

Non-Fungible Tokens and Intellectual Property

A Report to Congress

March 2024



The Honorable Chris Coons
Chair
Subcommittee on Intellectual Property
United States Senate
218 Russell Senate Building
Washington, D.C. 20510

The Honorable Thom Tillis
Ranking Member
Subcommittee on Intellectual Property
United States Senate
113 Dirksen Senate Office Building
Washington, D.C. 20510

March 12, 2024

Dear Chairman Coons and Ranking Member Tillis:

On behalf of the United States Patent and Trademark Office (“USPTO”) and the United States Copyright Office, we are pleased to deliver a copy of a report entitled *Non-Fungible Tokens and Intellectual Property*, which is available to the public on the websites of both offices.

By letter dated June 9, 2022, Senator Leahy and Senator Tillis requested that the USPTO and the Copyright Office (collectively, “the Offices”) jointly undertake a study to examine current and future applications of non-fungible tokens (“NFTs”); how intellectual property laws apply to NFTs and assets associated with NFTs; intellectual property-related challenges arising from the use of NFTs; and potential ways to use NFTs to secure and manage intellectual property rights.

In response to this request, the Offices solicited comments from interested stakeholders and members of the public through a Notice of Inquiry and three public roundtables. The Offices received input from a broad spectrum of commenters, including creators, brand owners, innovators, entrepreneurs, technologists, academics, industry associations, and intellectual property practitioners. The Report details stakeholder input, incorporates information gathered from research conducted by the Offices, and includes the Offices’ analyses of key issues identified during the Study.

The feedback the Offices received included a diversity of views about the opportunities and intellectual property-related challenges associated with NFTs. For example, some artists saw promise in the potential to use NFTs to obtain royalty payments on downstream sales, and to incorporate various licensing terms within NFTs, while others expressed concerns about forms of copyright infringement associated with NFTs. Many trademark owners saw opportunities to use NFTs to enhance brands and reach new consumers, while others described significant

trademark infringement and enforcement challenges. Some commenters also noted the potential to use NFTs to manage and license patent rights, while others offered differing opinions about whether designs associated with NFTs can meet the requirements for design patent protection. While many commenters discussed possible uses of NFTs, the Offices note that recent fluctuations in value and uncertainty in the markets for NFTs make predictions about the adoption of NFT technology difficult.

While many stakeholders raised concerns about copyright and trademark infringement associated with NFTs, most believed that current intellectual property laws are adequate to deal with infringement. Moreover, many expressed concern that NFT-specific legislation would be premature at this time and could impede the development of new NFT applications, given the evolving nature of the technology. The Offices agree with these assessments and do not believe that changes to intellectual property laws, or to the Offices' registration and recordation practices, are necessary or advisable at this time.

We hope the Report assists you as you evaluate NFT technology and its impact on intellectual property rights, laws, and policies. Please do not hesitate to contact us if you have any questions regarding the Report or its findings and conclusions.

Sincerely,



Kathi Vidal
Under Secretary of Commerce for
Intellectual Property and Director of the
United States Patent and Trademark Office



Shira Perlmutter
Register of Copyrights and the Director of the
United States Copyright Office

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TABLE OF CONTENTS

- I. Background.....1
 - A. Study History.....1
 - B. What Are NFTs?2
 - 1. A Unique Cryptographic Token.....3
 - 2. Ownership Recorded to a Blockchain or Other Distributed Ledger System.....3
 - 3. Providing the Owner Rights in or Access to One or More Assets or Entitlements5
 - C. NFT Creation and Transfer.....6
 - D. Uses and Challenges of NFTs8
- II. Copyright14
 - A. Copyright Protection and the Minting, Storage, Marketing, and Transfer of NFTs14
 - 1. Minting.....14
 - 2. Storage18
 - 3. Marketing and Offering for Sale20
 - 4. Transferring NFTs and Associated Rights23
 - B. Enforcement.....29
 - C. Evolving role of NFTs in the Copyright Ecosystem.....33
 - 1. Provenance.....33
 - 2. Copyright Registration and Recordation.....35
 - 3. Remuneration for Resale or Licensed Use.....39
 - 4. Digital Rights Management42
 - D. Summary42
- III. Trademarks45
 - A. Evolving Role of NFTs in the Trademark Ecosystem.....45
 - B. Federal Registration of Trademarks Involving NFTs.....47
 - 1. Obtaining a U.S. Trademark Registration.....47
 - 2. Scope of Protection Afforded a U.S. Trademark Registration50
 - C. Trademark Infringement and Enforcement.....54
 - D. Commenter Recommendations for Best Practices, Education, and Policy Surrounding Trademarks and NFTs57
 - 1. Best Practices57
 - 2. Agency Education and Guidance.....58
 - 3. Are New Laws Necessary?59

E. Potential USPTO Use of NFTs in the Trademark Context.....	60
F. Summary	62
IV. Patents.....	63
A. Use of NFTs to Manage Patents	63
1. Transferring Rights and Portfolio Management.....	63
2. Tracking Royalties	64
3. Fractional Patent Ownership.....	64
B. Obtaining Patent Rights for NFT-related Inventions.....	65
1. Patent Eligibility	65
2. Novelty and Non-Obviousness.....	68
3. Inventorship.....	69
4. Are New Laws Necessary?	70
C. Potential USPTO Use of NFTs in the Patent Context.....	70
D. Summary	71
V. Conclusion	72

Appendices

Appendix A:	Participants in the Roundtable on Trademarks and NFTs
Appendix B:	Participants in the Roundtable on Patents and NFTs
Appendix C:	Participants in the Roundtable on Copyrights and NFTs
Appendix D:	Notice of Inquiry – Study on Non-Fungible Tokens and Related Intellectual Property Law Issues (November 23, 2022)
Appendix E:	Notice of Inquiry – Study on Non-Fungible Tokens and Related Intellectual Property Law Issues (December 21, 2022)
Appendix F:	Parties Who Submitted Comments in Response to the November 23, 2022, Notice of Inquiry, extended by the December 21, 2022, Notice of Inquiry
Appendix G:	Sample Definitions and Explanations of NFTs from Domestic and International Government Materials and Resources

EXECUTIVE SUMMARY

Non-fungible tokens (NFTs) are part of an emerging technology landscape that leverages blockchain technology for a variety of uses. Many of these uses, such as representing ownership of digital art or authenticity of products and services, implicate intellectual property (IP) rights. To evaluate the IP law and policy issues associated with NFTs, on June 9, 2022, Senator Patrick Leahy and Senator Thom Tillis, Chair and Ranking Member of the Senate Judiciary Committee’s Subcommittee on Intellectual Property, respectively, requested that the United States Patent and Trademark Office (USPTO) and the United States Copyright Office (together, the “Offices”) undertake a joint study.¹ This Report presents the Offices’ findings and conclusions.

Section I provides background on the Study and an overview of NFT technology:

- For purposes of this Report, the term “NFT” refers to a unique cryptographic token, the ownership of which is recorded to a blockchain or other distributed ledger system, and which provides the owner rights in or access to one or more assets or entitlements.
- Commenters identified various current and potential uses for NFTs, including in the sale of digital artwork, as tickets for exclusive events, or as authentication for luxury goods.
- Some features of NFT technology can create risks of infringing IP rights or challenges to enforcing them. Nothing about the technology prevents a user from creating an NFT associated with intellectual property (for example, a digital artwork) that the user does not own. To the extent infringing material resides on the blockchain, the immutability of the blockchain may limit IP owners’ recourse. Further, NFTs and their associated assets are often stored on decentralized networks that do not require users to provide personal identification, which can be an obstacle to enforcement.
- The most common concern raised about NFTs, however, was the prevalence of consumer confusion about the IP rights implicated in their creation or transfer. Unsophisticated consumers may conflate the purchase of an NFT associated with a digital good with ownership of IP rights in that good. Even sophisticated consumers may struggle to ascertain what rights accompany a particular NFT, because there are few marketplace standards for clear disclosure by NFT sellers.

Sections II through IV examine the relationship between NFTs and copyrights (section II), trademarks (section III), and patents (section IV).

¹ Letter from Sen. Patrick Leahy, Chair, and Sen. Thom Tillis, Ranking Member, Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary, to Kathi Vidal, Under Secretary of Commerce for Intell. Prop. and Dir., U.S. Patent and Trademark Office, and Shira Perlmutter, Register of Copyrights and Dir., U.S. Copyright Office (June 9, 2022), <https://www.copyright.gov/policy/nft-study/senate-letter.pdf>; Letter from Kathi Vidal, Under Secretary of Commerce for Intell. Prop. and Dir., U.S. Patent and Trademark Office, and Shira Perlmutter, Register of Copyrights, U.S. Copyright Office, to Sen. Patrick Leahy, Chair, and Sen. Thom Tillis, Ranking Member, Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary (July 8, 2022), <https://www.copyright.gov/laws/hearings/response-to-june-9-2022-letter.pdf>.

The copyright-specific issues discussed in section II include: (i) how the creation, storage, marketing, and transfer of NFTs implicate copyright law; (ii) how rightsholders may enforce copyright against NFT-related infringement; and (iii) what roles NFTs could play in the copyright ecosystem, such as documenting authorship, provenance, and ownership of creative works, enhancing copyright registration and recordation, facilitating payment of “resale royalties,” and enabling digital rights management. The Offices found:

- To the extent that an NFT is associated with a copyrightable work, the creation, storage, marketing, or transfer of that NFT may implicate copyright owners’ exclusive rights. Some features of NFTs—such as typically pseudonymous ownership and decentralized storage—can raise challenges to enforcing a copyright, but these are not new problems in the online space, and some commenters reported they have had success using existing laws.
- Proposals to use NFTs to replace or supplement copyright recordkeeping did not demonstrate added value. As a replacement for current recordation practices, the immutability of blockchain technology leaves NFTs vulnerable to perpetuating inaccurate records.
- NFTs may offer opportunities for U.S. artists to obtain remuneration from downstream resales of their works. As U.S. copyright law does not expressly provide for such remuneration, these opportunities depend on the code underlying the NFTs and the rules of the platforms on which they’re sold rather than any statutory entitlement.

The trademark issues discussed in section III include: (i) opportunities NFT technology presents for brand owners; (ii) concerns associated with obtaining trademark registrations for NFT-related goods and services; (iii) uncertainty regarding whether a trademark registration for traditional goods or services can be used to prevent uses and registration of the same mark in connection with similar digital goods or services tied to NFTs, and vice versa; and (iv) the prevalence of trademark infringement, and the enforcement challenges, associated with NFTs and NFT platforms. The Offices found:

- NFT technology and blockchain networks present new opportunities for trademark owners to build their brands, reach new consumers with interactive products and services, document the provenance of products, and manage trademark rights. However, some features of these technologies also pose challenges for trademark owners, including the fact that records stored on blockchain networks are theoretically immutable, which can complicate efforts to remove inaccurate or fraudulent records.
- Trademark infringement is prevalent on NFT marketplaces, and trademark enforcement efforts are complicated by the decentralized and anonymous nature of NFT platforms, and the decentralized nature of the blockchain networks on which NFTs are stored. While some NFT platforms have developed protocols to help trademark owners enforce their rights, there is no central authority that requires all platforms to do so, nor is there

a cross-platform mechanism to settle trademark-related disputes involving blockchain-based domain names.

- Nevertheless, most commenters disfavored new, NFT-specific laws to address trademark infringement both because NFT technology is still evolving rapidly and because many federal court cases involving these issues are still pending and will likely provide answers regarding whether existing trademark laws are sufficient.
- Trademark applicants, registrants, and practitioners need guidance regarding obtaining and enforcing trademark registrations in the context of NFTs. The USPTO has provided guidance on these issues and will continue to work with stakeholders to identify additional needs.

The patent issues discussed in section IV include: (i) the use of NFTs to manage registration, ownership, and licensing of patents; and (ii) how current patent laws apply to NFT-related inventions. The Offices found:

- While blockchain technology and NFTs can play a role in supporting management, transfer, and licensing of patent rights, commenters' concerns regarding the difficulty of identifying bad actors on NFT platforms and of correcting inaccurate or fraudulent information stored on blockchain networks also apply in the context of patent rights.
- Commenters provided a variety of views regarding how current patent laws and requirements apply to inventions related to NFTs and blockchain technology. Patent applicants and practitioners could benefit from guidance regarding obtaining patents in the context of NFTs. The USPTO has provided guidance on these issues and will continue to work with stakeholders to identify additional needs.

Section V contains the Offices' overall conclusions. The Offices found that changes to IP laws are not currently necessary to address the use of NFTs as the unique aspects of the technology generally do not raise new IP problems. The challenges they do raise, such as concerns about the legal status of smart contracts or consumer confusion over what rights accompany the purchase of an NFT, are better addressed through other means.

I. INTRODUCTION AND BACKGROUND

A. *Study History*

On June 9, 2022, Senator Patrick Leahy and Senator Thom Tillis, Chair and Ranking Member of the Senate Judiciary Committee’s Subcommittee on Intellectual Property, respectively, requested by letter that the Offices undertake a joint study on the various IP law and policy issues associated with NFTs.² In their letter, the Senators noted the growing adoption of NFTs in “nearly all spheres—from academia to entertainment to medicine, arts, and beyond.”³ For this reason, the Senators concluded that “it is imperative that we understand how NFTs fit into the world of intellectual property rights—as said rights stand today and as they may evolve as we move into the future.”⁴

On November 23, 2022, the Offices issued a Federal Register Notice to solicit written comments from stakeholders on a range of IP issues and topics associated with NFTs.⁵ On December 21, 2022, the Offices extended the period for submitting written comments through February 3, 2023.⁶ The Offices received a total of sixty comments from a wide range of stakeholders, including voluntary bar associations, industry organizations, nonprofit entities, businesses, entrepreneurs, academics, artists, and inventors.

The Offices’ notice also announced a series of three online public roundtables to provide additional opportunities for stakeholder input.⁷ The roundtables were divided by subject matter: the “Trademarks and NFTs” roundtable was held January 24, 2023,⁸ “Patents and NFTs” on January 26, 2023,⁹ and “Copyrights and NFTs” on January 31, 2023.¹⁰ A total of ninety-five stakeholders participated in the roundtables.

This Report reviews and analyzes the public input, focusing on how NFTs may affect the protection of copyrights, trademarks, and patents. The Report also considers the implications that NFTs may have for the Offices’ practices.

² *Id.*

³ *Id.* at 1.

⁴ *Id.*

⁵ Study on Non-Fungible Tokens and Related Intellectual Property Law Issues, 87 Fed. Reg. 71584 (Nov. 23, 2022). The Notice was published under dockets PTO-C-2022-0035 and COLC-2022-0005.

⁶ Study on Non-Fungible Tokens and Related Intellectual Property Law Issues, 87 Fed. Reg. 78090 (Dec. 21, 2022).

⁷ Study on Non-Fungible Tokens and Related Intellectual Property Law Issues, 87 Fed. Reg. at 71586.

⁸ *Roundtable: Trademarks and Non-Fungible Tokens*, U.S. PATENT AND TRADEMARK OFFICE, <https://www.uspto.gov/ip-policy/trademark-policy/roundtable-trademarks-and-non-fungible-tokens>.

⁹ *Roundtable: Patents and Non-Fungible Tokens*, U.S. PATENT AND TRADEMARK OFFICE, <https://www.uspto.gov/ip-policy/patent-policy/roundtable-patents-and-non-fungible-tokens>.

¹⁰ *Non-Fungible Token Study*, U.S. COPYRIGHT OFFICE, <https://www.copyright.gov/policy/nft-study/>.

As with any emerging technology, the use of NFTs is subject to rapid change and development.¹¹ This Report serves as a snapshot of views regarding the relationship between NFTs and intellectual property rights as of the time the Study was conducted.

B. *What Are NFTs?*

A single, uniformly accepted definition of NFTs does not currently exist.¹² That said, virtually all stakeholders identified several features common to NFTs. Based on that input, for the purpose of this Report, the term “NFT” refers to: (i) a unique cryptographic token,¹³ (ii) the ownership of which is recorded to a blockchain (or another type of digital distributed ledger system),¹⁴ (iii) that provides the owner rights in or access to one or more assets¹⁵ or entitlements.¹⁶

¹¹ Some have projected massive growth in the NFT industry. *Non-Fungible Tokens (NFT): Global Market*, BCC RESEARCH (Nov. 2022), <https://www.bccresearch.com/market-research/information-technology/nft-market.html> (projecting market cap of \$125.6 billion by 2027, with a compound annual growth rate of 27.3%). However, predictions of growth haven’t necessarily materialized. See, e.g., Hassan Shittu, *Why are NFT Prices Crashing? Azuki Plummets 11% and Bored Apes Falls 16%—Here’s What You Need to Know*, CRYPTONEWS (July 3, 2023), <https://cryptonews.com/news/why-are-nft-prices-crashing-azuki-plummets-11-bored-apes-falls-16-heres-what-you-need-know.htm> (describing decreases in trading activity and prices in the NFT market); Ezra Reguerra, *NFT collections take massive price hit in 2023: Nifty Newsletter, May 24–30*, COINTELEGRAPHY (May 31, 2023), <https://cointelegraph.com/news/nft-collections-take-massive-price-hit-in-2023-nifty-newsletter-may-24-30> (describing the drop in value of some NFT collections of up to 95%).

¹² See Appendix G (providing sample definitions and explanations of NFTs from domestic and international government materials and resources). In the Federal Register Notice for this Study, the Offices provided the Merriam-Webster dictionary definition for “non-fungible token” as a starting point for discussion. Study on Non-Fungible Tokens and Related Intellectual Property Law Issues, 87 Fed. Reg. at 71585. Many respondents commented that this definition did not sufficiently capture the attributes of NFTs, with one commenter contending that it is “simultaneously too broad and too narrow in its description.” Decentralized Future Council, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 3 (Feb. 3, 2023). See also Entertainment Software Association (“ESA”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2023); ACT | The App Association (“App Association”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1–2 (Feb. 3, 2023); Anoop Bungay (“Bungay”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 108–09 (Feb. 23, 2023).

¹³ See, e.g., Music Artists Coalition (“MAC”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 6 (Feb. 3, 2023); ESA Comments at 2; James Gatto (“Gatto”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2–3 (Feb. 3, 2023).

¹⁴ See, e.g., MAC Comments at 6; National Music Publishers’ Association (“NMPA”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 10 (Feb. 3, 2023); Robert Paul (“Paul”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Jan. 29, 2023); Gatto Comments at 2.

¹⁵ The Offices here use the word “asset” broadly and take no position on its meaning in the context of NFTs in other bodies of law.

¹⁶ See, e.g., American Intellectual Property Law Association (“AIPLA”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 3 (Feb. 2, 2023); Trademark Roundtable Tr. at 20–21 (Jan. 24, 2023) (Morgan Reed, App Association); Decentralized Future Council Comments at 3; ESA Comments at 2; App Association Comments at 2; Bungay Comments at 108.

1. A Unique Cryptographic Token

“Token,” in this context, means “[a] digital representation of value or rights.”¹⁷ NFTs are “non-fungible,” meaning that each token is unique and non-interchangeable, as opposed to, for example, cryptocurrency tokens, where each token has equivalent value and is therefore interchangeable with any other such token.¹⁸ They are “cryptographic” because technical features of the tokens ensure that their data are only available to authorized users.¹⁹

2. Ownership Recorded to a Blockchain or Other Distributed Ledger System

Ownership and transfers of NFTs are recorded on a distributed ledger called a blockchain. A 2022 report by the Congressional Research Service describes a blockchain as:

[A] database technology that records and stores information in blocks of data that are linked or “chained” together. Data stored on a blockchain are continually shared, replicated, and synchronized across the nodes in a network—individual computer systems or specialized hardware that communicate with each other and store and process information. This system enables tamper-resistant recordkeeping without a centralized authority or intermediary.²⁰

The transactions recorded on a block typically go through a cryptographic process which creates a unique identifier, or hash, for that group of transactions.²¹ The block itself undergoes a similar process to create a unique identifier, or hash, for the individual block.²² Then each block of transactional record data is chained together “through each block containing the hash digest

¹⁷ *Glossary: Digital Token*, THOMSON REUTERS PRACTICAL LAW, [https://uk.practicallaw.thomsonreuters.com/w-024-0323?transitionType=Default&contextData=\(sc.Default\)](https://uk.practicallaw.thomsonreuters.com/w-024-0323?transitionType=Default&contextData=(sc.Default)).

¹⁸ See Benedict George, *No Stupid Questions: What’s a Crypto Token, Anyway?*, COINDESK (May 11, 2023), <https://www.coindesk.com/learn/no-stupid-questions-whats-a-crypto-token-anyway/>; *Nonfungible definition*, LAW INSIDER, <https://www.lawinsider.com/dictionary/nonfungible>.

¹⁹ For definitions of cryptography, see *Glossary: cryptography*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (“NIST”), <https://csrc.nist.gov/glossary/term/cryptography>.

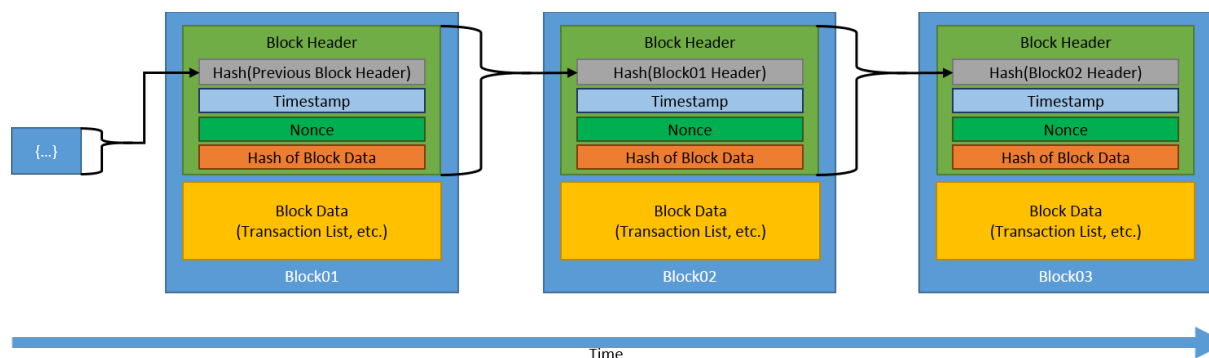
²⁰ KRISTEN E. BUSCH, CONG. RSCH. SERV., R47064, BLOCKCHAIN: NOVEL PROVENANCE APPLICATIONS at Summary (2022), <https://crsreports.congress.gov/product/pdf/R/R47064>.

²¹ See DYLAN YAGA ET AL., NIST, NISTIR8202, BLOCKCHAIN TECHNOLOGY OVERVIEW 7 (2018), <https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.8202.pdf> (“Hashing is a method of applying a cryptographic hash function to data, which calculates a relatively unique output (called a message digest, or just digest) for an input of nearly any size (e.g., a file, text, or image). It allows individuals to independently take input data, hash that data, and derive the same result—proving that there was no change in the data. Even the smallest change to the input (e.g., changing a single bit) will result in a completely different output digest.” (emphasis omitted)).

²² See *id.*

of the previous block’s header, thus forming the *blockchain*.”²³ (See Figure 1.) Blockchain ledgers are capable of flagging and preventing recordation of new transactional data that attempts to alter previously stored blocks of data.²⁴ The records are commonly described as being immutable.²⁵

Figure 1: Blockchain Data Structure²⁶



Several commenters offered an important qualification regarding NFT “ownership” being recorded on the blockchain: Blockchain technology cannot distinguish between “ownership” and “possession.”²⁷ If an NFT is improperly transferred (*e.g.*, through a phishing scam), once

²³ See *id.* at 17. KRISTEN E. BUSCH, CONG. RSCH. SERV., R47189, NON-FUNGIBLE TOKENS (NFTs) at Summary (2022), <https://crsreports.congress.gov/product/pdf/R/R47189> (defining a blockchain as “a digital database that records data on a decentralized network of computers without the use of a central authority”). For more information on blockchain technology, see CHRIS JAIKARAN, CONG. RSCH. SERV., R45116, BLOCKCHAIN: BACKGROUND AND POLICY ISSUES (2018), <https://crsreports.congress.gov/product/pdf/R/R45116>, and KRISTEN E. BUSCH, CONG. RSCH. SERV., R47064, BLOCKCHAIN: NOVEL PROVENANCE APPLICATIONS at Summary (2022). Notably, blockchains are merely one type of distributed ledger technology (“DLT”). See HIROKI WATANABE ET AL., ENHANCING BLOCKCHAIN TRACEABILITY WITH DAG-BASED TOKENS (IEEE 2019), <https://ieeexplore.ieee.org/abstract/document/8946176>. For simplicity purposes, this Report will use the term “blockchain” because blockchain is the DLT on which NFTs are most commonly stored.

²⁴ See Yaga et al., BLOCKCHAIN TECHNOLOGY OVERVIEW 17.

²⁵ While blockchains are frequently referred to as immutable, there are situations where modifications are possible. See *id.* at 34.

²⁶ *Blockchain Image*, NIST, <https://www.nist.gov/image/blockchainpng> (last visited February 2024).

²⁷ One commenter described this ownership-versus-possession issue as inherent in the decentralized structure of the blockchain itself: “As there is no governing authority and no cross-chain or marketplace validation of NFTs or the underlying artifacts to which they attach, any party can represent any addressable content as an asset for sale regardless of who actually owns the property rights behind the artifact.” Aon PLC (“Aon”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2023).

Several other commenters raised distinctions between ownership and possession of an NFT. See Corsearch UK Ltd. (“Corsearch”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1 (Jan. 9, 2023) (“In fact, most common blockchains for minting NFTs do not have a mechanism for distinguishing between possessing a

the smart contract executes and the transaction is recorded on the blockchain ledger the unauthorized party could be recorded as the new possessor regardless of the circumstances surrounding the transfer. As one commenter explained, “the law can and will certainly disagree with what the blockchain says about who owns a particular asset.”²⁸

3. Providing the Owner Rights in or Access to One or More Assets or Entitlements

NFTs can be used to record the owners’ rights in or access to assets or entitlements with which the token is associated. This feature of NFTs creates most of their value. The nature of the assets or entitlements associated with an NFT can vary depending on the industry involved. Examples may include a piece of digital art,²⁹ a voucher that can be used to redeem sneakers,³⁰ front row tickets to a concert,³¹ or a share in royalties from the sale of a song³² or e-book.³³

The distinction between the token and the associated asset or entitlement is important.³⁴ While each token will be unique, multiple NFTs may be associated with an identical asset (*e.g.*, the

token and owning it. If someone steals your physical item, it’s generally understood that the item is still yours. But with an NFT, the ‘owner’ is whoever has the token in their wallet. So, if someone’s NFT gets stolen via a phishing scam, the blockchain treats the thief as the new owner.”); Runhua Wang and Jyh-An Lee (“Wang & Lee”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 7 (Feb. 3, 2023) (“What is worse is that some blockchains, such as Ethereum, do not distinguish possessing an NFT from owning it, and this technical inability further confuses the potential NFT market participants.”); App Association Comments at 3 (“For example, while the blockchain can track possession of an NFT, it cannot distinguish between ownership and possession.”). For the purposes of this Report, the term “possession” refers to the act of holding custody of an NFT, and the term “ownership” to mean that the person holding custody of the NFT has not obtained custody of the token or associated asset by improper means.

²⁸ Copyright Roundtable Tr. at 22:7–9 (Jan. 31, 2023) (Alfred Steiner, Meister & Steiner).

²⁹ See, *e.g.*, Copyright Alliance, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 5–6 (Feb. 3, 2023) (describing current uses of NFTs in connection with photography and visual art).

³⁰ See, *e.g.*, Trademark Roundtable Tr. at 81:3–7 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS America Corp.); International Trademark Association (“INTA”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 5–6 (Feb. 3, 2023) (noting a project whereby Nike allowed owners of NFTs to redeem sneakers).

³¹ Copyright Alliance Comments at 4.

³² See, *e.g.*, MAC Comments at 3–4; The American Association of Independent Music, the Recording Industry Association of America, Inc., and Screen Actors Guild - American Federation of Television and Radio Artists (“A2IM et al.”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 4 (Feb. 3, 2023).

³³ See, *e.g.*, Copyright Alliance Comments at 8–9 (describing an app that allows readers to purchase NFTs that provide them a share of royalties from the sale of e-books). For additional NFT use cases, see Dapper Labs Inc. (“Dapper Labs”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 5–7 (Feb. 2, 2023); A2IM et al. Comments at 4–5; Copyright Alliance Comments at 3–9; Gatto Comments at 4–6; Trademark Roundtable Tr. at 89 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt, Kurnit, Klein & Selz, PC); and INTA Comments at 13–20. See also discussion *infra* section II.C.3.

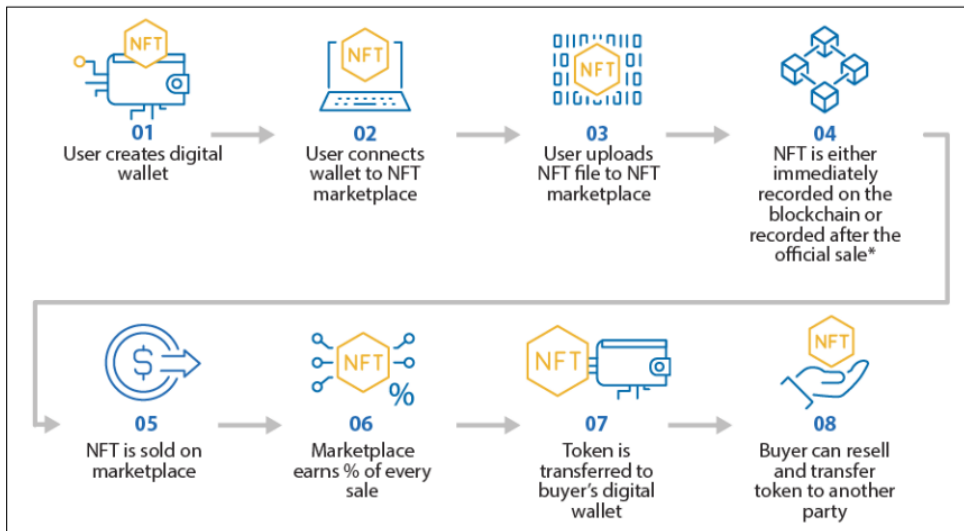
³⁴ However, the boundaries of each are only beginning to be explored in the courts. See Shanti Escalante-De Mattei, *Code is Not Law: Case on Who Owns the First NFT Dismissed by Judge*, ARTNEWS, March, 23, 2023

same digital work).³⁵ Also, while an NFT holder may own the token, that does not necessarily mean the token transfers to the holder any intellectual property rights in an asset or entitlement to which the token is linked.³⁶

C. NFT Creation and Transfer

NFTs are created by a process called “minting” in which a user publishes a new token to a blockchain.³⁷ The services of an NFT marketplace—a digital platform for buying and selling NFTs—are often utilized to complete this process.³⁸ As indicated in the graphic below, NFTs are generally stored in locations commonly referred to as digital wallets; when minted, the NFT is stored in the minter’s wallet, and when transferred, it is put in the buyer’s wallet.

