25.

⁹⁶ *Id.* at 130.

⁹⁷ At least one court has relied on *Cartoon Network*'s “suggest[ion] that the duration requirement would be satisfied where the program remained in the RAM for at least several minutes” to support a finding of infringement. *SimplexGrinnell LP v. Integrated Sys. & Power, Inc.*, 642 F. Supp. 2d 167, 189 (S.D.N.Y. 2009) (internal citations omitted) (finding a copy was created when software was loaded into RAM for “several minutes to several hours”).

⁹⁸ See Eric Goldman, “DVR as a Service” *Isn't Copyright Infringement*—*Cartoon Network v. CSC Holdings, TECHNOLOGY & MARKETING LAW BLOG* (Aug. 4, 2008), http://blog.ericgoldman.org/archives/2008/08/dvr_as_a_servic.htm (noting that *Cartoon Network* “deftly side-steps” the difficulty of identifying any particular durational threshold).

that the RS-DVR buffers are safely to one side of it. Without some durational metric, the outcomes of litigation will be the only reliable indications of the status of RAM instantiations.

But if the court's description of the RS-DVR buffers is any indication, its rationale is not one rooted entirely in temporal considerations. The court, shortly before concluding that the buffers did not result in copies, noted that their data was "rapidly and automatically overwritten as soon as it [wa]s processed."⁹⁹ Although this fact relates to the duration of buffer data, the court's recitation suggests a concern that goes beyond the quantitative inquiry to touch on the ways in which the system processes and uses data. Both parties stressed the role of qualitative factors parties in their briefing, so the court's sensitivity to the issue is not entirely surprising.¹⁰⁰ If the court did take these factors into account, precisely which qualitative considerations it thought relevant remains unclear. Equally unexplained is the relationship between quantitative and qualitative factors. *Cartoon Network* offers no insight as to their interplay or relative weight.

Because the court's logic is largely obscured, *Cartoon Network* introduces a significant degree of uncertainty to future disputes over temporary instantiations. For all its faults, the hard RAM copy doctrine that emerged from *Peak* and its progeny offered a high degree of predictability. All instantiations of copyrighted works in the memory of computing devices were copies. Even if incorrect as a matter of law and unjustifiable as a matter of policy, the *Peak* rule led to reasonably settled expectations about the legal risk to developers of digital technologies. This bright-line rule also greatly simplified the court's task in evaluating claims of infringement.

Cartoon Network sacrifices this clarity in exchange for what the Second Circuit reasonably deems an outcome more consistent with the text and purpose of the Copyright Act. As the court admits, the inquiry required by *Cartoon Network* is necessarily a fact-specific one that must proceed on a case-by-case basis.¹⁰¹ To the extent future courts follow the Second Circuit's lead, the common law process will define the contours of the transitory duration requirement with greater clarity. But as the initial marker along

⁹⁹ *Cartoon Network*, 536 F.3d at 130.

¹⁰⁰ CSC maintained that buffer data existed only while in transit between system components, and were thus literally transitory. Brief and Special Appendix for Defendants-Counterclaimants-Appellants at 40, *Cartoon Network v. CSC Holdings*, 536 F.3d 121 (2d Cir. May 30, 2007) (Nos. 07-1480-cv(L), 07-1511-cv(CON)), 2007 WL 6101602. Plaintiffs, on the other hand, urged the court to consider the functional role of buffer copies in enabling permanent downstream copies. Because buffer instantiations were capable of being reproduced in fixed hard disk copies, they argued buffer data should be treated as fixed. See Brief of Plaintiffs-Counterclaim-Defendants-Appellees the Cartoon Network at 49-50, *Cartoon Network v. CSC Holdings*, 536 F.3d 121 (2d Cir. June 20, 2007) (Nos. 07-1480-cv(L), 07-1511-cv(CON)), 2007 WL 6101601. As a matter of statutory interpretation, the notion that the phrase "for more than a transitory duration" modifies potential downstream copies rather than the instantiation in question is implausible.

¹⁰¹ See *Cartoon Network*, 536 F.3d at 130 (noting that cases turn on the specific conduct at issue).

that path, *Cartoon Network* offers limited guidance in locating the elusive line between fixed copies and fleeting ephemera.¹⁰²

This uncertainty is exacerbated by the narrow facts before the court. The buffers it considered persisted for only 0.1 to 1.2 seconds and were rapidly and automatically overwritten by incoming data.¹⁰³ Even within these narrow confines, the Second Circuit left open the possibility that “other factors not present here may alter the duration analysis significantly.”¹⁰⁴ This cryptic proviso further limits the counsel that *Cartoon Network* offers future courts.

Given these open questions, *Cartoon Network* cannot claim to have fully resolved the controversy over RAM instantiations. Nonetheless, by rejecting a dominant but flawed statutory reading, *Cartoon Network* represents the first tentative steps towards a solution to the RAM copy problem. For too long, a well-rehearsed debate has centered on *Peak*. Courts have blindly followed it, and scholars have doggedly attacked it. But before *Cartoon Network*, few had offered alternative methodologies. Despite its imperfections, *Cartoon Network* frees courts from the rigid *Peak* doctrine and suggests the possibility of a new way forward. The next Part builds on the Second Circuit’s insights to outline a complete framework for the analysis of temporary instantiations.

III. DEVELOPING A FRAMEWORK FOR RAM INSTANTIATIONS

Peak provides consistent and predictable outcomes in RAM copy cases, but rests on an unjustifiable reading of the statute. *Cartoon Network* offers a more nuanced and more accurate statutory interpretation, but threatens unpredictability in future cases. An ideal framework for analyzing temporary instantiations would combine the subtlety of *Cartoon Network* with the predictability of *Peak*. But these two values are in tension. *Peak*’s predictability, after all, stems from its sweepingly over-inclusive understanding of RAM copies. This Part attempts to construct an approach that is mindful of the best features of *Peak* and *Cartoon Network* by identifying concrete factors that courts should consider in distinguishing fixed copies from mere instantiations.

¹⁰² As a result, the few courts that have decided RAM copying questions in the wake of *Cartoon Network* have failed to embrace its fundamental lesson. In *SimplexGrinnell LP v. Integrated Sys. & Power, Inc.*, the court bypassed any genuine analysis of the RAM copy question by limiting *Cartoon Network* to exceptionally brief instantiations and concluding that those lasting for “several minutes to several hours” were necessarily fixed. 642 F. Supp. 2d at 189.

In another recent case, the Fourth Circuit upheld a jury verdict against a defendant for creating RAM copies when its employees powered on computers containing the plaintiff’s software, the license for which had expired. *Quantum Sys. Integrators, Inc. v. Sprint Nextel Corp.*, Nos. 08-1534-45, 2009 U.S. App. LEXIS 14766, at *18-19 (4th Cir. July 7, 2009). The court cited *Cartoon Network* in passing, but relied on *Peak* for the proposition that RAM instantiations are fixed copies. *Id.*

¹⁰³ See *supra* text accompanying note 95.

¹⁰⁴ *Cartoon Network*, 536 F.3d at 130.

Specifically, this Part begins by exploring the relevance of the statutory definitions of “copies” and “fixed,” the shared starting points in both *Peak* and *Cartoon Network*. Some have argued that these definitions, which were crafted to clarify the scope of the subject matter protected by copyright, are irrelevant to questions of infringement. But this Part suggests that, despite the focus of the drafters of the Copyright Act, those definitions play a central role in the analysis of infringement in cases dealing with temporary instantiations.

Next, this Part explores the meaning of those definitions. In particular, it aims to give some content to a central requirement of fixation—that an instantiation persist for more than a transitory duration. Three sets of considerations shed light on the scope of transitory duration: its application in the copyrightability context; qualitative dimensions that take into account the function of temporary instantiations; and the traditional roles of the reproduction right. Based on these considerations, this Part develops a set of factors on which courts can rely to identify fixed copies.

A. *The Relevance of Statutory Definitions*

The terms “copies” and “fixed” play two roles in copyright law.¹⁰⁵ First, they figure in determining whether a work is eligible for protection. Second, as *Peak* and *Cartoon Network* demonstrate, they help courts determine whether the reproduction right has been infringed.¹⁰⁶ Although the Copyright Act defines these terms generally, Congress crafted their definitions with copyrightability concerns at the fore. As a result, a “copy” as defined by the Act for protectability purposes might be quite distinct from the concept of a “copy” in the infringement context. If so, courts considering RAM instantiations are mistaken in their shared reliance on the statutory definitions as the starting point for their inquiry.

