

FIXING RAM COPIES

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INTRODUCTION

Unsurprisingly, the copy is a central concept in the copyright system. Copyrights originally conferred control over the creation and disposition of copies

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by granting exclusive rights to print and publish books and printed material.¹ Of course, copyright no longer confines itself to regulating printing and publishing. Modern copyright has grown to embrace exclusive rights to display, perform, 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 digital technologies pose for our deeply analog understanding of copies. For most of the history of copyright law, copies were the exception rather than the rule. But digital technologies render copies not just prevalent, but pervasive, accelerating the expansion of copyright 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

¹ See LYMAN RAY PATTERSON, COPYRIGHT IN HISTORICAL PERSPECTIVE 46-48 (describing the control the Stationers’ monopoly afforded over publication and disposition of copies in 16th and 17th 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. 8 Anne, c. 19 (1710). 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, ch. 15, 1 Stat. 124 (1790).

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

³ See *infra* Part III.A.

⁴ See John Tehranian, *Infringement Nation: Copyright Reform and the Law/Norm Gap*, 2007 UTAH L. REV. 537, ___-___ (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 (defining “copies”). The central question this Article addresses is the extent to which data stored in RAM constitutes a copy in this strict sense. To avoid unnecessary confusion in terminology, this Article will use 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.

conception to digital technologies only through significant contortions.

Scholars, courts, and policy makers 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

The Second Circuit's recent decision in *Cartoon Network v. CSC Holdings*, which held that CSC did not create copies by buffering segments of television programs,⁸ promises not only to reignite the longstanding controversy over the RAM copy doctrine, but 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. 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 Article 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 works.

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*.

⁶ 991 F.2d 511 (9th Cir. 1993); see *infra* Part I. _.

⁷ See *infra* Part I.B.

⁸ 536 F.3d 121 (2d Cir. 2008).

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 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 opportunity to interpret. Although precise delineation is difficult, this Part will consider three sets of concerns that shed some light on the scope “transitory duration”: its application in the context of copyrightability; qualitative considerations related to the function of RAM instantiations; and a comparison of the work RAM copies do in the copyright system and the traditional role 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

In order for digital works to be displayed, performed, or manipulated by a computing device, they must be rendered in memory. This is equally true of computer programs and digital representations of text, images, and music. Every commonplace interaction with digital information depends of that information being loaded into RAM.⁹ 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 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. Users of copyrighted works maintain that RAM instantiations are too impermanent to

⁹ 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 Nicholson, *supra* note ___, at 149. 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.

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 424 (2003). 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.* 425-26 (2003).

qualify as copies. As described below, the Ninth Circuit in *MAI v. Peak*, the first case to directly address this debate, sided with the copyright holders. In time, *Peak* came to stand for the notion that all RAM instantiations, however fleeting, are copies. As this rule was 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.¹⁰ But rather than directly confronting these challenges in the Copyright Act of 1976, Congress deferred.¹¹ It turned to the expertise of the National Commission on New Technological Uses of Copyright Works (“CONTU”), a body empaneled to study these challenges and offer legislative recommendations.¹² In response to CONTU’s final report,¹³ Congress enacted the Computer Software Act of 1980, explicitly recognizing computer programs as

¹⁰ 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 (1984).

¹¹ See 17 U.S.C § 117 (Supp. I 1977). Prior to its 1980 amendment, § 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.

¹² See Act of Dec. 31, 1974, Pub. L. No. 93-573, tit. II, 88 Stat. 1873, 1873-74 (authorizing the creation of the Commission and empowering it to study and report on computer-related uses of copyrighted works as well as the the use of photocopiers).

¹³ See NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT (1979) [hereinafter CONTU].

copyrightable subject matter.¹⁴

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*.¹⁵ MAI manufactured and serviced a line of computers.¹⁶ 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 machines. Peak offered competing repair and maintenance services for MAI computers.¹⁷

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.¹⁸ 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.¹⁹ 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."²⁰

On appeal, Peak argued that the RAM instantiations created when its technicians booted a MAI computer or launched the diagnostic program did not constitute copies because they were not fixed.²¹ 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."²² An instantiation of a work is a "copy" only to the extent it is fixed — that is to say,

¹⁴ Pub. L. No. 96-517, 94 Stat. 3007 (1980) (codified at 17 U.S.C. §§ 101, 117 (1982)) (adding a statutory definition of "computer program" to § 101 and substituting a new § 117 permitting owners of copies of computer programs to modify them and create archival copies).

¹⁵ See *MAI Systems Corp. v. Peak Computer Inc.*, 1992 WL 159803 (C.D. Cal. April 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, ___ n.3 (3d Cir. 1983) (contrasting RAM to "permanent memory devices").

¹⁶ 1992 WL 159803 at *__.

¹⁷ *Id.* at __.

¹⁸ *Id.* at __.

¹⁹ 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." 1992 WL 159803 at *2.

²⁰ 991 F.2d at 515.

²¹ *Id.* at 517.

²² 17 U.S.C. § 101.

“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.”²³

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 copies. According to the court, if RAM instantiations can be perceived, reproduced, or communicated, they are copies.²⁴

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 application 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.²⁵

But this context sensitive RAM copy rule is difficult to square with the text of *Peak*. In two passages, the court appeared to couch its rule in fact dependent terms.²⁶ 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

²³ *Id.*

²⁴ 991 F.2d at 519.

²⁵ *See, e.g.,* *Advanced Computer Services v. MAI Systems 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); *Marobie-FL v. National Association of Fire Equipment Distributors*, 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.”); *London-Sire Records, Inc. v. Doe 1*, 542 F. Supp. 2d 153, 175 (D. Mass. 2008) (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”) (citing *Peak*). *See also Cartoon Network*, 536 F.3d at ____ (2d Cir. 2008) (interpreting *Peak* as premised on RAM instantiations persisting for several minutes).

²⁶ First, the court stated that the RAM instantiations were copies because *Peak* could “view the error log and diagnose the problem with the computer.” 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.

the elements of fixation. 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”²⁷ 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.”²⁸ In light of these factually unmoored conclusions, the soft RAM copy doctrine requires courts to fill in blanks in the Ninth Circuit’s reasoning. 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 holding that has come to dominate the judicial understanding of temporary instantiations.