Figure 2: NFT Transaction Process³⁹



During the minting process, the NFT creator will choose what assets or entitlements to associate with the token.⁴⁰ NFT marketplaces generally do not authenticate the underlying assets

<https://www.artnews.com/art-news/news/kevin-mccoy-quantum-case-dismissed-free-holdings-sothebys-1234662076/> (discussing *Free Holdings Inc. v. Kevin McCoy and Sotheby's Inc.*)

³⁵ *Can There be Multiple NFTs for One Piece of Digital Art?*, NFT PLAZAS, <https://nftplazas.com/learn-about-nfts/multiple-nfts-for-one-piece-of-digital-art/>.

³⁶ Gatto Comments at 7.

³⁷ For an overview of the minting process, see Mythili Devarakonda, *CryptoPunks to Cool Cats: How to Make Your Own NFT Collection and Put them Up for Sale*, USA TODAY (Nov. 18, 2022), <https://www.usatoday.com/story/tech/tips/2022/11/18/how-to-make-an-nft/10147315002/>.

³⁸ Kristen E. Busch, CONG. RSCH. SERV., R47189, NON-FUNGIBLE TOKENS (NFTs) 7 (2022), <https://crsreports.congress.gov/product/pdf/R/R47189>.

³⁹ *Id.*

⁴⁰ See, e.g., *What is Minting?*, OPENSEA (June 7, 2023), <https://opensea.io/learn/what-is-minting-nft>.

associated with NFTs.⁴¹ While marketplaces may require minters to adhere to a list of general representations and warranties, some commenters observed that most marketplaces do not appear to conduct any independent due diligence to ensure that an asset connected with an NFT is non-infringing.⁴²

The assets or entitlements associated with an NFT can be stored on- or off-chain. Generally, the NFT metadata will either contain a copy of the asset, or an identifier for the asset's location.⁴³ "On-chain" storage means that the asset associated with the NFT is stored on the blockchain.⁴⁴ With "off-chain" storage of an asset, the NFT's metadata contains information that points to a different location, which could be a physical location, a centralized storage system (e.g., a URL) or a decentralized storage system⁴⁵ (e.g., the InterPlanetary File System (IPFS)) where the asset is actually held.⁴⁶ Centralized storage systems typically have a single control point or place where an asset is stored or maintained.⁴⁷ In contrast, IPFS, a decentralized system, "break[s] large files into shards and distributes those shards across a network."⁴⁸

In preparing the NFT, the creator usually incorporates a "smart contract" to govern its uses.⁴⁹ Despite its name, a smart contract is not necessarily a legal contract. One practitioner succinctly

⁴¹ See *infra* section II.C.1.

⁴² Copyright Roundtable Tr. at 49:13–51:13 (Jan. 31, 2023) (Megan Noh, Pryor Cashman); Copyright Alliance Comments at 14; MAC Comments at 6. One commenter noted that the "markets themselves do not necessarily have an onus to determine the authenticity of an asset associated with the NFT." Callum Lootsma ("Lootsma"), Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 3 (Feb. 3, 2023).

⁴³ Copyright Roundtable Tr. at 53:6–55:13 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation).

⁴⁴ Joshua L. Durham ("Durham"), Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 14 (Jan. 1, 2023); App Association Comments at 2.

⁴⁵ See *Decentralized Storage*, ETHEREUM (Apr. 7, 2023), <https://ethereum.org/en/developers/docs/storage/> ("Unlike a centralized server operated by a single company or organization, decentralized storage systems consist of a peer-to-peer network of user-operators who hold a portion of the overall data, creating a resilient file storage sharing system. These can be in a blockchain-based application or any peer-to-peer-based network."); see also Copyright Roundtable Tr. at 18:1–7 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) ("With decentralized storage systems, every piece of content has a particular content ID, and that piece of content can be stored in multiple places, and when you look for a particular content ID, you can pull that content from multiple places, not just one server.").

⁴⁶ Copyright Roundtable Tr. at 54:5–55:1 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation).

⁴⁷ Usman Khalil et al., *A Comparative Analysis on Blockchain versus Centralized Authentication Architectures for IoT-Enabled Smart Devices in Smart Cities: A Comprehensive Review, Recent Advances, and Future Research Directions*, 22 SENSORS 1, 16 (July 10, 2022), <https://www.mdpi.com/1424-8220/22/14/5168> ("The mechanism implies a centralized server which makes this architecture more central as the mechanism depends on the central authority (i.e., the central server) to store authentication data.").

⁴⁸ *IPFS Decentralized Storage*, KALEIDO, [https://www.kaleido.io/blockchain-platform/ipfs-file-store#:~:text=The%20InterPlanetary%20FileSystem%20\(IPFS\)%20aims,handles%20large%20amounts%20of%20data.](https://www.kaleido.io/blockchain-platform/ipfs-file-store#:~:text=The%20InterPlanetary%20FileSystem%20(IPFS)%20aims,handles%20large%20amounts%20of%20data.)

⁴⁹ While use of a smart contract is most common, Cardano is an example of a blockchain platform that allows minting of NFTs without the use of a smart contract. See *How are NFTs being minted without smart contract in Cardano?*, (Jul. 10,

defined a smart contract as “self-executing computer code, stored on the blockchain, [that] receives data, causing actions to be triggered upon the occurrence of certain conditions programmed into the smart contract code.”⁵⁰ A smart contract, among other things, “determines the name of each of the NFTs, constrains how they can be sold or transferred, and controls which digital files are associated with each of the NFTs.”⁵¹ The Offices received many comments discussing issues arising from the use of smart contracts—from confusion about their enforceability to their potential to implement novel systems for creator remunerations upon NFT resale. These issues are discussed further below.

Transferring an NFT involves reassigning possession of the digital token.⁵² The transfer is also recorded on the blockchain. As discussed further below, this transfer of possession of the token does not necessarily entail a physical or digital transfer of the associated asset as the asset is generally stored off chain. Similarly, there is nothing inherent to a token that would automatically transfer the rights in an associated asset.⁵³

While NFTs can be minted and transferred without third-party involvement, many sellers and buyers facilitate trades using NFT marketplaces.⁵⁴ These platforms vary in function and may also allow users to mint, store, and sell NFTs, as well as display associated digital assets.⁵⁵

D. Uses and Challenges of NFTs

The possible uses for NFTs are broad, diverse, and continuing to develop.⁵⁶ Some of the activities and business models identified by stakeholders included the following:

2023, 2:38 PM), <https://cardano.stackexchange.com/questions/5/how-are-nfts-being-minted-without-smart-contract-in-cardano>; see also Patent Roundtable Tr. at 90:5–6 (Jan. 26, 2023) (Merav Ozair, Wake Forest University, Emerging Technologies Mastery (discussing how basic NFTs can be minted “without a smart contract.”)).

⁵⁰ Gatto Comments at 4 n.8. See also Kristen E. Busch, CONG. RSCH. SERV., R47189, NON-FUNGIBLE TOKENS (NFTs) 5–6 (2022) (“Smart contracts are automatically executed by the computers in the blockchain network if a specific set of conditions are met or the smart contract is ‘called.’”).

⁵¹ *Hermès Int’l v. Rothschild*, No. 22-cv-00384, 2023 WL 1458126, at *2 (S.D.N.Y. Feb. 2, 2023). See *id.* (“Importantly, the ‘smart contract’ is distinct from the NFT with which it is associated: the contract and the NFT can therefore be owned by two unrelated people or entities.”); see also Gatto Comments at 4 n.8; KRISTEN E. BUSCH, CONG. RSCH. SERV., R47189, NON-FUNGIBLE TOKENS (NFTs) 5–6 (2022).

⁵² See *supra* section I.B.2–3 (discussing ownership vs. possession).

⁵³ Often the token will point to a copy of the work represented by the NFT but does not usually contain a copy of the work itself. See *supra* section I.C; *infra* section II.A.1; Aon Comments at 1 (“NFTs inherently lack any native structure to demonstrate legal ownership. This relies effectively on community agreement that an asset issued from a given source is the ‘official version’ and the further assumption that the publisher had the property rights to do so.”).

⁵⁴ INTA Comments at 26.

⁵⁵ *Id.*

⁵⁶ See, e.g., Dapper Labs Comments at 5–7; Michael Kasdan (“Kasdan”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Jan. 26, 2023) (“[T]he use cases for NFTs are incredibly broad and diverse.”).

- NFTs can be used as a way for brands to bridge the digital and physical worlds by entitling the NFT holder to an additional service, experience, or real-world item.⁵⁷
- Musicians and record labels have used NFT technology to offer fans unique album art and exclusive perks, such as front row tickets and VIP experiences at live concerts.⁵⁸
- Authors and publishers are exploring NFT technology for new opportunities. Some independent writers are creating images of their novel covers or even pages of text that they then sell as an NFT that includes a link to “unlock” or download a full version of the work.⁵⁹ Some publishers are experimenting with other applications.⁶⁰
- In the field of photography and visual art, the advent of NFTs has resulted in a flurry of transactions involving preexisting physical works converted to digital art, preexisting digital works, and new digital works created solely for the purpose of NFT offerings. In 2022, the Andy Warhol Foundation partnered with Christie’s auction house and sold five unique versions of digital works created by Warhol in the 1980s that were recovered from a floppy disc in 2014, garnering over \$3 million.⁶¹

⁵⁷ INTA Comments at 3; Trademark Roundtable Tr. at 80:22–25, 81:3–7 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS America Corp.) (“After our first NFT release, we wanted to create NFTs that would provide additional value to a consumer apart from simply being a collectible that lives in your digital wallet . . . Our third NFT release was coupled with a physical shoe that could only be purchased with cryptocurrency. This was both a marketing tactic and it had a practical element to it as well. To associate this release exclusively with customers who are active in the Metaverse.”); Trademark Roundtable Tr. at 86:26–28 (Jan. 24, 2023) (Joe Guagliardo, Dentons US, LLP) (NFTs are “a way for brands to . . . bridge brick and mortar and Web2 with Web3 and the metaverse.”); Trademark Roundtable Tr. at 89:17–19 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt, Kurnit, Klein & Selz, PC) (“[B]rands are exploring offerings in the digital world that incorporate offerings in the physical world.”); Copyright Roundtable Tr. at 97:7–98:21 (Jan. 31, 2023) (Shekinah Apedo, Deadfellaz).

⁵⁸ Copyright Alliance Comments at 4–5; A2IM et al. Comments at 3–5 (explaining that NFT use cases include proof of attendance; access to live events and physical items; limited digital pressings and virtual vinyl; digital trading cards; artist-branded digital wearables; participation in copyright royalties; access to fan communities and virtual experiences). Copyright Roundtable Tr. at 117:2–13 (Jan. 31, 2023) (Jordan Bromley, Manatt, Phelps & Phillips) (discussing NFTs and ticketing for music performances); *id.* at 250:13–251:2 (Jan. 31, 2023) (Michael Lewan, Recording Academy) (noting music industry possibilities but lack of Academy consensus).

⁵⁹ Copyright Alliance Comments at 8–9; Copyright Roundtable Tr. at 111:1–23 (Jan. 31, 2023) (Umair Kazi, The Authors Guild).

⁶⁰ Copyright Alliance Comments at 8–9 (“Companies like Readl, Scenarex, and Publica are harnessing blockchain technology to enable authors to offer NFTs that provide access to their literary works and shares of royalties.”).

⁶¹ *Id.* at 5–6.

Beyond these uses, commenters highlighted opportunities and risks that NFTs, in their view, may present for the protection of IP rights. For example, some commenters proposed that blockchain technology could aid recordkeeping⁶² by providing an immutable record of a trademark's first use,⁶³ a patent's first filing,⁶⁴ or registration of a copyright.⁶⁵ This recordkeeping could, according to some commenters, make transfers more efficient⁶⁶ and counterfeiting more difficult.⁶⁷

Others suggested that smart contracts could give owners finer control over transfers of their IP, including a mechanism to collect remuneration for subsequent sales.⁶⁸ They asserted that NFTs

⁶² A few roundtable participants discussed the use of NFTs for recordkeeping outside of the intellectual property sphere. *See, e.g.*, Copyright Roundtable Tr. at 242:2–19 (Jan. 31, 2023) (Daniel Uribe, GenoBank.io) (discussing recordkeeping and data privacy in the context of healthcare-related NFTs); *id.* at 255:22–256:19 (Jan. 31, 2023) (Ryan Wright) (discussing NFTs in the context of health care).

⁶³ Trademark Roundtable Tr. at 64:16–22 (Jan. 24, 2023) (Jessica Neer McDonald, Neer McD PLLC / Blockish IP) (“[T]he ability to have timestamped evidence of actual use and frequency of use is extremely helpful from the perspective of a brand owner and those that may be considering ‘did I come after this person?’ By being able to trace things back to a public blockchain, it can be extremely valuable. Not just for showing dates of first use, but also things like acquired distinctiveness [and] secondary meaning.”); *see also id.* at 38:29–39:12 (January 24, 2023) (Thad Chaloentiarana, ABA-IPL) (“NFTs could make it easier to perform due diligence by automating the tracing of the original owner and chain of title of a trademark, as the ownership information would be recorded, not only on the USPTO’s registration and assignment records, but also on the blockchain, which would make it much more easily accessible. Similarly, NFTs associated with registrations and timely updates to the blockchain by the USPTO could facilitate real-time confirmation of the status of the registration as active, which would make it easier for trademark information to be used in smart contracts. Moreover, the implementation of NFTs associated with certificates of registration could increase security and efficiency by eliminating, or at least reducing first, the need for physical certificates to be sent by mail.”).

⁶⁴ Lootsma Comments at 1.

⁶⁵ *See, e.g.*, American Bar Association’s Section of Intellectual Property Law (“ABA-IPL”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 9 (Jan. 20, 2023) (noting “the possibilities for blockchain technologies to modernize the recordkeeping process for digital assets and the potential for integration into the application, registration, and similar filing processes with the Office” and suggesting that metadata could be imported into applications); Kasdan Comments at 7 (suggesting copyright registration certificates as a potential “use case[]” for NFTs as the “US Copyright Office[] is the source of these IP rights”).

⁶⁶ Motion Picture Association (“MPA”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 4 (Feb. 3, 2023) (“NFTs could be effective in authenticating certain rights in a digital asset, akin to other legal instruments that perform similar functions What is novel about NFTs is that details of the arrangement are kept in a secure and publicly accessible form on the blockchain, and the blockchain records are automatically updated when the asset is transferred. This can help NFT holders prove the authenticity of the underlying NFT to which the blockchain record refers and the extent of their rights to the NFT. That makes further transfers of the NFT and any associated rights more efficient and secure, fostering a marketplace.”).

⁶⁷ Scott Pollan (“Pollan”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Dec. 19, 2022); *see also* INTA Comments at 33, 37–38; Trademark Roundtable Tr. at 26 (Jan. 24, 2023) (Morgan Reed, App Association).

⁶⁸ *See, e.g.*, Graphic Artists Guild, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2023); Gatto Comments at 4, 8; AIPLA Comments at 2.

and smart contracts have the potential to democratize IP creation and ownership by enabling creators to circumvent established middlemen and engage directly with consumers,⁶⁹ including through collaborative content creation.⁷⁰ Multiple commenters noted several instances in which NFTs have given underrepresented artists direct access to markets and enabled them to give new commercial life to their works.⁷¹

⁶⁹ INTA Comments at 25 (“For creators, the additional opportunity is that there is a relatively easily accessible new technology medium to create and distribute their works that doesn’t require established barriers to entry such as ‘middleman’ distributors such as record labels, galleries, or internet platforms terms of use (e.g., Twitter, Instagram), and that allows ease of marketing across the Internet.”); MAC Comments at 3–4 (“Recently, there have been efforts by certain creators and platforms in the music industry to democratize the ownership of music-related IP by offering fans and NFT buyers the ability to actually invest in the music and careers of their favorite artists and participate in the artist’s upside via ownership of music NFTs linked to fractionalized royalty interests.”).

⁷⁰ See Inventiv.org, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Nov. 23, 2022) (“Artists can register works as smart contracts on blockchain. Musicians can co-create and share in the credits. Over the years music has become increasingly ‘single player’, but NFTs enables the possibility of a collaborative web3 content creation platform to automate the trust in digital collaboration so creators and artists can be more connected than ever.”); NamerTips LLC (“NamerTips”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1, 3 (Jan. 9, 2023) (“[B]lockchain technology is now blurring the lines of distinction between developer and end-user by enabling anyone to be ‘the creator’ Blockchains are globally democratizing digital asset creation, licensing and ownership with every single minted transaction.”); Kasdan Comments at 3–4 (“NFTs and web3 . . . have the potential to create better opportunities for inventors, creators, artists. The ‘democratizing effect’ of web3 can provide more control of and more ability to profit by accessing markets more directly and eliminating institutional gatekeepers.”); see also Copyright Roundtable Tr. at 264:24–265:5 (Jan. 31, 2023) (Kofi Mensah, Sagos Distro) (“[B]lockchain technology has provided us the opportunity not only to be able to release old catalog data by 10 years ago and making a revenue with the old catalog that we had in NFTs and Web3, but it has also allowed us the opportunity to train new artists and new technology interns who are now exploring other avenues when it comes to technology.”).

⁷¹ Copyright Roundtable Tr. at 108:11–109:3 (Jan. 31, 2023) (Tonya Evans, Penn State Dickinson Law) (“[T]he reality that black artists in the United States historically have received less protection or, in some cases, no protection for their work has severely undermined the intended economic benefits to the creator and the benefit to progress to society as a whole, and importantly, during the period of enslavement, black people were regarded as property and, therefore, legally incapable of creating or owning property of their own, and the loss of generational wealth is obviously incalculable. . . . [NFTs have the potential] to level[] the playing field.”), 163:13–25 (“I know personally folks who not only have given new life to their existing work but maybe just working in the digital space and actually making quite a bit of money, and the reason is not just because of the art itself and the potential for secondary market or downstream micro-payments as a result of smart contracts but also the unique aspects from a tax perspective of the token itself that is taxed as a capital asset and enjoying gains and losses if they’re being paid in ETH, for example. That is a game changer because generational wealth is never built on incomes . . . but on capital assets.”); *id.* at 162:12–25 (Jan. 31, 2023) (Yayoi Shionoiri, City Lights Law) (“We’ve seen some incredible artists like female-presenting artists like Sarah Meyohas, Sarah Friend, and Rachel Rossin, as well as someone like FEWOCIOUS, who identifies as a transgender young person, use this technology to self-actualize and express their creativity and in doing so reap economic benefits for themselves and in turn promote the useful arts”); see also Patent Roundtable Tr. at 77:21–80:2 (Jan. 26, 2023) (Cleve Mesidor, The Blockchain Foundation) (describing the ways blockchain technology and NFTs can empower individuals from underrepresented groups and providing specific examples of creators and entrepreneurs from such communities who have utilized NFTs).

At the same time, many voiced doubts about the utility of NFT and blockchain technologies in the IP system,⁷² as well as concerns that NFTs could be used to infringe IP rights or frustrate enforcement. Many of these concerns arise from the same features of blockchain technology that support the opportunities just discussed. For example, while blockchain’s immutability makes it attractive for recordkeeping purposes, it might also impair attempts to correct inaccurate entries.⁷³ Similarly, the smart contracts that some believe could provide IP owners greater control over transfers and licensing may hamper such efforts to the extent these instruments do not operate across different blockchains or NFT marketplaces.⁷⁴ And from an enforcement perspective, NFTs’ often-decentralized storage,⁷⁵ on platforms that do not require personal identification,⁷⁶ can make it difficult to identify infringers or take down infringing copies.

⁷² See Christopher Deeton (“Deeton”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Dec. 19, 2022) (“NFT’s DILUTE the ETHICS AND PRACTICAL INTENT of established IP formats, and therefore should be considered ‘something else.’”); Copyright Roundtable Tr. at 159:7–161:2 (Jan. 31, 2023) (George Johnson, Songwriter).

⁷³ NMPA Comments at 10; *see also* Aon Comments at 2.

⁷⁴ See AIPLA Comments at 4–5; MAC Comments at 5. *See also* Trademark Roundtable Tr. at 87:15–19 (Jan. 24, 2023) (Joe Guagliardo, Dentons US, LLP) (“We have many different blockchains, i.e., like operating systems that have different standards. And even within the same blockchain, each marketplace, where we may see royalties or they may implement royalties, are implementing them in different ways as a technical matter.”); ABA-IPL Comments at 8 (“There is a widespread misconception that these secondary market rights are included in the structure of the NFT itself, when in fact they are added in a separate ‘smart contract’ that is layered on top and must be recognized and honored by the marketplace through which the secondary sale takes place.”); Trademark Roundtable Tr. at 8:3–9 (Jan. 24, 2023) (David Callner, M9 Solutions).

⁷⁵ *See supra* note 45 and accompanying text.

⁷⁶ *See* Graphic Artists Guild at 1; AIPLA Comments at 4–5; A2IM et al. Comments at 6; Copyright Alliance Comments at 16; INTA Comments at 24; *see also* Eoin Jennings, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Feb. 6, 2023); Trademark Roundtable Tr. at 106:1–9 (Jan. 24, 2023) (Justin Pierce, Venable LLP).

Separate from debates about NFTs' utility, nearly all commenters asked the Offices to consider consumer confusion about the IP rights entailed in the creation or transfer of an NFT.⁷⁷ Several called for sellers to clearly disclose what rights accompany an NFT in the form of an "NFT Owner Agreement" and for buyers to affirmatively agree to the terms of this agreement in order to complete an NFT sale.⁷⁸ For now, as one commenter noted, "[i]t can be a time-consuming and technologically challenging process for even the most sophisticated consumer to conduct this level of diligence [to ensure they are purchasing a legitimate NFT]."⁷⁹

In sum, commenters asserted that NFTs can be used to provide new mechanisms for people to purchase digital and physical goods and interact with creators, and to provide additional opportunities for creators to monetize their creations. At the same time, they cautioned that NFTs can be a significant source of confusion, particularly for those with little understanding of how they work, and that some of the claimed benefits of NFTs and the blockchain may be overstated. They also warned that, while NFTs may be useful as a means of monetizing one's creations, they also raise significant infringement and enforcement issues.

In the next three sections, this Report discusses the IP issues raised by NFTs in the context of copyrights, trademarks, and patents, respectively.

⁷⁷ See, e.g., Huski.ai, Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 5–6 (Feb. 3, 2023); A2IM et al. Comments at 2; Gatto Comments at 11–12. See also Copyright Roundtable Tr. at 105:16–106:19 (Jan. 31, 2023) (Ashley Joyce, NMPA); ABA-IPL Comments at 8.

⁷⁸ Gatto Comments at 11–12; see also Copyright Roundtable Tr. at 105:16–106:19 (Jan. 31, 2023) (Ashley Joyce, NMPA).

⁷⁹ Dapper Labs Comments at 10. See also Aon Comments at 1 ("The NFT represents a largely unverified claim that a given seller has authority to transfer associated IP. The current mechanism requires a high degree of trust of the issuing party with limited ability to verify the party, its rights, or the associated asset."). Smart contracts, although machine-readable, may not be decipherable by those who wish to purchase an NFT. See Copyright Roundtable Tr. at 40:22–24 (Jan. 31, 2023) (James Gatto, AIPLA).

II. COPYRIGHT

The copyright considerations arising from the development and use of NFTs fall into three broad categories: (i) how the minting, storage, marketing, and transfer of NFTs implicates copyright law; (ii) how rightsholders may enforce copyright protections against NFT-related infringement; and (iii) what roles NFTs may play in the copyright ecosystem.

A. Copyright Protection and the Minting, Storage, Marketing, and Transfer of NFTs

NFTs associated with creative works may intersect with copyright law at four distinct points in their life cycle: (i) the initial creation or “minting” of the NFT itself; (ii) the storage of the underlying asset associated with the NFT; (iii) the marketing and offering for sale of the NFT; or (iv) transfer of the NFT, which may or may not convey rights in the associated asset.

1. Minting

The minting of an NFT may raise three separate copyright issues. First, if the minting creates a new copy of a copyrighted work, it may implicate the copyright owner’s exclusive right of reproduction.⁸⁰ Second, if the minted NFT contains a smart contract which generates a new work, or the associated asset is an AI output,⁸¹ there may be questions about whether that work is copyrightable. Third, independent of any associated asset, the code underlying the NFT itself may be copyrightable.

Although many types of assets can be associated with NFTs, the associated assets are frequently collectibles or creative works.⁸² The minting of an NFT may, but does not always, involve

⁸⁰ The broader relations between minting and reproduction have yet to be litigated in the United States, but commenters reported that at least one court outside of the U.S. has found that minting an NFT constituted an act of reproduction. Wang & Lee Comments at 8 (“Although the court held that an NFT transaction was not a ‘publication’, the minting of an NFT based on an existing physical artwork constituted reproduction and network dissemination under the Chinese Copyright Law.” (footnote omitted)) (citing Shenzhen Qice Diechu Wenhua Chuangyi Youxian Gongsi Su Hangzhou Yuan Yuzhou Keji Youxian Gongsi (深圳奇策迭出文化创意有限公司诉杭州原与宙科技有限公司) [Shenzhen Qice Diechu Cultural Creativity Co., Ltd. v. Hangzhou Yuanyuzhou Technology Co., Ltd.] (Hangzhou Internet Ct. 2022) (China)).

⁸¹ Art Blocks, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1 (Feb. 3, 2023) (“[A]rtworks are created and managed through the use of a smart contract that governs a variety of details regarding the attributes, ownership and transferability of the artwork.”).

⁸² See Matthieu Nadini, Laura Alessandretti, et al, Mapping the NFT revolution: market trends, trade networks, and visual features, *Sci. Rep.* 11, October 22, 2021, <https://www.nature.com/articles/s41598-021-00053-8#citeas> (analyzing market volume, transaction volume, and trade networks across 6.1 million NFT trades).

making a copy of a work.⁸³ Often the process of minting only involves creating the token,⁸⁴ with the token simply pointing or linking to a location where the associated asset is stored. Commenters generally agreed that if the minting of a token does not create a copy of a work, but only provides a reference or link to an existing work, then it does not implicate the right of reproduction.⁸⁵ However, it is possible that tokenizing a work could implicate other exclusive rights.⁸⁶ For example, one roundtable participant suggested that the minting of an NFT associated with an existing copyrighted work could constitute the creation of a derivative work.⁸⁷ Two recent lawsuits raising this derivative work issue were either settled or dropped, so the issue has yet to be directly addressed by U.S. courts.⁸⁸

⁸³ See Copyright Roundtable Tr. at 39:8–11 (Jan. 31, 2023) (Alfred Steiner, Meister & Steiner) (“If an NFT is minted and all that happens is a pointer is generated to an asset that’s already stored somewhere, I don’t think copyright is implicated at all”); Internet Archive, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2–3 (Feb. 3, 2023) (“NFTs do not necessarily have anything to do with *copying*. NFT standards are generally agnostic as to how the referenced or underlying intangible assets (such as an image of a work of art) are handled. Minting platforms that employ these standards may choose to require the user to upload a copy of a work (thereby potentially implicating reproduction rights); however, they also may allow simple references to existing works hosted on traditional web servers or on decentralized storage systems such as IPFS (and, in either case, generally not resulting in a new reproduction of the work). Likewise, display or trading platforms may choose to honor or present referenced files in any of these ways, and may choose to make or not make their own incidental copy. Of course, it is also possible to mint an NFT without the use of any platform at all, which would allow all of these freedoms and more, by writing one’s own standard-complaint contract. In any event, the important point for our purposes here is that there is nothing inherent in the structure or concept of an NFT that requires copying the underlying asset.”).

⁸⁴ Copyright Roundtable Tr. at 33:6–8 (Jan. 31, 2023) (James Gatto, AIPLA) (noting that “what you’re creating in the minting process typically is the token, . . . unless you’re also minting or creating the art at the same time”).

⁸⁵ Creative Commons Comments at 6 (“The simple minting of a token does not necessarily imply the exercise of an exclusive right of the copyright holder under 17 U.S.C. 106.”); Internet Archive Comments at 2 (“Minting platforms . . . may choose to require the user to upload a copy of a work (thereby potentially implicating reproduction rights); however, they also may allow simple references to existing works hosted on traditional webservers or on decentralized storage systems such as IPFS (and, in either case, generally not resulting in a new reproduction of the work)).” Some stakeholders, however, noted that other copyright intersections relating to the act of linking to a copyright protected work in the context an NFT remain unsettled. Copyright Roundtable Tr. at 33:19–34:6 (Jan. 31, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (observing that “simply linking” is “clearly not a copyright violation” while deep linking may be different); *cf.* Pex, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 6 (Feb. 1, 2023) (“Pex believes the Copyright Act should be amended to make clear that the minting of an NFT tied to a piece of content is equivalent under the law to copying the underlying work.”); *see also supra* section I.C.