The term “copy” helps delineate copyrightable subject matter by drawing a conceptual distinction between tangible embodiments of a work and the work itself. A copy is a “material object[] . . . in which a work is fixed . . . and from which the work can be perceived, reproduced, or otherwise communicated.”¹⁰⁷ Copies include not only reproductions of a work,

¹⁰⁵ See *Matthew Bender & Co. v. West Publ'g Co.*, 158 F.3d 693, 702 (2d Cir. 1998) (noting that “the sole purpose of § 101’s definitions of the words ‘copies’ and ‘fixed’ is . . . to define the material objects in which copyrightable and infringing works may be embedded and to describe the requisite fixed nature of that work within the material object”).

¹⁰⁶ The terms also figure in analysis of infringement of the distribution right. 17 U.S.C. § 106(3) (2006); see *infra* Part III.B.

¹⁰⁷ 17 U.S.C. § 101. Similarly, the Act defines “phonorecords” as “material objects in which sounds, other than those accompanying a motion picture or other audiovisual work, are fixed by any method now known or later developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.” *Id.*

but also “the material object . . . in which the work is first fixed.”¹⁰⁸ For the purposes of the Copyright Act, an original manuscript of a work is just as much a copy as any downstream duplicate. These copies are distinct from the intangible intellectual creation of the author, or the “work” in the parlance of the Copyright Act.¹⁰⁹ Previous acts did not define “copies,”¹¹⁰ but the 1976 Act took pains to distinguish between a copyrighted work and its physical embodiment.

The Register of Copyrights¹¹¹ first voiced the need for a statutory definition of “copies” in 1965. According to the Register, the failure to distinguish between works of authorship and the material objects embodying them “resulted in a great deal of unnecessary confusion” and “unpredictable or unfair” results in individual cases.¹¹² Congress agreed that this definition “reflect[ed] a fundamental distinction between the ‘original work’ which is the product of ‘authorship’ and the multitude of material objects in which it can be embodied.”¹¹³ Congress saw the definition of “copies” as central to the question of copyrightability, explaining “two essential elements—original work and tangible object—must merge through fixation in order to produce subject matter copyrightable under the statute.”¹¹⁴

Fixation plays a different and more fundamental role in the copyrightability context. In order to be protected by copyright, a work must be “fixed in any tangible medium of expression.”¹¹⁵ The origins of this requirement are constitutional. Article I, section 8, clause 8 of the Constitution empowers Congress to grant authors exclusive rights in their “Writings.”¹¹⁶ This limitation accommodates a wide range of media, but precludes protection for works not recorded in some enduring form.¹¹⁷ In

¹⁰⁸ *Id.*

¹⁰⁹ The Copyright Act enumerates categories of works of authorship eligible for protection, among them literary, dramatic, and musical works, motion pictures, and sound recordings. See 17 U.S.C. § 102.

¹¹⁰ See, e.g., Copyright Act of 1909, ch. 320, 35 Stat. 1075 (1909) (current versions at 17 U.S.C. §§ 101–02).

¹¹¹ The Register of Copyrights is the “director of the Copyright Office of the Library of Congress” and is charged with “advise[ing] Congress on national and international issues relating to copyright.” 17 U.S.C. § 701.

¹¹² STAFF OF H. COMM. ON THE JUDICIARY, 89TH CONG., SUPPLEMENTARY REPORT OF THE REGISTER OF COPYRIGHTS ON THE GENERAL REVISION OF THE U.S. COPYRIGHT LAW: 1965 REVISION BILL 4 (Comm. Print 1965).

¹¹³ H.R. REP. NO. 94-1476, at 53 (1976); S. REP. NO. 94-473, at 52 (1975). Congress used these same terms a decade earlier to describe the identical definition of copies introduced in 1965. See H.R. REP. NO. 89-2237, at 45 (1966).

¹¹⁴ See H.R. REP. NO. 89-2237, at 45.

¹¹⁵ 17 U.S.C. § 102(a).

¹¹⁶ U.S. CONST. art. I, § 8, cl. 8.

¹¹⁷ See *Goldstein v. California*, 412 U.S. 546, 561 (1973) (“[T]he word ‘writings’ . . . may be interpreted to include any physical rendering of the fruits of creative intellectual or aesthetic labor.”); *Burrow-Giles Lithographic, Co. v. Sarony*, 111 U.S. 53, 58 (1883) (embracing an understanding of “Writings” that includes “all forms of writing, printing, engraving, etching, &c., by which the ideas in

the context of copyrightability, fixation ensures compliance with this constitutional mandate.

“Fixed” was likewise defined in the 1976 Act with an eye to copyrightability concerns. Earlier revision bills left “fixed” undefined, relying on the common law understanding of fixation.¹¹⁸ But with the enumeration of audiovisual works as copyrightable subject matter, Congress defined “fixed” in an effort to clarify the copyright status of live broadcasts.¹¹⁹ Generally, a work is fixed “when its embodiment in a copy . . . is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.”¹²⁰ However, the statute goes on to stipulate that “[a] work consisting of sounds, images, or both, that are being transmitted, is ‘fixed’ . . . if a fixation of the work is being made simultaneously with its transmission.”¹²¹ This exception to the general rule was intended to ensure that live programs, notably sporting events, are accorded copyright protection simultaneously with their broadcast, before a complete fixation exists.¹²²

Given this emphasis on copyrightability, one leading treatise author has criticized courts for relying on the definitions of “fixed” and “copies” to resolve the thorny issues presented by RAM instantiations.¹²³ William Patry has argued that both *Peak* and *Cartoon Network* display an undue preoccu-

the mind of the author are given visible expression”); see also Aaron K. Perzanowski, *The Penumbra Public Domain: Constitutional Limits on Quasi-Copyright Legislation*, 10 U. PA. J. CONST. L. 1081, 1119–20 (2008) (quoting same and indicating that writings only include works “reduced to some tangible physical representation”).

¹¹⁸ 3 WILLIAM F. PATRY, *PATRY ON COPYRIGHT* § 9:63 (2007).

¹¹⁹ *Id.* Patry also notes that Congress sought “to exclude from protection evanescent images captured momentarily in the memory of a computer.” *Id.*

¹²⁰ 17 U.S.C. § 101.

¹²¹ *Id.*

¹²² H.R. REP. NO. 94-1476, at 52 (1976) (noting that the definition of “fixation” was intended to resolve “the status of live broadcasts—sports, news coverage, live performances of music, etc.—that are reaching the public in unfixed form but that are simultaneously being recorded”). The inclusion of this definition also prompted Congress to explain that “purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other cathode ray tube, or captured momentarily in the ‘memory’ of a computer” were beyond the scope of fixation. *Id.* at 53.

The simultaneous transmission exception raises questions about the extent to which instantiations like those at issue in *Cartoon Network* satisfy the embodiment requirement of fixation. The necessity of the exception suggests that the partial fixation of a work is normally insufficient to render the entire work fixed. Like the fixation of a live transmission, the instantiations created in the buffers of the RS-DVR system are only partial. But unlike the fixation of a live transmission, the buffer never contains the entire work, only a series of partial instantiations. In this sense, the partial serial instantiations in the RS-DVR buffer are even less fixed than the live transmissions Congress altered the Copyright Act to embrace.

¹²³ See 3 PATRY, *supra* note 118, § 9.63; 1 WILLIAM F. PATRY, *PATRY ON COPYRIGHT* § 3.24 (2007).

pation with these statutory definitions.¹²⁴ According to Patry, the two opinions rely on a “semantic sleight-of-hand” that equates a “copy” in the statutorily defined copyrightability sense with an infringement of the reproduction right.¹²⁵ Patry suggests courts should rely instead on the common law understanding of “copies” that developed in the reproduction context, an understanding that incorporates an inherent requirement of materiality, for reproduction purposes.¹²⁶ As Patry notes, neither “infringement” nor “reproduction” is defined by the Copyright Act, suggesting that Congress did not intend to disturb common law standards for infringement.¹²⁷

The terms “copies” and “fixed” were not defined with the RAM copy controversy in mind. Nonetheless, those definitions are likely to remain central to the resolution of disputes over RAM instantiations. Although the *Peak* line of cases and *Cartoon Network* differ in fundamental respects, both accept these definitions as a common starting point. More importantly, nothing in the text of the Copyright Acts indicates that the term “copies” as used in connection with the reproduction right refers to anything other than that term’s statutory definition. The conspicuous presence of “copies” within the reproduction right simply cannot be ignored.