A raft of opinions has mechanically applied *Peak*, typically with little regard to their particular facts.²⁹ In a subsequent case dealing with another independent service provider, the Ninth Circuit cast its earlier holding in *Peak* in fact-independent terms.³⁰ Subsequent decisions have extended *Peak*, with a similar disinterest in its facts, to scenarios and legal theories well beyond its original context. Direct and

²⁷ *Id.* at 518.

²⁸ *Id.*

²⁹ *Stenograph L.L.C. v. Bossard Associates, Inc.*, 144 F.3d 96, 102 (D.C. Cir. 1998) (interpreting *Peak* as holding that “RAM reproduction constitutes a copy”); *Tricom, Inc. v. Electronic 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); *FM Indus. v. Citicorp Credit Servs.*, 2008 U.S. Dist. LEXIS 20670 (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 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).

³⁰ *Triad Systems Corp. v. Southeastern 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...”).

indirect liability for websites and electronic bulletin boards,³¹ the scanning of copyrighted photographs,³² and the development of interoperable software³³ have all fallen within the ambit of *Peak*.

Equally importantly, these cases reflect a substantive hardening of *Peak*'s central holding. In its simplest term, the rule that emerges from *Peak*'s progeny is "RAM reproduction constitutes a copy."³⁴ Other courts have explicitly rejected the notion that the duration of temporary instantiations factors into their analysis.³⁵ 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."³⁶ To the extent the Ninth Circuit's holding in *Peak* was checked

³¹ See *Intellectual Reserve, Inc. v. Utah Lighthouse Ministry, Inc.*, 75 F. Supp. 2d 1290, (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. 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"); *Religious Technology Center v. Netcom On-line Communication Services, 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"); *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).

³² See *Tiffany Design, Inc. v. Reno-Tahoe Specialty, Inc.*, 55 F. Supp. 2d 1113, (D. Nev. 1999) (relying on *Peak* in holding that the scanning of a copyrighted image into RAM constituted a reproduction).

³³ See *MDY Indus., LLC v. Blizzard Entm't, Inc.*, 2008 U.S. Dist. LEXIS 53988 (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, 1005-06 (C.D. Cal. 2007) (finding a strong likelihood of success 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).

³⁴ *Stenograph*, 144 F.3d at 102.

³⁵ As one court opined, "in making a copy, even a temporary one, the person who [did so] infringes the copyright." *Intellectual Reserve*, 75 F. Supp. 2d at ____, (D. Utah 1999); see also *Triad Systems Corp. v. Southeastern Express Co.*, 31 U.S.P.Q. 2d 1239 (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") (internal quotations omitted).

³⁶ *Tiffany Design*, 55 F. Supp. 2d at ____ (emphasis added)

by its factual record, the bulk of 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.³⁷ 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 Copyright Act, its legislative history, and 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 policy makers 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 perceive the output of MAI's software, the court ignored the requirement that an instantiation persist "for a period of more than transitory duration."³⁸ 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, *Peak* relied on CONTU's assertion that "the introduction of a work into a computer memory would, consistent with the law, be a reproduction."³⁹ 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.⁴⁰ It could refer to stable and undoubtedly fixed read only memory and hard disk storage or to more volatile

³⁷ See BRUCE A. LEHMAN, INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE 65 (describing *Peak*'s holding "that booting a PC involves copying" as "unexceptional").

³⁸ 17 U.S.C. § 101.

³⁹ CONTU at 23.

⁴⁰ 991 F.2d at 519 "recogniz[ing] that these authorities are somewhat troubling" because they don't distinguish between RAM, hard disks, or ROM.

RAM.⁴¹ Second, since Congress enacted no legislative changes in response to the report's characterization, this isolated statement lacks authoritative weight.⁴² 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: “[I]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.*”⁴³ Admittedly, decades old legislative history from a Congress that, by its own admission, was hesitant to legislate in the

⁴¹ Joseph P. Liu, *Owning Digital Copies: Copyright Law and the Incidents of Copy Ownership*, 42 WM. & MARY L. REV. 1245 (2001); 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 (1995); James Boyle, *Intellectual Property Policy Online: A Young Person's Guide*, 10 HARV. J. LAW & TECH. 47 (1996).

⁴² See Liu, *supra* note __, at __.

⁴³ H.R. REP. NO. 94-1476, at 53 (1976), 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 III, 89th Cong. 1861 (1966) (“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.”).

nascent realm of digital copyright should not be regarded as dispositive.⁴⁴ Nonetheless, the Ninth Circuit's willingness to rely on the CONTU report's non-authoritative 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.⁴⁵ 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 tangentially⁴⁶ and suffers from the same ambiguity found in the CONTU report, potentially not referring to

⁴⁴ 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). This provision, while rebuking *Peak*, assumes that courts could consider instantiations in RAM to be copies. Likewise, the DMCA added a new § 512 creating a number of safe harbors for provider 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. 2 (2005) (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").

⁴⁵ 991 F.2d at 519.

⁴⁶ 847 F.2d 255, ___ (5th Cir. 1988); see also Bradley J. Nicholson, *The Ghost in the Machines: MAI Systems Corp. v. Peak Computer, Inc. and the Problem of Copying in RAM*, 10 HIGH TECH. L.J. 147 (1995).

RAM at all.⁴⁷

The court also relied on *Apple Computer, Inc. v. Formula Int'l Inc.*⁴⁸ 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. Formula argued that its reproduction was protected under § 117 of the Copyright Act, which permits copies created as an essential step in using a computer program.⁴⁹ 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 “temporary fixation[s]” because once the “computer is turned off, the copy of the programs recorded in RAM is lost.”⁵⁰

Peak insisted that *Apple's* use of the terms “copy” and “fixation” to describe RAM instantiations supported its holding. But *Apple's* choice of terminology is at best ambiguous. *Apple* appears to have used “copy” and “fixation” in their nontechnical sense, not the strict sense defined in the Copyright Act. The peculiar phrase “temporary fixation” offers further support for this reading. A fixation necessarily persists for more than a transitory duration.⁵¹ If *Apple* used the term “fixation” in its technical sense, its reference to temporary fixations is borders on self-contradictory. What is clear from *Apple* is that the court considered RAM instantiations, in contrast to ROM copies, temporary in nature.⁵² Rather than bolstering *Peak's* conclusion, this interpretation 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.⁵³ Neither the non-authoritative CONTU report nor the *Vault* opinion unambiguously refer to RAM instantiations at all. And *Peak* demonstrably misinterpreted both the *Apple* decision and the text of the Copyright Act. Given this tottering foundation, the broad RAM copy doctrine *Peak* conceived, even if not

⁴⁷ Elkin-Koren, *supra* note __, at 354.