⁸⁶ *See infra* section II.A.2 Storage.

⁸⁷ *See* Copyright Roundtable Tr. at 34:7–11 (Jan. 31, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (“If you’re actually creating a hash of the underlying image or the underlying work, that could be considered a derivative right under copyright law.”). *But see* Creative Commons, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 6 (Feb. 3, 2023) (“An NFT that is simply a reference to a work is not a derivative work—a derivative work must ‘contain two distinct forms of authorship’, both the original work and a new work of authorship that adapts it (as detailed in the Compendium of U.S. Copyright Office Practices, section 507.1).”).

⁸⁸ *See* Joint Stipulation of Dismissal with Prejudice at 2, *Miramax, LLC v. Tarantino*, No. 2:21-cv-08979 (C.D. Cal. Oct. 6, 2022); Notice of Settlement, *Miramax, LLC v. Tarantino*, No. 2:21-cv-08979 (C.D. Cal. Sep. 8, 2022); Order at 1,

To the extent that a minting process does involve making a copy of the work, it would implicate the right of reproduction.⁸⁹ As noted above,⁹⁰ several stakeholders observed that there is little in the associated technology that provides a guardrail against the unauthorized creation of an NFT associated with a third party's work.⁹¹ Instead, a collection of terms and conditions, user representations, associated metadata, and on- or off-chain contracts exist in varied forms to discourage the minting of NFTs associated with assets to which the minter has no rights.⁹² Many stakeholders stressed the importance of ensuring that the person minting an NFT holds proper authorization to do so at the outset because later corrections can be extremely difficult, if not impossible.⁹³

TamarindArt, LLC v. Husain, No. 22-cv-00595 (S.D.N.Y. Feb. 8, 2023) (“order dismissing all claims due to settlement”); *see also* Copyright Alliance Comments at 22–23.

⁸⁹ *See* Internet Archive Comments at 2 (“Minting platforms . . . may choose to require the user to upload a copy of a work (thereby potentially implicating reproduction rights) . . .”); *id.* at 6 (“[I]f someone mints an NFT of an artist’s work without permission and a reproduction is made, then the artist can bring a claim of copyright infringement.”); *see also* Creative Commons Comments at 6 (“Where the minting and sale of a token does involve . . . an exclusive right of the author (for example, reproducing a work of art on a digital marketplace), the existing bounds of copyright should be sufficient: if the copy is unlicensed, the copy of the work may be infringing, but the associated token itself is not the infringing object.”).

⁹⁰ *See infra* sections II.C and III.C.1.

⁹¹ *See* Copyright Roundtable Tr. at 12:3–10 (Jan. 31, 2023) (Kevin Madigan, Copyright Alliance) (“Many creators . . . have encountered problems with NFT-related infringement and fraudulent activity, which I think has a lot to do with sort of the lack of safeguards at the minting and listing stages that can ensure that those uploading and offering NFTs for sale in marketplaces are authorized to do so”); Copyright Alliance Comments at 13 (“[T]here are no guardrails at the point of creation or minting that would ensure the NFT’s creator has the right to use or convey rights in an associated work”); Dapper Labs Comments at 10 (“Because NFTs can be easily created and traded using blockchain technology, it is technically possible for unscrupulous individuals to create and sell NFTs that are linked to certain content without first obtaining permission from the actual owner of that content.”); *see also* Copyright Roundtable Tr. at 213:9–21 (Jan. 31, 2023) (Gina Moon, OpenSea) (“[Regarding pre-upload or discussions around that is the way that not all marketplaces work . . . a lot of users can just go interact directly and they deploy their own smart contracts, and the NFTs as well as the content associated with those NFTs through links is deployed separately from any NFT marketplace. So there is sort of a question on how you would actually intervene in that way ahead of time because there won’t be a singular platform that you would go to say here’s a reference set of infringing material.”). *Id.* at 27:11–15 (Jan. 31, 2023) (Abby North, North Music Group) (“[W]ith regard to smart contracts, one of the fears is that bad actors can enter this ecosystem right from the very beginning and that infringement can take place right at the point of creation of the smart contract.”); *Cf. Id.* at 180:3–182:2, 223:24–225:7 (Jan. 31, 2023) (Jean-Marc Deltorn, CEIPI, the International IP Studies Centre of the University of Strasbourg) (discussing perspective NFT marketplaces in the context of Article 17 of the EU Digital Single Market Directive); *See generally id.* at 237:7–15 (Jan. 31, 2023) (Aarthi Anand, Cahill Gordon & Reindel) (discussing generally international intellectual property and NFTs).

⁹² *See* AIPLA Comments at 5 (“Many marketplaces and minting platforms adopt a terms of service that prohibits minting or sale of NFTs unless the entity minting or selling has the rights necessary to do so. However, most marketplaces and minting platforms do not go through the verification process.”).

⁹³ *See* section II.C.1.

It is also possible to mint an NFT associated with an asset that is not subject to copyright protection.⁹⁴ For example, generative AI outputs associated with NFTs may not qualify as works of human authorship for the purposes of copyright protection,⁹⁵ or the associated asset could be a song or image for which any copyright protection has long expired. Commenters detailed many types of current and evolving NFT functions and dynamic features presenting novel questions that would require a fact-specific analysis.⁹⁶ For example, one commenter noted that, with a dynamic NFT, the image associated with it may be “programmatically modified by random data in a random way,” raising questions about the image’s copyrightability.⁹⁷

Finally, several commenters discussed considerations related to the protection of code associated with an NFT.⁹⁸ Commenters were split on whether tokens or smart contracts are protectable by copyright, with many asserting that they should be treated as general software code for the purposes of copyright,⁹⁹ while others questioned whether the associated metadata and resource identifiers of smart contracts are the type of creative expression copyright protects.¹⁰⁰

⁹⁴ Internet Archive Comments at 2 (“NFTs do not necessarily have anything to do with copyrightable works. NFTs can relate to works that are subject to copyright, but they can also relate to things that have nothing to do with copyright at all. For example, an NFT could relate to ownership of real estate or a physical object, or it could provide authentication to access a particular event or venue—real or virtual.”).

⁹⁵ See *Thaler v. Perlmutter*, No. 22-cv-1564, 2023 WL 5333236, at *4 (D.D.C. Aug. 18, 2023) (stating that “human authorship is a bedrock requirement of copyright” in affirming the Office’s refusal to register a work “autonomously” created by AI); Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence, 88 Fed. Reg. 16190, 16192 (Mar. 16, 2023) (explaining that “[w]hen an AI technology determines the expressive elements of its output, the generated material is not the product of human authorship”); Copyright Roundtable Tr. at 32:18–20 (Jan. 31, 2023) (James Gatto, AIPLA) (“[I]f it’s AI-generated, the works may or may not be copyrightable depending on the level of human authorship, et cetera.”).

⁹⁶ See Gatto Comments at 5–6 (discussing dynamic NFTs and layered NFTs); Graphic Artists Guild Comments at 2 (“In dynamic NFTs, the artwork associated with an NFT changes in response to changes in external conditions. Often the change occurs via automatic changes encoded into the NFTs smart contract, which trigger changes to the NFT metadata.”); see also AIPLA Comments at 2–3 (discussing examples of dynamic NFTs).

⁹⁷ Gatto Comments at 5.

⁹⁸ See Creative Commons Comments at 6 (“Creating a new IP right that extends to creation of a token itself would have unintended consequences—extending copyright to acts associated with a copyrighted work that do not themselves involve making a copy, but simply involve making reference to the existence of an authorized copy of a work, goes beyond the intended scope of the exclusive rights of the author.”); ABA-IPLA Comments at 10; see also Gatto Comments at 8.

⁹⁹ See ABA-IPLA Comments at 10 (supporting “the general concept that copyrightable computer programming code forming part of, or otherwise associated with, NFTs would be registerable with the Copyright Office”); Art Blocks Comments at 2–3 (Feb. 3, 2023) (“It will be helpful for the industry to have the ability to protect the underlying computer program or ‘code’ that creates the NFT.”). Gatto Comments at 8 (noting that blockchain protocol “like other code is subject to copyright protection”).

¹⁰⁰ See Copyright Roundtable Tr. at 23:15–21 (Jan. 31, 2023) (Joseph Gratz, Morrison & Foerster) (“[T]he ERC-721 smart contract itself that constitutes the NFT . . . doesn’t ordinarily contain anything or can’t tell you anything other than who owns it and the location of a place where metadata can be found. And those things themselves are not ordinarily going to be or contain copyrightable authorship in and of themselves . . .”).

2. Storage

An asset associated with an NFT is often, but not always, located or stored in a place distinct from the token itself.¹⁰¹ If an associated asset is a creative work, and the work is stored “on-chain,” then a copy of the work is included on the blockchain with the token itself.¹⁰² If an associated work is stored “off-chain,” it is stored at a place distinct from the token.¹⁰³ How and where an NFT-associated work is stored carries copyright implications. For example, in the context of on-chain storage, this often requires making a copy of a work.¹⁰⁴

The vast majority of works associated with NFTs are stored off-chain, with the ledger entry pointing to the work directly or to a uniform resource identifier detailing where it is located.¹⁰⁵ Stakeholders generally agreed that if an NFT merely points to the location of a work already present at an external location, for example a sound recording or a digital painting stored on a traditional web server or decentralized storage system, then the right of reproduction likely would not be implicated.¹⁰⁶ However, at least one roundtable participant observed that even if a work is stored off-chain, whether copyright rights are implicated by that off-chain storage

¹⁰¹ See *supra* section I.C; see also Copyright Roundtable Discussion Tr. at 53:6–55:13 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) (describing how NFTs and associated assets are stored); Gatto Comments at 4 (“Typically, a digital asset represented by an NFT is not stored on the blockchain (although it can be). The digital file may be stored on-chain or off-chain.”).

¹⁰² See, e.g., Durham Comments at 24 (“If an NFT’s metadata (i.e., the digital asset) is stored on-chain, the portion of the blockchain that stores that metadata (e.g., the specific block) is a copy or phonorecord because it resides in a material object—the blockchain network—which is a network of computers maintaining a single virtual computer.”). In addition, in cases where the work itself is generated at the point of minting, the stored copy may be the original and only copy of the work, not a reproduction of a pre-existing work.

¹⁰³ See *supra* section I.C (discussing storage).

¹⁰⁴ ABA-IPLA Comments at 2 (“A growing number of projects move all of the data to the blockchain, including the underlying content. . . . Typically, NFT projects utilizing an on-chain method of storage must . . . convert the content to machine readable format.”).

¹⁰⁵ Copyright Roundtable Tr. at 54:19–23 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) (“[T]he third way of storing NFTs, which is what happens in the vast majority of cases, is that instead the ledger points to a content ID and that content ID is a hash or like a numerical representation of that particular piece of content”).

¹⁰⁶ See section II.A.1 (discussing minting of NFTs); Comments from Internet Archive at 2–3 (“NFTs do not necessarily have anything to do with copying. NFT standards are generally agnostic as to how the referenced or underlying intangible assets (such as an image of a work of art) are handled. Minting platforms that employ these standards may choose to require the user to upload a copy of a work (thereby potentially implicating reproduction rights); however, they also may allow simple references to existing works hosted on traditional web servers or on decentralized storage systems such as IPFS (and, in either case, generally not resulting in a new reproduction of the work). Likewise, display or trading platforms may choose to honor or present referenced files in any of these ways, and may choose to make or not make their own incidental copy. Of course, it is also possible to mint an NFT without the use of any platform at all, which would allow all of these freedoms and more, by writing one’s own standard-complaint contract. In any event, the important point for our purposes here is that there is nothing inherent in the structure or concept of an NFT that requires copying the underlying asset.”).

remains a fact-specific inquiry.¹⁰⁷ Similarly, other roundtable participants noted that, depending on the smart contract or parameters of where the associated work is stored, the distribution or display right may be implicated.¹⁰⁸

Whether the off-chain storage of the work associated with the NFT is centralized or decentralized¹⁰⁹ can also affect the copyright owner's exclusive rights or ability to enforce those rights. If an associated work is stored at a single or centralized location, whether the work is in physical or digital form, the NFT is likely referring to a specific copy in a specific place.¹¹⁰ In a decentralized storage context, although there may be a single work or uniform resource identifier included in the NFT as a reference, multiple identical digital copies of the associated work, all with the same identifier, may be stored across many servers.¹¹¹ Therefore, storage on a decentralized system can involve making a number of additional digital copies of the associated work.¹¹²

¹⁰⁷ See Copyright Roundtable Tr. at 35:2–16 (Jan. 31, 2023) (Kevin Madigan, Copyright Alliance) (“[I]f the minter is the same person who uploads an infringing copy of a work online in a different location, even if the NFT itself doesn't house that work but points to or links to it, that person could still be liable for direct infringement, but even if the infringing work already exists online somewhere and then a different person comes along and mints an NFT that links to it, . . . there's still questions of contributory liability if they knowingly link to that infringing copy. So I would just say determining what rights are implicated, it really depends on what the minted NFT consists of or links to, and simply because a copyrighted work isn't part of a resulting NFT doesn't mean there aren't rights implications.”).

¹⁰⁸ See *id.* at 115:14–23 (Jan. 31, 2023) (Jeff Sedlik, PLUS Coalition) (contending that NFTs can implicate the distribution and display rights copies of works where “a copy is transmitted to the person who's receiving it,” which persists in their browser cache that “can be perceived,” “viewed,” “copied,” and “further distributed”); Dapper Labs Comments at 4 (noting that “with Ethereum-compatible NFTs, calling the ‘TokenURI’ function of the smart contract of the NFT will publicly display its metadata, including the URL where the specific associated digital content is located” and because of this “other unrelated applications—such as NFT marketplaces or NFT museums—can display the specific digital content associated with such NFT”).

¹⁰⁹ See section II.A.2. for a description of centralized and decentralized storage.

¹¹⁰ See Copyright Roundtable Tr. at 17:22–24 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) (“[I]n centralized storage systems, you're looking for a particular file in a particular place in the world”); see also MASTERWORKS.IO <https://www.masterworks.com/about/how-it-works> (last visited February 2024) (tokenizing and securitizing physical goods which are stored off-chain).

¹¹¹ *Id.* at 18:1–6 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) (“With decentralized storage systems, every piece of content has a particular content ID, and that piece of content can be stored in multiple places, and when you look for a particular content ID, you can pull that content from multiple places, not just one server.”). *Id.* at 214:23–215:1 (Jan. 31, 2023) (Emilio Cazares, Contributor to the SuperRare Ecosystem) (“There's redundancy in the way that these assets are stored, and a platform doesn't necessarily have any ability to prevent downstream IPFS nodes from emerging.”).

¹¹² Storage may also involve storing sub sections of the larger files across many servers. See *supra* note 48.

Storage differences were not paramount for all stakeholders, and at least one cautioned against applying different regulatory approaches based on location, viewing storage as more of a technical issue.¹¹³ Another commenter asserted that regardless of where the work is stored, when an NFT is transferred the associated work does not transfer via reproduction to the new owner, which is a key difference from the transfer of other works in the digital environment (a topic further explored in section II.A.4, *infra*).¹¹⁴

3. Marketing and Offering for Sale

The marketing of an NFT may implicate a copyright owner’s exclusive rights in any copyrightable work associated with the NFT.¹¹⁵ If the associated work is a work of visual art, a marketplace will often display a thumbnail of the associated artwork on its website, and may allow a prospective purchaser to click on that display to see a larger version, along with information about the NFT.¹¹⁶ A display of the associated work may require making a copy of the work, implicating the reproduction right as well as the public display right.¹¹⁷ Although a

¹¹³ Botond Breszkovics, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1 (Feb. 3, 2023) (“What I personally disagree with is the different regulatory approach for off-chain and on-chain NFTs. In my view, all NFTs should be regulated and judged in the same way, regardless of the location of the visual content displayed by the NFT, because the location of the content is a technical issue, but it will not affect the specificity of an NFT.”).

¹¹⁴ Durham Comments at 26 (“Regardless of whether the NFT’s media file is stored on-chain (in the contract), or off-chain (e.g. referenced by a website URL in the contract), the file is never moved or reproduced, title passes within the NFT smart contract itself.”).

¹¹⁵ See Copyright Roundtable Tr. at 12:7–10 (Jan. 31, 2023) (Kevin Madigan, Copyright Alliance) (noting “the lack of safeguards at the . . . listing stage[] that can ensure that those uploading and offering NFTs for sale in marketplaces are authorized to do so”).

¹¹⁶ See, e.g., NIFTY GETAWAY, <https://www.niftygateway.com/> (last visited February 2024) (displaying various NFTs for sale); 1C129E, *Editions by Rainer Hosch*, OPENSEA (Feb. 2023), <https://opensea.io/collection/editions-by-rainer-hosch> (displaying several NFT-associated photographs from one person for sale). See Dapper Labs Comments at 4 (describing how a marketplace might be able to display an off-chain asset associated with an NFT); Copyright Roundtable Tr. at 37:17–38:4 (Jan. 31, 2023) (Megan Noh, Pryor Cashman) (noting that the marketplace display may implicate copyright).

¹¹⁷ See Creative Commons Comments at 6 (“Where the minting and sale of a token does involve, somewhere in the process, an exclusive right of the author (for example, reproducing a work of art on a digital marketplace), the existing bounds of copyright should be sufficient: if the copy is unlicensed, the copy of the work may be infringing, but the associated token itself is not the infringing object.”); Copyright Roundtable Tr. at 33:19–34:6 (Jan. 31, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (commenting that “deep linking may be a copyright violation”); *id.* at 43:11–19 (Jan. 31, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (discussing whether display would be fair use); *id.* at 47:24–48:19 (Jan. 31, 2023) (Kevin Madigan, Copyright Alliance) (distinguishing the display of “thumbnail images, like those that were found not to be infringing in cases like Perfect 10,” which “found the thumbnail images were a sort of highly beneficial public function because they improved access to information on the internet” from “a purely commercial NFT marketplace where sort of the public benefit is not as clear”); *id.* at 67:1–22 (Jan. 31, 2023) (Megan Noh, Pryor Cashman) (discussing right to display in connection with first sale); *id.* at 115:14–23 (Jan. 31, 2023) (Jeff Sedlik, PLUS Coalition) (asserting that copies of works associated with NFTs are distributed and displayed”); see also *Perfect 10, Inc. v. Amazon, Inc.*, 508 F.3d 1146, 1160 (9th Cir. 2007). Some cases have held that a display of thumbnail versions of a picture is fair use. See *id.* at 1164–

copyright owner may authorize these uses to facilitate the sale of the NFT, in the case of an unauthorized reproduction or display, the use may constitute an infringement, unless it qualifies as fair use.

Similarly, where the associated work is a digital phonorecord, the marketplace may permit a prospective purchaser or website viewer to play the phonorecord in whole or in part.¹¹⁸ This implicates the copyright owner’s public performance right (and the reproduction right, if a copy is made). Indeed, playing the phonorecord may implicate the public performance right with respect to both the sound recording and any musical composition it contains.¹¹⁹ Thus, even if the seller of the NFT has obtained an appropriate license as to one of the copyrighted works,¹²⁰ there could still be an infringement of the other.¹²¹ If the user can download the associated

68; *Kelly v. Arriba Soft Corp.*, 336 F.3d 811 (9th Cir. 2003). Those cases, however, may not be equally applicable to NFT marketplaces that promote the sale of NFTs connected with the allegedly infringing work. See *Free Speech Sys. LLC v. Menzel*, 390 F. Supp. 3d 1162, 1171–72 (N.D. Cal. 2019) (questioning whether *Perfect 10* applies outside the context of a search engine); see also *VHT, Inc. v. Zillow Group, Inc.*, 918 F.3d 723, 742–44 (9th Cir. 2019) (holding that Zillow’s use of real estate photographs to create a searchable database on a website was not a fair use). The result may also depend on where the image is stored. See *Hunley v. Instagram*, 73 F.4th 1060, 1069-71 (9th Cir. 2023) (discussing the server test, including various courts that have not endorsed it).

¹¹⁸ See, e.g., Terra Naomi, *Say It’s Possible*, ASYNC PLAYER (2021), <https://async.market/music/master/0xb6dae651468e9593e4581705a09c10a76ac1e0c8-2285> (allowing one to “Listen on Async Player”); NMPA Comments at 4 (“NFT platforms often facilitate access to pre-sale digital music content by allowing the content to be fully streamed or downloaded as part of an auction listing. This includes content that is shown to users who are browsing NFTs for sale on an NFT platform ...”). Notably, the Async Player website also displays what appears to be album cover art, which may implicate the display rights of the visual artwork. Terra Naomi, *Say It’s Possible*, ASYNC PLAYER (2021), <https://async.market/music/master/0xb6dae651468e9593e4581705a09c10a76ac1e0c8-2285>. See also A2IM et al. Comments at 11 (“[I]n February 2022, RIAA sent a cease-and-desist letter to HitPiece, an NFT platform that, without authorization, marketed NFTs associated with RIAA’s members’ sound recordings and artists on a massive scale, listing thousands of NFTs. The site immediately ceased its activity and subsequently relaunched its platform with a much smaller catalog of NFT offerings, using Audible Magic content recognition technology to help verify ownership of music prior to minting an NFT and to guard against unauthorized use of music in NFTs.”); Comments by Copyright Alliance at 10–11 (discussing RIAA and Hitpiece).

¹¹⁹ See 17 U.S.C. §§ 106(4), 106(6).

¹²⁰ What constitutes an appropriate license may also be a fact specific consideration. See NMPA Comments at 13 (“First, Section 115 is solely a mechanical license and would not apply to (1) NFTs involving scrolling or audiovisual images with music (requiring a direct sync license with the rightsholder), (2) NFTs where the lyrics or musical notes/sheet music are displayed (requiring a print or ‘Graphic Rights’ license), or (3) NFTs where the song is materially changed or combined with other content (requiring a derivative work license directly from the rightsholder, 17 U.S.C. § 106(2))”).

¹²¹ If the NFT minter or seller has no rights in either the musical composition or the sound recording then there may be infringement of both copyrights. Cf. Copyright Roundtable Tr. at 27:3–7 (Jan. 31, 2023) (Abby North, North Music Group) (“[W]hen somebody purchases an NFT and they don’t understand—they don’t even understand the difference between a composition and a sound recording, let alone with rights they have acquired with this NFT.”).

phonorecord, both the reproduction and distribution rights of the copyright owner(s) of both the sound recording and the musical work may also be implicated.¹²²

An NFT seller who does not have rights in the associated work may be liable for infringement, but the circumstances in which the marketplace itself would be liable are not settled. Although one commenter expressed the view that NFT marketplaces could qualify for section 512(c) safe harbors,¹²³ U.S. courts have not addressed this issue.¹²⁴ Internationally, the Hangzhou Internet Court ruled that an NFT platform was not eligible for China’s online service provider safe harbor because it failed to exercise an adequate duty of care in monitoring its platform for infringement.¹²⁵

¹²² See CrossBorder Works Comments at 1 (“We do not have clarity of whether an NFT with music embedded is a personal copy like a downloaded MP3 or a cloud copy. We have differing opinions on how performance rights will work in decentralized platforms.”). Cf. A2IM et al. Comments at 11 (stating that they had sent a cease-and-desist letter to a marketplace, HitPiece). See also *Perfect 10, Inc. v. Giganews, Inc.*, 847 F.3d 657, 669 (9th Cir. 2017) (discussing distribution rights); *SA Music LLC v. Apple, Inc.*, 592 F. Supp. 3d 869, 889 (N.D. Cal. 2022) (discussing distribution rights and “making available” as distribution); W. Patry, PATRY ON COPYRIGHT § 13.11.50 (questioning the result in *SA Music*).

¹²³ Copyright Alliance Comments at 19 (noting that “legitimate NFT marketplaces can avail themselves of the Digital Millennium Copyright Act (“DMCA”) safe harbor provisions by complying with section 512(c)’s requirements”).

¹²⁴ See, e.g., Copyright Roundtable Tr. at 245:19–246:2 (Jan. 31, 2023) (Jeff Gluck, Gluck Law Firm) (“NFT marketplaces can’t hide behind safe harbor protection if they curate and play an active role in selecting the art on their platforms, which most of them do, and, further, if the NFT marketplaces are using their own technology to mint the NFTs, create the NFTs for the creators, then they’re participating, even aiding the infringement”); *id.* at 248:22–249:2 (Jan. 31, 2023) (Jennifer Pariser, MPA) (“We need to figure out what liability platforms have. It is not merely when they curate content.”); Comments of NMPA at 4–5 (discussing possible liability of NFT marketplaces); Aon Comments at 3 (suggesting that marketplaces should be required to verify, at least to some extent, the ownership of assets associated with NFTs sold on the marketplace); A2IM et al. Comments at 9, 12 (same); *SA Music LLC v. Apple, Inc.*, 592 F. Supp. 3d at 889–91 (imposing liability on Apple, Inc. for making available unauthorized copies of works that were uploaded by third parties); see also Copyright Roundtable Tr. at 186:25–188:1 (Jan. 31, 2023) (Gina Moon, OpenSea) (discussing use of DMCA against marketplaces); Pex Comments at 6 (“Pex believes the Copyright Act should be amended to make clear that the minting of an NFT tied to a piece of content is equivalent under the law to copying the underlying work, meaning that NFT marketplaces would be required to comply with the DMCA.”); Copyright Roundtable Tr. at 211:9–18 (Jan. 31, 2023) (Cesar Fishman, Pex) (discussing possible amendments to DMCA in the NFT context). See generally M. Nimmer and D. Nimmer, NIMMER ON COPYRIGHT § 12B.04.

¹²⁵ The court concluded that the NFT platform had a higher duty of care than traditional online platforms because it could conduct an *ex ante* review of the digital works on its platform without incurring additional cost and because it received direct economic benefits by collecting gas fees when minting NFTs and commissions on every transaction. *Shenzhen Qice Diechu Wenhua Chuangyi Youxian Gongsi Su Hangzhou Yuan Yuzhou Keji Youxian Gongsi* (深圳奇策迭出文化创意有限公司诉杭州原与宙科技有限公司) [*Shenzhen Qice Diechu Cultural Creativity Co., Ltd. V. Hangzhou Yuanyuzhou Technology Co., Ltd.*] (Hangzhou Internet Ct. 2022) (China). Cf. Copyright Roundtable Tr. at 180:3–182:2, 223:24–225:7 (Jan. 31, 2023) (Jean-Marc Deltorn, CEIPI, the International IP Studies Centre of the University of Strasbourg) (discussing perspective NFT marketplaces in the context of Article 17 of the EU Digital Single Market Directive).

4. Transferring NFTs and Associated Rights

Transferring an NFT involves transferring possession of a digital token. This does not necessarily entail a physical or digital transfer of the associated asset¹²⁶ or the copyright rights associated with the underlying work.¹²⁷ Whether transfer of an NFT implicates rights in the underlying work depends on factors such as whether a copy of a copyrighted work is created, publicly displayed, publicly performed, or publicly distributed, as well as whether the parties have entered into a valid agreement to transfer or license some or all of the copyright rights.

Just as ownership of a particular copy of a painting is separate from ownership of copyright in the painting,¹²⁸ ownership of an NFT and ownership of any copyright interests in the associated work are separate.¹²⁹ Although some NFT marketplaces may suggest that a token purchase signifies ownership of or a license to make use of a work,¹³⁰ nothing about the token necessarily entails exclusivity over anything but the token itself.¹³¹ Even if the NFT metadata specifies ownership of a particular digital or physical copy of a work, ownership of that copy does not in itself confer ownership of copyright rights in the work.

Instead, a separate agreement is ordinarily needed to effectively transfer any copyright or other associated rights in conjunction with the NFT transaction.¹³² As noted above, smart contracts can be programmed to execute upon the transfer of the NFT, purportedly automating the transfer of some associated rights.¹³³ It is, however, an open question whether smart contracts

¹²⁶ Often the token will point to a copy of the work represented by the NFT but does not usually contain a copy of the work itself. Because the asset is not usually stored on the token itself, the asset is not usually transferred when the token is transferred. *See supra* section I.C.

¹²⁷ *See* Aon Comments at 1 (“NFTs inherently lack any native structure to demonstrate legal ownership. This relies effectively on community agreement that an asset issued from a given source is the ‘official version’ and the further assumption that the publisher had the property rights to do so.”).

¹²⁸ *See* 17 U.S.C. § 202.

¹²⁹ *See also* Hayleigh Boshier, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Jan. 9, 2023) (“An NFT does not give any intellectual property rights in the collectable to the purchaser; in the same way that a purchaser of a vinyl owns the tangible property but does not have any rights to the song”).

¹³⁰ *See How Do NFT Copyrights Work?*, MINTABLE, <https://editorial.mintable.com/how-do-nft-copyrights-work/> (last visited February 2024) (“When you buy an NFT, you’re basically buying a token on the blockchain that signifies ownership over an asset.”).

¹³¹ Under the typical arrangement of the token metadata pointing to a digital asset associated with the work, even the suggestion that a purchaser may own a specific copy may be illusory. *See* David J. Kappos et al, *NFTs, Incentives and Control: Technical Mechanisms and Intellectual Property Rights*, 6.1 STAN. 93, 103 (Jan. 10, 2023) (“Under this basic arrangement, an NFT creator can freely modify or remove the image file from its server, changing the image associated with a specific NFT.”).

¹³² Copyright ownership may also be transferred by will, intestate succession, or operation of law. *See* 17 U.S.C. § 201(d)(1); *see also* Copyright Roundtable Tr. at 175:8–176:15 (Jan. 31, 2023) (Sarah Conley Odenkirk, Cowan DeBeats Abrahams & Sheppard) (discussing the challenges of contracting in the NFT space).