But the precise contribution of the definition of “copies”—and by extension “fixed”—to the infringement analysis requires a closer look at the varied ways in which copyright law talks about copies. In the infringement context, copyright concerns itself with copies in three distinct ways. First, copyright requires that an infringing work be a copy in the factual sense. The infringing expression must borrow from the protected work. Independently created works, no matter how similar, do not infringe.¹²⁸ Second, the alleged infringement must be a copy in the legal sense. In other words, the accused work must be substantially similar to the protected work.¹²⁹ Factual and legal copying are necessary to establish infringement of any of the copyright holder’s exclusive rights. But the reproduction right—the right “to

¹²⁴ See 3 PATRY, *supra* note 118, § 9.63.50 (agreeing with the outcome in *Cartoon Network* but suggesting “a much simpler way to get to that result” that rejects the equation of “copy” in the infringement analysis with that term’s statutory definition). 1 PATRY, *supra* note 123, § 3.24.

¹²⁵ 3 PATRY, *supra* note 118, §§ 9.63, 9.63.5.

¹²⁶ *Id.*

¹²⁷ *Id.* § 9:63 (“Reproduction is not defined.”); 1 PATRY, *supra* note 123, § 3.24 (“In the 1976 Act Congress declined to include a definition of infringement.”).

¹²⁸ See *Mazer v. Stein*, 347 U.S. 201, 218 (1954) (“[A] copyrighted directory is not infringed by a similar directory which is the product of independent work Absent copying there can be no infringement of copyright.” (footnotes omitted)).

¹²⁹ See *Boisson v. Banian, Ltd.*, 273 F.3d 262, 268 (2d Cir. 2001) (“[N]ot all copying results in copyright infringement, even if the plaintiff has a valid copyright. Plaintiffs must also demonstrate ‘substantial similarity.’” (citations omitted)); see also 4 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 13.01[B] (2009) (“[C]opying is ordinarily established indirectly by the plaintiff’s proof of access and substantial similarity.” (internal citations and quotations omitted)).

reproduce the copyrighted work in copies”¹³⁰—contemplates copies in a third sense. For an infringement to violate the reproduction right, rather than, for example, the public performance right, the infringing work needs to be embodied in some concrete form. Showing a motion picture in public infringes if the performance is a copy in the factual and legal senses. But because the performance does not result in a copy in the third sense, it is not an infringement of the reproduction right.

These three conceptions of the copy shed some light on the charge that *Peak* and *Cartoon Network* conflate “copies” as defined by the Copyright Act with copies for infringement purposes. Patry posits that courts used a strict definitional understanding of “copies” as a substitute for copying in the legal sense.¹³¹ But it appears more likely that *Peak* and *Cartoon Network* relied on the statutory definitions to inform the third notion of copying, not the second.¹³² Since the RAM instantiation cases involved literal bit-for-bit copying, those courts were likely not concerned with substantial similarity. Instead, the courts focused on whether these factual and legal copies could be deemed fixed copies in the sense required by the reproduction right.

Although not dispositive, the definitions of “fixed” and “copies” are an inescapable component of infringement of the reproduction right. In most cases, this element is not disputed. But in cases alleging RAM copies, the question of whether the instantiations in question are “fixed” and therefore “copies” in the sense defined by the statute is largely outcome determinative. The precise demands of those definitions, however, remain largely undefined. The discussion below outlines their contours.

B. *The Contours of Transitory Duration*

The definitions of “copies” and “fixed” are central to the RAM copy question but remain poorly understood in at least one key respect. The status of temporary instantiations turns largely on the meaning of the phrase “transitory duration.”¹³³ Instantiations that persist for more than a transitory

¹³⁰ 17 U.S.C. § 106(1) (2006).

¹³¹ See 3 PATRY, *supra* note 118, § 9.63; 1 PATRY, *supra* note 123, § 3.24.

¹³² Prior to 1976, copyright law did not draw an explicit distinction between the second and third notions of “copies” for infringement purposes. As one commentator describing the state of affairs under the 1909 Act explained:

It would seem that a copy involves the conception that it must have some degree of permanency or the maxim *de minimis* would apply. Thus, while the making of a single copy may be infringement, if this copy were destroyed almost as soon as made, as, for example, if a vaudeville artist drew with colored chalks, or if a verse were cast upon a screen through a stereopticon, it may be doubted whether such a temporary production could fairly be called a copy.

ARTHUR W. WEIL, *AMERICAN COPYRIGHT LAW* 406 (1917).

¹³³ See 17 U.S.C. § 101 (“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.*” (emphasis added)).

duration are copies, and those that do not are mere ephemera. But the precise contours of the transitory duration requirement remain largely obscured. In order to avoid a common law process mired in arbitrary durational line drawing, courts need more concrete guidance. Three sets of considerations might offer courts that much needed direction. First, because “copies” and “fixed” were defined for subject matter purposes, their application in the copyrightability context might provide some guidance. Second, a handful of courts discussing these definitions in the infringement context have suggested that “transitory duration” requires consideration of not only the temporal longevity of an instantiation but qualitative factors relating to the manner and purpose of their creation as well.¹³⁴ Third, courts might focus on the degree to which RAM instantiations served as functional substitutes for longer lasting fixed copies.

1. Copyrightability & Fixation.—Because Congress defined “copies” and “fixed” to clarify copyright’s subject matter, one might expect the interpretation of those terms in disputes over copyrightability to inform our understanding of “transitory duration.” However, virtually no reported decisions analyze the statute’s transitory duration clause in the copyrightability context.¹³⁵ In part, the simultaneous fixation provision explains this dearth of cases. By ensuring that commercially valuable broadcasts are considered fixed so long as they are recorded simultaneously with their transmission, Congress rendered the bulk of likely litigation over fixation unnecessary.¹³⁶

Given the lack of relevant case law, any effort to rely on the scope of copyrightable subject matter to inform our reading of “transitory duration” must build from first principles. The fixation requirement serves two primary functions in the copyright system, purposes that could help to illuminate the contours of the durational requirement.

¹³⁴ See, e.g., *CoStar Group, Inc. v. Loopnet, Inc.* 373 F.3d 544, 551 (4th Cir. 2004) (describing the transitory duration inquiry as involving both quantitative and qualitative considerations).

¹³⁵ A number of early video game cases rejected arguments by defendants that the games at issue were not sufficiently fixed because their audiovisual displays were generated each time the games were played. These courts determined that the games were fixed, although not in a form immediately perceptible without the operation of a machine. These cases did not reach the question of whether the screen displays themselves were of sufficient duration to be independently copyrightable. See, e.g., *Williams Elecs., Inc. v. Artic Int’l, Inc.*, 685 F.2d 870 (3d Cir. 1982); *Stern Elecs., Inc. v. Kaufman*, 669 F.2d 852 (2d Cir. 1982); *Midway Mfg. Co. v. Artic Int’l, Inc.*, 547 F. Supp. 999 (N.D. Ill. 1982), *aff’d* 704 F.2d 1009 (7th Cir. 1983).

¹³⁶ The very need for the simultaneous fixation exception provides some insight into the proper understanding of “fixed.” A live television broadcast is capable of being perceived or reproduced regardless of whether it is simultaneously fixed by the copyright holder. If the ability to perceive, reproduce, or otherwise communicate a work were enough to satisfy the fixation requirement, there would be no need for the simultaneous fixation provision. That exception to the general rule for fixation therefore further undermines *Peak’s* hard RAM copy doctrine. But because the images and sounds of a live broadcast persist only instantaneously, this exception does not help locate the outer bounds of “transitory duration.”