⁴⁸ 594 F. Supp. 617, 621 (C.D. Cal. 1984).

⁴⁹ See 17 U.S.C. § 117.

⁵⁰ 594 F. Supp. at 622.

⁵¹ See 17 U.S.C. § 101 (defining fixation as persisting for “more than a transitory duration”).

⁵² See also *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, ___ n.3 (3d Cir. 1983) (explaining “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”).

⁵³ The court also relied on a leading treatise authored by a commissioner of CONTU. See 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.*

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.⁵⁴ This expansion of the reach of the copyright grant marks a significant departure from its traditional scope.

Moreover, this expansion makes a hash of the statutory scheme crafted by Congress, one characterized by enumerated and distinct exclusive rights.⁵⁵ To the extent copyright 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.⁵⁶ Aside from diluting the coherence of the statutory system, the RAM copy doctrine razes a crucial distinction between private and public uses.⁵⁷ While the display and performance rights granted by the Copyright Act extend only to public use, 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.⁵⁸ 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

⁵⁴ See Jessica Litman, *The Exclusive Right to Read*, 13 CARDOZO ARTS & ENT. L.J. 29 (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 Jule L. Sigall, *Comment, Copyright Infringement Was Never This Easy: RAM Copies and Their Impact the Scope of Copyright Protection for Computer Programs*, 45 CATH. U.L. REV. 181, 217-19 (1995) (arguing that RAM copies should be considered fair uses); Mark Lemley, *Dealing With Overlapping Copyrights on the Internet*, 22 U. DAYTON L. REV. 547 (1997) (suggesting that implied license provides a defense, but it does so "precisely ... where ... least needed"). The degree of insulation these defenses offer in practice remains far from certain.

⁵⁵ See 17 U.S.C. § 106 (listing the exclusive rights of copyright holders).

⁵⁶ 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 (2001).

⁵⁷ See Reese, *supra* note __, at __; Elkin-Koren, *supra* note __, at __.

⁵⁸ See Lemley, *supra* note __, at __.

instantiations.⁵⁹ 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 they see fit without risking a violation of the distribution right.⁶⁰ But while you may be free to give your dog-eared paperback to a friend, emailing an eBook is a riskier proposition. Under *Peak*, the transmission of that text results not only in an act of distribution exempted by first sale, but also 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 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.⁶¹ DVRs record television programming to hard disks, enabling time-

⁵⁹ 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. See Lemley, *supra* note __, at ____.

⁶⁰ See Lemley, *supra* note __, at 575-76; Liu, *supra* note __, at __.

⁶¹ See *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 (noting that DVR owners ranked the device as the third most indispensable item after the washing machine and microwave oven).

shifted viewing and allowing users to pause and rewind live broadcasts.⁶² Companies like Tivo market standalone set-top DVRs to consumers, while cable and satellite providers offer similar boxes that integrate with their services.⁶³

Cablevision, a major cable television provider, has offered traditional set-top DVRs to its customers since 2004.⁶⁴ 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 would be virtually indistinguishable from its more traditional counterpart. Users would schedule recordings and initiate playback through onscreen menus controlled via remote control, and the same programs available for recording using the set-top DVR would be available using the RS-DVR.⁶⁵

But the design of the RS-DVR differed from older set-top models in some important respects. Whereas traditional DVRs are self-contained, storing 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. This networked design offers Cablevision a number of

⁶² In many respects the DVR represents a linear technological progression from an earlier innovation in home recording, the video cassette recorder, or VCR. In *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417 (1984), 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 non-infringing use. Despite the *Sony* safe harbor, early DVR developers faced similar allegations of indirect infringement. See Complaint, *Paramount Pictures Corp. v. ReplayTV & SonicBlue*, 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*, bIPllog, <http://journalism.berkeley.edu/projects/biplog/archive/000751.html> (March 21, 2003).

⁶³ *Twentieth Century Fox Film Corp. v. Cablevision Systems 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).

⁶⁴ *Id.* at ___.

⁶⁵ *Id.* at ___.

benefits, including reduced hardware, installation, and maintenance costs.⁶⁶

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").⁶⁷ Plaintiffs alleged CSC would directly infringe its rights of reproduction and public performance by offering the RS-DVR.⁶⁸ These claims were based on a number of alleged acts of infringement, only some of which bear on the RAM copy controversy.⁶⁹

Contextualizing these allegations requires a discussion of the relevant technical details. 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 Cablevision's television programming enters a device called the Broadband Multimedia Router ("BMR"). The BMR divides that single data stream into separate streams for each television channel.⁷⁰ This conversion requires the BMR to load the data stream into its buffer memory, a form of RAM, for no more than 1.2 seconds.⁷¹

The BMR then relays these data streams to one of many Arroyo servers containing hard drives on which recorded programs are stored.⁷² The server buffers these streams in its primary ingest buffer, which retains no more than three frames

⁶⁶ However, the efficiencies of the RS-DVR were limited to some extent by legal rules. 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.* at ___. 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, <http://www.freedom-to-tinker.com/blog/felten/cablevision-and-anti-efficiency-policy> (April 18th, 2007).

⁶⁷ *Twentieth Century Fox*, 478 F. Supp. 2d at ___.

⁶⁸ Claims for contributory and vicarious liability were conspicuously absent from the complaint. As a strategic matter, 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 ___.

⁶⁹ 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 ___.

⁷⁰ 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 ___.

⁷¹ *Id.* at ___.

⁷² *Id.* at ___.

— or one tenth of a second — of video for each channel at any one time.⁷³ These streams are buffered by the primary ingest buffer automatically, regardless of whether a customer requests a recording of any particular program.⁷⁴

If a customer initiates a recording, the Arroyo server moves data for the selected channel from the primary ingest buffer to its secondary ingest buffer.⁷⁵ 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.⁷⁶ 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 Arroyo 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 cases⁷⁷ and the Copyright Office's Section 104 Report,⁷⁸ concluded that buffer instantiations are copies because they can be reproduced on hard disk in a permanent form.