¹³³ *See* Art Blocks Comments at 2 (“A creator of an asset is able to assign the rights the creator desires to transfer to any subsequent purchasers/owners of the asset immediately, upon creation and deployment of the smart contract. In the way of IP ownership, there is no clearer way to digitally record ownership.”).

can affect a valid transfer of copyright. For a transfer of copyright or an exclusive license of any copyright rights to be valid under the Copyright Act,¹³⁴ it must be in writing and signed by the owner of the rights or their authorized agent.¹³⁵ Courts have not ruled on whether smart contracts can satisfy this requirement.¹³⁶

Some commenters suggested that a separate agreement to license copyright interests alongside an NFT may be found in the terms of service of NFT marketplaces.¹³⁷ Simply presenting terms of service without obtaining the buyer's agreement may not be sufficient.¹³⁸ In any event, not all NFT sales take place on a marketplace, and sales outside a given marketplace may not be

¹³⁴ The Copyright Act of 1976 (Title 17 of the U.S. Code).

¹³⁵ See 17 U.S.C. § 204(a).

¹³⁶ See Creative Commons Comments at 5 (“For rights to a creative work associated with an NFT to be transferred or licensed along with sale of the token, a purchase agreement must separately provide for the transfer or licensing of those rights.”); Copyright Roundtable Tr. at 42:21–25 (Jan. 31, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (“[I]t should be noted that there are some rights, specifically exclusive rights, under copyright law that have to be passed only through written signed documents. Whether or not a smart contract can effectuate that remains to be seen.”); Gatto Comments at 12 (“Much has been written about including the NFT license terms in the metadata or smart contract of the NFT. This is helpful, but likely not legal [sic] sufficient without more.”); Center for Cultural Innovation (“Ctr. for Cultural Innovation”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 5 (“[C]opyright law requires a signed writing for valid transfers and the sale of a NFT may not always satisfy this requirement.”); INTA Comments at 30 (“Traditional copyright law states that transfer of ownership or assignment can only be done in writing signed by the assignor or his represented agent. However, NFTs basically being smart contracts are devoid of written transfer of rights.”); See also Marie Clopterop and Enrico Bonadio, *NFTs: promisingly transformational, yet fraught with IP pitfalls—Part I*, KLUWER COPYRIGHT BLOG (June 19, 2023), <https://copyrightblog.kluweriplaw.com/2023/06/19/nfts-promisingly-transformational-yet-fraught-with-ip-pitfalls-part-i/>.

¹³⁷ See MAC Comments at 7 (“In certain situations, the license agreement and associated terms and restrictions are documented off-chain directly between the artist/creator and the NFT marketplace or platform, rather than in the smart contract underlying the NFT itself, and the artist is thus reliant on the NFT marketplace to communicate and enforce the terms of the license against NFT buyers via the platform’s Terms of Service or Terms of Use, which may not always capture all of the parameters agreed to in the license agreement.”). Of concern, a particular marketplace’s terms of service can change, resulting in a thicket of confusion as to subsequent purchasers’ rights. See ABA-IPLA Comments at 6 (“[i]nformation related to the terms and conditions that are found on the primary marketplace websites can be capriciously changed, as well as the explanations and clarifications contained in the frequently asked questions (“FAQ”) sections or other text on the marketplace or launch site. Similarly, the terms in marketplaces and launch sites can often contradict each other.”); see also section II.C.3.

¹³⁸ See, e.g., *Nicosia v. Amazon.com, Inc.*, 834 F.3d 220, 231–34, 235–38 (2d Cir. 2016) (concluding that, for the contractual terms of an online marketplace’s “hybrid” agreement—between a clickwrap and a browsewrap agreement—to be binding on a buyer, the buyer must be provided reasonable notice of such terms); *Nguyen v. Barnes & Noble Inc.*, 763 F.3d 1171, 1176–79 (9th Cir. 2014) (voiding a contractual term found in an online marketplace’s terms of use because the buyer neither affirmatively nor constructively assented to the browsewrap terms, concluding that “where a website makes its terms of use available via a conspicuous hyperlink on every page of the website but otherwise provides no notice to users nor prompts them to take any affirmative action to demonstrate assent, even close proximity of the hyperlink to relevant buttons users must click on—without more—is insufficient to give rise to constructive notice”).

subject to that marketplace's terms.¹³⁹ As a result, subsequent purchasers may not receive or accept all the contractual terms associated with the NFT.¹⁴⁰ Commenters identified presentation of agreement terms to subsequent purchasers as a significant challenge in the NFT space.¹⁴¹

The licensing of copyright interests within the context of an NFT transfer raises the same issues. Transferring an NFT does not itself imply or grant a license in any associated work.¹⁴² While a license for a work may accompany the NFT through a smart contract, it can also be conveyed separately through a different contract, which may result in dissociation between the NFT and the license agreements pertaining to the work.¹⁴³ In such cases, the terms of the license and expected remunerations for subsequent use or sale may not be binding on subsequent purchasers. This may effectively result in limitations on the rights granted to NFT holders.¹⁴⁴ Even if rights to use the work associated with the NFT are effectively licensed to the NFT holders, these rights may not be irrevocable.¹⁴⁵

¹³⁹ AIPLA Comments at 4 (noting that “resales or other transfers of NFTs may be done peer-to-peer, or outside of traditional NFT marketplaces or platforms, which also presents challenges in ensuring subsequent purchasers are presented with and accept the NFT Owner Agreement”).

¹⁴⁰ *Id.*

¹⁴¹ Creative Commons Comments at 5 (“For rights to a creative work associated with an NFT to be transferred or licensed along with sale of the token, a purchase agreement must separately provide for the transfer or licensing of those rights.”); Gatto Comments at 12 (“For the NFT Owner Agreement to be legally binding on a subsequent purchaser, ideally the subsequent purchaser should also be presented with and affirmatively accept the agreement before purchase. Rarely is this done.”); AIPLA Comments at 4 (“To be legally binding and enforceable, the NFT Owner Agreement generally needs to be presented to a potential purchaser prior to purchase and the purchaser must take some affirmative action to indicate their acceptance of its terms. If the NFT is later resold, subsequent purchasers should also affirmatively accept the NFT Owner Agreement so that the NFT Owner Agreement is binding on them as well.”); *see infra* section II.C.3.

¹⁴² *See* Dapper Labs Comments at 14–15 (“Generally, where there are no explicit terms or conditions of license, NFT holders will most likely have an implied right to display and reproduce the artwork for their NFT for their personal use and enjoyment.”).

¹⁴³ *See* Graphic Artists Guild Comments at 6 (“Licensing terms or a transfer of copyrights may be conveyed in contracts provided separately from the smart contract. When that occurs, those agreements are decoupled from the NFT, causing confusion about who owns which rights as the NFT is resold downstream.”).

¹⁴⁴ AIPLA Comments at 4 (“To be legally binding and enforceable, the NFT Owner Agreement generally needs to be presented to a potential purchaser prior to purchase and the purchaser must take some affirmative action to indicate their acceptance of its terms. If the NFT is later resold, subsequent purchasers should also affirmatively accept the NFT Owner Agreement so that the NFT Owner Agreement is binding on them as well.”); Graphic Artists Guild Comments at 6 (noting that in instances where the NFT and contract are “decoupled” “royalties on the resale of the NFTs are also decoupled from the transfer of copyrights. An artist may continue to receive royalties from artwork to which they no longer own the rights.”); *see also* Gatto Comments at 12 (“For the NFT Owner Agreement to be legally binding on a subsequent purchaser, ideally the subsequent purchaser should also be presented with and affirmatively accept the agreement before purchase. Rarely is this done.”).

¹⁴⁵ *See* section II.C.2 *infra* at 44 (noting that it is unclear how NFTs would account for statutory termination under sections 203 and 304(c) of the Copyright Act, which permit authors or their heirs to terminate grants of rights in works after a statutorily-prescribed period); *supra* note 131; Kappos et al., *supra* note 131 at 111 (noting that “the

While participants in traditional fine art markets may understand that when you purchase a physical painting, the artist still owns the copyright, among buyers and sellers of NFTs, the distinction between transferring ownership of an NFT that links to a copy of a work and transferring ownership of the copyright in the work has generated substantial confusion.¹⁴⁶ It is possible for NFT smart contracts to automatically license and memorialize rights as to subsequent purchasers, but most do not, or do so incompletely.¹⁴⁷ Moreover, NFT purchasers may not be accustomed to acquiring rights in digital content beyond those that enable their own personal use.¹⁴⁸ Yet, perhaps due to the unique nature of the NFT they acquire, it is evident that some purchase NFTs with the expectation of obtaining valuable legal rights in the associated work.¹⁴⁹ One group announced after selling their NFTs that they would be placing all the

license for the Koda NFTs, which ‘live’ on certain Otherdeeds, is a ‘revocable license . . . [to] the [associated Koda] Art,’ meaning that a holder may find itself holding an NFT with absolutely no rights to use or even display the art the NFT references.”).

¹⁴⁶ Copyright Roundtable Tr. at 114:12–15 (Jan. 31, 2023) (Jeff Sedlik, PLUS Coalition) (“[T]here is a lot of confusion on both sides, both by the sellers and the buyers, as to the rights that they’re granting and receiving and what they have the right to do.”); *id.* at 15:24–16:1 (Jan. 31, 2023) (Brill, Decentralized Future Council) (“[T]here is confusion on IP rights that are granted by NFTs, so education, education, education is essential here.”); *See generally id.* at 93: 19–21 (Jan. 31, 2023) (Vickie Nauman, CrossBorder Works) (“[W]e have wide-ranging confusion in this space and there’s a lack of any kind of best practices.”).

¹⁴⁷ *See* ABA-IPL Comments at 11 (“The Section notes that NFT creators can facilitate the appropriate reuse of their NFT related assets by detailing the rights of a purchaser, including uses of any licensed IP rights, through smart contracts, although this is not a complete solution. In some circumstances, such as for derivative works of fine art, a compulsory licensing model may be appropriate.”); *see also* NMPA Comments at 8 (“Some NFT platforms can guarantee that secondary sales on-platform occur according to conditions set by the seller, such as continuing royalties. NFT platforms, however, typically cannot warrant that secondary sales occurring off-platform include continuing royalties.”).

¹⁴⁸ Dapper Labs Comments at 7 (“Most consumers’ experience with digital goods relates to goods licensed for personal use (like e-books, music, and movies). The average consumer simply is not used to acquiring other rights (e.g., commercial rights or the rights to create derivatives) in digital content. While it can be challenging for NFT creators to educate consumers about those rights, it is also an opportunity to provide consumers with valuable additional rights beyond those that they would otherwise get when buying a physical good or downloading a song or a movie.”); *See also* Copyright Roundtable Transcript at 184:21–185:24 (Jan. 31, 2023) (Dan Schmerin, Metaversal) (licensing and user education and engagement).

¹⁴⁹ *See* Creative Commons Comments at 3 (“[C]onfusion [over copyright ownership] persists in the world of NFTs, particularly given the emphasis on unique ownership in much of the language surrounding the creation and sale of these digital objects.”); *See also* Copyright Roundtable Tr. at 193:5–194:2 (Jan. 31, 2023) (Sarah Conley Odenkirk, Cowan DeBeats Abrahams & Sheppard) (discussing the need for clarification on how rights travel and ways to provide clarity); *also id.* at 254:12–17 (Jan. 31, 2023) (Zachary L. Catanzaro, St Thomas University, College of Law) (“I’ve looked at a number of smart contract languages where the marketing says you’re going to own this NFT, but then you dig into the terms of the licensing agreement, and the licensing agreement carves out a number of exceptions that it doesn’t mean that they’re really acquiring anything.”).

underlying copyrights for individual works associated with the NFTs under CC0 licenses.¹⁵⁰ One individual NFT holder complained about losing a licensing deal after this change.¹⁵¹

Commenters identified IP-related education for both consumers and creators as an important way to mitigate confusion about the rights that accompany the transfer or purchase of an NFT, with varying emphases on the need for platforms and marketplaces to educate participants, or for sellers to educate buyers.¹⁵² One opined that “NFT platforms must develop and publish clear terms of use that spell out the rights associated with the purchase of an NFT.”¹⁵³ Some suggested a role for the Offices in developing educational resources for NFT participants¹⁵⁴ or “guidelines for NFT users and creators regarding IP rights.”¹⁵⁵

¹⁵⁰ @kevinrose/, TWITTER (Aug. 4, 2022, 2:39 PM), <https://twitter.com/kevinrose/status/1555262099093200896> (“Today, we’re announcing that @moonbirds and @oddties_xyz are moving to the CC0 public license.”). A “CC0” license means “no rights reserved” and effectively invites the public to use a work as though it were in the public domain. <https://creativecommons.org/public-domain/cc0/>.

¹⁵¹ @Lakoz_, TWITTER (Aug. 5, 2022, 11:04 AM), https://twitter.com/Lakoz_/status/1555570398267412480 (“FYI, shortly after the @moonbirds CC0 announcement, I actually lost a 6 figure licensing deal that I’d been working on for a while. I understand the decision, but the approach by the team could’ve been much better.”).

¹⁵² See Creative Commons Comments at 3 (“The primary IP-related challenge is education.”); A2IM et al. Comments at 5 (suggesting buyers, sellers, and marketplaces become adequately informed about the scope of the rights being conveying); NMPA Comments at 11 (general description of areas for education); Kiribex (personal) Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 1 (Feb. 6, 2023); Copyright Roundtable Tr. at 20:4–6 (Jan. 31, 2023) (John Stroh, Frost Brown Todd) (there’s a big education gap in terms of people’s understanding of copyright law and copyright licensing).

¹⁵³ MPA Comments at 6 (“IP owners and NFT marketplace platforms should work together to educate consumers as to what they have obtained by buying an NFT. In particular, NFT platforms must develop and publish clear terms of use that spell out the rights associated with the purchase of an NFT.”); See also Creative Commons Comments at 3 (suggesting market-based adoption of standardized licenses instead of other potential legislative based solutions).

¹⁵⁴ Creative Commons Comments at 3 (“There is a role for the Copyright Office in public education to correct these misperceptions, as it has with works in other media.”); Huski.ai Comments at 8 (“The Offices should consider creating new educational resources covering IP basic rights, e.g., providing basic IP educational FAQs, checklists and toolkits, for use by artists, entrepreneurs, and the digital assets industry.”).

¹⁵⁵ Decentralized Future Council Comments at 7 (“With confusion surrounding the connection between IP rights and NFT use, education efforts regarding what IP rights are granted when purchasing an NFT should be promoted by both industry and government. Education should be advanced by and presented to all stakeholders involved, including the platforms that mint or sell NFTs, the creators of NFTs, and the users. The government can be very helpful in this regard, starting with developing guidelines for NFT users and creators regarding IP rights.”).

Commenters debated the application of copyright’s first sale doctrine to the transfer of NFT-associated digital works.¹⁵⁶ The first sale doctrine allows the owner of a particular copy of a work to sell or otherwise dispose of that copy without the copyright owner’s consent.¹⁵⁷ The doctrine does not, however, generally apply to the distribution of digital works over the internet,¹⁵⁸ because digital transmissions ordinarily involve making new copies.¹⁵⁹ Some stakeholders argued that the doctrine might apply differently in the context of NFTs, as transfers do not typically involve making reproductions or moving assets, with the NFT merely pointing to the location of the work.¹⁶⁰

¹⁵⁶ 17 U.S.C. § 109.

¹⁵⁷ *Id.*

¹⁵⁸ See *Capitol Records LLC v ReDigi, Inc*, 910 F.3d 649, 657 (2d Cir. 2018) (holding that notwithstanding the first sale doctrine, unauthorized sale and transfer of music files constituted an unauthorized reproduction); *Redbox Automated Retail LLC v Buena Vista Home Entertainment Inc*, 399 F. Supp. 3d 1018, 1032-33 (C. D. Cal. 2019) (rejecting application of first sale doctrine to digital download codes).

¹⁵⁹ U.S. Copyright Office, A Report Of The Register Of Copyrights Pursuant To § 104 Of The Digital Millennium Copyright Act Section at 79 (2001), <http://www.copyright.gov/reports/studies/dmca/sec-104-report-vol-1.pdf> (“The transmissions that are the focus of proposals for a ‘digital first sale doctrine’ result in reproductions of the works involved. The ultimate product of one of these digital transmissions is a new copy in the possession of a new person.”) (footnote omitted); U.S. Patent & Trademark Office, White Paper on Remixes, First Sale, and Statutory Damages, at 35 n.202 (2016), <https://www.uspto.gov/sites/default/files/documents/copyrightwhitepaper.pdf> (“This section focuses on the distribution of a work via digital transmission, which typically involves making a copy of the work.”). The first sale doctrine is only an exception to the distribution right. 17 U.S.C. § 109. This additional copying implicates the copyright owner’s exclusive right of reproduction. See *Capitol Records LLC v ReDigi, Inc*, 910 F.3d 649, 656.

¹⁶⁰ See Durham Comments at 24 (arguing that the first sale doctrine applies to digital goods transferred via blockchain, differentiating NFT sales from those at issue in *ReDigi*, as the reproduction right is not implicated when no copy is made) (Joshua L. Durham, *Creating True Digital Ownership with the “First Sale” Doctrine*, 23 Wake Forest J. of Bus. & Intell. Prop. 137, 157–58 (Feb. 20, 2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4365074). The reproduction question will similarly depend on multiple factors. See *supra* section II.A.4 (top of section). But see Copyright Alliance Comments at 20–21 (“Because the NFT is simply a token that includes a digital contract that may include terms associated with the underlying work, and not the work itself, the first sale doctrine is not implicated in the transfer or sale of the NFT itself. Moreover, in cases involving digital works, like MP3s, courts have made unequivocally clear that the resale of a digital work is not covered by the first sale doctrine. Similarly, in *Disney Enterprises Inc. v. Redbox Automated Retail LLC*, a federal court found that the first sale doctrine does not apply to the sale of digital download codes that gave the purchaser an option to create a copy in the future. If an NFT grants the owner a similar option to download a copy of a work, then subsequent transfers would not be covered by the first sale doctrine. Ultimately, the first sale doctrine would not limit liability for the post-sale reproductions of any digital files associated with NFT.”); Gatto Comments at 13; see *supra* note 114.

B. Enforcement

Despite the common confusion as to the rights implicated in the creation or transfer of an NFT, most commenters expressed the view that existing laws are generally adequate to enforce copyright against NFT-related infringements.¹⁶¹ In particular, they noted that copyright owners have had success using the Digital Millennium Copyright Act's (DMCA) notice-and-takedown system to ask NFT marketplaces to delist specific NFTs associated with infringing assets.¹⁶² Nonetheless, they identified at least three online enforcement challenges arising from pseudonymous ownership and decentralized storage of NFTs: problems with identifying infringers; jurisdictional challenges; and difficulty with removing infringing content.

Many commenters stated that neither blockchains nor NFT marketplaces necessarily require sellers to provide real names, making it difficult to identify infringers.¹⁶³ The marketplaces, the

¹⁶¹ A2IM et al. Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 3; Computer & Communications Industry Association ("CCIA"), Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 3; MPA, Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 9 ("In the MPA members' experience with NFTs thus far, existing law has proven adequate to address any associated copyright issue."); NYIPLA, Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 3 ("The NYIPLA believes that current copyright laws are adequate to address the protection and enforcement of copyrights in the context of NFTs as there are no unique copyright issues that NFTs present"); Aon Comments at 4; Internet Archive Comments at 6; Dapper Labs Comments at 1, 17 ("Dapper believes that the current DMCA notice and take-down procedures work well to disable access to NFTs associated with infringing content from front-end interface websites."); Copyright Alliance Comments at 20; ESA Comments at 3. *But see* Gatto Comments at 15 (suggesting this Study "could consider any modifications to the DMCA as applied to NFTs that would be beneficial to facilitate the intent of the DMCA i.e. to take down infringing content in an easy and cost effective way without the need for litigation."); Pex Comments at 2 ("At this scale of NFT creation and trade, traditional means of policing fraudulent or infringing NFTs cannot keep up").

¹⁶² ESA Comments at 5 ("ESA members . . . have been successfully leveraging partnerships with NFT marketplaces and other types of platforms to take down listings of copyright-infringing NFTs utilizing the notice-and-takedown procedure in Section 512 of the Digital Millennium Copyright Act."); A2IM et al. Comments at 5 ("To date, the RIAA has sent over 400 infringement takedown notices to NFT marketplaces for NFTs that infringe our members' trademarks or copyrights. For the most part, the NFT listings are taken down."); INTA Comments at 43 (reporting on one law firm's experience that NFT marketplaces "generally removed NFTs with infringing content within 7 to 10 days of receipt of our DMCA complaint and follow-up outreach"); Gatto Comments at 14 ("Where . . . an NFT is listed on a US-based marketplace, we have had good success in having the marketplace take the NFT down upon receipt of the [DMCA] takedown notice."). *But see* INTA Comments at 24 (stating that many NFT marketplaces "do not have take-down procedures like ISPs or on-line marketplaces such as Amazon have").

¹⁶³ INTA Comments at 35 ("In the NFT (crypto) space it's not always easy to identify the infringer for notice requirements."); Copyright Alliance Comments at 24 ("Further frustrating creators is the fact that NFT sellers are not required to provide proof of ownership or even their real name to start an auction on OpenSea and other NFT marketplaces, whereas copyright owners must share personal information and proof of ownership to effectuate a takedown."); *id.* at 16 ("[E]ven if a copyright owner succeeds in having a listing removed using a DMCA takedown notice, identifying the infringing party is extremely difficult because the blockchain data may only include an alphanumeric address and the person responsible could be located anywhere in the world."); A2IM et al. Comments at 6 ("Rightsholders must engage in significantly more investigation to identify the person/s connected to crypto wallets [containing infringing NFTs]."); *See also* Copyright Roundtable Tr. at 238:19-24 (Jan. 31, 2023) (Stephen Kelly, Cypress); Amanda Sharp ("Sharp"), Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at

blockchain network, the storage locations of the unauthorized asset, or the persons responsible for any of them may be located outside the United States, raising jurisdictional challenges.¹⁶⁴

Like many digital files, works associated with NFTs may not be stored in one location that is easily accessible for a DMCA takedown request.¹⁶⁵ According to commenters, the NFT marketplaces that receive takedown requests do not ordinarily store NFTs or their associated assets.¹⁶⁶ They can remove a specific listing on their platforms, but the NFT will remain on the blockchain, and its associated asset (for example, an unauthorized reproduction of a painting) may also be on the blockchain or in other storage locations.¹⁶⁷

9–10 (Feb. 3, 2022); *cf.* Copyright Roundtable Tr. at 194:5–24 (Jan. 31, 2023) (Sarah Conley Odenkirk, Cowan DeBeats Abrahams & Sheppard) (“Issues of anonymity and pseudonymity are certainly problematic in terms of enforcement in the NFT space, but they offer an opportunity to revisit this issue both from a traditional registration standpoint as well as within the Web3 ecosystem. Doing so will certainly help balance First Amendment and privacy issues that are critical considerations in the NFT space as well, and one tech solution that might offer some opportunities could be the tokenizing of identities. . . . Establishing a standard method for controlling access to true identities through tokenized identities in appropriate circumstances, probably subject to court order, could prove much more efficient than taking various platforms, publishers, or manufacturers to court for the sole purpose of unmasking an infringer’s identity.”).

¹⁶⁴ A2IM et al. Comments at 6; INTA Comments at 24 (“Further, because NFT markets are international, enforcement can become complicated jurisdictionally”); AIPLA Comments at 5 (“Even when they are tracked down, it is not feasible to try to get jurisdiction over them in the US, making the enforcement more burdensome. The jurisdictional issues for enforcing TM and copyrights should be considered in light of the easy access blockchain technology provides to US consumers.”); Pex Comments at 5 (“Especially regarding NFTs tied to digital assets residing off-chain, the underlying work can ultimately reside on hard-to-find websites or on servers outside the jurisdiction of law enforcement, raising all the issues that the Copyright Office has thoroughly explored related to foreign rogue sites.”).

¹⁶⁵ AIPLA Comments at 4 (“The Digital Millennium Copyright Act (DMCA) may be helpful in some cases but is not necessarily helpful in all situations (e.g., where a digital asset associated with an NFT is stored on a decentralized storage system that is not under control of a single entity, or where multiples copies of the digital asset are stored at different nodes, the server provider which receives the DMCA notice may not be able to effectively ‘take down’ the digital asset, or prevent it from being accessed by third parties.”).

¹⁶⁶ Copyright Alliance Comments at 19; Gatto Comments at 14 (“The token remains associated with the owner’s wallet on the blockchain and the digital assets remains stored at its storage location. Often this is not a storage location hosted by the marketplace. Thus, takedowns from most marketplaces, just prevent a sale on that marketplace.”).

¹⁶⁷ AIPLA Comments at 7 (“IP owners have used, and can use, the DMCA process with U.S.-based marketplaces and other platforms to take down the infringing NFT, but this does not necessarily eliminate the NFT or the infringing asset associated with the NFT. It only removes the display of the NFT from the marketplace. The owner can continue to sell or distribute the infringing NFTs on other platforms (i.e., those hosted abroad) or peer-to-peer. And the digital asset remains stored at its storage location.”); Copyright Alliance Comments at 16 (“In addition, the underlying content is often digitally stored separately from where the NFT is offered. This creates additional challenges to fully effective enforcement.”); NMPA Comments at 5 (“[I]t is questionable whether NFT platforms can comply with DMCA takedown notices where content is stored or linked on a decentralized network.”); ABA-IPL Comments at 12 (“Even if a marketplace is willing to take down a listing for an infringing work, that work may be outside the control of the marketplace for purposes of the DMCA, or continue to pop up in another marketplace.”); *id.* at 12 n.26 (“An overriding issue is that a takedown doesn’t effectively target the creator or group of creators responsible for minting the NFT to a blockchain, or subsequent owners of the NFT, and any underlying assets. For marketplaces, a takedown

Where the infringing work is stored off-chain, some commenters suggested that enforcement may be easier if the work resides on a centralized platform (for example, a large image-sharing site).¹⁶⁸ A rightsholder can send a DMCA takedown notice to the platform, and removal of the work from the platform will, as one commenter put it, “disable the NFT because the URL or URI [uniform resource identifier] in the [NFT’s] metadata will point to a location with no file.”¹⁶⁹ Where, however, the infringing work is stored off-chain but on a decentralized network like the Interplanetary File System, achieving complete removal may be more difficult,¹⁷⁰ and stakeholders discussed alternate methods of enforcement.¹⁷¹

On the other hand, where the NFT or its associated asset resides on a blockchain network,¹⁷² some commenters were doubtful that the deletion or “takedown” of the infringing asset is

means that a particular marketplace will no longer allow an NFT to be listed. The infringing content may still exist, whether on-chain or linked off-chain, or some combination of both.”); Copyright Roundtable Tr. at 215:22–216:6 (Jan. 31, 2023) (Emilio Cazares, Contributor to the SuperRare Ecosystem) (“based on my experience as a DMCA agent in this space, that the takedown doesn’t do anything. You know, like, it’s a cosmetic gesture to stay in formal compliance with the DMCA, but at the very end, anyone familiar with the protocol can move these assets and can still sell and trade and transfer and sell them on another marketplace, and a DMCA notice kind of just acts as a warning, hey, sell your infringing asset now because they’re coming for you.”). Some commenters suggest that rightsholders could attempt to reach the source of an infringing NFT by serving a notice upon the provider of the NFT owner’s wallet, *see* Copyright Alliance Comments at 25, or upon the owner directly by airdropping a “notice” token into the wallet itself. *See* Gatto Comments at 15.

¹⁶⁸ Gatto Comments 14 (stating that where an asset is hosted on a centralized server, “a DMCA takedown notice to that entity may remove the digital asset from the server”); *See also* Copyright Roundtable Tr. at 213:24–214:18 (Jan. 31, 2023) (Gina Moon, OpenSea) (discussing takedown and enforcement mechanisms).

¹⁶⁹ *Id.*

¹⁷⁰ *See, e.g.,* Gatto Comments at 14 (“It is common for the digital assets associated with many NFTs to be stored on a *decentralized* storage system, such as IPFS. This makes it much harder for takedowns regarding under the current DMCA procedures. Sometimes, the file may be stored in multiple locations under control of multiple entities. Sometimes parts of the file may be stored under control of different entities.”); Copyright Roundtable Tr. at 58:25–59:3 (Jan. 31, 2023) (Alfred Steiner, Meister & Steiner) (“[I]f you wanted to take something down from the Interplanetary File System, you would have to disable all the pinning services or all people that are pinning a particular content.”). *But see id.* at 61:15–62:7 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation) (describing advantages of decentralized storage for whack-a-mole problem—“And what’s so great about that is it means no matter where it’s stored, if it’s stored in a million places or one place, [if blocked at gateway] you can’t view it through that gateway because it’s a particular Content ID”).

¹⁷¹ *See* Copyright Roundtable Tr. at 231:11–232:15 (Jan. 31, 2023) (Emilio Cazares, Contributor to the SuperRare Ecosystem) (discussing alternate methods for dispute resolution); *id.* at 187:15–21 (Jan. 31, 2023) (Gina Moon, OpenSea) (“[N]ot only does a blockchain provide sort of a content ID system that isn’t tied to just one proprietary platform for rights-holders, it also provides access and information for buyers so they themselves can make informed decisions regarding authenticity and provenance of NFTs they’d like to own.”) *But see* Copyright Alliance Comments at 11 (expressing skepticism that blocking a “hash” associated with infringing material would effectively block access to the material on a decentralized network).