The first of these functions is evidentiary. By requiring that protectable works be committed to a tangible and enduring form, copyright avoids problems of proof that would otherwise stymie enforcement efforts.¹³⁷ Fixation clarifies questions of authorship and ownership, and it defines the bounds of the copyright grant through reference to a stable instantiation that can be compared to alleged infringements. If unfixed works could be protected, “copyright law would forever be mired in disputes over the definition and boundaries of the works claiming copyright protection.”¹³⁸

Second, fixation helps to ensure that the copyright system serves its constitutional objective. The Constitution enables Congress to enact copyright legislation not to reward authors but “to promote the progress of science.”¹³⁹ The exclusive rights provided by copyright law are intended as an incentive for authors to create works and disseminate them publicly, initially under the strictures of copyright and later freely within the public domain. Public dissemination and construction of the public domain are central to the encouragement of knowledge and learning that animates copyright law¹⁴⁰ and represent half of the implicit quid pro quo of the copyright system. Authors are granted exclusive rights in exchange for the promise that their works will be available to the public. By ensuring that works are captured in some lasting form, copyright law encourages authors to express their ideas on paper, where they can be preserved, copied, and disseminated—thus enriching the public domain and promoting progress.¹⁴¹

If fixation serves these two purposes, “transitory duration” should be interpreted with them in mind. To the extent an embodiment is so evanescent that it impedes the goals of fixation, its duration is transient. This standard, of course, does not require permanence. All physical embodiments decay over time. Books are vulnerable to mold and insects;¹⁴² film is subject to chemical deterioration;¹⁴³ and even modern digital storage media

¹³⁷ See Douglas Lichtman, *Copyright as a Rule of Evidence*, 52 DUKE L.J. 683, 730–34 (2003) (discussing evidentiary functions of fixation).

¹³⁸ Gregory S. Donat, Note, *Fixing Fixation: A Copyright with Teeth for Improvisational Performers*, 97 COLUM. L. REV. 1363, 1400 (1997); see also Lichtman, *supra* note 137, at 730–34; Russ VerSteeg, *Jurimetric Copyright: Future Shock for the Visual Arts*, 13 CARDOZO ARTS & ENT. L.J. 125, 132 (1995) (discussing the practical problem of proof addressed by fixation).

¹³⁹ U.S. CONST. art. I, § 8, cl. 8.

¹⁴⁰ See *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (noting copyright’s purpose of “promoting broad public availability”).

¹⁴¹ See, e.g., Joseph C. Merschman, Note, *Anchoring Copyright Laws in the Copyright Clause: Halting the Commerce Clause End Run Around Limits on Congress’s Copyright Power*, 34 CONN. L. REV. 661, 681 (2002) (noting that the fixation requirement is critical to the bargain between society and copyright holders).

¹⁴² HARRY MILLER LYDENBERG & JOHN ARCHER, *THE CARE AND REPAIR OF BOOKS* 17–26 (1945).

¹⁴³ LIBRARY OF CONG., *REDEFINING FILM PRESERVATION: A NATIONAL PLAN 1* (1994), available at <http://www.loc.gov/film/plan.html> (describing the dangers posed to “old films from nitrate deterioration and newer films from color fading and the ‘vinegar syndrome’”).

break down over time.¹⁴⁴ Although these media deteriorate, they typically persist long enough to achieve the aims of fixation.

Bronze, print, and film can be contrasted with more fleeting means of representing a work. Text scrawled on a frosted windowpane,¹⁴⁵ skywriting, sand castles, and ice sculptures are all examples of inherently temporary instantiations. Given the characteristics of these media, they are suspect candidates for fixation. Embodiments that typically survive for only a few minutes or a few hours appear unlikely to qualify as fixed when measured against the underlying purposes of the fixation requirement. Such short-lived media will not generally provide reliable evidence of the bounds of copyrighted expression, nor will they enable dissemination and preservation of the author's contribution to public discourse.

A couple of examples may help illustrate this point. The Polaroid instant camera, introduced in 1947, allows photographers to capture an image that develops on special film over the course of a minute.¹⁴⁶ Imagine a technology that works much like the Polaroid, but in reverse. A photo captured on film appears immediately, but fades to black in the span of several minutes. The photographer's work is embodied in tangible form for a short time. But without being reproduced in some more stable form, that instantiation cannot serve as evidence of infringement, nor can it contribute to the progress of science in the sense the Framers intended.¹⁴⁷ As a result, it should be considered transitory in duration and unfixed.¹⁴⁸

To take a more commonplace example, consider email. Typically, as we draft an email message, its contents are contained in RAM. Unless that message is saved as a draft or sent to a recipient, it is not retained in any

¹⁴⁴ JEFF ROTHENBERG, AVOIDING TECHNOLOGICAL QUICKSAND: FINDING A VIABLE TECHNICAL FOUNDATION FOR DIGITAL PRESERVATION 2 (1999), <http://www.cllr.org/pubs/reports/rothenberg/pub77.pdf> (noting that "the physical lifetimes of digital storage media are often surprisingly short").

¹⁴⁵ See Ira L. Brandriss, *Writing in Frost on a Window Pane: Email and Chatting on RAM and Copyright Fixation*, 43 J. COPYRIGHT SOC'Y U.S.A. 237, 237 (1996) (arguing that RAM instantiations are insufficiently permanent to be considered fixed for copyrightability purposes); see also Donald M. Millinger, *Copyright and the Fine Artist*, 48 GEO. WASH. L. REV. 354, 359 (1980) (suggesting that site specific art installations that "last only a few days or weeks" fail to satisfy the fixation requirement); Joan Infarinato, Note, *Copyright Protection for Short-Lived Works of Art*, 51 FORDHAM L. REV. 90, 112 (1982) (expressing uncertainty as to whether works lasting three months are sufficiently fixed).

¹⁴⁶ Tony Long, 'Feb. 21, 1947: Take a Polaroid' Enters the English Language, WIRED.COM, Feb. 21, 2008, http://www.wired.com/science/discoveries/news/2008/02/dayintech_0221.

¹⁴⁷ We might also question the extent to which the authors of such short-lived works want or require copyright protection. In this sense a stable fixation may serve as a useful gauge for whether copyright exclusivity is necessary to incentivize creation. See Brandriss, *supra* note 145, at 242–44.

¹⁴⁸ But see *Patterson v. Century Prods., Inc.*, 93 F.2d 489, 493 (2d Cir. 1937) (suggesting that "a painting reproduced in colors that quickly faded to leave the canvas blank would, when the reproduction was complete, be a copy regardless of its life as such"). In *Patterson*, the court held that the unauthorized exhibition of a motion picture constituted a "copy" under the Copyright Act of 1909, which included no general right of public performance. *Id.* at 492–93. To the extent the Second Circuit's reading of "copy" under the 1909 Act bears on the proper understanding of that term under the 1976 Act, the court's earlier reading appears to have been implicitly rejected in *Cartoon Network*.

long-term storage medium such as a hard drive. If an author decides to discard a draft email rather than send or save it, one can argue persuasively that fixation did not occur. A message stored in RAM is automatically overwritten as the computer uses its limited resources for other tasks.¹⁴⁹ That temporary RAM instantiation, as a result, cannot serve the evidentiary and progress promotion functions of fixation. Whether the draft email remains open on the author's desktop for an hour or a day, this conclusion appears equally appropriate.

If presented with a sufficient number of disputes over fixation, one should expect courts to rely on the typical characteristics of a given medium rather than burdensome and potentially inconsistent determinations in each individual case. While this mode of analysis will serve courts well in the majority of cases, courts cannot rely solely on the medium of embodiment in all cases. Outliers on both ends of the fixation spectrum are likely to arise. Works embodied in generally stable media may deteriorate unexpectedly. For example, consider a cast bronze sculpture destroyed by a natural disaster just seconds after its creation. Although bronze would indicate more than sufficient fixation in most instances, an embodiment destroyed so quickly—regardless of medium—cannot serve the functions of fixation.¹⁵⁰ By the same token, outliers of the opposite sort are likely to arise. Occasionally, a work embodied in a typically evanescent medium may persist for an unusually long time. If a particular reverse Polaroid image or draft email persists for an atypical duration—months or years, for example—these outlier cases should be considered on their particular and peculiar facts.