Like the sources upon which it relied, the court appears to ignore 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 Arroyo server hard disk drives. Nonetheless, the ability to create a downstream reproduction is offered 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. Under that rationale, any instantiation capable of being perceived, reproduced, or communicated is a copy.

On appeal, the Second Circuit showed considerably less deference to the orthodox RAM copy analysis. Rather than simply reciting the definitions of "copies"

⁷³ *Id.* at ___.

⁷⁴ *Id.* at ___.

⁷⁵ *Id.* at ___.

⁷⁶ *Id.* at ___.

⁷⁷ The district court, in keeping with the bulk of the case law, adopted the hard variant of *Peak*'s RAM copy doctrine. *Id.* at ___ (noting that "numerous courts have held that the transmission of information through a computer's random access memory ... creates a 'copy'").

⁷⁸ 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 ___ (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.

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.⁷⁹ First, it must be sufficiently embodied to be perceived, reproduced, communicated.⁸⁰ Second, that embodiment must persist for more than a transitory duration.⁸¹ 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*.⁸² The Second Circuit took great pains to rhetorically minimize its departure from the Ninth Circuit’s approach to temporary instantiations. *Cartoon Network* 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.”⁸³ 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 maintains, 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 suggests, would accuse the Ninth Circuit of ignoring the text of the Copyright Act.

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

⁷⁹ 536 F.3d at ____.

⁸⁰ *Id.* at ____ (citing 17 U.S.C. § 101).

⁸¹ *Id.*

⁸² The Second Circuit also openly criticized the Section 104 Report for reading the durational requirement out of the statute. *Id.* at _____. 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.*; 104 REPORT ____.

⁸³ *Id.* at ____.

Peak creates.⁸⁴

After endeavoring to minimize its departure from *Peak*, *Cartoon Network* offered a relatively 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.⁸⁵ The court noted that data in these buffers persists for only 0.1 to 1.2 seconds and are automatically overwritten.⁸⁶ Stressing the fact specific nature of inquiry, the court was satisfied that the RS-DVR buffers contained unfixed transitory instantiations, not copies.

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*

⁸⁴ 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, Inc., 129 S. Ct. 985 (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. 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 refusing to grant 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 unrelated to the claim that *Cartoon Network* and *Peak* are reconcilable.

⁸⁵ CSC argued that copies resulting from subscriber commands to record and playback content were made, if at all, by the subscriber rather than Cablevision. 536 F.3d at _____. This argument extended to the secondary ingest and streaming buffers, prompting the court to focus its analysis on the buffers CSC admittedly created. With respect to the secondary ingest buffer, the court held that any copies created in requests to record a program were created by subscribers. *Id.* at _____. 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 _____.

⁸⁶ *Id.* at _____.

Network clears the initial hurdle of lending independent meaning to each component of the statutory definition 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 undoubted 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 matter of pure durational line drawing. The court repeatedly stresses the brief existence of these would-be copies.⁸⁷ 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.⁸⁸ The court simply informs them 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 durational 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 [was] processed.”⁸⁹ 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. The role of qualitative factors was stressed by both parties

⁸⁷ 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.*, 2009 U.S. Dist. LEXIS 30657, 41-42 (S.D.N.Y. Mar. 31, 2009) (internal citations omitted) (finding copy created when software loaded into RAM for “several minutes to several hours”).

⁸⁸ See Eric Goldman, “DVR as a Service” Isn’t Copyright Infringement—*Cartoon Network v. CSC Holdings*, Technology & Marketing Law Blog, http://blog.ericgoldman.org/archives/2008/08/dvr_as_a_servic.htm (Aug. 4, 2008) (noting that *Cartoon Network* “deftly side-steps” the difficulty of identifying any particular durational threshold).

⁸⁹ *Id.* at ___.

in their briefing, so the court's sensitivity to them is not entirely surprising.⁹⁰ If the court did take these factors into account, precisely which qualitative considerations it thought relevant remains largely a mystery. 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, *Peak*'s RAM copy doctrine 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 unjustified as a matter of policy, this 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 as fact-specific one that must proceed on a case-by-case basis.⁹¹ 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 that path, *Cartoon Network* offers limited guidance in locating the elusive line between fixed copies and fleeting ephemera.

This uncertainty is exacerbated by the narrow facts before the court. The buffers at issue persisted for only 0.1 to 1.2 seconds, the court having excluded a two-second buffer from consideration on other grounds.⁹² And these buffers were rapidly and automatically overwritten by incoming data. Even within these narrow confines, the Second Circuit left open the possibility that "other factors not present here may alter the duration analysis significantly."⁹³ This cryptic proviso further limits the counsel *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

⁹⁰ CSC maintained that buffer data existed only while in transit between system components, and were thus literally transitory. CSC Brief at 28. 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* Plaintiffs Brief at 49-50. 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. Nonetheless, this argument may point to functional considerations that could inform the durational analysis. *See infra* ____.

⁹¹ 536 F.3d at ____.

⁹² *See supra* note ____.

⁹³ 536 F.3d at ____.

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 around *Peak*. Courts have blindly followed it, and scholars have doggedly attacked it. But before *Cartoon Network*, few have offered alternative methodologies. Its imperfections notwithstanding, *Cartoon Network* frees us from *Peak* and reminds us of the possibility of a new way forward. The next Part builds on the Second Circuit's insights to outline a 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 unjustifiably broad 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.

It begins by exploring the relevance of the statutory definitions of “copies” and “fixed,” the shared starting point 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 will suggest 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 the considerations, this Part will develop a set of factors courts can rely on to identify fixed copies.

A. The Relevance of Statutory Definitions

The terms “copies” and “fixed” play two roles in copyright law.⁹⁴ 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. 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.

In order to be protected by copyright, a work must be “fixed in a tangible medium of expression.”⁹⁵ 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.”⁹⁶ This limitation accommodates a wide range of media, but precludes protection for works not recorded in some enduring form.⁹⁷ In the context of copyrightability, fixation ensures compliance with this constitutional mandate.

The term “copy” plays a somewhat different role in delineating copyrightable subject matter. It draws 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 can be perceived, reproduced, or otherwise communicated.”⁹⁸ Copies include not only reproductions of a work, but also “the material object ... in which a work is first fixed.”⁹⁹ 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, the “work” in the parlance of

⁹⁴ See *Matthew Bender & Co., Inc. v. West Pub. Co.*, 158 F.3d 693, 702 (2nd 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”).