¹⁷² Commenters agreed that storage of a complete art asset on chain is rare. *See, e.g.,* Copyright Roundtable Tr. at 53:6–54:4 (Jan. 31, 2023) (Marta Belcher, Filecoin Foundation).

possible.¹⁷³ That is because, as discussed above, blockchains are designed to be immutable.¹⁷⁴ Each entry in the blockchain ledger contains information about the previous entry, and each node in the blockchain network validates the integrity of the ledger.¹⁷⁵ It is not supposed to be possible to overwrite a previous entry.¹⁷⁶

In the Offices' view, and as many stakeholders acknowledged,¹⁷⁷ none of these issues arising from decentralized storage or pseudonymity are unique to NFTs.¹⁷⁸ The internet itself is to some

¹⁷³ See Copyright Alliance Comments at 25–26 (“A DMCA takedown notice or 512(h) subpoena could be sent to the digital wallet service provider, which may have the ability to remove an NFT that incorporates infringing material from a user’s wallet and identify the NFT owner. However, because NFTs are immutable and theoretically reside indefinitely on a blockchain network, it’s unclear whether an NFT would ever be able to be ‘deleted’ or taken offline.”); Dapper Labs Comments at 14 (“‘Blocks’ on a public blockchain, including a record of an NFT, cannot be deleted, per se, without affecting the entire blockchain. Thus the ability to ‘remove’ an NFT does not really exist.”); Graphic Artists Guild Comments at 3 (“Once the NFT has been minted and sold, the market no longer be [sic] able to destroy or ‘burn’ the NFT. Unless the smart contract gives the NFT issuer admin access to the wallet, the marketplace doesn’t have the ability to access the NFT and may not have the means to contact the owner of the wallet containing the NFT.”); Art Blocks Comments at 2 (describing copying of NFTs and noting that when a copy “is minted and stored on the blockchain, it is unchangeable and it is currently impossible to remove”); Copyright Roundtable Tr. at 211:22–212:18 (Jan. 31, 2023) (Fishman, Pex) (discussing limitations of DMCA notices sent to NFT marketplaces). *But see* ABA-IPL Comments at 12 n.26 (“[I]f the actual owner or project can be found, then they could be ordered to send the NFT to a burn address so it is effectively burned from the particular blockchain. This would make the NFT and the associated content no longer available and the infringement would then cease.”). Beyond questions regarding immutability one stakeholder noted challenges in the digital ecosystem related to long term record availability. Patent Roundtable Tr at 101:16–29 (Jan. 26, 2023) (Patricia Mackenzie) (“[I]t’s also really important to remember that most of these protocols run on things like AWS, which are not necessarily things that will exist in 150 years. And that’s like an ongoing, really difficult infrastructural problem. So just keep that into consideration. Technologists like me are working as hard as we can to try to solve technical challenges of having something that can exist and be stored. Because blockchain, again, it only stores the record of the exchange. It doesn’t necessarily store the work. And trying to create a system where that work is stored as long as something like Nefertari’s tomb is an ongoing thing that we’re working on that’s not done yet.”).

¹⁷⁴ See *supra* section I.B.2.

¹⁷⁵ See *id.*

¹⁷⁶ See *id.*; see also Art Blocks Comments at 2; Dapper Labs Comments at 16–17.

¹⁷⁷ See Copyright Roundtable Tr. at 24:4–25:6 (Jan. 31, 2023) (Joseph Gratz, Morrison & Foerster) (“[T]he point I want to make is NFTs involve storing expressive works on servers accessible over the internet, and there is nothing that weird about it from a copyright infringement litigation point of view, and copyright already has the tools and statutory limitations and exceptions to understand and address it.”); A2IM et al. Comments at 3 (“Nevertheless . . . the enforcement challenges presented by NFTs do not appear to be unique to NFTs and are similar to those already present with online intellectual property infringement more generally.”).

¹⁷⁸ See, e.g., Copyright Roundtable Transcript at 251:18–252:1 (Jan. 31, 2023) (Michael Lewan, Recording Academy) (“I think it was said earlier you can’t really unmint an NFT. Once that bell has rung, it’s rung. You might be able to deplatform it, file a 512 notice. You can’t really get rid of it, so this is definitely not unique, you know, we see the same sort of stuff happening with user-generated content platforms like YouTube that are, you know, rife with 512 notices and issues with management there”).

extent a decentralized network,¹⁷⁹ and rightsholders have long reported challenges identifying infringing users of common internet platforms.¹⁸⁰

For *any* infringing copy on the internet (regardless of whether it is associated with an NFT), removing the copy from one location on the internet does not necessarily remove it from every other location. Nor is it always easy to identify the original source for the reproduction, which may be located anywhere in the world. These are familiar problems for copyright owners in the digital age, and commenters were generally optimistic that existing enforcement tools may address parallel issues in the NFT market.¹⁸¹

C. Evolving role of NFTs in the Copyright Ecosystem

Stakeholders also discussed several potential uses for NFT technology in ways that could complement features of the copyright ecosystem. Some asserted that NFTs could benefit artists, consumers, and the copyright system as a whole, while others raised both technical and policy reasons for skepticism.

1. Provenance

Several commenters highlighted the use of NFTs as recordkeeping tools to aid in documenting the provenance of creative works and copyright ownership.¹⁸² Provenance refers to the “chronological history of a work of art,” which typically is determined by tracing its chain of

¹⁷⁹ Ian Bogost, *So Much for the Decentralized Internet*, THE ATLANTIC (July 26, 2020), <https://www.theatlantic.com/technology/archive/2020/07/twitter-hack-decentralized-internet/614593/> (describing the original, decentralized design of the internet, as well as its later trend toward more centralized platforms).

¹⁸⁰ See U.S. COPYRIGHT OFFICE, SECTION 512 OF TITLE, at 164-65 (2020) (“SECTION 512 REPORT”), <https://www.copyright.gov/policy/section512/section-512-full-report.pdf> (describing rightsholders’ frustrations with using 512(h) subpoenas to identify infringers). See also Elenora Rosati, *The Localization of IP Infringements in the Online Environment: From Web 2.0 to Web 3.0 and the Metaverse*, WIPO, 35 (2023) <https://www.wipo.int/export/sites/www/enforcement/en/pdf/case-study-the-localiaztion-of-ip-infringement.pdf> (“WIPO 2023 Report on IP Infringements in the Online Environment”).

¹⁸¹ See *supra* section I.D. Tangentially, a recent WIPO-commissioned report examined IP enforcement issues from Web 2.0 to Web 3.0 and the Metaverse and concluded that “the existing legal framework—as interpreted by courts in several jurisdictions in relation to the Web 2.0 scenarios—appears to offer sufficiently robust guidance for the localization of IPR infringements, including those committed through the metaverse(s).” WIPO 2023 Report on IP Infringements in the Online Environment at 5, <https://www.wipo.int/export/sites/www/enforcement/en/pdf/case-study-the-localiaztion-of-ip-infringement.pdf>. This conclusion, however, came with the caveat that “substantial challenges might arise in terms of retrieving evidence” to tie such IPR infringements to a particular territory, and that variations in remedies and enforcement options across jurisdictions may warrant considering broader harmonization of applicable laws and jurisdictional determinations. *Id.* Cf. *infra* section III.C.

¹⁸² See, e.g., ABA-IPL Comments at 9; Ctr. For Cultural Innovation Comments at 3–4; Dr. Willis Grajales (“Grajales”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 6–7; Internet Archive Comments at 1; Michael Kasdan Comments at 7; NYIPLA Comments at 1; Scott Pollan Comments at 1; Tavarus Blackmon Art LLC (“Tavarus Blackmon Art”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 4 (Jan. 4, 2023); Matthew Mc Carter, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Feb. 6, 2023).

ownership, possession, and use.¹⁸³ These commenters cited NFTs as a way for creators and rightsholders to create an immutable record of ownership, licenses, and artistic contribution for the particular asset associated with the NFT.¹⁸⁴ Some also observed that using NFTs as recordkeeping tools may not only benefit creators and consumers but also assist with the long-term preservation of digital artifacts.¹⁸⁵

On the other hand, commenters also cautioned that NFTs' recordkeeping function can suffer from a "garbage in/garbage out" problem. That is, "if incorrect or fraudulent content is entered into the blockchain (through minting an NFT or otherwise), it remains incorrect or fraudulent information on which vendors and consumers cannot rely."¹⁸⁶ For example, one commenter noted that NFT minting platforms "often mint artists'/creators' works (*i.e.*, create the NFTs) in their own wallets before transferring the [NFTs] to either the creator or the first purchaser."¹⁸⁷ This causes the blockchain record to show the minting platform as the creator.¹⁸⁸ Another issue raised is that, while the blockchain stores a record of which wallet minted the NFT, this does not necessarily demonstrate who owns or controls that wallet, so that NFTs minted by anonymous or pseudonymous wallets may not contain a complete and usable record of ownership history.¹⁸⁹ This also makes it difficult to ascertain if the original minter "is a trusted source for the underlying asset."¹⁹⁰

¹⁸³ 1 ALEXANDRA DARRABY, DARRABY ON ART LAW § 2:60 (26th ed. 2023) ("DARRABY ON ART LAW").

¹⁸⁴ *See, e.g.*, NYIPLA Comments at 1 ("NFTs, by virtue of being a blockchain-based asset, are self-authenticating, [and] individuals may more easily verify the true owner of an NFT and whether the asset they are being presented with is authentic and of known provenance. . . . [P]rovenance and authenticity of the NFTs are more easily confirmed via blockchain technology than through traditional means."); Grajales Comments at 7 ("By tokenizing these assets, the creator can establish proof of ownership and control over the distribution and usage of their work."); Tavarus Blackmon Art Comments at 5 ("NFTs have provided a way for the business owners to create works directly for the global markets and establish ownership and provenance of unique works of Art. In the case of works that have been created with licensed contributions, NFTs provide a way for the business owner to establish copyright and trademark in the public and market use-case."); Corsearch Comments at 1 ("NFTs are commonly treated as unique digital assets that could be verified on a blockchain. They can be used to document the authenticity of an asset by providing a tamper-proof record of its ownership and provenance."); Paul Comments at 1 ("Every transaction is recorded on the public ledger, providing a clean and transparent provenance for the work, and enabling all of an artist's work and its history to be quickly and easily compiled into a digital catalogue raisonné.").

¹⁸⁵ *See* Internet Archive Comments at 1; Creative Commons Comments at 3.

¹⁸⁶ ABA-IPL Comments at 6; *see also* Copyright Alliance Comments at 13–14; Amalyah Keshet ("Keshet"), Comments Submitted in Response to Offices' Nov. 23, 2022, Notice of Inquiry at 1–2.

¹⁸⁷ ABA-IPL Comments at 7.

¹⁸⁸ *See id.*

¹⁸⁹ *See* A2IM et al. Comments at 7.

¹⁹⁰ *Id.*; *see also* Copyright Roundtable Tr. at 191:15–20 (Jan. 31, 2023) (Susan Chertkof, RIAA) ("NFT ecosystems are both decentralized and multijurisdictional. It is difficult to identify an NFT seller because their identity is often shielded. The NFT and the associated digital asset are frequently stored separately.").

Some commenters pointed to NFTs as a way to verify the authenticity of a work, as distinguished from its ownership history.¹⁹¹ They noted, however, that the “garbage in-garbage out” problem can exist in that context as well.¹⁹² As discussed in section II.A.1 above, it is possible to mint an NFT associated with a work even if the minter does not own the work or the rights to it. If an NFT is created without obtaining the proper rights, the ownership details stored within the blockchain network may contain inauthentic data.¹⁹³ Commenters noted that while some platforms require authentication of ownership, many simply facilitate transactions without verification.¹⁹⁴

2. Copyright Registration and Recordation

Several stakeholders proposed that NFTs and blockchain technology could be used to improve or enhance the Copyright Office’s registration of copyrighted works and recordation of documents pertaining to copyright.¹⁹⁵ They offered few specifics but suggested that use of these

¹⁹¹ See, e.g., Kasdan Comments at 3, 7; NYIPLA Comments at 1–2; Creative Commons Comments at 3; MPA Comments at 4–5; Copyright Alliance Comments at 13–14; MAC Comments at 6; see also 1 DARRABY ON ART LAW § 2:62(3) (“Provenance is not an authentication. Provenance is an history of an object, not an analysis of its genuineness, although provenance is relevant to authenticating objects. Experts who authenticate objects research provenance, but provenance, in and of itself, is not an authentication or a declaration of authenticity.”).

¹⁹² See Copyright Alliance Comments at 13–14; Grajales Comments at 9 (“[T]here are difficulties in ensuring authenticity, provenance, and ownership of digital items, and virtual representations of physical items in the NFT market.”); Corsearch Comments at 1 (“NFTs only provide a record of ownership and provenance, not necessarily a guarantee of authenticity. Whilst an NFT can verify that a particular item is the original item, it cannot necessarily prove that the item is genuine or not a counterfeit.”).

¹⁹³ See Copyright Alliance at Comments 13–14; Kasdan Comments at 7 (“[A]uthenticity is only guaranteed at the source when the NFT is first minted.”).

¹⁹⁴ See Copyright Alliance Comments at 14.

¹⁹⁵ See ABA-IPL Comments at 9 (noting “the possibilities for blockchain technologies to modernize the recordkeeping process for digital assets and the potential for integration into the application, registration, and similar filing processes with the Office[]” and suggesting that metadata could be imported into applications); Kasdan Comments at 7 (suggesting copyright registration certificates as a potential “use case” for NFTs as the “US Copyright Office is the source of these IP rights”); Tavarus Blackmon Art Comments at 6, 11 (“NFTs can be used in integration with the . . . [Electronic Copyright Office] to establish copyright ownership, IP Rights, transfer of rights, control and add management tools to smart contracts and enforce IP rights.”); Copyright Roundtable Tr. at 243:25–244:16 (Jan. 31, 2023) (Jeff Gluck, Gluck Law Firm). A few commenters explained how they are already using NFTs to facilitate or supplement registration of works with the Copyright Office. See *id.* at 243:23–244:04 (Jan. 31, 2023) (Jeff Gluck, Gluck Law Firm) (commenting that his company built an automated tool that files an application with the Copyright Office and generates an NFT that represents the application); Tavarus Blackmon Art Comments at 8–9 (providing an example where, in addition to associating a copyrighted work with an NFT as an off-chain asset, the copyright registration certificate for the work is also associated with the NFT). Separately, some commenters requested the office consider creating an industry-specific group registration option for NFT collections. See Copyright Roundtable Tr. at 102:21–23 (Jan. 31, 2023) (Jeremy Goldman, Frankfurt Kurnit Klein & Selz) ([T]he copyright registration system is not optimized for these types of collections. There's no intuitive way to group register a collection of digital art.”); *id.* at 262:11–19 (Jan. 31, 2023) (Ash Kernan) (“I feel the Office should give serious contemplation or consideration to creating an industry-specific group registration for NFT collections or, I guess, I should say more specifically the artworks associated therewith that recognizes and accommodates the peculiarities of NFTs and among them

technologies could expand access to services, reduce transaction costs, or provide additional security.¹⁹⁶

Other commenters expressed doubt, however, about NFT and blockchain technology's potential to improve copyright registration and recordation.¹⁹⁷ Although some viewed decentralized blockchain technology as offering access and security advantages over records managed by a single governmental entity, others saw risk in relying on the continued existence of a particular blockchain network for preservation of copyright records.¹⁹⁸ Similarly, where some commenters saw cost benefits to using NFTs, at least one noted that "transaction fees . . . that are due in order to maintain IP-protected assets on a blockchain can be high and exclusive of those who have minimal resources."¹⁹⁹ Many warned that NFT-based recordkeeping could only be as reliable as the information entered.²⁰⁰

specifically the high number of works that are often included and unique identifiers that the smart contract address.").

¹⁹⁶ See Graphic Artists Guild Comments at 5 ("[A] blockchain record is not a substitute for a copyright registration. But for visual artists who for a variety of reasons do not register their copyrights—the high cost of registration and/or volume of artwork they've created—an NFT can provide an immutable record of their claim of authorship."); Inventiv.org Comments at 1 (noting that using a decentralized ledger may improve security and access to records pertaining to copyrighted works); NamerTips Comments at 5 (observing that "blockchain technology has opened the door for broader populations to establish a record of their works and offerings on their own terms" on "[t]erms that are void of an intermediary tier structure" and that "may come with a default level of protection by way of ledger-verification"); NYIPLA Comments at 2 (noting "the benefits of using NFTs as a new form of media in which IP rights holders may fix their works include that they can easily document the authenticity of the asset based on blockchain's 'unbreakable' technology," which "theoretically" makes "verifying the seller's ownership or authority over the asset" less difficult). There was, to be clear, no allegation that the Copyright Office's records are not secure.

¹⁹⁷ See Gatto Comments at 17 (acknowledging that it is "feasible" to use NFTs to represent ownership and licenses of registered works and that "[t]here are many perceived benefits" while noting that "numerous questions should be considered in deciding whether to go down this path"); MPA Comments at 5 ("[A] well-functioning system that tracks the ownership of copyrights already exists: the Copyright Office's registration and recordation system.").

¹⁹⁸ See Keshet Comments at 2 ("[N]othing prevents an NFT platform from going out of business and shutting down its servers, wiping out everything on them."); NMPA Comments at 6 ("With respect to the 'physical' security of the digital content files, unfortunately not all NFT platforms are created equal and accessibility and security of the media files on each platform may differ. Some platforms store content on cloud servers that they control. Others use decentralized storage solutions such as the InterPlanetary File System ('IPFS'), which increases the number of servers where music content is located, but in some cases with permission-ing controls that make access and hacking more difficult."); Ctr. for Cultural Innovation Comments at 8 ("The storage of digital files is typically on the InterPlanetary File System (IPFS) rather than in the NFT itself. So to the extent the NFT has a unique underlying digital asset, the asset may not always be retrievable, and parties could lose a record of the IP being managed through the NFT.").

¹⁹⁹ App Association Comments at 2; *see also id.* at 4–5.

²⁰⁰ See Aon Comments at 1 ("Proving authenticity currently presents a challenge because the digital asset ecosystem lacks a centralized source of truth—in certain cases, any party can represent any digital artifact under any licensing scheme as their own without legal or financial consequence."); Copyright Alliance Comments at 13–14 ("A significant problem that copyright owners and creators have frequently encountered in the NFT space is that there is often no way to ensure that the creator or seller of an NFT has any authority to mint the NFT, sell it, or transfer any relevant rights to the associated asset."); Ctr. for Cultural Innovation Comments at 8 ("Just because a copyrighted work is

In the Offices' view, and as several stakeholders acknowledged, there are a number of reasons why the use of current NFT technology would not improve the Copyright Office's registration or recordation systems. First, unlike NFTs, registration practices provide strong disincentives against submitting inaccurate information, including that a registration may be cancelled by the Copyright Office²⁰¹ or deemed invalid by a court,²⁰² and criminal penalties can be assessed for knowingly making a false representation of material fact.²⁰³ No equivalent disincentives exist for including inaccurate information about copyrighted works in NFT metadata, though some commenters proposed requiring authentication and screening.²⁰⁴ Second, where information turns out to be inaccurate, the mutability of Office records is a feature, not a bug. The Office can correct records. But where NFTs are associated with inaccurate records, the technology is likely

associated with an NFT does not mean that the NFT holder has any valid rights in that work, and background research is still necessary in each instance before relying on NFTs as a marker of authority."); Copyright Roundtable Tr. at 12:25–14:01 (Jan. 31, 2023) (James Grimmelman, Cornell Law School) (observing that "paper trails can fail," but it is often not due to "technical failures in the recordkeeping system," but rather because "the information the parties attempt to record never corresponded to reality in the first place" such as in "cases involving forgery, fraud, duress, or mistake, or cases in which a transactional formality fails").

²⁰¹ See U.S. Copyright Office, *Compendium of Copyright Practices* § 212.4 (3d ed. 2021).

²⁰² See 17 U.S.C. § 411(b). Likewise, in the recordation context, the Office relies on the information provided with a submission and a court could later determine that a document containing inaccuracies is invalid. See 37 C.F.R. § 201.4(f) ("The Copyright Office will rely on the certifications submitted with a document and the information provided by the remitter on Form DCS and, if provided, in an accompanying electronic title list. The Office will not necessarily confirm the accuracy of such certifications or information against the submitted document."); *id.* § 201.4(g) ("The fact that the Office has recorded a document is not a determination by the Office of the document's validity or legal effect. Recordation of a document by the Copyright Office is without prejudice to any party claiming that the legal or formal requirements for recordation have not been met, including before a court of competent jurisdiction."); *id.* § 201.10(f)(5) ("The Copyright Office will rely on the certifications submitted with a notice and the information provided by the remitter The Office will not necessarily confirm the accuracy of such certifications or information against the submitted notice."); *id.* § 201.10(f)(4) ("The fact that the Office has recorded a notice is not a determination by the Office of the notice's validity or legal effect. Recordation of a notice of termination by the Copyright Office is without prejudice to any party claiming that the legal or formal requirements for effectuating termination (including the requirements pertaining to service and recordation of the notice of termination) have not been met, including before a court of competent jurisdiction."); see also *id.* §§ 201.4(h)(4), 201.10(f)(6)(iv) (applying same regulations to pilot program for electronic recordation).

²⁰³ See 17 U.S.C. § 506(e); U.S. Copyright Office, *Compendium of Copyright Practices* § 212.1 (3d ed. 2021).

²⁰⁴ See ABA-IPL Comments at 7 ("Looking to the future, if the Offices were involved in a minting process for approved registrations as NFTs, this could leverage the Offices as a resource for establishing a centralized authentication system with regard to verifying the creator and/or owner of copyrightable works, marks, or inventions."); Aon Comments at 3 ("Government endorsement of certain 'registries' could inform a standard of care in which those marketplaces that have aided and abetted the facilitation of fraudulent activity could face legal consequences of not having screened posted assets prior to posting for sale."); Huski.ai Comments at 5 ("The purveyors of an NFT should be required to warrant that the underlying assets are original works of authorship, when represented as such, and thus are eligible for copyright protection. Further, policy-makers should consider whether the purveyors of an NFT should be required to warrant that the associated digital assets (*e.g.*, the art, video, or music) have been fully registered with the USPTO/USCO.").

to simply perpetuate, rather than resolve, unreliability issues.²⁰⁵ NFTs are therefore more susceptible to accuracy problems than other types of copyright records.²⁰⁶

In addition, registration and recordation records maintained by the Copyright Office are neither static nor do they necessarily represent a complete record of ownership for a work, which raises practical issues about NFTs relying on filings made with the Copyright Office. A registration can be invalidated after the Copyright Office makes a registration determination²⁰⁷ or supplemented to correct or amplify information.²⁰⁸ For an NFT associated with a work to remain up to date and consistent with the registration record, it would need to regularly access updates from the Copyright Office, which could present a technical challenge. While the Copyright Office is developing a new online Enterprise Copyright System, which is expected to include application programming interface (API) functionality to facilitate transmission of updated public record information, such functionality does not yet exist.²⁰⁹ Further, as one commenter noted, “the centralization of records with a governing authority . . . provides additional benefits to address concerns with fraud, mistakes, revocation, etc. which could be challenging to address with a decentralized network.”²¹⁰ Because recordation of transfers is voluntary, not all transfers are recorded, and the public record associated with a particular work may not show its full chain of title.²¹¹ Moreover, recordation of a document pertaining to

²⁰⁵ See ABA-IPL Comments at 7 (“There is still a ‘garbage-in, garbage-out’ problem that exists, meaning that if incorrect or fraudulent content is entered into the blockchain (through minting an NFT or otherwise), it remains incorrect or fraudulent information on which vendors and consumers cannot rely. The blockchain-registered asset is corrupted at the moment of creation.”); Keshet Comments at 2–3 (“[T]here is nothing preventing the recording of false or incorrect information in an NFT (in computer jargon, GIGO or garbage in, garbage out). The word immutable means unchangeable, not indisputable.”).

²⁰⁶ See AIPLA Comments at 5–6 (“[C]urrently, NFTs typically do not document a seller’s ownership of or authority to sell an asset. A mechanism is needed to ensure that the NFT is actually minted by or on behalf of the owner or licensee of the rights therein.”); NMPA Comments at 10 (“[T]he blockchain is immutable and yet information recorded on the chain may not be verified or accurate.”).

²⁰⁷ See 17 U.S.C. §§ 410(b), 411(b); COMPENDIUM (THIRD) § 212.4.

²⁰⁸ See 17 U.S.C. § 408(d); 37 C.F.R. § 202.6. Some examples of how copyright registration records maintained by the Copyright Office may change include: a co-author who was not named in the registration as a co-claimant could file their own application to add that information to the record, see 37 C.F.R. § 202.6(d)(3)(i); a party can take issue with a prior registration by asserting an “adverse claim” that names a different party as the author and/or claimant for the work, see COMPENDIUM (THIRD) § 1808; and a party can register the unpublished version of a work and then seek a separate registration for the published version even if the two versions are exactly the same.

²⁰⁹ See ABA-IPL Comments at 5 (“The Office[] could support and promote connecting once disparate marketplaces with uniform systems, powered by blockchain or other similar API systems, and promote transparency and automation efforts. For example, by approving or endorsing specific standards for marketplaces to follow, in addition to providing an open API that allows the marketplaces to have equal access to information from the Office[], including registered works, licenses, transfers, and assignments.”).

²¹⁰ Copyright Alliance Comments at 17.

²¹¹ See 17 U.S.C. § 205; 37 C.F.R. § 201.4.

copyright is not a determination of a document’s validity or legal effect.²¹² For these reasons, to the extent that an NFT associated with a work relies on documents recorded with the Copyright Office to demonstrate the work’s chain of title, the record of ownership in the NFT may be incomplete or inaccurate.²¹³

3. Remuneration for Resale or Licensed Use

Several commenters noted that NFTs have been used by visual artists and other creators to facilitate payment of “resale royalties” for subsequent sales of their works.²¹⁴ Many countries provide a resale royalty right (or *droit de suite*) for visual artists, giving the artist a percentage of

²¹² See 37 C.F.R. § 201.4(g) (“The fact that the Office has recorded a document is not a determination by the Office of the document’s validity or legal effect. Recordation of a document by the Copyright Office is without prejudice to any party claiming that the legal or formal requirements for recordation have not been met, including before a court of competent jurisdiction.”); *id.* § 201.10(f)(4).

²¹³ While some commenters suggest that NFTs and blockchain technology could serve as an alternative to registration and recordation with the Copyright Office, others pointed out legal and policy considerations that limit their usefulness for these purposes. First, to the extent that minting an NFT associated with a work is used as an alternative to copyright registration, it would not convey the same statutory benefits. For example, a certificate of registration issued by the Copyright Office constitutes prima facie evidence of a work’s validity and gives a claimant—including any author or any party that owns one or more of the exclusive rights in the work, regardless of whether they are named in the certificate—the right to institute an infringement action as well as to seek the remedies of statutory damages and attorney’s fees. See 17 U.S.C. §§ 410(c), 411(a), 412; Copyright Alliance Comments at 17; Graphic Artists Guild Comments at 8 (“To fully enforce their copyrights, artists will need to register the copyrights to [their] works.”). Second, using an NFT to transfer ownership of a copyrighted work may not satisfy the Copyright Act’s “signed writing” requirement for transfers. See 17 U.S.C. § 204(a); Ctr. for Cultural Innovation Comments at 5 (“[C]opyright law requires a signed writing for valid transfers and the sale of a NFT may not always satisfy this requirement.”); INTA Comments at 30 (“Traditional copyright law states that transfer of ownership or assignment can only be done in writing signed by the assignor or his represented agent. However, NFTs basically being smart contracts are devoid of written transfer of rights.”). Third, even if a transfer executed on the blockchain using a smart contract is considered valid, it would not convey the statutory benefits of recordation with the Copyright Office, namely, imputing constructive notice of the transfer and providing priority over a conflicting transfer of rights. See 17 U.S.C. § 205(c), (d). Fourth, NFTs cannot effectuate statutory termination, which permits authors or their heirs to terminate grants of rights in works after a statutorily-prescribed period by complying with certain formalities, including recordation of a notice of termination with the Copyright Office. See 17 U.S.C. §§ 203, 304(c); Ctr. for Cultural Innovation Comments at 5 (“[C]opyright law allows creators a termination window 35 years after a transfer of copyright, and it is unclear whether this is practicable or easily enforceable on the blockchain, or appropriately communicated to creatives and purchasers.”). *But see* Lootsma Comments at 2 (“Smart contracts can be used for automatic termination based on time or other oracle based indicators.”); Copyright Roundtable Tr. at 109:6–13 (Evans, Penn State Dickinson Law) (proposing “decentralized autonomous copyright termination”).

²¹⁴ Decentralized Future Council Comments at 4–5; MAC Comments at 4–5; Copyright Roundtable Tr. at 88:6–18, 140:1–8 (Jan. 31, 2023) (Yayoi Shionoiri, City Lights Law); Copyright Alliance Comments at 12; Ctr. for Cultural Innovation Comments at 6–7; INTA Comments at 25. See also Marie Clopterop and Enrico Bonadio, *NFTs: promisingly transformational, yet fraught with IP pitfalls—Part II*, KLUWER COPYRIGHT BLOG (June 21, 2023), <https://copyrightblog.kluweriplaw.com/2023/06/21/nfts-promisingly-transformational-yet-fraught-with-ip-pitfalls-part-ii/>.

the proceeds each time a physical copy is sold,²¹⁵ enabling them to share in any increase in its value over time.²¹⁶

Although current U.S. law does not provide a resale royalty right, NFTs can offer an opportunity for creators to require continuing remunerations via smart contract. NFT smart contracts allow for these remunerations²¹⁷ to be encoded and triggered when transactions occur on the blockchain,²¹⁸ so that the minter is entitled to collect a certain percentage of all the subsequent sales.²¹⁹

Examining the frequency of continuing remunerations in the context of NFTs, Professor Edward Lee and Nelson Rosario have noted that such contracts are already widely used, reporting that “[i]n a survey of the Top 25 NFT projects by sales volume, the vast majority—23 projects, or 92 percent—have elected to receive resale royalties.²²⁰ In their view, “[resale royalties are] one of the single largest, positive shifts that NFTs have opened up for artists compared to the traditional art markets.”²²¹

Similar uses of NFT smart contracts may be available in the music context. As with visual art transactions, these contracts may be structured to provide the creator a portion of the revenue each time the NFT is resold. One commenter noted that some music creators and platforms have offered fans the ability to purchase “NFTs linked to fractionalized royalty interests” in a specific song or recording (*e.g.*, streaming royalties).²²² If the royalty stream increases, the value

²¹⁵ See U.S. COPYRIGHT OFFICE, *RESALE ROYALTIES: AN UPDATED ANALYSIS* (2013), App. E, <https://www.copyright.gov/docs/resaleroyalty/usco-resaleroyalty.pdf> (listing resale royalty statutes from various countries).