Analyzing fixation from the perspective of copyrightability offers some insights into the transitory duration analysis. Works embodied in physical form that fail to enable the evidentiary and progress promotion functions should not qualify as fixed. These two functions of fixation offer some broad guidance in locating the temporal line dividing fixed and unfixed instantiations. If the standards for copyrightability are any guide, that distinction should not turn on differences of seconds, minutes, or even hours. Such embodiments are all poorly suited to serve the functions of fixation and therefore equally transitory in duration. Nonetheless, if RAM instantiations persist for an atypically long period of time, classification as copies appears more appropriate.

2. *Qualitative Factors.*—Although the copyrightability considerations discussed above effectively push the durational inquiry towards drawing distinctions on the basis of days, weeks, or months rather than seconds, minutes, or hours, anything approaching a precise durational limit will require greater common law development. The question of transitory dura-

¹⁴⁹ See MUELLER, *supra* note 10, at 416–17.

¹⁵⁰ Admittedly, an approach that would result in inconsistent protection for authors who took identical steps to achieve fixation could be characterized as unfair. But without the public benefits of fixation, the copyright grant under such circumstances would be entirely one-sided.

tion is not a matter of pure durational line drawing, however. A number of courts considering fixation in the infringement context have considered qualitative factors as a supplement to quantitative ones. These decisions stress the importance of functional attributes in determining whether an instantiation is fixed.

One case, *Mura v. Columbia Broadcasting System, Inc.*, addressed the problem of fixation well before the enactment of the Copyright Act of 1976.¹⁵¹ *Mura* considered a claim under the 1909 Act arising out of the use of hand puppets on a children's television program. *Mura* created and sold a line of copyrighted hand puppets.¹⁵² The producers of "The Captain Kangaroo Show" purchased some of these puppets and used them on air without *Mura's* explicit consent.¹⁵³ *Mura* sued for infringement, offering evidence that the puppets appeared on screen for thirty-five seconds in one instance and for "several minutes" on a later occasion.¹⁵⁴ Although each individual image of the puppets lasted only a small fraction of a second when broadcast,¹⁵⁵ Columbia Broadcasting System (CBS) created a permanent kinescope recording of the shorter appearance.¹⁵⁶

Because the 1909 Act included no general public display right, the court focused on reproduction.¹⁵⁷ According to the court, the relevant question was whether "the presentation on the television program, by an image reproduction of a transitory and impermanent nature [was] a copying of the puppets."¹⁵⁸ The court concluded that the "evanescent reproduction" of the puppet on screen was "so different in nature from the copyrighted hand puppet that . . . it [was] not a copy."¹⁵⁹

The court's conclusion reflects both a quantitative judgment about the length of the on-screen instantiations and a qualitative concern over the extent to which those instantiations served a function comparable to the puppets themselves. Because the images on screen were so dissimilar from a functional perspective, the court concluded they were not copies. Whether this substitutability analysis is better conceptualized as a component of the legal copying inquiry or the question of fixation is difficult to discern. Because the 1909 Act did not define "copies" and "fixed," those two questions were less distinct. More fundamentally, the functional equivalence and durational considerations are deeply intertwined. The fact that evanescent im-

¹⁵¹ 245 F. Supp. 587 (S.D.N.Y. 1965).

¹⁵² *Id.* at 588.

¹⁵³ *Id.*

¹⁵⁴ *Id.* at 588–89.

¹⁵⁵ *Id.* at 589.

¹⁵⁶ *Id.* at 588. The court largely ignored this undoubtedly fixed copy of the broadcast on the grounds that it was never commercially exploited by CBS. *Id.*

¹⁵⁷ See Copyright Act of 1909, ch. 320, § 1, 35 Stat. 1075, 1075–76 (1909).

¹⁵⁸ *Mura*, 245 F. Supp. at 589.

¹⁵⁹ *Id.* at 590.

ages of puppets are not functionally comparable to actual hand puppets is partly a reflection of the short lifespan of those on-screen images.

More recent courts have noted the importance of functionality in the “transitory duration” analysis under the 1976 Act. The district court’s decision in *Triad Systems Corp. v. Southeastern Express Co.*, a case decided in the immediate wake of *Peak*, suggested that the focus on temporal duration should give way to consideration of “what [a] copy does, and what it is capable of doing, while it exists.”¹⁶⁰ According to the court, “[t]ransitory duration’ is a relative term that must be interpreted and applied in context.”¹⁶¹ Applying this standard, the *Triad* court concluded that the RAM instantiation at issue was “the functional equivalent of a longer lasting copy” and was therefore fixed.¹⁶²

Courts are also concerned with the ways in which technologies create, manipulate, and use temporary instantiations. *CoStar Group, Inc. v. LoopNet, Inc.* offers one example.¹⁶³ *CoStar* involved claims of direct copyright infringement against the provider of a website that enabled users to upload photos of real estate. *CoStar* maintained an extensive database of commercial real estate listings, including its copyrighted images of properties.¹⁶⁴ *LoopNet* operated a website that enabled real estate brokers to post property listings.¹⁶⁵ Some of *LoopNet*’s users included *CoStar* photographs in their listings without *CoStar*’s permission.¹⁶⁶ *CoStar* maintained that by storing these photos on its servers and transmitting them to Internet users, *LoopNet* engaged in direct infringement.¹⁶⁷

The Fourth Circuit rejected *CoStar*’s infringement claim, relying largely on its determination that *LoopNet*—much like *Cablevision* in its dispute with *Cartoon Network*—did not volitionally engage in copying.¹⁶⁸ If copies were made, *LoopNet*’s users made them. While *LoopNet* could face indirect infringement claims to the extent it facilitated infringement, the court rejected *CoStar*’s direct infringement theory.¹⁶⁹

This lack of volition aside, the court questioned whether the alleged copies created using the *LoopNet* site were fixed. The court expressed deep skepticism about whether data stored automatically in RAM during the transmission of listings to Internet users persisted for more than a transitory

¹⁶⁰ No. C 92 1539-FMS, 1994 WL 446049, at *5 (N.D. Cal. Mar. 18, 1994), *aff’d in part, rev’d in part*, 64 F.3d 1330 (9th Cir. 1995).

¹⁶¹ *Id.*

¹⁶² *Id.* But see *infra* Part III.B.

¹⁶³ 373 F.3d 544 (4th Cir. 2004).

¹⁶⁴ *Id.* at 546.

¹⁶⁵ *Id.* at 547.

¹⁶⁶ *Id.*

¹⁶⁷ *Id.* at 548.

¹⁶⁸ *Id.* at 550.

¹⁶⁹ *Id.* at 549–50. *CoStar* included an indirect infringement claim in its complaint, but the parties later stipulated to its dismissal. *Id.* at 547.

duration. According to the Fourth Circuit, these RAM instantiations were “a temporary, automatic response to the user’s request” and “function[ed] solely to transmit the user’s data.”¹⁷⁰ The court rejected the notion that instantiations resulting from this process were “‘fixed’ in the sense that they are ‘of more than transitory duration.’”¹⁷¹

According to the Fourth Circuit, the transitory duration analysis turns on both qualitative and quantitative considerations. The qualitative component looks to the functional role of the instantiation, the purpose it serves in the overall system, and the means by which it carries out that function. The quantitative component is concerned with “the period during which the function occurs.”¹⁷²

Cartoon Network also hinted at an underlying concern with the functional aspects of fixation. In determining that RS-DVR buffer instantiations were not copies, the Second Circuit noted that the buffer data was automatically overwritten.¹⁷³ The court’s efforts to draw causal connections between each buffer instantiation and the purpose it served in the RS-DVR system likewise reflects a concern for qualitative considerations. Although its approach was less explicit than that of the *CoStar* court, the Second Circuit was interested in not only how long buffer data persisted, but also what function it served in the RS-DVR system.

The qualitative dimensions of “transitory duration” offer courts another set of tools for differentiating temporary instantiations from fixed copies. Although courts have not reached a consensus, instantiations created automatically as a necessary step to some further manipulation of data, or deleted after serving their function, appear less likely candidates for fixation. Ultimately, these specific characteristics are manifestations of a broader concern with the degree to which temporary instantiations serve as functional equivalents of more permanent fixed copies. As discussed below, a fuller treatment of that question requires an understanding of both the purpose of the reproduction right and the work done by the RAM copy doctrine.

¹⁷⁰ *Id.* at 551.