⁹⁵ 17 U.S.C. § 102(a).

⁹⁶ U.S. CONST. art. I, § 8, cl. 8.

⁹⁷ See Aaron K. Perzanowski, *The Penumbra Public Domain: Constitutional Limits on Quasi-Copyright Legislation*, 10 U PA. J. CONST. L. 1081, 1119-20 (2008).

⁹⁸ 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.*

⁹⁹ *Id.*

the Copyright Act.¹⁰⁰ Previous acts did not define “copies,”¹⁰¹ but the 1976 Act took pains to distinguish between a copyrighted work and its physical embodiment.

The Register of Copyrights 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.¹⁰² 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.”¹⁰³ Congress saw the definition of “copies” as central to the question of copyrightability, explaining that “two essential elements — original work and tangible objects — must merge through fixation in order to produce subject matter copyrightable under the statute.”¹⁰⁴

Likewise, the definition of “fixed” was drafted with an eye to copyrightability. Earlier revision bills left “fixed” undefined, relying on the common law understanding of fixation.¹⁰⁵ 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.¹⁰⁶ 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.”¹⁰⁷ But 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.”¹⁰⁸ 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

¹⁰⁰ 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.

¹⁰¹ *See, e.g.*, Copyright Act of 1909, 35 Stat. 1075 (1909).

¹⁰² Supplementary Report of the Register of Copyrights on the General Revision of the U.S. Copyright Law: 1965 Revision Bill 4, 89th Cong., 1st Sess. (House Comm. Print 1965).

¹⁰³ H.R. REP. NO. 1476, 94th Cong., 2d Sess. 53 (1976); S. REP. NO. 473, 94th Cong. 1st Sess. 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. 2737, 89th Cong. 2d Sess. 45 (1966).

¹⁰⁴ *Id.*

¹⁰⁵ WILLIAM F. PATRY, PATRY ON COPYRIGHT § 9:63 (2008).

¹⁰⁶ *Id.*

¹⁰⁷ 17 U.S.C. § 101.

¹⁰⁸ *Id.*

complete fixation exists.¹⁰⁹

The drafters of these definitions were focused squarely on questions of copyrightability. The counterintuitive inclusion of original embodiments of a work within the scope of “copies” offers textual support of this focus, as does the simultaneous fixation rule. The legislative history only reinforces this conclusion. Moreover, the text and legislative history offer no indication that the drafters paid any particular attention to the implications of these definitions for infringement.

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.¹¹⁰ William Patry has argued that both *Peak* and *Cartoon Network* display an undue preoccupation with these statutory definitions.¹¹¹ These opinions, the argument goes, rely on a “semantic sleight-of-hand” that equates a “copy” in the statutorily-defined copyrightability sense with an infringement of the reproduction right.¹¹² Patry suggests courts should rely instead on the common law understanding of “copies” for reproduction purposes, one which includes an inherent requirement of materiality.¹¹³ As Patry notes, neither “infringement” nor “reproduction” are defined by the Copyright Act, suggesting that Congress did not intend to disturb common law standards for infringement.¹¹⁴

“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 accepted these definitions as a common starting point. Equally 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

¹⁰⁹ H.R. REP. NO. 1476, 94th Cong., at 5 (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 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” were beyond the scope of fixation. *Id.* at 53.

¹¹⁰ See PATRY, *supra* note __, at §§ 3.24 & 9.63.

¹¹¹ See *Id.* at §§ 3.24 & 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).

¹¹² *Id.* at § 9:63.

¹¹³ *Id.*

¹¹⁴ *Id.* at §§ 3:24 & 9:63.

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.¹¹⁵ Second the alleged infringement must be a copy in the legal sense. That is, the accused work must be substantially similar to the protected work.¹¹⁶ 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 reproduce the copyrighted work in copies”¹¹⁷ — 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's position is that courts used a strict definitional understanding of “copies” as a substitute for copying in the legal sense.¹¹⁸ 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.¹¹⁹ 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

¹¹⁵ See *Mazer v. Stein*, 347 U.S. 201, 218 (1954) (explaining that “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.”).

¹¹⁶ See *Boisson v. Banian, Ltd.*, 273 F.3d 262, 268 (2d Cir. 2001) (noting that “not all copying results in copyright infringement, even if the plaintiff has a valid copyright. Plaintiffs must also demonstrate substantial similarity”) (internal citations and quotations omitted). See also 4 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 13.01 (2005).

¹¹⁷ 17 U.S.C. § 106(1).

¹¹⁸ See PATRY, *supra* note ___, at §§ 3.24 & 9.63.

¹¹⁹ Prior to the 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).

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 begins to outline their contours.

B. The Contours of Transitory Duration

The definitions of “copies” and “fixed” in the Copyright Act are relevant to the RAM copy question, but remain poorly understood in at least one key respect. The status of temporary instantiations turns on the meaning of the phrase “transitory duration.”¹²⁰ Instantiations that persist for more than a transitory 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. Two potential sources might lend some content to the transitory duration requirement. First, because “copies” and “fixed” were defined for subject matter purposes, their application in the copyrightability context might offer 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 their function as well.¹²¹

1. Copyrightability & Fixation

Because Congress defined “copies” and “fixed” to clarify copyright’s subject matter, we might expect to find guidance in interpreting “transitory duration” from courts considering questions of copyrightability. However, virtually no reported decisions analyze the statute’s transitory duration clause in the copyrightability

¹²⁰ See 17 U.S.C. § 101 (providing that “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).

¹²¹ See, e.g., *CoStar Group, Inc. v. Loopnet, Inc.* 373 F.3d 544 (4th Cir. 2004) (describing the transitory duration inquiry as involving both quantitative and qualitative considerations).

context.¹²² In part, this dearth of cases is explained by the simultaneous fixation provision. 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.¹²³

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.

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.¹²⁴ Fixation defines the bounds of the copyright grant through reference to a stable instantiation that can be compared to alleged infringements. If unfixed works were protected, “copyright law would forever be mired in disputes over the definition and boundaries of the works claiming copyright protection.”¹²⁵

Second, fixation helps to ensure that the copyright system serves its constitutional objective of encouraging learning. The Constitution enables Congress

¹²² A number of early video games 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 Intern., Inc., 547 F.Supp. 999 (N.D. Ill. 1982), *aff’d* 704 F.2d 1009 (7th Cir. 1982).