²¹⁶ *Id.* at 31–32; see also *id.* at 2–4 (supporting enactment of a resale royalty right). The Berne Convention provides authors of original works of art and original manuscripts an inalienable right to an interest in any subsequent sale of the work after the first transfer by the author, but that requirement is optional and reciprocal. See Berne Convention for the Protection of Literary and Artistic Works art. 14*ter*, Sept. 9, 1886, as revised July 24, 1971, and as amended Sept. 28, 1979, S. TREATY DOC. NO. 99-27, 1161 U.N.T.S. 3 (1986) (“Berne Convention”).

²¹⁷ Typically, these rates fall between 5 to 10% of the NFT purchase price in subsequent sales of visual arts. Copyright Roundtable Tr. at 139:16–19 (Jan. 31, 2023) (Yayoi Shionoiri, City Lights Law).

²¹⁸ *Id.* at 88:14–18, 139:14–16 (Yayoi Shionoiri, City Lights Law).

²¹⁹ It is important to note that although these subsequent remunerations are often colloquially referred to as “resale royalties,” this is a term of art whose definition and use in treaties and statutes may differ substantially. See Berne Convention at art.14*ter*.

²²⁰ Professor Edward Lee and Nelson Rosario (“Lee & Rosario”), Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2022) (noting a median royalty of 5% of the sales price and an average royalty of 4.184% and that sales on one marketplace, OpenSea, yielded a total of over \$1.5 billion in resale royalties from July 2021– July 2022).

²²¹ Lee & Rosario Comments at 2 (quoting Tyler Hobbs, the creator of Fidenza, in Andrew Hayward, *Royalties Chaos Shows Ethereum NFT Market ‘More Serious’ Than Solana: Fidenza Artist Tyler Hobbs*, DECRYPT (Oct. 18, 2022), <https://decrypt.co/112333/ethereum-nft-market-more-serious-solanafidenza-artist-tyler-hobbs>). See also Copyright Roundtable Tr. at 88:10–18 (Jan. 31, 2023) (Yayoi Shionoiri, City Lights Law).

²²² MAC Comments at 3.

of the NFT will as well, and the creator will have the opportunity to share in the profits generated by future sales. In addition, some commenters suggested that NFTs may provide an opportunity to track and manage the division of royalty interests among multiple parties and, if NFTs ultimately become divisible, further monetize works.²²³

Stakeholders cautioned that the payment of resale royalties may be difficult to enforce and easily circumvented, especially when subsequent NFT sales take place on different marketplaces or “off-chain.”²²⁴ Payment of resale royalty is not guaranteed and depends on whether the marketplace where the NFT is resold recognizes and honors the obligation.²²⁵ They noted that NFT marketplaces currently lack this type of standardization,²²⁶ but some mentioned possible solutions and work being done to address this concern.²²⁷ However, over the past year,

²²³ *Id.* at 5 (“[B]lockchain technology allows for royalty splits amongst the various collaborators to be programmed into the [smart contract] . . . , such that the artist’s and collaborators’ respective royalty shares are immutably and irrevocably encrypted on the blockchain, making royalty entitlements simple to trace whenever the NFT is resold to another buyer.”); Copyright Alliance Comments at 12 (“Copyright lawyers have predicted that, if NFTs do become divisible, a purchaser could sell fractional shares of an NFT and the copyright owner could receive a percentage of both the resale of the NFT and each subsequent individual interest in that NFT. This may create additional avenues for artists, fans, and rightsholders to further participate in the monetization of copyrighted works.” (footnote omitted)); *See also* Copyright Roundtable Tr. at 206:6–13 (Jan. 31, 2023) (Kayvan Ghaffari, MakersPlace) (with a smart contract there are capabilities at present where different rights-holders or different creators can actually be listed as the creator of the particular NFT. And so, if you had, for example, a music NFT, you could actually list out each of those individuals on the NFT and allocate their royalty stream based on any preexisting licensing agreements”); Copyright Roundtable Tr. at 260:8–16 (Jan. 31, 2023) (Mike-Charles Nahounou, musician) (You can share royalties on the engineer or audio engineer who made that and who I always think is undervalued who made that engineering sonic decision to make that 808 boom more than that. It made that, you know, all the creators in the creative process can now participate in a new model where, you know, record labels, of course, they get disintermediated, but they can still work with the community because the dollars aren't going anywhere.”).

²²⁴ *See supra* note 137; *supra* note 164.

²²⁵ Ctr. for Cultural Innovation Comments at 6, 9 (“[R]esale royalties may not run with the token if it moves between marketplaces. Currently this appears to depend on the terms of service of the marketplaces”); Copyright Roundtable Tr. at 140:1–6 (Jan. 31, 2023) (Yayoi Shionoiri, City Lights Law) (“However, royalty payments are enforceable on a marketplace level, and it is always possible to take the negotiation of a transaction off chain. So I think it’s interesting to think about interoperability among marketplaces for the enforcement of royalty rights going forward.”); Lootsma Comments at 3; Gatto Comments at 12 (“Often the payment of the resale royalty is automated via the NFT smart contract, But [sic] depending on where the NFT is resold, some marketplaces do not recognize this and the resale royalty is not paid.”); *see also* ABA-IPL Comments at 8 (“There is a widespread misconception that these secondary market rights are included in the structure of the NFT itself, when in fact they are added in a separate ‘smart contract’ that is layered on top and must be recognized and honored by the marketplace through which the secondary sale takes place.”); *See supra* section I.C; Lee & Rosario Comments at 3–4 (“Even though OpenSea had NFT sales worth only 50 percent or less of the total ETH volume among marketplaces, OpenSea was responsible for 75 percent or more of the resale royalties collected.”).

²²⁶ MAC Comments at 5.

²²⁷ Ctr. for Cultural Innovation Comments at 10 (mentioning “consumer protection-type laws and regulations that require platforms to notify them clearly of the deal they are entering.”); Professor Lee & Rosario Comments at 4; Gatto Comments at 12; Callum Lootsma Comments at 3 (noting perpetual resale royalties are “subject to marketplaces/purchasers enforcing the royalties, though this is a problem that is being worked on and will likely be solved in the near future”).

NFT marketplaces, including most recently OpenSea, have moved to royalty-optional models and no longer enforce the mandatory collection of resale fees.²²⁸

4. Digital Rights Management

A few commenters raised the possibility that NFTs and smart contracts could be used as a form of digital rights management (DRM)—digital tools used to communicate and control the terms on which consumers can access and use copyright works.²²⁹ One commenter provided several examples of entities currently using NFTs in this way, including startups that allow authors to “publish literary works as part of an NFT” and “prevent piracy and other unauthorized uses through the incorporation of digital rights management tools” which may present “new ownership paradigms through which smart contracts can include specific terms as to whether a purchaser can alienate content, share it with others . . . and so on.”²³⁰

Another roundtable participant, however, cautioned against the use of NFTs as “another type of DRM or way to close off information.”²³¹

D. Summary

Although NFT technology is novel, the copyright issues it raises generally are not. To the extent an NFT contains or links to an unauthorized copy of a copyrighted work, the creation or marketing of that NFT will implicate copyright law the same way as any unauthorized reproduction or display.²³² Existing enforcement tools are available to address NFT-linked

²²⁸ See Devin Finzer, Changes to creator fees on OpenSea, OPENSEA (August 17, 2023), <https://opensea.io/blog/articles/creator-fees-update>; Jacob Kastrenakes, A key feature of NFTs has completely broken, THE VERGE (Aug. 17, 2023), <https://www.theverge.com/2023/8/17/23836440/nft-creator-royalty-fees-are-dead-opensea-optional> (noting that “[a]s the market for NFTs collapsed, marketplaces have lowered their own trading fees and stopped enforcing royalty fees in order to attract sellers.”); Brady Dale, Market Royalties for NFT Creators on the Way Out, AXIOS (Nov. 3, 2022), <https://www.axios.com/2022/11/03/market-artist-royalties-nft-creators>.

²²⁹ App Association Comments at 6. Copyright Roundtable Tr. at 253:6–10 (Jan. 31, 2023) (Catanzaro, St. Thomas University, College of Law); see also Remaster, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Feb. 6, 2023).

²³⁰ Copyright Alliance Comments at 17–18 (quoting Eileen Brown, *New Platform Uses NFTs as a Gateway for Digital Rights Management*, ZDNET (Mar. 4, 2021), <https://www.zdnet.com/finance/blockchain/new-platform-uses-nfts-as-a-gateway-for-digital-rights-management/>); see also *id.* at 18 (pointing to emerging projects within the e-book sector that use NFTs as DRM by relying on smart contracts to “include specific terms as to whether a purchaser can alienate content, share it with others, create derivative works, and so on”); ABA-IPL Comments at 9–10 (commenting that when associated with a smart contract pool or embedded with a script signature, NFTs could be used for such DRM as license term expiration, facilitation of periodic payments, and other payments with defined or verifiable triggering events).

²³¹ Copyright Roundtable Tr. at 65:12–21 (Jan. 31, 2023) (Hillary Brill, Decentralized Future Council).

²³² See *supra* sections II.A.2 and II.A.3.

infringements just as they are for other online infringements.²³³ Most stakeholders agreed at this point there does not appear to be any need to change copyright law to address NFTs.²³⁴

In the comments that the Offices received, the most frequently cited challenges were not about copyright itself but about consumer confusion and contracts. Stakeholders recommended additional public education to ensure that consumers know what rights and obligations they are obtaining with the transfer of an NFT.²³⁵ Some also recommended greater transparency and standardization around licenses.²³⁶

²³³ See *supra* section II.B; see also Copyright Roundtable Tr. at 80:2–9 (Jan. 31, 2023) (Joseph Gratz, Morrison & Forrester) (“I want to return to technology neutrality and note that almost none of the really interesting things about NFTs directly implicate copyright law The resale royalty stuff doesn’t directly implicate copyright law. The things that implicate copyright law are the most boring things about NFTs, like storing the JPEG on a web server.”); *id.* at 247:3–6,17–19 (Jan. 31, 2023) (Jennifer Pariser, MPA) (“The copyright law does not actually have very much to say at all about NFTs Just because NFTs are associated with copyrighted works doesn’t mean they themselves implicate copyright law.”).

²³⁴ See *id.* at 247:20–22 (Jan. 31, 2023) (Jennifer Pariser, MPA) (“We need also to resist the temptation to morph copyright law in line with consumer expectations.”); *id.* at 249:4–6 (Jennifer Pariser, MPA) (“The copyright law as it exists today is adequate to handle the needs of the small number of copyright issues presented by NFTs.”). *But cf.* Hayleigh Boshier Comments at 2 (Jan. 9, 2023) (“The laws need to be updated that regulate the NFT platforms and providers to protect creators and consumers of NFTs.”); Adam Sherman and Maureen Kelly, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2023) (“[C]opyright protection should be amended to explicitly cover the creation of NFTs. Specifically, the exclusive rights set forth in 17 U.S.C. § 106 should be amended to include the creation of NFTs.”); see generally Brian Frye, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 3–4 (Feb. 3, 2023).

²³⁵ See, e.g., Creative Commons Comments at 3 (“The primary IP-related challenge is education.”); Ctr. for Cultural Innovation Comments at 1 (“Artists need better tools to understand and influence the ways NFT marketplace terms impact their intellectual property rights, including the ability to assess terms, determine licenses, as well as choose or change platforms.”); Decentralized Future Council Comments at 7 (“With confusion surrounding the connection between IP rights and NFT use, education efforts regarding what IP rights are granted when purchasing an NFT should be promoted by both industry and government. Education should be advanced by and presented to all stakeholders involved, including the platforms that mint or sell NFTs, the creators of NFTs, and the users. The government can be very helpful in this regard, starting with developing guidelines for NFT users and creators regarding IP rights.”); Huski.ai Comments at 8 (“The Offices should consider creating new educational resources covering IP basic rights, e.g., providing basic IP educational FAQs, checklists and toolkits, for use by artists, entrepreneurs, and the digital assets industry.”); MPA Comments at 6 (“IP owners and NFT marketplace platforms should work together to educate consumers as to what they have obtained by buying an NFT. In particular, NFT platforms must develop and publish clear terms of use that spell out the rights associated with the purchase of an NFT.”); NMPA Comments at 11; Copyright Roundtable Tr. at 247:25–248:4 (Jan. 31, 2023) (Jennifer Pariser, MPA) (“We need to actually remind and educate consumers and platforms what rights they are getting and what they are not getting, and, generally speaking, they are not getting any of the 106 copyright rights.”).

²³⁶ See *supra* section II.A.4; see generally *infra* note 309 (discussing transparency in the context of NFTs).

Discussions of NFTs' opportunities, similarly, focused on contract as much as copyright. Many commenters opined on NFTs' potential use to deliver resale royalties to artists.²³⁷ Some were more sanguine than others,²³⁸ but in any event the ability of NFTs to deliver resale royalties depends primarily on cross-platform technological and contractual issues rather than copyright law.²³⁹

Finally, while there were a few proposals to use NFT or blockchain technology within the copyright system for registration or recordation, there were at least as many comments highlighting significant practical, technical, or legal drawbacks to doing so.²⁴⁰ The Copyright Office concludes that the current drawbacks are substantial and does not at this time see a positive role for deploying NFT or blockchain technology for registration or recordation.

²³⁷ See *supra* section II.C.3.

²³⁸ See *id.*

²³⁹ See *id.*

²⁴⁰ See *supra* section II.C.2.

III. TRADEMARKS

A. *Evolving Role of NFTs in the Trademark Ecosystem*

Trademarks perform the same functions in NFT markets as they do in other markets: They identify the source of goods and services and distinguish the goods and services of one party from those of others.²⁴¹ For example, trademarks can be used to indicate the source of underlying assets associated with NFTs, such as digital art, video clips of iconic sports moments, or physical shoes.²⁴² Trademarks can also indicate the source of services, such as unique entertainment experiences or club memberships, access to which is represented by NFTs.²⁴³

Accordingly, NFTs and NFT marketplaces present new opportunities for brand owners “to strengthen their brand identity and also to reach a new type of public.”²⁴⁴ Many brand owners have already entered this ecosystem and are using their trademarks in connection with products and services tied to NFTs.²⁴⁵

²⁴¹ See Lanham Act § 45; 15 U.S.C. § 1127 (definition of “trademark”).

²⁴² INTA Comments at 3 (stating “NFTs can be linked to digital or physical assets, each of which can be bought or sold under a trademark identifying source or origin” and providing these and other examples of digital assets that can be associated with NFTs); *see also id.* at 19 (providing details regarding the National Basketball Association’s trademark registrations for the mark NBA TOP SHOT for downloadable virtual goods and digital media, for providing entertainment services in the nature of non-downloadable digital collectibles for use in digital environments, and for digital collectible services, all of which the NBA offers in connection with NFTs).

²⁴³ Dapper Labs Comments at 6 (“An NFT can represent proof of membership in a group or organization, and grant the holder access to certain benefits.”); Trademark Roundtable Tr. at 85:30–86:2 (Jan. 24, 2023) (Joe Guagliardo, Dentons US) (“NFTs, if you view them as really a digital wrapper, at a fundamental level, it’s a digital wrapper for digital goods, for physical goods, and/or for services. And obviously those goods, services, digital assets can be branded.”).

²⁴⁴ *Id.* at 103:2–3 (Jan. 24, 2023) (Giulia Maienza, Herbert Smith Freehills); *see also id.* at 86:26–28 (Jan. 24, 2023) (Joe Guagliardo, Dentons US) (noting that NFTs offer “a way for brands to connect on chain, i.e., blockchain, and off chain data, to bridge brick and mortar and Web2 with the Web3 and the metaverse.”).

²⁴⁵ See INTA Comments at 19, (describing the NBA’s use of trademarks in connection with offering video clips of famous sports plays associated with NFTs); Trademark Roundtable Tr. at 80:21–81:4 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS) (“We released our first NFT collection in 2021, which was an NFT as a digital artwork asset. . . . Our second release was with a move-to-earn platform that encourages and inspires consumers to move. . . . Our third NFT release was coupled with a physical shoe that could only be purchased with cryptocurrency.”); *id.* at 103:4–7 (Jan. 24, 2023) (Giulia Maienza, Herbert Smith Freehills) (“So in this specific case in which we assisted companies, the minting of NFTs was related to redeemable products. . . . for example, to prestigious wine and spirits, and with different key advantages for the marketing of these products.”); *id.* at 89:8–25 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt Kurnit Klein & Selz) (“Our clients are incorporating NFTs into their businesses and their brand building in a variety of ways. Some sell NFTs that point to unique digital art, often to be displayed in digital wallets. . . . Others are using NFTs in advertising, incorporating their brands into digital artworks for purchase or giveaway, or allowing NFTs to be exchanged for entry into private events. Beyond this, brands are exploring offerings in the digital world that incorporate their current offerings in the physical world. For example, companies are organizing all kinds of clubs - book clubs, wine clubs, art clubs. They’re shipping books, wines, sculptures to their members through the traditional mail, while sending NFTs that verify the authenticity of their goods and also giving club members access, through

Section I.D, *supra*, discussed the many ways NFTs can be used by copyright, patent, and trademark owners alike to manage and enforce their IP rights. However, some of these and other applications of NFTs are particularly relevant to trademark owners. For example, NFTs and associated transaction records stored on blockchain networks can be used to demonstrate the provenance of digital and real-world products and to track products' chains of title to help mitigate counterfeiting.²⁴⁶ One commenter noted that NFTs can be used to “chart a clear pathway of ownership from the creator, to the consumer” and provided a hypothetical example of a luxury goods company issuing a serialized NFT for each handbag offered in a high-end line, which could allow resellers to provide the associated NFT as verification of the provenance of the bag.²⁴⁷

NFT transaction records on blockchain networks may also be helpful in connection with the U.S. trademark registration process. For example, sales records associated with an NFT could indicate dates of use for a trademark used in connection with the NFT's underlying asset, which could help establish a mark's date of first use, that a mark has been in use for a period of time sufficient to achieve acquired distinctiveness, or that a mark has not been abandoned.²⁴⁸

In addition, brand owners can use NFTs, in combination with smart contracts, to manage trademark rights. One commenter explained that these technologies can be used to design, collect payments associated with, and enforce sophisticated trademark licensing regimes.²⁴⁹

While most commenters agreed that NFTs present new opportunities for trademark owners, many also discussed the uncertainty and challenges arising from this emerging technology. Trademark-specific issues arising from the development and use of NFT technology can generally be grouped into the following categories: (i) issues associated with obtaining trademark registrations for NFT-related goods and services; (ii) uncertainty regarding whether

those NFTs, to exclusive events with the authors and the winemakers and the artists. Lots of exciting things happening.”).

²⁴⁶ INTA Comments at 3 (“NFTs can also be connected to real-world physical assets in an attempt to fight counterfeits. For example, NFTs are currently being used to authenticate expensive sneakers or rare bottles of alcohol.”); Trademark Roundtable Tr. at 103:7–16 (Jan. 24, 2023) (Gulia Maienza, Smith Herbert Freehills) (“The creation of NFTs and their circulation on blockchain platforms facilitated, for example, to guarantee safety and to show authenticity, integrity, and traceability of the products and all the related documents. . . . This experience has shown how NFT[s] could be used as an effective measure, also to tackle counterfeiting.”); *id.* at 71:15–17 (January 24, 2023) (Moish Peltz, Falcon Rappaport & Berkman) (“There [are] so many use cases from authentication, anti-counterfeiting, and so forth that really provide such potential for brands.”).

²⁴⁷ Pollan Comments at 1.

²⁴⁸ Trademark Roundtable Tr. at 64:15–23 (Jan. 24, 2023) (Jessica Neer McDonald, Neer McD PLLC / Blockish IP) (“So as far as [trademark] opportunities go, the ability to have timestamped evidence of actual use and frequency of use is extremely helpful from the perspective of a brand owner and those that may be considering ‘did I come after this person?’ By being able to trace things back to a public blockchain, it can be extremely valuable. Not just for showing dates of first use, but also things like acquired distinctiveness [and] secondary meaning. . . . as well as an abandonment defense.”).

²⁴⁹ *Id.* at 20:28–21:21 (Jan. 24, 2023) (Morgan Reed, App Association) (describing the utility of smart contracts to design and implement trademark licensing regimes in the context of franchises).

a trademark registration for traditional goods or services can be used to prevent uses and registration of the same mark in connection with similar digital goods or services tied to NFTs, and vice versa; and (iii) trademark infringement and enforcement challenges associated with NFTs and NFT platforms.

B. Federal Registration of Trademarks Involving NFTs

1. Obtaining a U.S. Trademark Registration

Several commenters requested guidance and provided recommendations regarding how to describe, classify, and demonstrate use in commerce appropriately for NFT-related goods and services in applications for federal trademark registration.

a. Appropriate Identification and Classification of NFT-related Goods and Services

The USPTO's Trademark Next Generation ID Manual (ID Manual) sets forth a non-exhaustive list of identifications of goods and services the USPTO considers acceptable in trademark registrations. The ID Manual is updated regularly as market practices evolve and currently contains numerous entries for NFT-related goods and services. In general, the USPTO requires that identifications for NFT-related goods and services describe the underlying assets or services being offered with specificity. Relevant examples from the ID Manual include:

- “Class 009: Downloadable image files containing {indicate subject matter or field, e.g., trading cards, artwork, memes, sneakers, etc.} authenticated by non-fungible tokens (NFTs);”
- “Class 016: Paintings authenticated by non-fungible tokens (NFTs);” and
- “Class 35: Provision of an online marketplace for buyers and sellers of {indicate goods, e.g., sneakers, paintings, etc.} authenticated by non-fungible tokens (NFTs).”

Several commenters recommended that the USPTO provide additional examples of acceptable identifications for NFT-related goods and services in the ID Manual, to better accommodate the broad spectrum of such goods and services.²⁵⁰ Others recommended re-evaluating the wording of current ID Manual entries. For example, some commenters noted that while the ID Manual uses “downloadable” in sample identifications for certain NFT-related digital assets, often such

²⁵⁰ *Id.* at 88:10–14 (Jan. 24, 2023) (Joe Guagliardo, Dentons US) (“So, for example, when does a class 9 downloadable image of a painting authenticated by an NFT become class 42 software? When it actually has some more dynamic and interactive qualities, or a financial service, or an interactive game? Again, a different class, a different description, or all of the above?”); *id.* at 91:26–31 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt Kurnit Klein & Selz) (“We hope the USPTO encourages trademark registration, but requires that identifications be narrowly tailored to the specific goods and services offered by the registrant, allowing space for new entrants to register their own marks for their own narrowly-tailored goods and services, and that the PTO also takes care to understand the technology that underlies these products.”); *id.* at 112:17–28 (Jan. 24, 2023) (Moish Peltz, Falcon Rappaport & Berkman (“And so that's where it gets frustrating when you start thinking about, how do I describe a goods and services description for that? And it's being shoehorned into something that may fit one slice of what an NFT is, but it's prohibitive, perhaps, of a broader function as it exists today and much more so as it may exist going forward.”)); *id.* at 76:1–17 (Jan. 24, 2023) (Alfred Steiner, Meister & Steiner) (providing proposals for three new identifications for NFT-related services).

assets are not downloadable, but rather stored on a third-party platform and merely *accessible* by the purchaser.²⁵¹ Another indicated that while NFTs do not always perform an “authenticating” function, the USPTO requires the phrase “authenticated by non-fungible tokens (NFTs) in identifications.”²⁵²

Several commenters also provided views regarding international class designations for goods and services associated with NFTs. The United States is a party to the Nice Agreement,²⁵³ and the USPTO adheres to the Nice Classification system, an agreed-upon, numbered international classification system for goods and services in trademark registrations. Under the Nice Classification system and USPTO practice, classification of goods and services associated with NFTs is determined according to the characteristics of the underlying assets or services, not the NFT itself.

Many commenters urged the USPTO to consider the full spectrum of goods and services associated with NFTs when determining international class designations. Some emphasized that classification designations need to distinguish the variety of goods and services that can be offered via NFTs and blockchain technology.²⁵⁴ One recommended classifying non-downloadable assets associated with NFTs as services rather than goods.²⁵⁵ The same commenter proposed specific identifications, and international class designation

²⁵¹ See Jayaram Law, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 4 (Feb. 6, 2023) (“Jayaram”) (“The current ID manual suggests that most “virtual goods” are downloadable image files authenticated by NFTs. But this may not be a good fit for a vast majority of assets, which are typically viewed online but never downloaded in the way application software or the video file containing a movie might be.”); see also Trademark Roundtable Tr. at 98:6–10 (Jan. 24, 2023) (Eliana Torres, Nixon Peabody) (“You’re buying the NFT, you get the certificate of authentication for that image. . . [which] is hosted on a separate third-party website or URL or URI. And that is a problem because this seems to be more of a non-downloadable image.”).

²⁵² See Gatto Comments at 9 (“I will note that in some NFT-related trademark applications, some examiners have required that the description specify that the NFT ‘authenticates’ digital assets. As noted above, this is inaccurate.”).

²⁵³ The Nice Agreement (Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks) is an international agreement that establishes a standardized system for classifying goods and services associated with trademark registrations.

²⁵⁴ See App Association Comments at 5 (“The USPTO should assess all potential on-chain assets and define what class they would be registered under within the Nice Classification.”); Trademark Roundtable Tr. at 114:27–30 (Jan. 24, 2023) (Peter Jackson, Greenberg Glusker) (“And I think that it’s important not to cabin the discussion to one or another or some group because it really may differ depending on the nature of what is being provided or whether it’s goods or services.”); *id.* at 113:19–21 (Jan. 24, 2023) (Addam Kaufman, Oracle) (highlighting the differences among NFT-related goods and services, and stating “[I] think in terms of classification, we need to look deep into what they’re actually offering and not just classify it as an NFT in one category of a product.”); *id.* at 47:30–48:11 (Jan. 24, 2023) (Maria Scungio, International Association for the Protection of Intellectual Property (“AIPPI”)) (“[T]here are other opportunities in the service classes—class 35, 36, 41, and 43—to seek protection for such activities as virtual fashion shows, virtual hotels and restaurants, financial exchanges, and marketplaces for digital goods.”).

²⁵⁵ *Id.* at 75:16–76:2 (Jan. 24, 2023) (Alfred Steiner, Meister & Steiner) (“The USPTO’s Trademark ID Manual characterizes these things in Class 9, as downloadable files authenticated by NFTs, but I don’t think that accurately describes what an NFT buyer is buying. . . . So it would be more accurate to put the identification of goods and services for a typical NFT project in [service] Class 42”).

recommendations, for various services NFTs can facilitate.²⁵⁶ Others urged the USPTO to advocate for international standardization of classification policies for NFT-related goods and services.²⁵⁷

On April 20, 2023, the USPTO added several new identifications for NFT-related goods and services to the ID Manual. These new entries included identifications for physical goods and various services associated with NFTs. In addition, in May of 2023, the USPTO successfully advocated at the Thirty-Third session of the Nice Committee of Experts (“the Committee”) for more uniform classification policies for goods and services associated with NFTs. As a result, the Committee added new identifications to the Nice Alphabetical List in Classes 9, 35, and 42.²⁵⁸ The Committee also added an identification for “clothing authenticated by non-fungible tokens [NFTs]” in Class 25,²⁵⁹ which represents the Committee’s acknowledgement that physical goods can be associated with NFTs and provides guidance on how such goods should be classified.

b. Appropriate Evidence of Trademark Use in Connection with NFT-related Goods and Services

Generally, to obtain or maintain a federal trademark registration, an applicant or registrant must demonstrate that it is using the mark in U.S. commerce.²⁶⁰ This is done via “specimens of use” that show the mark as used in commerce on or in connection with the goods and services identified in the application or registration.²⁶¹

Several commenters stated trademark applicants and registrants face uncertainty regarding how the requirement for specimens should be met in cases involving NFTs and suggested that trademark offices provide guidance explaining which types of specimens are appropriate for different types of goods and services tied to NFTs.²⁶² In addition, two commenters suggested

²⁵⁶ See *id.* at 75:31–76:17 (Jan. 24, 2023) (Alfred Steiner, Meister & Steiner) (recommending specific identifications of services in Classes 42 and 45, including “in class 45, ‘copyright licensing of digital files associated with nonfungible tokens’ or simply ‘copyright licensing.’”).

²⁵⁷ See, e.g., *id.* at 53:31–54:2 (Jan. 24, 2023) (Susan Stearns, INTA) (“We’d like to see the USPTO work with the international communities to have harmonization in registration classifications.”).

²⁵⁸ See Report of the Nice Union Committee of Experts, Thirty-Third Session (2023) at 4. (<https://www3.wipo.int/classifications/nice/niclef/public/en/project/CE330/annex/5/pdf>).

²⁵⁹ *Id.*

²⁶⁰ See Lanham Act §§ 1, 8; 15 U.S.C. §§ 1051(a), 1058 (1946).

²⁶¹ See Trademark Manual of Examining Procedures (“TMEP”) § 904.