¹⁷¹ *Id.* In an effort to reconcile its treatment of RAM instantiations with *Peak*’s broad holding, the court distinguished the *CoStar* facts on the grounds that any temporary instantiations created on LoopNet’s servers were used solely to “automatically receive[] . . . and transmit[]” information to users. *Id.* *CoStar* maintains that, unlike in *Peak*, the instantiations did not “function[] in the service of the computer or its owner.” *Id.*

CoStar’s efforts to distinguish its facts underscore the acrobatics that *Peak* demands from any court offering a nuanced analysis of RAM instantiations. The images at issue in *CoStar* were unquestionably used by LoopNet in creating and operating its site. Those RAM instantiations “function[ed] in the service” of LoopNet, just as instantiations of computer software function in the service of their user. *Id.* The fact that LoopNet was a passive operator of its server, with no knowledge of the unauthorized nature of its use, might demonstrate its lack of volition, but it is irrelevant to the question of fixation.

¹⁷² *Id.*

¹⁷³ *Cartoon Network LP v. CSC Holdings*, 536 F.3d 121, 130 (2d Cir. 2008).

3. *Functional Equivalence*.—A temporary instantiation could function as the equivalent of a more permanent copy of a work in a number of ways. Like stable copies, temporary instantiations can, to varying degrees, enable access, use, distribution, and copying. But the exclusive right of reproduction is not equally concerned with each of these potential functions of copies. Its aims are more limited. To the extent treating RAM instantiations as copies enables copyright holders to leverage the reproduction right to do work unintended by Congress, courts should adopt a narrower understanding of functional equivalence. When courts consider transitory duration from a qualitative perspective, they should focus on the degree to which RAM instantiations serve functions traditionally regulated by the reproduction right. This subsection considers each of the ways in which RAM instantiations might serve functions similar to more permanent copies and examines the degree to which the reproduction right concerns itself with those functions.

a. *Copies as regulators of access*.—Copies enable access to copyrighted works. Possession of a tangible copy is not a guarantee of access to the underlying work,¹⁷⁴ and works are sometimes accessible even without a copy.¹⁷⁵ Nonetheless, copies tend to be a useful proxy for access, and control over copies helps rights holders enable or restrict access to their works. Because digital works cannot be accessed without being loaded into memory, RAM instantiations offer a similar degree of control over access.

Some commentators argue that *Peak* and subsequent RAM copy decisions are best understood as an effort by courts to extend to copyright holders exclusive rights over access.¹⁷⁶ In an environment in which works can be exploited without the creation of long-term copies, copyright holders have argued that they need a mechanism for asserting control over access.¹⁷⁷ By treating RAM instantiations as copies, courts have allowed copyright holders to leverage the reproduction right as a tool to prevent unwanted access to their works. As software and other services increasingly reside on remote servers rather than CD-ROMs or local hard drives, copyright hold-

¹⁷⁴ Access to the work contained in a copy, for example, could be restricted through encryption.

¹⁷⁵ Television and radio broadcasting are examples of enabling access without necessarily creating copies.

¹⁷⁶ See I. Trotter Hardy, *Computer RAM “Copies”: Hit or Myth? Historical Perspectives on Caching as a Microcosm of Current Copyright Concerns*, 22 U. DAYTON L. REV. 423, 453 (1997) (suggesting that courts have interpreted “copies” to include RAM instantiations as a means of providing an exclusive right to “access and use” information).

¹⁷⁷ For example, the increasing reliance on cloud computing, a model that relies on remotely stored data and software accessed by users through the Internet rather than locally stored files, has increased copyright-holder concern over the need to regulate access to their works. See Brief for Copyright Alliance as Amicus Curiae Supporting Petitioners, *Cable News Network, Inc. v. CSC Holdings*, 129 S.Ct. 2890 (2009) (No. 08-448), 2008 WL 4887717, at *15–16 (noting that economic value can be realized from copyrighted works, without distributing stable copies, through application service provider and cloud computing business models).

ers worry that without a broad RAM copy doctrine, they will be powerless to prevent unauthorized access.¹⁷⁸

The equation of RAM instantiations and stable copies on the basis of their shared ability to regulate access is problematic for two reasons. First, as the need for a broad RAM copy doctrine as a gap filler suggests, copyright has not traditionally afforded rights holders control over access. The reproduction right has certainly not played that role in the analog realm. Copyright forbids theatergoers from taping the latest blockbuster, but it cannot stop them from sneaking into the theater.¹⁷⁹ The shared ability of rights holders to regulate access to works offers no independent rationale for treating RAM instantiations and copies as functionally equivalent.

Second, to the extent the desire to restrict access is one that demands a response, Congress has acted. Specific legislative efforts have provided rights holders a great deal of protection against unauthorized access. The Digital Millennium Copyright Act (DMCA) guards against the circumvention of technological measures that restrict access to copyrighted works and even bans the distribution of technologies that enable such acts of circumvention.¹⁸⁰ Additionally, the Computer Fraud and Abuse Act prevents unauthorized access to networked computer resources under certain circumstances.¹⁸¹ Given these legislative interventions, there is no need to enlist the reproduction right to do work so far beyond its intended scope. And to the extent any such need exists, Congress, not the courts, is best positioned to affect such a fundamental change to the reproduction right.

b. Copies as regulators of use.—Just as copies serve as proxies for access, they also enable copyright holders to regulate particular uses of their works. Without a tangible copy of a play, for example, a theater company would find it difficult to stage a production. Likewise, use of digital works depends on RAM instantiations. Classifying those instantiations as copies helps copyright holders restrict the uses made of their works.

However, it is far from clear that such restrictions are the province of the reproduction right. Copyright law has not traditionally regulated the use of works through its exclusive right of reproduction. Instead, copyright relies on rights of public display and performance to control the use of protected works.¹⁸² Importantly, these rights draw an explicit distinction between public and private use, permitting exclusivity with regard to the former, but leaving the latter unregulated. Many instances of alleged RAM copying could fall within the public display and performance rights, under-

¹⁷⁸ *Id.*

¹⁷⁹ See 17 U.S.C. § 106(1) (2006); 18 U.S.C. § 2319B (2006) (prohibiting the “[u]nauthorized recording of Motion pictures in a Motion picture exhibition facility”).

¹⁸⁰ 17 U.S.C. § 1201(a).

¹⁸¹ See 18 U.S.C. § 1030 (defining circumstances under which accessing a computer is unlawful).

¹⁸² See Reese, *supra* note 60, at 84.

mining the need for reliance on the reproduction right.¹⁸³ Only where copyright holders target purely private uses would a broad RAM copy doctrine be necessary, but these cases are precisely those in which RAM copies would subvert the distinction between public and private that Congress has embedded in the scope of the copyright grant.

The control over use enabled by a broad RAM copy doctrine is particularly troubling when coupled with the routine enforcement of end-user license agreements that purport to govern the use of digital works. A spate of recent cases has treated violations of license terms as copyright infringement on the basis of RAM copying,¹⁸⁴ demonstrating the power over the behavior of both customers and competitors resulting from this combination.

*MDY Industries v. Blizzard Entertainment*¹⁸⁵ is one example. Blizzard operates World of Warcraft (WoW), a massively multiplayer online role-playing game.¹⁸⁶ “WoW players control characters within a virtual universe, exploring the landscape, fighting monsters, performing quests, building skills, and interacting with other players and computer-generated characters.”¹⁸⁷ Blizzard’s end-user license agreement and terms of use spell out the rules that govern the use of its WoW software and services. These rules prohibit players from using third-party software that modifies or automates the in-game experience.¹⁸⁸

MDY developed just such a program. The Glider, a “bot” that automates the play of WoW, allowed its users to continue playing while away from their computers.¹⁸⁹ The Glider thereby enabled users to collect in-game resources to advance quickly through the ranks within WoW. Many WoW users understandably view such automatic play as cheating, and Blizzard considers the use of bots harmful to the value of its service.¹⁹⁰ In response, Blizzard sued MDY, alleging contributory and vicarious copyright

¹⁸³ See *id.* at 144–46.