¹²³ 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.”

¹²⁴ *See* Douglas Lichtman, *Copyright as a Rule of Evidence*, 52 DUKE L.J. 683, 730–34 (2003) (discussing evidentiary functions of fixation).

¹²⁵ 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 ___, at 730–34; Russ VerSteege, *Jurimetric Copyright: Future Shock for the Visual Arts*, 13 CARDOZO ARTS & ENT. L.J. 125, 132 (1994) (discussing the practical problems addressed by fixation).

to enact copyright legislation not to reward authors but “to promote the progress of science.”¹²⁶ The exclusive rights it provides 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 law.¹²⁷ These functions 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 limiting protection to fixed works, copyright law encourages authors to express their ideas on paper, where they can be preserved, copied, and disseminated. By ensuring that works are captured in some lasting form, fixation furthers the goals of enriching the public domain and promoting progress.¹²⁸

If fixation serves these two purposes, “transitory duration” should be interpreted with them in mind. To the extent an embodiment is so evanescent 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;¹²⁹ film is subject to chemical deterioration;¹³⁰ and even modern digital storage media break down in time.¹³¹ Although these media deteriorate, they typically persist long enough to achieve the aims of fixation.

Marble, print, and film can be contrasted with more fleeting means of representing a work. Text scrawled on a frosted window pane,¹³² 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.

¹²⁶ U.S. CONST. art. I, § 8, cl. 8.

¹²⁷ See *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (noting copyright’s purpose of “promoting broad public availability”).

¹²⁸ See, e.g., Joseph C. Merschman, *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).

¹²⁹ HARRY MILLER LYDENBERG ET AL., *THE CARE AND REPAIR OF BOOKS* 23-31 (1960).

¹³⁰ LIBRARY OF CONGRESS, *REDEFINING FILM PRESERVATION: A NATIONAL PLAN* (1994), <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’”).

¹³¹ JEFF ROTHENBERG, *AVOIDING TECHNOLOGICAL QUICKSAND: FINDING A VIABLE TECHNICAL FOUNDATION FOR DIGITAL PRESERVATION* (1998), <http://www.clir.org/pubs/reports/rothenberg/introduction.html> (noting that “the physical lifetimes of digital storage media are often surprisingly short”).

¹³² See Ira I. Brandriss, *Writing in Frost on a Window Pane: E-mail and Chatting on RAM and Copyright Fixation*, 43 J. COPY. SOC’Y 237 (1996) (arguing that RAM instantiations are insufficiently permanent to be considered fixed for copyrightability purposes).

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, first introduced in 1947, allows photographers to capture an image that develops on special film over the course of a few minutes.¹³³ 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 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. As a result, it should be considered transitory in duration and unfixed.

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 long term storage medium such as a hard drive. If an author decides to discard a draft email rather than send or save it, there is a strong case to be made that fixation did not occur. A message stored in RAM is automatically overwritten as the computer uses its limited resources for other tasks.¹³⁴ 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.

But the fixation inquiry should not turn on a case by case determination of the degree to which particular instantiations fulfill the evidentiary and progress promotion functions. Resolving questions of fixation on the particular circumstances of each work's embodiment would place an unreasonable burden on courts and the Copyright Office and could lead to an inefficient proliferation of copyrightability disputes. Such an approach could also result in inconsistent protection for authors who took identical steps to achieve fixation. Authors who attempt to fix their works in reasonably permanent instantiations should not be denied protection if that embodiment happens to decay prematurely. Consider a marble statue destroyed by a natural disaster just seconds after its completion. Despite its brief duration, this instantiation should be treated as fixed because it was embodied in a reliably stable medium.

Rather than case by case scrutiny, the fixation inquiry should focus on the typical characteristics of the medium in which a work is embodied. From this perspective, the transitory duration requirement is satisfied when a work is embodied

¹³³ 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.

¹³⁴ See MUELLER, *supra* note ___, at ___.

in a form that generally endures long enough to reliably serve the evidentiary and progress promotion functions. This approach simplifies the tasks of the arbiters of copyrightability and builds in a presumption in favor of authors who make good faith efforts to fix their works. But it must also account for outliers on the other end of the copyrightability spectrum. Just as works embodied in typically stable media sometimes deteriorate quickly, 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 for an atypical duration — months or years, for example — these outlier cases should be considered on their particular and peculiar facts.

Thinking about fixation from the perspective of copyrightability offers some insights into the transitory duration analysis. First, with the exception of occasional outliers, the durational analysis should focus on the characteristics of the media of embodiment chosen by the author. To the extent works captured in a given medium fail to enable the evidentiary and progress promotion functions, they should not be considered fixed. Second, these two functions of fixation offer some broad guidance in locating the temporal dividing line between 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 of equally transitory duration. Admittedly, without clear judicial input, any conclusions based on the role of fixation in the copyrightability context are necessarily tentative. Moreover, as discussed below, other factors unique to the infringement context could contribute to the meaning of “transitory duration.”

2. Qualitative Factors

Without judicial guidance, no specific quantitative guidelines regarding the scope of transitory duration are likely to emerge. But a number of courts considering fixation in the infringement context have considered qualitative factors as a supplement to pure durational line drawing. The 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 1976.¹³⁵ *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.¹³⁶ The producers of *The Captain Kangaroo Show* purchased some of these puppets and used them on air without *Mura*’s explicit consent.¹³⁷ *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.¹³⁸ Although each individual

¹³⁵ 245 F. Supp. 587 (S.D.N.Y. 1965)

¹³⁶ *Id.* at 588.

¹³⁷ *Id.*

¹³⁸ *Id.* at 588-89.

image of the puppets lasted only a small fraction of a second when broadcast,¹³⁹ CBS created a permanent kinescope recording of the shorter appearance.¹⁴⁰

Because the 1909 Act included no general public display right, the court focused on reproduction.¹⁴¹ According to the court, the question before it was whether “the presentation on the television program, by an image reproduction of a transitory and impermanent nature [was] a copying of the puppets.”¹⁴² The court concluded that the “evanescent reproduction” of the puppet on screen was “so different in nature from the copyrighted hand puppet that ... it is not a copy.”¹⁴³

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 images 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 decision in *Triad Systems Corp. v. Southeastern Express System, Inc.*, 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.”¹⁴⁴ According to the court, “transitory duration” is “a relative term that must be interpreted and applied in context.”¹⁴⁵ *Triad* concluded that the RAM instantiation at issue was “the functional equivalent of a longer lasting copy” and was therefore fixed.¹⁴⁶

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.¹⁴⁷ *CoStar* involved claims of direct copyright infringement against the provider of a website that enabled users to upload photos of real estate. *CoStar*

¹³⁹ *Id.* at 589.