²⁶² See, e.g., Fédération Internationale des Conseils en Propriété Intellectuelle (FICPI) Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 2 (Feb. 3, 2023) (“... clear guidance should be given by trademark offices on ways of proving use of NFTs, both in opposition and cancellation proceedings, and also in relation to demonstrating use and intent of use in jurisdictions where the use is a prerequisite for trade mark registration.”); Trademark Roundtable Tr. at 95:26–28 (Jan. 24, 2023) (Mark Jansen, Fenwick) (“[W]e need some further guidance on non-traditional specimens, and I think that would go a long way in giving brand owners peace of mind that they have the requisite use.”); *id.* at 81:8-10 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS) (“We’re facing a number of challenges as it relates to NFTs and most of the challenges relate to uncertainty. One issue is proving use with the USPTO.”).

that guidance is needed regarding how to appropriately demonstrate continued use in commerce after one-of-a kind or limited-edition assets tied to NFTs (e.g., unique digital collectibles) have been sold or discontinued.²⁶³ One questioned whether the USPTO should permit registration of a trademark for the provision of such unique, limited-edition goods or, instead, treat them like book and film titles for trademark registration purposes.²⁶⁴

One practitioner, summarized the sentiments of many commenters when he urged the USPTO and trademark practitioners to “[c]arefully consider...descriptions, classifications, [and] allegations of use in commerce, as...NFTs become more common, and indeed and most importantly, more dynamic.”²⁶⁵

In 2022, the USPTO provided NFT-specific training to trademark examining attorneys regarding NFT technologies, NFT platforms, goods and services associated with NFTs, and appropriate identifications and specimens of use for such goods and services. The USPTO provided a training webinar on the same issues for trademark practitioners in December 2022, and subsequently posted the video recording of that webinar on the USPTO website.²⁶⁶ The USPTO will continue to update its NFT-specific training and guidance as NFT technology continues to develop and new issues arise.

2. Scope of Protection Afforded a U.S. Trademark Registration

In general, U.S. trademark law prohibits registration of marks that are so similar to a previously registered mark, or an unregistered mark that was previously and continuously used, as to be likely to cause consumer confusion.²⁶⁷ To determine whether an applied-for mark is sufficiently similar to an existing mark, USPTO trademark examining attorneys must conduct a “likelihood of confusion” analysis,²⁶⁸ in which they consider, among other things, the similarity of: the marks; the goods or services with which the marks are, or are intended to be, used; and the channels of trade in which the goods or services travel.²⁶⁹ Federal courts must also conduct a

²⁶³ See *id.* at 81:14–17 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS) (“It’s also not clear that we would be able to use the same NFTs that were minted with our maintenance and renewal applications if the company decided to discontinue releasing new collections.”); *id.* at 76:21–26 (Jan. 24, 2023) (Alfred Steiner, Meister & Steiner) (asking “whether and how an NFT creator can show continued use for an NFT collection after it sells out. Popular NFT collections may sell out in hours or even minutes. Once that happens, is the NFT creator still offering goods or services for sale in commerce?”).

²⁶⁴ *Id.* at 77:10–13 (Jan. 24, 2023) (Alfred Steiner, Meister & Steiner) (“This takes me to my third and final topic, whether NFT collection titles should immediately qualify for trademark registration or instead be treated like book and film titles, which require a series to merit registration.”).

²⁶⁵ *Id.* at 88:19–22 (Jan. 24, 2023) (Joe Guagliardo, Dentons US).

²⁶⁶ The video recording of this webinar is available at <https://www.uspto.gov/about-us/events/registering-trademarks-newer-technologies-nfts-blockchain-cryptocurrency>.

²⁶⁷ See 15 U.S.C. § 1052(d).

²⁶⁸ See TMEP § 1207.01.

²⁶⁹ See *In re E. I. du Pont de Nemours and Co.*, 476 F.2d 1357, 177 USPQ 563 (C.C.P.A. 1973) (setting forth these and additional factors to be considered when the USPTO conducts a likelihood of confusion analysis).

similar “likelihood of confusion” analysis to determine whether trademark infringement has occurred.²⁷⁰

NFT sellers can tie a variety of goods and services to NFTs, including digital versions of physical products offered in traditional markets. Multiple commenters explained that stakeholders currently face significant uncertainty regarding whether the USPTO and federal courts will, when conducting likelihood of confusion analyses, consider physical goods offered outside of NFT markets as similar to digital versions of those goods associated with NFTs.²⁷¹ Several commenters reported that this uncertainty stymies brand owners and practitioners in their efforts to make decisions about trademark portfolio management and enforcement strategies.²⁷²

For example, one commenter asked whether a trademark registration for physical clothing would be cited by the USPTO as a prior conflicting mark during examination of an application for the same mark for digital clothing associated with NFTs.²⁷³ Concerns focused on whether “brands have to expand the scope of their IP portfolios to cover NFTs, possibly embarking on expensive global registration projects,” or if the zone of natural expansion covers use of their marks in this new digital medium.²⁷⁴

Some practitioners suggested that bad actors could take advantage of this uncertainty. According to one practitioner, bad actors could “free ride” off of the goodwill of existing registered marks for physical goods by obtaining registrations for identical marks for similar

²⁷⁰ See 15 U.S.C. § 1114(1); see also *Polaroid v. Polaroid*, 287 F.2d 492 (2nd Cir. 1961) (setting forth the factors courts use to conduct a likelihood of confusion analysis pursuant to trademark infringement claims).

²⁷¹ Trademark Roundtable Tr. at 80:8–10 (Jan. 24, 2023) (Natalia Aranovich, Aranovich Law Firm) (“I think a digital asset was never confused before with clothes or a tennis shoe. But now we're going to see more of that.”); *id.* at 94:5–10 (Jan. 24, 2023) (Mark Jansen, Fenwick) (“So the place to start is whether protection for physical products extends to the virtual good counterparts, which I know is an issue that's come up multiple times today. Basically, can an IP owner stretch their existing trademark rights to cover electronic or virtual products, for instance, NFTs?”); *id.* at 72:25–30 (Jan. 24, 2023) (Frederic Rocafort, Harris Bricken) (“I would like to focus on some of the practical issues regarding trademarks and NFTs that we are encountering in our practice. The first concerns the issue of relatedness between goods as it is addressed in the NFT context. The question is really to what extent should an analysis of relatedness consider or ignore the barrier that exists between physical goods and virtual goods?”).

²⁷² See *id.* at 56:13–17 (Jan. 24, 2023) (Thomas Brooke, INTA) (“If we're just talking straight up filing a trademark application and trying to get it registered . . . how much of a zone of expansion should the examining core grant to prior registrants? What's going to happen in oppositions?”); *id.* at 69:8–14 (Jan. 24, 2023) (Michael Geller, DLA Piper) (“When NFTs started to explode around this time last year, we saw a flood of new filings in class 9, some in other classes, but mostly 9, associated with NFTs. So the question at that point becomes, as the previous presenter noted, how do you protect a brand asset when class 9 is being flooded, but the brand owner may provide particularly goods in class 18, class 25, any other goods class?”); *id.* at 54:13–18 (Jan. 24, 2023) (Susan Stearns, INTA) (“Will a standard fashion application, for example, for [Class] 25 in apparel, be enforceable in a digital format, whether it's an NFT or other digital format seen in the ‘metaverse’? Those are issues that our practitioners are grappling with on a day-to-day basis that we really feel need[] to have some clarity.”).

²⁷³ *Id.* at 56:18–22 (Jan. 24, 2023) (Thomas Brooke, INTA).

²⁷⁴ INTA Comments at 23.

digital goods in the NFT space.²⁷⁵ One expressed concern that bad actors may engage in “NFT trademark cybersquatting” by registering trademarks “just so that they can profiteer from it later.”²⁷⁶

Multiple commenters noted that this uncertainty has led some brand owners with existing trademark registrations for physical goods and services to seek new registrations of the same marks for goods and services associated with NFTs, in order to expressly secure protection in the NFT space.²⁷⁷ However, one practitioner pointed out that not all brand owners have the resources or the legally-required intent to use to file such applications.²⁷⁸

Many commenters indicated they are closely monitoring cases in federal courts addressing trademark infringement issues, including likelihood of confusion questions, in the NFT space,²⁷⁹

²⁷⁵ See Trademark Roundtable Tr. at 83:17–22 (Jan. 24, 2023) (Angela Kalsi, Greensfelder, Hemker & Gale) (“So how then will the USPTO treat applications in NFT classes for identical or confusingly similar marks that are registered in different classes that under a traditional relatedness of goods analysis, may not lead to a 2(d) refusal, but in reality, it could mean granting registration to someone trying to free ride on a brand's goodwill in the NFT space[?]”); see also *id.* at 67:19–24 (Jan. 24, 2023) (Nedeen Nasser, Nasser Law) (“For instance, a luxury brand may not currently be in class 9 - downloadable media - but if someone applies for it using that luxury brand name, there's really nothing stopping them from getting an NFT under that name. We just have to do a better job - or we'll have to do a good job of - making sure that those NFTs don't get granted ownership in the wrong hands.”).

²⁷⁶ *Id.* at 67:9–13 (Jan. 24, 2023) (Nedeen Nasser, Nasser Law).

²⁷⁷ INTA Comments at 45 (“We have also observed that certain companies are focused on defensive trademark filings to make sure they can protect against use of their marks in connection with NFTs and other virtual goods by third parties. To support these defensive filings, some companies are working to create their own virtual goods, even where the sale of virtual goods is not a core part of the business. This appears to be, at least in part, the result of uncertainty surrounding whether traditional goods and services will be deemed sufficiently related to NFTs and virtual goods such that companies can prevent third parties from using their marks in this new space.”); Trademark Roundtable Tr. at 94:8–17 (Jan. 24, 2023) (Mark Jansen, Fenwick) (discussing “the surge and trend in major companies refiling applications for their marks for virtual goods and services”); *id.* at 81:10–14 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS) (“Asics is in a spot where we are minting NFTs and would potentially be able to submit one of our NFTs as a specimen of use. But that is a different story for brands that haven't yet entered the space, but may want to defensively file an application.”); *id.* at 54:11–13 (Jan. 24, 2023) (Susan Stearns, INTA) (“There's a lot of discussion on defensive filings that brand owners feel that they're compelled to do now because of the uncertainty in this space.”); see also Patent Roundtable Tr. at 95:15–17 (Jan. 26, 2023) (Pamela Norton, TitleChain) (“What's happening today is brands don't know how to participate. They're filing new trademark filings, trying to cover themselves in the metaverse, and they can't figure out what to do.”).

²⁷⁸ Trademark Roundtable Tr. at 94:17–19 (Jan. 24, 2023) (Mark Jansen, Fenwick) (“... not every brand owner has the budget or the requisite intent to use to file in all these new verticals.”).

²⁷⁹ See *id.* at 79:25–28 (Jan. 24, 2023) (Natalia Aranovich, Aranovich Law Firm); *id.* at 83:5–11 (Jan. 24, 2023) (Angela Kalsi, Greensfelder, Hemker & Gale); *id.* at 81:30–31 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS); *id.* at 49:14–17 (Jan. 24, 2023) (Maria Scungio, AIPPI).

such as *Hermès Int'l v. Rothschild*²⁸⁰ and *Nike v. StockX*.²⁸¹ Multiple commenters noted these cases could provide needed guidance to the USPTO and stakeholders about how federal courts will apply existing trademark laws in the context of NFTs, including likelihood of confusion analyses comparing real world physical goods with digital goods associated with NFTs.²⁸²

However, the absence of clear, controlling judicial precedent deepens the uncertainty as to how likelihood of confusion analyses will be undertaken in the NFT space. Several commenters recommended that the USPTO provide guidance to trademark examining attorneys and stakeholders on this question, with one practitioner adding that such guidance would also help ensure examining attorneys consistently apply the likelihood of confusion analysis in this context.²⁸³

Notably, following the USPTO's Trademarks and NFTs roundtable and the close of the public comment period for the Offices' Study, in *Hermès Int'l v. Rothschild*, a federal jury found that artist Mason Rothschild's use of the term "MetaBirkin" to market and sell his digital artwork—which was associated with NFTs and consisted of digital depictions of Hermès' physical "Birkin" bags—caused dilution of and infringed Hermès' "BIRKIN" trademarks.²⁸⁴ Following the jury verdict in *Hermès*, the district court issued an opinion and order on the parties' post-trial motions, which, in part, granted the plaintiff's motion for a permanent injunction against the defendant.²⁸⁵

²⁸⁰ *Hermès Int'l v. Rothschild*, No. 1:22-cv-00384 JSR (S.D.N.Y. Feb. 8, 2023) (*see infra* discussion of jury verdict and subsequent opinion and order of the court).

²⁸¹ *Nike v. StockX*, No. 22-cv-00983 (S.D.N.Y.) (Nike, Inc. alleges the defendant's unauthorized use of Nike's trademarks in connection with defendant's digital sneaker assets, which are associated with NFTs, infringes Nike's trademarks).

²⁸² *See, e.g.* Trademark Roundtable Tr. at 94:20–22 (Jan. 24, 2023) (Mark Jansen, Fenwick) ("And the outcome of some of the recent cases that are percolating, like the Hermès challenge to Rothschild's "MetaBirkin," will likely inform some of the strategy going forward."); *id.* at 83:3–11 (Jan. 24, 2023) (Angela Kalsi, Greensfelder, Hemker & Gale) ("And for clients who are not so interested in the NFT world, they want to ensure their IP will be protected too. So, like all of us here, I'm watching with interest the *Hermes* case of the MetaBirkins and the *Nike v. StockX* case addressing the first sale doctrine. And it will be important to get clarity on these legal issues going forward. As companies are increasingly tokenizing their physical products, they will need to know how and if their NFTs would be distinct from the physical assets to which they correspond.").

²⁸³ *See, e.g., id.* at 107:25–108:5 (Jan. 24, 2023) (Peter Jackson, Greenberg Glusker) ("I think that we've seen a pretty inconsistent application in examination standards to date . . . [a]nd so I think that the entire examination pool could use more clarity around the ways that NFTs should be analyzed from a [likelihood of] confusion and registrability perspective."); *id.* at 94:3–5 (Jan. 24, 2023) (Mark Jansen, Fenwick) ("To that end, I think some guidance on the scope and the limits of trademark rights [would] benefit brand owners and accused infringer and platforms alike.").

²⁸⁴ *Hermès Int'l v. Rothschild*, No. 1:22-cv-00384 JSR (S.D.N.Y. Feb. 8, 2023).

²⁸⁵ *Hermès Int'l v. Rothschild*, No. 1:22-cv-00384 JSR (S.D.N.Y. June 23, 2023), (The court's opinion and order stated "[G]iven the likelihood that the continued sale and marketing of the MetaBirkins NFTs will generate confusion as to source among the public, Rothschild and any 'other persons who are in active concert or participation with him,' including his associated, business partners, and others he has commissioned to market the MetaBirkins NFTs, are enjoined from using the Birkin marks or otherwise misleading the public about the source of the MetaBirkins NFTs...").

The finding of trademark infringement suggests at least one U.S. district court would consider digital, NFT-related depictions of physical products to be sufficiently similar to physical products not associated with NFTs to substantiate a finding of likelihood of confusion. Further, the finding of trademark dilution suggests that an owner of a famous trademark for physical goods can successfully bring a trademark dilution claim to prevent unauthorized uses of its mark in connection with digital goods tied to NFTs.

C. Trademark Infringement and Enforcement

Sections I.D and II.B, *supra*, discuss IP enforcement challenges—common to copyright, patent, and trademark holders alike—presented by NFT technology. A discussion of enforcement challenges specific to trademark owners follows below.

Trademark misappropriation and infringement are common on NFT platforms.²⁸⁶ One provider of IP enforcement solutions stated that trademark infringement is the most common type of IP infringement it has observed on NFT platforms,²⁸⁷ the level of IP infringement it observes on NFT marketplaces is often higher than that on other online channels,²⁸⁸ and one of its clients has reported “over 100,000 infringing NFTs . . . per month to the NFT marketplaces.”²⁸⁹ The same commenter described the impersonating tactics infringers employ, including using third-party trademarks on or in connection with collections of assets underlying NFTs, in NFT descriptions, and in user account or digital wallet names.²⁹⁰ In addition, a technology industry association warned that bad actors misappropriate trademarks to solicit, and then exploit, consumers’ personal information and urged the Offices to consider this risk in the context of NFTs.²⁹¹

The lack of controlling judicial precedent regarding whether a trademark registration for physical goods can be enforced against use of that mark on similar digital goods tied to NFTs complicates enforcement efforts. One commenter noted that brand owners are not confident NFT platforms will take down unauthorized uses of a mark in connection with digital goods based on a trademark registration for similar physical goods.²⁹²

²⁸⁶ See, e.g., A2IM et al. Comments at 11 (“To date, the RIAA has sent over 400 infringement takedown notices to NFT marketplaces for NFTs that infringe our members’ trademarks or copyrights.”); Trademark Roundtable Tr. at 12:14–16 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch) (“Ninety percent of takedown requests sent by the IP owners that we work with are targeting trademark-infringing content and are based on trademark rights.”).

²⁸⁷ *Id.* at 11:3–4 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch).

²⁸⁸ *Id.* at 12:6–8 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch).

²⁸⁹ *Id.* at 12:9–11 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch).

²⁹⁰ See *id.* at 12:27–29 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch).

²⁹¹ App Association Comments at 4 (“The Offices should consider how the following common IPR violation scenarios will apply to the use of NFTs...Disregarding trademark rights, an infringer will seek to use an app’s name or trademarked brand to trick users into providing their information to the infringer for exploitation.”).

²⁹² Trademark Roundtable Tr. at 81:19–24 (Jan. 24, 2023) (Jacquelyn Knapp, ASICS) (“We don’t know if our trademarks in standard classes will always be accepted by platforms to take down unauthorized or counterfeit NFTs.”).

Another form of trademark misuse on NFT platforms is the unauthorized inclusion of trademarks in blockchain-based domain names (sometimes referred to as Web3 domain names). Blockchain-based domain names are simple, human-readable identifiers for digital addresses on blockchain networks.²⁹³ They can identify the location of a blockchain-based website, application, or digital wallet.²⁹⁴ They can also function as a digital identity.²⁹⁵

Blockchain-based domain names can be utilized by trademark owners to promote brands and build presences in NFT marketplaces.²⁹⁶ However, many commenters reported that the unauthorized use of trademarks in these domain names was a major concern. One commenter observed that there are “an infinite number of ways for a bad actor to incorporate a famous, well known, or even other brand into a blockchain domain name.”²⁹⁷ The same commenter detailed the potential harms that infringing blockchain-based domain names cause, including consumer confusion, which can lead to consumers mistakenly sending cryptocurrency or other NFT assets to an impostor's wallet.²⁹⁸ Because they can identify commercial locations on blockchain networks and NFT platforms such as websites, apps, and sellers and purchasers’

Will platforms require a trademark registration that specifically covers NFTs or other digital goods? Will the registration from any country be sufficient, or will it be something else entirely?”).

²⁹³ See INTA Comments at 22 (“Web3 domain names are classified as Utility NFTs. Web3 domain names. . . map user-friendly identifiers to blockchain-based digital addresses.” According to the commenter, and providing examples of popular Web3 domain extensions include Ethereum’s “.ETH,” Unstoppable Domain’s “.CRYPTO” and “.NFT.”); Trademark Roundtable Tr. at 16:7–8 (Jan. 24, 2023) (Elizabeth Grabowski, Unstoppable Domains) (“Web3 domains function as a unique identifier on the blockchain. They can serve as an identifier for a decentralized web address and to identify crypto wallets, simplifying cryptocurrency payment routing by replacing long, unintelligible crypto wallet addresses with a simple human-readable address.”); see also Patent Roundtable Tr. at 15:27–28 (Jan. 26, 2023) (Giovanna Fessenden, Hamilton, Brook, Smith & Reynolds) (“The internet is what we call Web2, and the blockchain is Web3.”).

²⁹⁴ Trademark Roundtable Tr. at 11:31–12:2 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch) (“[Web3 domain names] can be used to create digital identities linked to a crypto wallet, create a website, or build decentralized applications.”).

²⁹⁵ INTA Comments at 22 (stating the primary uses for Web3 domain names are digital wallets, usernames, and digital identities); Trademark Roundtable Tr. at 16:12–18 (Jan. 24, 2023) (Elizabeth Grabowski, Unstoppable Domains) (“Currently, our customers can use their domain as a base-level digital identity using the Web3 domain to verify social media accounts and display an NFT profile picture. They can also use their Web3 domain as a universal login ID for a number of crypto applications that have integrated with Unstoppable Domains.”).

²⁹⁶ See INTA Comments at 3; Trademark Roundtable Tr. at 89:26–90:6 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt Kurnit Klein & Selz) (“In addition to branding NFTs with their trademarks, brands are opening digital wallets and associating them with blockchain domain names that incorporate their trademarks, associating those domain names with social media handles and with their websites. . . . and by using their trademarks, they're adding a layer of trust for consumers that are sending or receiving cryptocurrency or other NFT assets to or from the brand's wallets. So, because of the otherwise anonymous and unregulated nature of Web3, brands' abilities to use their trademarks and consumers' abilities to rely on those trademarks as source indicators is even more critical.”).

²⁹⁷ *Id.* at 91:12–14 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt Kurnit Klein & Selz).

²⁹⁸ *Id.* at 91:14–16 (Jan. 24, 2023) (Kimberly Maynard, Frankfurt Kurnit Klein & Selz).

digital wallets, another commenter warned that infringing blockchain-based domain names “cause a higher risk of potential scams.”²⁹⁹

Multiple commenters reported that the improper use of these domain names also takes the form of cybersquatting,³⁰⁰ with one suggesting that “the sunrise of Web3 domains has created a new era of cybersquatting.”³⁰¹

Although one blockchain-based domain name registrar reported that it attempts to reserve domain names that include registered trademarks for verified trademark holders,³⁰² there are no centralized procedures for ensuring trademarks are not misused in this space.³⁰³ In addition, while the Internet Corporation for Assigned Names and Numbers (ICANN) has an established dispute resolution mechanism³⁰⁴ to address trademark-related conflicts involving internet domain names, no such mechanism exists in the blockchain-based domain name context.³⁰⁵

²⁹⁹ *Id.* at 12:2–3 (Jan. 24, 2023) (Svetlana Ilnitskaya, Corsearch); *see also* AIPLA Comments at 8 (“Blockchain domains can be particularly dangerous in the hands of an infringer because they can link directly to a wallet that can be used to steal consumer funds by imitating the brand owner.”).

³⁰⁰ AIPLA Comments at 5; Trademark Roundtable Tr. at 78:18–80:17 (Jan. 24, 2023) (Natalia Aranovich, Aranovich Law Firm); *id.* at 100:30–101:1 (Jan. 24, 2023) (Addam Kaufman, Oracle).

³⁰¹ *Id.* at 100:31–101:1 (Jan. 24, 2023) (Addam Kaufman, Oracle).

³⁰² *See id.* at 18:12–15 (Jan. 24, 2023) (Elizabeth Grabowski, Unstoppable Domains) (“We are endeavoring to protect the interests of trademark holders by making domains associated with a trademarked term unavailable for purchase on our website. We release these domains only to verified trademark holders.”); *see also id.* at 109:22–110:6 (Jan. 24, 2023) (Jessica McDonald, Neer McD PLLC / Blockish IP) (stating “not all [Web3 domain name registrars] are created equal,” and explaining that some such registrars reserve Web3 domain names for trademark owners, and at least one Web3 domain name protocol allows trademark owners with existing Internet domain names to use those domain names as their Web3 domain name).

³⁰³ *See id.* at 40:1–3 (Jan. 24, 2023) (Thad Chaloeintiarana, ABA-IPL) (“blockchain domains . . . currently don’t have any centralized authority for enforcement [of trademark rights]”).

³⁰⁴ ICANN’s Uniform Dispute Resolution Policy (UDRP).

³⁰⁵ *See* AIPLA Comments at 5 (“Blockchain domains . . . are not subject to ICANN or other centralized procedures for cancelling or transferring domains. The only way for the brand owner to obtain custody of the blockchain domain using its TM may be to track down the owner of the NFT associated with the blockchain domain and negotiate with the owner.”); *see also* Trademark Roundtable Tr. at 18:7–11 (Jan. 24, 2023) (Elizabeth Grabowski, Unstoppable Domains) (explaining that due to the technical features of blockchain, an NFT representing a Web3 domain name cannot be recalled by a third party once it is minted, which complicates efforts to establish a centralized brand ownership dispute resolution mechanism).

D. *Commenter Recommendations for Best Practices, Education, and Policy Surrounding Trademarks and NFTs*

1. **Best Practices**

As discussed in previous sections of this Report, several commenters proposed best practices and policies that NFT platforms and sellers could adopt to help protect IP owners' rights and ensure consumers understand precisely what they are purchasing with an NFT. Some recommended that NFT platforms establish processes to verify that NFT sellers own the assets they offer, and the trademark rights therein.³⁰⁶ Others urged NFT platforms and sellers to provide clear information to consumers about the uniqueness of the assets and NFTs they offer³⁰⁷ and to clearly identify what IP rights in underlying assets will be transferred upon each sale.³⁰⁸ One commenter provided a more detailed recommendation that NFT platforms and sellers encode information about IP rights that accompany a digital asset into NFTs and make that information accessible to prospective purchasers via a pop-up message or similar mechanism.³⁰⁹

In addition, one commenter suggested that, to inform consumers and aid trademark owners in identifying infringers, NFT minters should disclose their identities.³¹⁰ Another proposed that NFT platforms develop tools to enable IP owners to scan for infringement at the platform scale and request removal of infringing assets, and that platforms develop reasonable practices to

³⁰⁶ See AIPLA Comments at 5 (“Currently, NFTs typically do not document a seller's ownership of or authority to sell an asset. A mechanism is needed to ensure that the NFT is actually minted by or on behalf of the owner or licensee of the rights therein.”); Huski.ai Comments at 5 (“The person or entity offering an NFT should warrant that they have the sufficient, clear legal rights to the corresponding underlying collateral, such as IP assets, including any copyright or trademarks associated with the NFT transaction, including the underlying asset.”); NMPA Comments at 5–6.

³⁰⁷ A2IM et. al. Comments at 12–13 (“There are a variety of IP-adjacent issues that should be considered in connection with NFTs. These include . . . [d]evelopment of uniform consumer disclosures related to the uniqueness of an NFT in a given marketplace and whether access to the underlying digital asset is available through other means on the public internet.”).

³⁰⁸ Trademark Roundtable Tr. at 50:22–26 (Jan. 24, 2023) (Victoria Sheckler, RIAA) (“NFT sellers and marketplaces must ensure that they and their buyers have adequate information about the scope of IP rights that are being conveyed with an NFT that's associated with an underlying digital asset, and what rights are reserved.”).

³⁰⁹ AIPLA Comments at 6 (“Future solutions should allow for licensing rights that come with the digital asset linked to the NFT to be programmed into the metadata that runs with the NFT and accessible through a popup or some other reliable, automated, simple measure.”).

³¹⁰ Trademark Roundtable Tr. at 51:27–52:10 (Jan. 24, 2023) (Victoria Sheckler, RIAA) (“Proof of ownership of the token doesn't tell you if the minter is a trusted source of the underlying asset...and whether the minter has the rights to grant the IP licenses or rights in the underlying asset. . . . To address these issues, legitimate minters in the music industry often . . . provide related information on their websites to clearly state who minted the NFT, what IP rights are being conveyed to the buyer, and what limitations and conditions apply to those rights. We think that the inclusion of this additional information is important for transparency and accountability purposes.”).

stop repeat infringers.³¹¹ Several commenters also recommended the creation of a centralized mechanism to settle trademark disputes involving blockchain-based domain names that would be modeled on ICANN's Uniform Dispute Resolution Policy and applicable to all NFT marketplaces.³¹²

2. Agency Education and Guidance

Many commenters recommended that government agencies provide guidance and education to their workforces, industry stakeholders, and consumers on various matters. Some urged agencies to educate consumers regarding the IP rights to an underlying asset that flow to a purchaser with the sale of an NFT;³¹³ whether exceptions to IP laws, such as fair use and the first sale doctrine, apply to digital assets associated with NFTs;³¹⁴ and how to protect themselves against fraudulent or inauthentic NFT offerings.³¹⁵

In addition, several commenters urged the USPTO to create and publish guidance documents for trademark examining attorneys, practitioners, and industry stakeholders. As discussed above, proposals included: guidance for practitioners and industry stakeholders regarding appropriate identifications, classifications, and specimens of use for trademark applications with goods and services associated with NFTs;³¹⁶ training for trademark examining attorneys on how to conduct a proper likelihood of confusion analysis when a mark at issue involves goods or services that are associated with NFTs;³¹⁷ and associated guidance for stakeholders on how the USPTO determines whether physical goods are similar to digital goods associated with

³¹¹ See A2IM et. al. Comments at 10.

³¹² INTA Comments at 34 (“[I]t may be convenient to harmonize rules dealing with blockchain technologies and create an authority (similar to ICANN) to deal with controversies on a simple and centralized way. Otherwise, enforcing resolution in the many jurisdictions which may be involved may be a big challenge.”); Trademark Roundtable Tr. at 91:18–21 (Jan. 24, 2023) (Kimberly Maynard, Greensfelder, Hemker & Gale) (“We need laws or procedures, such as those already employed by WIPO for standard domain names, that will allow brands to stop nefarious uses of their trademarks in blockchain domain names.”); see also *id.* at 29:2–4 (Jan. 24, 2023) (Thomas Barrett, EnCirca) (“I do think that the industry will have to agree on a uniform trademark dispute process similar to the ICANN [UDRP].”).

³¹³ Decentralized Future Council Comments at 7 (“[E]ducation efforts regarding what IP rights are granted when purchasing an NFT should be promoted by both industry and government.”).

³¹⁴ *Id.*

³¹⁵ Trademark Roundtable Tr. at 28:10–17 (Jan. 24, 2023) (Dorothy Haraminac, GreenVets LLC and Kiribex) (“[T]here are people that come to me who have lost their life savings because they've fallen for a scam, a scam smart contract that masquerades as the real thing. They send all of their money to that thing, thinking it's the thing they've heard about in the news, because there's not any protection for that, and they have no understanding for how to verify that protection either. So some kind of guidance for the end user there would be really useful.”).

³¹⁶ See *supra* section III.B.1.

³¹⁷ See *supra* section III.B.2.