¹⁸⁴ See, e.g., *Facebook, Inc. v. Power Ventures, Inc.*, No. C 08-5780 JF (RS), 2009 U.S. Dist. LEXIS 42367, at *12 (N.D. Cal. May 11, 2009) (denying a motion to dismiss a copyright infringement claim premised on accessing a website for purposes prohibited by the terms of use); *MDY Indus., LLC v. Blizzard Entm’t, Inc.*, No. CV-06-2555-PHX-DGC, 2008 U.S. Dist. LEXIS 53988, at *10–11, 52 (D. Ariz. July 14, 2008) (granting summary judgment on a contributory copyright infringement claim against a developer of interoperable software premised on the creation of unauthorized RAM copies by end users); *Ticketmaster L.L.C. v. RMG Techs., Inc.*, 507 F. Supp. 2d 1096, 1104, 1116–17 (C.D. Cal. 2007) (finding a strong likelihood of success on claims for direct and contributory copyright infringement against a developer of automated ticket purchasing software for creating unauthorized RAM copies of a ticket vendor’s website).

¹⁸⁵ *MDY*, 2008 U.S. Dist. LEXIS 53988.

¹⁸⁶ *Id.* at *2–3.

¹⁸⁷ *Id.* at *2.

¹⁸⁸ *Id.* at *12–13, *16.

¹⁸⁹ *Id.* at *3–4.

¹⁹⁰ *Id.* at *4.

infringement, trafficking in circumvention tools in violation of the DMCA, tortious interference with contract, and unjust enrichment.¹⁹¹

Blizzard premised its indirect copyright infringement claims on alleged acts of direct infringement by Glider users, a theory embraced by the court. According to the court, WoW users who rely on Glider act outside the scope of Blizzard's license.¹⁹² If WoW users take subsequent actions that implicate the copyright holders' exclusive rights, they are engaged in infringement absent some defense. Mere use of a work is generally insufficient to infringe. However, relying on *Peak*, the court concluded that Glider users created infringing copies when they loaded WoW files into RAM.¹⁹³ In other words, Blizzard's terms of use allowed users to create RAM instantiations of the WoW software for normal gameplay, but prohibited them from doing so when using bots. Blizzard maintained that non-compliance with its terms constituted copyright infringement, and the court agreed.¹⁹⁴

Normally, copyright requires something more than breaking the rules of a game to support a finding of infringement. Regardless of your willful disregard of the instruction "Do not pass Go. Do not collect \$200," Parker Brothers has no colorable infringement case against you.¹⁹⁵ But if courts agree that license terms spell out the conditions under which use is permitted, and the RAM copy doctrine dictates that use and reproduction are one and the same, players who ignore such dictates in the digital world are exposed to potential infringement liability. This logic requires no reasonable connection between the conditions imposed on use and harm to legitimate copyright interests.

Imagine you download a song from your preferred digital music retailer, and the license agreement governing that download provides that you may listen to the song only if you agree to give it glowing reviews—or for that matter, if you agree to wear green on alternating Thursdays.¹⁹⁶ If RAM instantiations are copies, listening to lawfully acquired music after ignoring these speech or dress codes results in not just a breach of contract, but copyright infringement. The practical implications of that distinction are significant. Rather than being forced to prove damages arising from your actions, a rights holder could rely on the statutory damages provision of the Copy-

¹⁹¹ *Id.* at *5–6.

¹⁹² *Id.* at *21.

¹⁹³ *Id.* at *19.

¹⁹⁴ *Id.* at *52.

¹⁹⁵ Cf. J.F. Wilkinson, *The Play-Money Game That Made Millions*, SPORTS ILLUSTRATED, Dec. 2, 1963, at 54 ("You can go up to almost any literate American older than 10 and say: 'Go directly to jail. Do not pass Go. Do not collect \$200,' and he will surely know that you are talking about Monopoly.")

¹⁹⁶ Query whether the average consumer would be aware of his assent to such conditions. The terms currently governing use of the iTunes Store weigh in at roughly 15,000 words. See *Terms and Conditions*, APPLE INC., <http://www.apple.com/legal/itunes/us/terms.html> (last visited Aug. 9, 2010).

right Act, which provides for damages up to \$150,000 per work infringed,¹⁹⁷ as well as the generally permissive approach to injunctive relief in copyright cases.¹⁹⁸

Copyright does not provide rights holders exclusivity over reproduction as a means of enabling control over particular uses of their works. Even though a broad RAM copying rule is an effective tool for exercising such control, it would permit rights holders much greater power over private uses than copyright has traditionally conferred or Congress intended. As a result, courts should not be persuaded by claims that RAM instantiations, like more permanent copies, enable use of copyrighted works.¹⁹⁹

c. Copies as regulators of distribution.—A third function copies serve is to enable distribution. In contrast to access or use, the regulation of distribution shares a closer connection to the reproduction right. As a statutory matter, the distribution right is expressly limited to the sale, rental, lease, lending, or other transfer of copies.²⁰⁰ From a practical perspective, one reason copyright law might concern itself with reproduction is that the creation of copies could serve as a precursor to infringing distributions. In this sense, reproduction is closely tied to one of the core exclusive rights of the copyright grant.²⁰¹

Of course, the distribution right itself gives rights holders a more direct means of vindicating their interests. But the initial creation of copies could sometimes prove a more effective chokepoint for enforcement efforts than the distribution stage. For large-scale infringers, and particularly in a pre-digital era, reproduction was a more centralized operation while distribution was comparatively diffuse and more difficult to target effectively. At the very least, there is a plausible relationship between restricting reproduction and maintaining exclusivity over distribution.

To the extent temporary instantiations give rise to a threat of unauthorized distribution comparable to that posed by traditional copies, courts might have good reason to treat them as the functional equivalents of long-

¹⁹⁷ See 17 U.S.C. § 504(c) (2006) (providing for damages ranging from \$750 to \$30,000 per infringed work absent a showing of willfulness, and up to \$150,000 per work in cases of willful infringement). For a criticism of the size and unpredictability of statutory damages in copyright law, see Pamela Samuelson & Tara Wheatland, *Statutory Damages in Copyright Law: A Remedy in Need of Reform*, 51 WM. & MARY L. REV. 439 (2009).

¹⁹⁸ See 4 NIMMER & NIMMER, *supra* note 129, at § 14.06[A][1][b] (describing the issuance of preliminary injunctions in copyright infringement actions as “ordinary, even commonplace”).

¹⁹⁹ See, e.g., *Triad Sys. Corp. v. Se. Express Co.*, No. C 92 1539-FMS, 1994 WL 446049, at *5 (N.D. Cal. Mar. 18, 1994) (finding that a RAM instantiation was “the functional equivalent of a longer lasting copy” because it enabled use of software).

²⁰⁰ See 17 U.S.C. § 106(3).

²⁰¹ See Paul Edward Geller, *Beyond the Copyright Crisis: Principles for Change*, 55 J. COPYRIGHT SOC’Y 165, 173–74 (2008) (arguing that the right of reproduction is an important component of the copyright grant, “but only to the extent that creations continue to be exploited in the guise of hard copies” through, for example, distribution).

er-lasting copies. But RAM instantiations present very little threat of unauthorized distribution. Since they reside in the memory of a computing device until overwritten and only as long as the device maintains power,²⁰² RAM instantiations would prove difficult and expensive for infringers to distribute. Moreover, the volatility of RAM instantiations would render them of limited value to the public. In short, RAM is a strikingly impractical distribution medium. As a result, no realistic assessment of RAM instantiations could consider them equivalent to more permanent copies for the purposes of distribution.

d. Copies as regulators of reproduction.—Finally, copies enable copying. Though by no means necessary, tangible embodiments are often useful in reproducing faithful copies of a work. If the exclusive right to reproduce prevents the creation of an initial copy, it effectively guards against downstream copies arising from that first generation reproduction.

Like traditional fixed copies, an instantiation in RAM is capable of being reproduced in a lasting form. This ability to give rise to subsequent copies is sometimes cited as a reason to classify RAM instantiations as copies.²⁰³ But the ability to create a copy from an instantiation alone is not a sufficient condition for classification as a fixed copy. If it were, the distinction between the work and its tangible embodiment would collapse. Intellectual conceptions are capable of being transformed into tangible copies, but they are not themselves copies by virtue of that fact.

Nonetheless, the ability to generate downstream copies is one sense in which RAM instantiations and fixed copies could share functional similarity. But as a factual matter, they differ in the extent to which they allow for successive copying. Because of their volatile nature, RAM instantiations pose less of a threat of repeated prospective copying. Compared to more durable fixed copies, temporary instantiations are likely to be copied far fewer times.