¹⁴⁰ *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.*

¹⁴¹ See Copyright Act of 1909, 35 Stat. 1075, § 1 (1909).

¹⁴² *Id.* at 589.

¹⁴³ *Id.* at 590.

¹⁴⁴ 1994 WL 446049 at *5 (N.D. Cal. March 18, 1994), *aff’d* 64 F.3d 1330 (9th Cir. 1995).

¹⁴⁵ *Id.*

¹⁴⁶ *Id.* The courts conclusion is subject to debate. See *infra* ____.

¹⁴⁷ 373 F.3d 544 (4th Cir. 2004).

maintained an extensive database of commercial real estate listings, including its copyrighted images of properties.¹⁴⁸ LoopNet operated a website that enabled real estate brokers to post property listings.¹⁴⁹ Some of LoopNet's users included CoStar's photographs in their listings without permission.¹⁵⁰ CoStar maintained that by storing these photos on its servers and transmitting them to internet users, LoopNet engaged in direct infringement.¹⁵¹

The Court of Appeals for 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.¹⁵² If copies were made, LoopNet's users made them. LoopNet could face indirect infringement claims to the extent it facilitated copying, but not claims alleging direct infringement.¹⁵³

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 duration. These RAM instantiations, according to the Fourth Circuit, were “a temporary, automatic response to the user's request” and “function[ed] solely to transmit the user's data.”¹⁵⁴ The court rejected the notion that instantiations resulting from this process were “‘fixed’ in the sense that they are ‘of more than transitory duration.’”¹⁵⁵

For the Fourth Circuit, the transitory duration analysis turns on both

¹⁴⁸ *Id.* at 546.

¹⁴⁹ *Id.* at 547.

¹⁵⁰ *Id.* at 548.

¹⁵¹ *Id.*

¹⁵² *Id.* at 550.

¹⁵³ *Id.* at 549-50. CoStar included an indirect infringement claim in its complaint, but the parties later stipulated to its dismissal. *Id.* at 547.

¹⁵⁴ *Id.* at 551.

¹⁵⁵ *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 underscores 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.

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.”¹⁵⁶

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.¹⁵⁷ 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. While less explicit than *Costar*, *Cartoon Network* 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 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.

3. The Functions of Copies

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 section will consider each of the ways in which RAM instantiations might serve functions similar to more permanent copies and examine the degree to which the reproduction right concerns itself with those functions.

a. Copies as Regulators of Access

¹⁵⁶ *Id.*

¹⁵⁷ *Cartoon Network v. CSC Holdings*, 536 F.3d 121, ___ (2d Cir. 2008).

One function copies can serve is enabling access to copyrighted works. Possession of a tangible copy is not a guarantee of access to the underlying work,¹⁵⁸ and works are sometimes accessible even without a copy.¹⁵⁹ 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.

Peak and subsequent RAM copy decisions, some argue, are best understood as an effort by courts to extend to copyright holders exclusive rights over access.¹⁶⁰ If works can be exploited without the creation of long term copies, copyright holders insisted that they needed a mechanism for asserting control over access. By treating RAM instantiations as violations of the reproduction right, these courts allowed copyright holders to prevent unwanted access to their works. The desire for control over exploitation of works that does not result in or require the creation of long lasting copies is echoed in more recent concerns about cloud computing.¹⁶¹ As software and other services increasingly reside on remote servers rather than CD-ROMs or local hard drives, copyright holders worry that without a broad RAM copy doctrine, they will be powerless to prevent unauthorized access.

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 theater goers from taping the latest blockbuster, but it cannot stop them from sneaking into the theater.¹⁶² Their shared ability 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

¹⁵⁸ Access to the work contained in a copy, for example, could be restricted through encryption.

¹⁵⁹ Television and radio broadcasting are examples of enabling access without necessarily creating copies.

¹⁶⁰ 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 court have interpreted “copies” to include RAM instantiations as a means of providing an exclusive right to “access and use” information).

¹⁶¹ See Brief of Amicus Curiae Copyright Alliance in Support of Petitioners, *Cable News Network, Inc. v. CSC Holdings, Inc.* (No. 08-448) (noting that economic value can be realized from copyrighted works, without distributing stable copies, through application service provider and cloud computing business models).

¹⁶² 17 U.S.C. § 106(1); see *id.* § 2319B (prohibiting the “Unauthorized recording of Motion pictures in a Motion picture exhibition facility”).

any necessary protection against unauthorized access. The Digital Millennium Copyright Act 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. Additionally, the Computer Fraud and Abuse Act prevents unauthorized access to networked computer resources under certain circumstances. Given these legislative interventions, there is no need to enlist the reproduction right to do work so far beyond its intended scope.

b. Copies as Regulators of Use

Just as they serve as proxies for access, copies also enable copyright holders to regulate particular uses of their works. Without a tangible copy of a play, for example, a theatre 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.

But it is far from clear that such restrictions are the province of the reproduction right. As other commentators have noted, copyright does not regulate the use of works through its exclusive right of reproduction.¹⁶³ Instead, copyright relies on rights of public display and performance to control the use of protected works. 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, undermining the need for reliance on the reproduction right.¹⁶⁴ 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 Congress 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 license terms as copyright infringement on the basis of RAM

¹⁶³ See Litman, *supra* note __, at __.

¹⁶⁴ See Reese, *supra* note __, at __.

copying,¹⁶⁵ demonstrating the power over the behavior of both customers and competitors resulting from this combination.

MDY Industries v. Blizzard Entertainment is one example. Blizzard is the operator of World of Warcraft (“WoW”), a massively multiplayer online role playing game.¹⁶⁶ As the court explained 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.”¹⁶⁷ Blizzard’s software and services are governed by an end user license agreement and terms of use that spell out the rules playing WoW. These rules prohibit players from using third-party software that modifies or automates the in-game experience.