One may object that RAM instantiations yield perfect digital copies. Further, if those perfect copies are durable, the total number of reproductions resulting from a single RAM instantiation over several generations is comparable to a fixed copy. But this objection points to a separate reason to question the need for a broad RAM copy doctrine. If RAM instantiations need to be regulated because they give rise to fixed copies that are themselves dangerous to copyright interests, the simplest solution is to target these admittedly fixed downstream copies. This approach avoids an overly elastic notion of “copies” that would allow rights holder to restrict RAM instantiations for reasons unrelated to downstream reproduction. After all,

²⁰² See MUELLER, *supra* note 10, at 417.

²⁰³ See, e.g., Brief of Plaintiffs-Counterclaim-Defendants-Appellees at 49–50, *Cartoon Network LP v. CSC Holdings*, 536 F.3d 121 (2d Cir. 2008) (Nos. 07-1480-cv(L), 07-1511-cv(CON)), 2007 WL 6101601 (arguing that the buffer copies in the RS-DVR Service are “fixed” because “they exist *long enough* to be reproduced” into more permanent copies).

concerns over serial reproduction have hardly been the driving force motivating RAM copy litigation. To the extent downstream reproduction of RAM instantiations presents a genuine threat to copyright holders, an equally effective solution consistent with a more limited reading of “copies” is available.

On the whole, RAM instantiations are poor substitutes for durable copies. Copyright holders are justified in their concern that unauthorized copies of works will undermine the commercial value of their works. Unauthorized fixed copies typically function as near perfect substitutes for legitimate copies. They can be accessed, used, distributed, and copied to the same degree and for the same duration as a lawfully made copy. However, RAM instantiations do not share these qualities.²⁰⁴ Unlike durable copies, RAM instantiations have limited commercial value, and the primary value they do offer—temporarily enabling access and use—is protected through federal legislation and state contract law independent of the definition of “copies” and “fixed.” Treating RAM instantiations as copies unnecessarily constricts the reproduction right to do work unanticipated by the Copyright Act and unintended by Congress.

C. Evaluating RAM Instantiations

By mapping the contours of the “transitory duration” clause of the definition of fixation, we can draw some general conclusions to help courts evaluate future RAM instantiations and avoid uncertainty in the wake of *Cartoon Network*. These considerations by no means reduce the question of the status of temporary instantiations to a simple algorithm. However, they do offer some rough guidelines that simplify an otherwise potentially bewildering inquiry.

First, if copyrightability is any guide, durational distinctions of seconds, minutes, or even hours should not be determinative. If an instantiation that endures for 1.2 seconds is not fixed, a few additional moments should not change that conclusion, all other things being equal. Although this rule of thumb does not identify a precise line dividing fixed and unfixed instantiations, it does suggest that some courts have been unnecessarily parsimonious in drawing temporal distinctions.²⁰⁵

²⁰⁴ See *London-Sire Records, Inc. v. Doe 1*, 542 F. Supp. 2d 153, 175 n.29 (D. Mass. 2008) (determining that electronic phonorecords obtained from peer to peer services “precisely to be copies, indefinitely replayable and transferable” were fixed). But the *London-Sire* court recognized “that electronic copies can be of varying permanence . . . and it is not clear that all of them should be treated equally under the copyright statutes.” *Id.* (citing *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511, 518–19 (9th Cir. 1993)).

²⁰⁵ See, e.g., *SimplexGrinnell LP v. Integrated Sys. & Power, Inc.*, 642 F. Supp. 2d 167, 189 (S.D.N.Y. 2009) (finding a copy created when software was loaded into RAM for “several minutes to several hours”); *Advanced Computer Servs. v. MAI Sys. Corp.*, 845 F. Supp. 356, 363 (E.D. Va. 1994) (suggesting that RAM instantiations persisting for “seconds or fractions of a second . . . arguably would

Second, these temporal considerations generally do not require case-by-case evaluation. Instead, courts should focus on the typical characteristics of the medium in which an instantiation is embodied. This approach eases the burdens on courts and offers copyright holders and technology developers greater predictability. But if a particular instantiation proves an outlier by enduring for far longer than its medium would suggest, more careful consideration of its temporal duration is warranted.

Third, courts should consider qualitative factors in addition to temporal ones. Certain concrete qualitative indicia should weigh against finding that an instantiation is fixed. These criteria include the fact that an instantiation is necessary to operate a machine or system; that it is created automatically in the operation of that machine or system; and that it is deleted after serving that function. More broadly, the qualitative analysis should focus on the degree to which instantiations serve as functional substitutes for more permanent copies. In considering functional equivalence, courts should bear in mind that the reproduction right was not designed to provide copyright holders exclusive control over every interaction with their works.

Evaluated under these standards for fixation, most RAM instantiations fare poorly. Their typically brief existence falls short of any duration that would support an unequivocal claim to fixation. Qualitatively, RAM instantiations are often, though not always, created automatically as a necessary step in the operation of a machine or system. And as a general rule, they are poor functional substitutes for persistent copies.

This assessment tends to vindicate the Second Circuit's intuitive judgment in *Cartoon Network*. The RS-DVR buffer instantiations in that case were in many respects representative of RAM copies generally. They were short-lived, functionally necessary, and no replacement for enduring copies. Although the facts of *Cartoon Network* revealed the contrasts between fixed copies and temporary instantiations in sharp relief, most RAM instantiations differ from the RS-DVR buffer data in degree, not in kind. Moreover, this assessment further undermines both the reasoning and the outcomes in *Peak* and its progeny. The particular characteristics of the alleged copies in those cases offer no reason to deviate from the general conclusions about the status of RAM instantiations. Although their duration was marginally longer, such temporal differences alone cannot justify treating the instantiations at issue in those cases as copies.

But the preceding analysis does not demand an inflexible rule that RAM instantiations are never copies. Under certain circumstances, data stored in RAM could be properly described as fixed. If a particular RAM instantiation persisted far longer than is typical, perhaps for weeks or months, a careful consideration of the individual facts of that case would be necessary. Such an aberrant duration would alter both the temporal and qu-

be too ephemeral to be considered 'fixed' or a 'copy'" while those persisting for "minutes or longer" are copies).

alitative considerations, requiring the court to think carefully about the extent to which that instantiation served as a functional substitute for more traditional fixed copies. But such cases are likely to be rare. In the vast majority of cases RAM instantiations are neither “fixed” nor “copies” as the Copyright Act defines those terms.

CONCLUSION

Copyright has long struggled to understand how the fundamental concept of the copy should apply to temporary digital instantiations. Due to early judicial missteps, the debate has understandably focused on the flaws of a broad and inflexible RAM copy doctrine. Partly in response to these criticisms, courts appear on the precipice of a new mode of analyzing RAM instantiations. *Cartoon Network* took the first tentative steps in this direction. The Second Circuit distanced itself from *Peak* without openly rejecting it, recognizing the need for a new paradigm without endeavoring to articulate it fully.

This Essay has attempted to make the inner workings of a new RAM instantiation analysis less opaque. Although the Copyright Act is silent on the precise meaning of “transitory duration,” courts need not throw up their hands and ignore that language altogether, as the Ninth Circuit did in *Peak*, or rely on unpredictable instinctive assessments, as the Second Circuit arguably did in *Cartoon Network*. By understanding the quantitative and qualitative elements of transitory duration, courts can shift their focus from the metaphysical question of when a copy exists to a set of tangible inquiries into the duration and function of temporary instantiations. Courts can draw from these inquiries a set of reliable general conclusions that leave room for potential outliers yet avoid a burdensome case-by-case analysis of the characteristics of every RAM instantiation. Like *Peak*’s blanket rule, these guidelines offer predictability. Unlike *Peak*, this approach maintains some degree of flexibility and accurately reflects the language of the Copyright Act.

Given our increasingly digital environment, the status of RAM instantiations will continue to have profound implications for the scope of copyright law. The foundation of *Peak*’s RAM copy doctrine—the current dominant approach among courts—is at best unsteady. *Cartoon Network*, despite its reluctance to reject *Peak* outright, has served to further expose *Peak*’s vulnerabilities. But copyright law must develop a reliable and predictable standard to finally replace *Peak*. The suggestions offered here are intended to inform this new judicial approach to RAM instantiations.