MDY developed just such a program. The Glider, a “bot” that automates play of WoW, allowed its users to continue playing while away from their computers. The Glider thereby enabled users to collect in-game resources to advance more quickly through the ranks within WoW. Many WoW users understandably view such automatic play as cheating, and Blizzard considers their use harmful to the value of its service. Blizzard sued MDY, alleging contributory and vicarious copyright infringement, trafficking in circumvention tools in violation of the DMCA, tortious interference with contract, and unjust enrichment.

Blizzard premised its indirect copyright infringement claims on alleged acts of direct infringement by Glider users, a theory embraced by the court. WoW users who rely on Glider, according to the court, act outside the scope of Blizzard’s license.¹⁶⁸ 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. But, relying on *Peak*, the court concluded that when Blizzard’s customers loaded WoW files into RAM, they created infringing copies.¹⁶⁹

Normally, copyright requires something more than breaking the rules of a game to support a finding of infringement. Regardless of your willful disregard of

¹⁶⁵ See *Facebook, Inc. v. Power Ventures, Inc.*, 2009 U.S. Dist. LEXIS 42367 (N.D. Cal. May 11, 2009) (denying a motion to dismiss copyright infringement claim premised on accessing website for purposes prohibited by the terms of use); *MDY Indus., LLC v. Blizzard Entm’t, Inc.*, 2008 U.S. Dist. LEXIS 53988 (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, 1005-06 (C.D. Cal. 2007) (finding a strong likelihood of success 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).

¹⁶⁶ *MDY*, 2008 U.S. Dist. LEXIS 53988 at *___.

¹⁶⁷ *Id.* at *___.

¹⁶⁸ *Id.* at *___.

¹⁶⁹ *Id.* at *___.

the instruction “Do not pass Go. Do not collect \$200,” Parker Brothers has no colorable infringement case against you.¹⁷⁰ 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, ignoring such dictates in the digital world exposes a player to 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.¹⁷¹ 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 Copyright Act, which provides for damages up to \$150,000 per work infringed,¹⁷² as well as the generally permissive approach to injunctive relief in copyright cases.¹⁷³

Copyright does not provide copyright holders exclusivity over reproduction in order to allow them control over particular uses of their works. Even though a broad RAM copying rule is an effective means of obtaining and 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,

¹⁷⁰ See J.F. Wilkinson, The Play-money Game That Made Millions, *Sports Illustrated* (Dec. 2, 1963) (noting that “[y]ou 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.”).

¹⁷¹ Query whether the average consumer would be aware of their assent to such conditions. The terms currently governing use of the iTunes Store weigh in at over 18,000 words. See Apple Inc., Terms and Conditions, <http://www.apple.com/legal/itunes/us/terms.html>.

¹⁷² See 17 U.S.C. § 504(c) (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*, WM. & MARY L. REV. (forthcoming 2009).

¹⁷³ See NIMMER, *supra* note ___, at 14.06[A][1][b] (describing the issuance of preliminary injunctions in copyright infringement actions as “ordinary, even commonplace”).

enable use of copyrighted works.¹⁷⁴

c. Copies as Regulators of Distribution

Third, copies enable distribution. Unlike control over access or use, control over distribution is well within the scope of a copyright holder's exclusive rights. The distribution right is statutorily limited to tangible copies, and as a practical matter, distribution typically entails copies of a work, evidencing a clear connection between the creation of copies and one of the core exclusive rights of the copyright grant. So one reason copyright law might concern itself with reproduction in copies is that those copies could result in violation of the distribution right.

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 choke point 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 effectively target. At the very least, there is plausible relationship between restricting reproduction and the maintaining exclusivity over distribution.

If temporary instantiations give rise to a comparable threat of unauthorized distribution, courts might treat them as the functional equivalents of longer lasting copies with good reason. But RAM instantiations present very little threat of unauthorized distribution. Since they reside in the memory of a computing device only until overwritten and only as long as the device maintains power,¹⁷⁵ RAM instantiations would prove difficult and expensive for infringers to distribute and would be of limited value to the public. 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

¹⁷⁴ See, e.g., *Triad*, 1994 WL 446049, at *5 (finding that a RAM instantiations was “the functional equivalents of a longer lasting copy” because it enabled use of software).

¹⁷⁵ See MUELLER, *supra* note __, at __>

sometimes cited as a reason to classify RAM instantiations as copies.¹⁷⁶ 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. And 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 another 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, the potential for reproduction has not been the dominant motivation in 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 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. The same is not true of RAM instantiations.¹⁷⁷ 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

¹⁷⁶ See, e.g., Brief of Plaintiffs, at 49-50 *Cartoon Network LP v. CSC Holdings, Inc.* (arguing that “the buffer copies in the RS-DVR Service are “fixed” because they exist long enough to be reproduced” in more permanent copies).

¹⁷⁷ See *London-Sire Records, Inc. v. Doe 1*, 542 F. Supp. 2d 153, 175 (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 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)).

“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. But 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.¹⁷⁸

Second, these temporal considerations generally do not require case by case evaluation. Instead, they 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 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, RAM instantiations fare poorly. Their typically brief existence falls short of any duration that would support an

¹⁷⁸ See, e.g., *Advanced Computer Services v. MAI Systems 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); *SimplexGrinnell LP v. Integrated Sys. & Power, Inc.*, 2009 U.S. Dist. LEXIS 30657, 41-42 (S.D.N.Y. Mar. 31, 2009) (finding copy created when software loaded into RAM for “several minutes to several hours”).

unequivocal claim to fixation. Qualitatively, RAM instantiations are typically, 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 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, those 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, weeks or months perhaps, a careful consideration of the individual facts of that case would be necessary. Such an aberrant duration would alter both the temporal and qualitative 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 those terms are understood by the Copyright Act.

CONCLUSION

Copyright has long struggled to understand how the fundamental concept of the copy should apply to temporary digital instantiations. Because of early judicial missteps, debate understandably focused on the flaws of a broad inflexible RAM copy doctrine. No doubt 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. And it recognized the need for a new paradigm without endeavoring to fully articulate it.

This Article 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 *Peak* did, or rely on unpredictable instinctive assessments, as *Cartoon Network* arguably did. 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 avoid a burdensome case by case analysis of the characteristics of every RAM instantiation. Like *Peak*'s blanket rule, these guidelines offer predictability. But 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 currently dominant approach among this courts, is at best unsteady. *Cartoon Network*, despite its reluctance to reject *Peak* outright, has served to further expose its 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.