NFTs.³¹⁸ One commenter suggested that in the absence of guidance on the likelihood of confusion analysis, the USPTO should consider reviving a pilot program that allowed trademark owners to update their registrations to include digital versions of the physical goods identified in their registrations.³¹⁹ Another commenter noted that NFT creators also use trademarks and requested that the USPTO issue guidance targeted to such creators and to NFT resellers and collectors.³²⁰

3. Are New Laws Necessary?

Commenters generally urged that legislators exercise caution when considering new laws to protect trademark rights in the context of NFTs.³²¹ Many suggested new laws would be premature at this time because NFT technology is still new and changing rapidly.³²² One expressed the view that Congress should allow the NFT industry to self-regulate.³²³

³¹⁸ See *supra id.*

³¹⁹ Trademark Roundtable Tr. at 94:22–95:2 (Jan. 24, 2023) (Mark Jansen, Fenwick) (“But a possible stopgap measure that the Trademark Office might consider implementing is a fresh version of its Technology Evolution Pilot Program that allows brand owners to amend the goods and services identified in their registrations. So you’ll recall that this program allowed brand owners who were providing the same fundamental goods and services through an updated means, method or format to basically update their descriptions to cover these evolved goods and services. So if you’re making printed children’s books, you were all of a sudden eligible to amend to downloadable electronic children’s books if you no longer provided them in that printed format.”).

³²⁰ *Id.* at 9:31–10:7 (Jan. 24, 2023) (Dorothy Haraminac, GreenVets and Kiribex) (“The general theme I’ve noticed is that NFT creators and trademark holders are somehow presented as being at odds. That theme is a myth. NFT creators need a way to protect, use, and transfer their creations. They have a mechanism already through the Trademark Office, so I’d like to see additional guidance from the USPTO directly targeted to NFT creators, resellers, and collectors.”); see also Patent Roundtable Tr. at 84:4–8 (Jan. 26, 2023) (Lucinda Lewis, Car Culture, Inc.) (suggesting that government agencies should “educate creators on how they can express their IP, and smart contracts.”).

³²¹ See, e.g., Trademark Roundtable Tr. at 55:28–30 (Jan. 24, 2023) (Susan Stearns, INTA) (“[W]ithin the framework of existing laws, we should look to see where those solutions are already there, as opposed to rushing, as a prior panelist spoke about, creating a rush to new things.”).

³²² A2IM et. al. Comments at 3 (“We also caution the Offices against recommending changes in copyright or trademark law that are unique to NFTs while this still developing technology remains in its relative infancy.”); Trademark Roundtable Tr. at 71:17–20 (Jan. 24, 2023) (Moish Peltz, Falcon, Rappaport & Berkman) (“There will be a time, I think, like we saw with the DMCA or the ACPA, where there is a need to tweak or modernize the laws. That time may come. I don’t think we’re close to that time yet.”); *id.* at 61:20–25 (Jan. 24, 2023) (Victoria Sheckler, RIAA) (“[I]n response to your initial question about does the law need to be changed, I think we would urge caution at this point with respect to straight up copyright and trademark law. This is an emerging technology, just as other emerging technologies, and we need to wait to see how things develop.”).

³²³ *Id.* at 23:9–13 (Jan. 24, 2023) (Thomas Barrett, EnCirca) (“And so my message here is really for those folks in Congress that are under pressure to do something about the meltdown of various cryptocurrency platforms such as FTX and Genesis is, by all means, pass legislation to regulate cryptocurrency, but give NFTs a chance to self-regulate itself to protect trademark rights.”).

Many commenters also remarked that current IP laws provide mechanisms that appear to be sufficient to address IP rights in the NFT ecosystem.³²⁴ One provider of trademark enforcement solutions in NFT marketplaces noted that it has been successful in addressing observed infringements on NFT platforms with existing legal frameworks.³²⁵

While most commenters did not recommend the enactment of new laws, some suggested that clarifications to existing laws may be helpful and that international agreements may need to be updated in the future to accommodate NFT technology.³²⁶

E. Potential USPTO Use of NFTs in the Trademark Context

Several commenters raised the possibility that the USPTO could mint, issue, and record NFTs representing ownership of trademark registration certificates.³²⁷ As described by one commenter, the use of NFTs to issue and record trademark registration certificates on a blockchain could provide greater transparency and provenance for registrations and provide a tamper proof record that could lessen fraudulent activity.³²⁸ The same commenter further

³²⁴ See, e.g., A2IM et. al. Comments at 10, (“In general, NFTs do not appear to pose unique issues that would require a change in U.S. trademark or copyright law at this time.”); CCIA Comments at 3, (“Current IP laws are sufficient and working. New contexts and technologies do not necessarily require new, bespoke rules. Existing laws and regulations around IP enforcement and ownership have been enacted after thorough debate, tested in various scenarios, and proven valid for decades. And as we have seen over time, the current U.S. intellectual property system has allowed for strong IP protections to co-exist with the emergence of innovative technologies.”).

³²⁵ Corsearch Comments at 3 (“Corsearch’s current focus is the protection of IP rights on online NFT marketplaces, and we have been successful so far in addressing observed infringements within the existing legal frameworks.”).

³²⁶ See, e.g., ABA-IPL Comments at 13 (stating, in part, that “[e]xisting IP laws include mechanisms which may be adequate to enforce IP within the context of NFTs in certain situations” and that the “Anticybersquatting Consumer Protection Act [ACPA] may have some utility with respect to infringing web3 domain names” but that “ACPA likely should be reexamined in light of the emergence of decentralized NFT domain names to ensure that trademark owners have a way to protect IP rights in this area.”); AIPLA Comments at 7 (indicating that current IP laws are relevant but potential enhancements to the DMCA should be considered); App Association Comments at 7 (expressing that while existing IP laws may apply to some conduct on NFT marketplaces, uncertainties exist about their application and stating that consideration should be given into how to integrate the protection of NFT offerings into existing international treaties and future international agreements).

³²⁷ See, e.g., ABA-IPL Comments at 9 (“It is likely premature, but the certificates of registration associated with copyrighted works and trademarks as well as issued letters patent could themselves be minted as NFTs by those offices, and the chains of title when updated in the relevant office could be updated in the blockchain associated with the NFT. Doing so could assist in authenticating the ownership of at least U.S. IP rights in the context of due diligence for mergers and acquisitions and in recording licenses as smart contracts associated with the NFT assets.”); Kasdan Comments at 7 (“Some potential use cases that could be of interest to the USPTO are NFTs for registration certificates of copyrights, trademarks, and patents.”); Trademark Roundtable Tr. at 82:18–25 (Jan. 24, 2023) (Angela Kalsi, Greensfelder, Hemker & Gale) (“As an IP practitioner, I am really excited about the potential nonfungible tokens bring to our field. For instance. . . the possibility that one day trademark registration certificates could be issued as NFTs.”).

³²⁸ *Id.* at 38:23–28 (Jan. 24, 2023) (Thad Chaloeintiarana, ABA-IPL) (“NFTs could allow the Office to provide applicants with greater transparency and provenance of their trademark registrations. The use of NFTs could enable the Office

suggested that such a system could also facilitate fast, accurate confirmations of trademark registrations' statuses and chains of title and, if adopted by IP offices in other countries, could facilitate the secure exchange of information between offices and eliminate the need for trademark owners to present certified copies of registrations to foreign IP offices.³²⁹

However, several others raised concerns with using NFTs to represent ownership of registration certificates. One questioned the need for such a system and indicated that if an NFT-based registration system is created alongside the current system, disparities could arise between the two systems' records that would cause legal uncertainty.³³⁰ The same commenter questioned whether building an entirely new NFT-centered system is the most efficient way to ensure interoperability among national IP offices and whether trademark registrants would have sufficient knowledge about NFTs and blockchains to utilize those technologies' authentication features.³³¹ Another expressed concern about whether the USPTO would be able to effectively cancel NFTs representing trademark registrations and suggested that the USPTO would have to create and operate its own NFT platform to do so.³³²

to create a tamper-proof and immutable record of the registration and make it difficult for anyone to falsify certificates or to claim ownership of trademarks that aren't theirs.”).

³²⁹ *Id.* at 38:29–39:22 (Jan. 24, 2023) (Thad Chaloeintiarana, ABA-IPL) (“NFTs could make it easier to perform due diligence by automating the tracing of the original owner and chain of title of a trademark as the ownership information would be . . . reported not only on the USPTO’s registration and assignment records, but also on the blockchain, which would make it much more easily accessible. Similarly, NFTs associated with registrations and timely updates to the blockchain by the USPTO could facilitate real time confirmation of the status of the registration as active, which would make it easier for trademark information to be used in smart contracts. Moreover, the implementation of NFTs associated with certificates of registration could increase security and efficiency by eliminating, or at least reducing first, the need for physical certificates to be sent by mail . . . In the future, if and when trademark offices in other countries adopt NFT technologies, the USPTO’s use of NFTs in connection with registration certificates could facilitate the secure exchange of information between offices and enable users to present to foreign trademark offices, a link to their NFT in place of a certified copy of the registration.”).

³³⁰ *Id.* at 41:29–42:14 (Jan. 24, 2023) (Rebecca Tushnet, Harvard Law School) (“This leads me to have some cautions about some of the proposals. For example, if you mint an NFT and you also issue a registration that exists in the non-NFT legal system, inherently you create the potential for a gap opening up between the NFT and the non-NFT system, and you need a priority rule. So what do you do with good-faith purchasers without notice or bankruptcy or inheritance or really any regime that operates by operation of law? Some questions that I would want to talk about is, what is the problem we’re really trying to solve. . . . Why isn’t checking public records sufficient to deal with existing problems?”).

³³¹ *Id.* at 42:14–20 (Jan. 24, 2023) (Rebecca Tushnet, Harvard Law School) (“Can you make systems interoperate in a way that’s a little easier than building a whole new system of registration? Are the people who have problems with proving registration or with fake certificates of registration likely to know about or be able to take advantage of NFTs as authenticators? Before we have answers to those questions, I think we should not rush forward to say that NFTs are going to solve that problem.”).

³³² *Id.* at 68:3–12 (Jan. 24, 2023) (Nadeen Nasser, Nasser Law) (“I have the concern of the USPTO’s ability right now to be able to protect the integrity of the Register in using NFTs to validate ownership. The way I see it, the USPTO will have to figure out a way to exercise control over an exchange itself that it creates. Currently, we’ve got certificates being issued for registrations with the USPTO and the TTAB will monitor the validity of marks or cancel marks,

F. Summary

NFTs and NFT marketplaces present new opportunities for trademark owners to build their brands and reach new consumers with interactive products and services. Smart contracts accompanying NFTs can help brand owners manage their trademark rights and enforce trademark licensing terms. In addition, brand owners can use NFTs and associated transaction records stored on blockchain networks to demonstrate the provenance of their products, help mitigate counterfeiting, and indicate a trademark's dates of first use in commerce.

However, trademark infringement and misuse is prevalent on NFT marketplaces. In addition, trademark enforcement efforts are complicated by the decentralized and anonymous nature of NFT platforms, and the decentralized nature of the blockchain networks on which NFTs are stored. While some individual NFT platforms have developed protocols to help trademark owners enforce their rights, there is no centralized authority that requires all platforms to do so. There are also no cross-platform mechanisms to allow trademark owners to identify and take down infringing content, settle trademark-related disputes involving blockchain-based domain names, or confirm that sellers own the trademark rights associated with the assets they offer.

Nevertheless, most commenters did not favor enacting new laws to help IP owners protect and enforce their trademark rights in the NFT space. Many believe that the time is not ripe for new laws, because the technologies are constantly evolving. Others noted that many cases in federal courts addressing trademark rights in NFT marketplaces are still pending, and once resolved, will likely help indicate whether existing trademark laws are sufficient.

However, many commenters did recommend that NFT platforms adopt best practices and protocols to prevent trademark infringement. Commenters also recommended that the USPTO provide NFT-specific guidance to trademark examining attorneys and the public to help ensure the process for obtaining trademark protection is predictable and consistent and that trademark applicants and registrants can make informed portfolio management decisions.

The USPTO agrees that education regarding NFTs is important. The USPTO has provided NFT-specific training and guidance for its trademark examining attorneys and also for practitioners. It has also added identifications for a variety of NFT-related goods and services in its ID Manual to guide examining attorneys, practitioners, and trademark applicants and registrants. In addition, the USPTO has successfully advocated for more uniform international classification policies for NFT-related goods and services at the Nice Committee of Experts. The USPTO will continue to work with stakeholders to identify additional measures to ensure the processes for obtaining and maintaining trademark registrations contemplate NFTs and other emerging technologies and remain consistent, predictable, and fair.

respectively. But if down the line it cancels a mark, but that mark is an existing NFT, then there needs to be a way to actually cancel that NFT token, to remove it from the marketplace. That can only happen if the USPTO has its own exchange.”).

IV. PATENTS

A. Use of NFTs to Manage Patents

Many commenters discussed how NFTs and blockchain technology can be used to transfer and manage patent rights, track and collect patent royalties, and facilitate fractional ownership of patents.

1. Transferring Rights and Portfolio Management

Many commenters and roundtable participants suggested that patent holders could use NFTs to address perceived shortcomings in existing patent licensing and assignment practices. Some asserted that licensing contracts and assignments often lack important information, leading to potential confusion and conflict.³³³ One commenter noted that these problems could be mitigated if relevant legal terms and agreements were attached to NFTs, thereby resulting in “an immutable and auditable trail” of licensing and assignment documentation.³³⁴

Commenters also suggested that patent holders could use NFTs to enhance patent portfolio management. One commenter noted that many patents are underutilized and that associating NFTs with patent rights could make patent information, licensing, assignments, and commercialization more transparent and straightforward, thus enhancing opportunities for patent holders to commercialize and monetize their patents.³³⁵ The same commenter’s company recently minted individual NFTs for twenty-five million worldwide patents, which involved populating each of the NFTs with relevant patent data.³³⁶

Other commenters indicated that NFTs and blockchain records could provide immutable timestamps for patent application filings, could facilitate the storage of and secure access to IP documents, and could allow the management of IP portfolios in Web3 ecosystems.³³⁷

³³³ Patent Roundtable Tr. at 56:8–15 (Jan. 26, 2023) (Joel Bock, Dentons US LLP (“Dentons US”)) (“Today, many companies, instead of recording the full agreement where an IP asset has been assigned, where a patent has been assigned, or the full license agreement, where the entity is licensed a particular patent, oftentimes other types of documents are recorded, such as an assignment document, which doesn’t include information about the price that was paid for that assignment, or the other parameters of the transaction relating to that assignment.”); *id.* at 39:23–27 (Jan. 26, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (“Some have already mentioned that NFTs on the blockchain will provide a clear chain of custody of who owns what. In terms of patents, it’s another issue with the assignee database, and sometimes some people within the chain of custody don’t necessarily put their information into the database.”).

³³⁴ Lootsma Comments at 2.

³³⁵ Patent Roundtable Tr. at 65:18–21, 66: 21–26 (Jan. 26, 2023) (Leann Pinto, IPwe).

³³⁶ *Id.* at 65:25–66:26 (Jan. 26, 2023) (Leann Pinto, IPwe).

³³⁷ Lootsma Comments at 1; Power Patent Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry (Dec. 5, 2022) (“Power Patent”) (“[NFTs] offer[] a secure and transparent way to store IP documents, such as patent applications and trademarks, which enables them to be easily accessed when needed. . . .Businesses can register patents on blockchain for sale or licensing”); Patent Roundtable Tr. at 66:21–26 (Jan. 26, 2023) (Leann Pinto, IPwe).

2. Tracking Royalties

Many commenters and roundtable participants suggested that the technical characteristics of NFTs and smart contracts could aid in tracking and controlling the distribution of royalties associated with patent licenses. For example, some commenters noted that smart contracts associated with NFTs could automate royalty payments and the execution of other licensing terms and conditions, and ensure that royalty payments are transparent.³³⁸ Another suggested that NFTs' metadata could be used to preserve and communicate key information about underlying patents, including whether a patent is eligible to be a standard essential patent.³³⁹

3. Fractional Patent Ownership

Several commenters stated NFTs and blockchain technology can be used to fractionalize of assets as diverse as fine art,³⁴⁰ music,³⁴¹ and financial instruments³⁴². These assets are converted into tokens, and then the tokens are sold as “shares” to buyers. Some commenters suggested that patent ownership could also be fractionalized using these technologies. One expressed the view that fractionalizing patent ownership with NFTs “would create a more liquid sort of marketplace, an ability to . . . commodify expensive assets without necessarily licensing them.”³⁴³ However, the same commenter also identified a potential complication with fractionalizing patents with NFTs: because 35 U.S.C. § 262 allows each joint owner of a patent to exercise its patent rights without the consent of other joint owner(s), owners of fractionalized patents may face complications in coordinating patent management and licensing strategies.³⁴⁴ However, another stakeholder suggested that NFTs and blockchain technology can mitigate such problems by defining and communicating which permissions are granted to patent owners.³⁴⁵

³³⁸ Jayaram Comments at 3; Lootsma Comments at 4; Patent Roundtable Tr. at 25:24–27 (Jan. 26, 2023) (David Hardoon, Wang Hardoon P.C. (“Wang Hardoon”)).

³³⁹ *Id.* at 21:26–22:2, 22:11–12 (Jan. 26, 2023) (Mark Stignani, Barnes and Thornburg LLP (“Barnes and Thornburg”)).

³⁴⁰ Igniting Souls and Blockchain Life, Comments Submitted in Response to Offices’ Nov. 23, 2022, Notice of Inquiry at 26 (Feb. 8, 2023).

³⁴¹ *Id.*

³⁴² Patent Roundtable Tr. at 71:26–72:2 (Jan. 26, 2023) (Robert Mowry, Rekt Tech).

³⁴³ *Id.* at 41:12–14 (Jan. 26, 2023) (Dov Greenbaum, Yale University, Reichman University (IDC) Herzliya; Yale University).

³⁴⁴ *Id.* at 41:15–22 (Jan. 26, 2023) (Dov Greenbaum, Yale University, Reichman University (IDC) Herzliya; Yale University).

³⁴⁵ *Id.* at 71:17–29 (Jan. 26, 2023) (Robert Mowry, Rekt Tech) (“So the real utility of these NFT platforms and assets is the on-chain ownership that makes provenance for art and any number of different assets that have value associated with who's owned it and who's collected it, who's distributed it. Is it authentic to that artist? Is it from their wallet? That's of huge value that often makes it very difficult when you're trying to auction off things and you're having to

B. *Obtaining Patent Rights for NFT-related Inventions*

Many commenters provided views on how existing patent laws apply to NFT-related inventions. These comments specifically focused on eligibility, novelty, non-obviousness, and inventorship requirements.

1. Patent Eligibility

a. Utility Patents

For a claimed invention to be eligible for a utility patent, it: (i) must fall within one of four categories of invention identified in 35 U.S.C. § 101 (i.e., a process, machine, manufacture, or composition of matter); and (ii) must not be directed to a judicial exception (i.e., abstract ideas, laws of nature, or natural phenomena), unless the claim as a whole includes additional limitations amounting to significantly more than the exception.³⁴⁶

In *Mayo Collaborative Services v. Prometheus Labs, Inc.*,³⁴⁷ and later in *Alice Corp. Pty. Ltd. v. CLS Bank International*,³⁴⁸ the U.S. Supreme Court articulated a two-step framework for distinguishing patent-ineligible concepts from patent-eligible applications of those concepts.³⁴⁹ The first step is to consider whether the claims are directed to a judicial exception.³⁵⁰ If so, the second step is to consider whether the claims do significantly more than the judicial exception—i.e., whether additional elements considered separately or as an ordered combination transform the nature of the claim into a patent-eligible application of the judicial exception.³⁵¹ As applied by the USPTO, the question of whether a claimed invention is directed to a judicial exception is a two-pronged inquiry, where, in the first prong, it is determined whether the claim recites a judicial exception, and, if so, in the second prong, it is determined whether the claim represents a practical application of that exception.³⁵²

Multiple commenters indicated that the USPTO's current patent eligibility guidance was adequate to evaluate the patentability of NFT-related inventions. Some noted that under the current guidance, the USPTO's eligibility determination would largely depend on whether the

say, well, this may have been owned by this person, but we can't verify it and we have a handwritten letter. The blockchain makes it much more clear to have that done to the degree that it can be continued to be nurtured, is worthwhile.”).

³⁴⁶ Manual of Patent Examining Procedure (“MPEP”) § 2104 (9th ed., Rev. 07.2022, Feb. 2023); *see also* Patent Act, 35 U.S.C. § 101; *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 215 (2014).

³⁴⁷ 566 U.S. 66 (2012).

³⁴⁸ 573 U.S. 208 (2014).

³⁴⁹ *Mayo*, 566 U.S. at 77–78; *Alice*, 573 U.S. at 217–222.

³⁵⁰ *Mayo*, 566 U.S. at 77; *Alice*, 573 U.S. at 217–218.

³⁵¹ *Mayo*, 566 U.S. at 77–78; *Alice*, 573 U.S. at 217–218, 221–222.

³⁵² MPEP § 2106.04 (9th ed., Rev. 07.2022, Feb. 2023).

invention improves an NFT-related technology or otherwise implements a technological solution to a technological problem.³⁵³ One commenter expressed the view that while inventions that improve NFT-related technology would likely face fewer patent eligibility hurdles, inventions related to associating an NFT with an underlying asset could also be determined eligible if the claims are directed to a practical application rather than an abstract idea.³⁵⁴

Another commenter indicated that the USPTO's eligibility guidance should “restrict abstract processes that use NFTs in a manner that preempts the traditional business process” and should prioritize “methods and systems that interact with blockchains and allow NFTs to be created, traded, [and] managed in new ways.”³⁵⁵

In addition, some stakeholders urged the USPTO to publish additional examples to provide guidance to patent applicants and practitioners regarding which types of NFT-related technologies might be patent eligible.³⁵⁶

b. Design Patents

To be eligible for a design patent, a design must be: (i) new; (ii) original; (iii) ornamental; and (iv) for an article of manufacture.³⁵⁷ To be an ornamental design, the design must have been “created for the purpose of ornamenting” and cannot be the result or “merely a by-product” of functional or mechanical considerations.³⁵⁸ To comply with the article of manufacture

³⁵³ See Gatto Comments at 7–8 (suggesting that an NFT itself is primarily a unique identifier and an NFT-related invention involving a static NFT, by itself, is not likely to be patent-eligible, whereas an NFT-related invention involving a blockchain that implements a technological solution, such as a Layer-2 solution, would be more likely to be patent-eligible); Patent Roundtable Tr. at 24:6–25 (Jan. 26, 2023) (Hardoon, Wang Hardoon) (“That said, on the patentable subject matter front, I try to counsel clients about the distinction between improving blockchain technology, improving NFT technology, and merely applying that technology. For example, if they are improving the process of authentication or changing and improving protocols for mining blocks, for example, an alternative to proof of work or proof of stake, if they're reducing the cost of storage on the blockchain or reducing the time that it takes to process transactions in a way that doesn't harm the underlying blockchain, those are—or improving protocols for the creation of NFTs and their linkage to the use of external storage. I think where you're improving the functioning of those technologies—and I think there's a ton of innovation in that space—I think under patentable subject matter, those things are pretty clearly patentable. Where companies come to me and they're merely leveraging existing technology and using it just because they created a new coin or have an idea for a new way to use this technology, doesn't necessarily make sense to file a patent because their leveraging of that technology just might not provide enough material for it to be considered patentable subject matter.”).

³⁵⁴ *Id.* at 8:13–29, 9:24–29, (Jan. 26, 2023) (Joseph Wolfe, DLA Piper).

³⁵⁵ *Id.* at 31:23–26, 32:4–9 (Jan. 26, 2023) (Ryan Chowdhury, Fish & Richardson P.C.).

³⁵⁶ *Id.* at 10:1–7 (Jan. 26, 2023) (Joseph Wolfe, DLA Piper); *id.* at 48:1–9 (Jan. 26, 2023) (Kristopher Kastens, Kramer, Levin, Naftalis & Frankel).

³⁵⁷ 35 U.S.C. § 171(a).

³⁵⁸ *In re Carletti*, 328 F.2d 1020 (C.C.P.A. 1964); *Blisscraft of Hollywood v. United Plastic Co.*, 189 F. Supp. 333, 337 (S.D.N.Y. 1960), *aff'd*, 294 F.2d 694 (2d Cir. 1961).

requirement, applicants are required to show the design as applied to or embodied in an article of manufacture.³⁵⁹ The Supreme Court has opined that “[a] patentable design ‘gives a peculiar or distinctive appearance to the manufacture, or article to which it may be applied, or to which it gives form.’”³⁶⁰

Commenters expressed a range of differing views on designs associated with NFTs and whether they can meet the requirements for design patent protection. One expressed the view that user interfaces of a decentralized application associated with NFTs and blockchain could qualify for design patent protection.³⁶¹ Another suggested that design patent protection would be appropriate for “NFTs that are associated with an art object or some other physical image.”³⁶² However, another commenter remarked that the ornamentality and article of manufacture requirements would likely preclude design patent protection for an NFT itself.³⁶³ The same commenter reasoned that it is unclear whether underlying assets associated with NFTs are articles of manufacture, and whether NFTs are ornamental in relation to their underlying assets.³⁶⁴ Another stakeholder expressed the view that NFTs appear to be articles of manufacture, produced by software methods, but that NFTs do not appear to meet the requirements for designs in and of themselves, even though NFTs may “exemplify a design.”³⁶⁵

³⁵⁹ *Curver Luxembourg, SARL v. Home Expressions Inc.*, 938 F.3d 1334, 1340 (Fed. Cir. 2019) (confirming that “long-standing precedent, unchallenged regulation, and agency practice all consistently support the view that design patents are granted only for a design applied to an article of manufacture, and not a design *per se*”); MPEP § 1504.01 (9th ed., Rev. 07.2022, Feb. 2023).

³⁶⁰ *Samsung Electronics Co., Ltd. v. Apple Inc.*, 137 S. Ct. 429, 432 (S.Ct. 2016) (quoting *Gorham Co. v. White*, 14 Wall. 511, 525, 20 L.Ed. 731 (1872)).

³⁶¹ See Gatto Comments at 8 (“The user interface or elements [of a decentralized application] may qualify for design patent protection.”).

³⁶² Patent Roundtable Tr. at 58:10–15 (Jan. 26, 2023) (Joel Bock, Dentons US) (“In the past, the Patent Office has granted patents, design patents, that cover web pages or other types of non-physical objects as long as they are presented on some sort of display. And there’s no reason why NFTs that are associated, for example, with an art object or some other physical image cannot be protected in the same way through design patents.”).

³⁶³ *Id.* at 44:22–45:3 (Jan. 26, 2023) (Mikal-Ellen S. Bennett, Kindcaid and Associates, PLLC) (“But [NFTs] are different than design patents, with a whole host of issues regarding the underlying asset. For example . . . where the underlying asset is not necessarily as likely to be a protectable article of manufacture, like with a design patent. So this would undermine the entire design patent framework. If the underlying article of manufacturer—whatever that NFT was protecting—was not that article of manufacture. And, in addition, with the design patent framework, you have the issue of ornamentality. Not all of these NFTs are necessarily going to be ornamental to their underlying asset. So there’s not a great fit once you dig down into these more nuanced elements of that design patent.”).

³⁶⁴ *Id.*

³⁶⁵ Kiribex (personal) Comments at 3 (“Within the patent system, an NFT appears to be an article of manufacture; it is manufactured by software methods. . . .The resulting article of manufacture (the NFT) may exemplify a design, but it does not appear to meet the requirements for a design in and of itself.”).

2. Novelty and Non-Obviousness

a. Novelty

For an invention to be patentable, it must be novel, i.e., it must not be described in an issued patent, described in a printed publication, or have been in public use, on sale, or otherwise available to the public before the effective filing date of the invention.³⁶⁶ A claim is not novel when each and every element as set forth in the claims is found in a single prior art reference (e.g., a patent; published patent application; or an article, paper, or other document available to the public).³⁶⁷

Multiple commenters emphasized that it is important for the USPTO to apply the novelty requirement to NFT-related inventions.³⁶⁸ Their comments were underpinned by a common theme: Where NFT-related inventions are concerned, novelty determinations are difficult because of the newness of the technology, and therefore, both the USPTO and the public should explore the non-patent literature databases when assessing the prior art. For example, one commenter urged the USPTO to consider, and familiarize itself with, “the public space for NFT concepts,” which the commenter indicated “are not well indexed by common search engines.”³⁶⁹ Another commenter cautioned that when applicants and practitioners perform a prior art search on NFT-related inventions, “. . . it would be prudent to consider a broader search outside of patent databases.”³⁷⁰

One stakeholder recommended that the USPTO provide more training on novelty in the area of NFTs, so that the Office is awarding patents of the proper scope to NFT-related inventions.³⁷¹

b. Non-Obviousness

To be patentable, an invention must also be non-obvious. More specifically, the differences between the invention and the prior art must not be such that the invention as a whole would have been obvious before the effective filing date to a person having ordinary skill in the art.³⁷²

³⁶⁶ 35 U.S.C. § 102(a).

³⁶⁷ *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131 (9th ed., Rev. 07.2022, February 2023).

³⁶⁸ Gatto Comments at 8 (“If a blockchain solution implements a novel . . . consensus mechanism, Layer-2 solution or other technology this can be patentable . . . [s]ome wallets implement a novel . . . approach and this can be patentable . . . if dApps implement novel . . . functionality, they should be subject to patent protection”); Kiribex (personal) Comments at 2–3 (“I also implore the USPTO to execute a diligent consideration of the public space and avoid lowering the bars for novel, non-obvious, and other requirements”); Kasdan Comments at 6; Patent Roundtable Tr. at 4:5–7 (Jan. 26, 2023) (Wolfe, DLA Piper).

³⁶⁹ *Id.* at 66:13–16 (Jan. 26, 2023) (Dorothy Haraminac, GreenVets LLC and Kiribex).

³⁷⁰ *Id.* at 10:12–14 (Jan. 26, 2023) (Joseph Wolfe, DLA Piper).

³⁷¹ *Id.* at 37:20–22 (Jan. 26, 2023) (Michael Kasdan, Wiggin and Dana LLP).

³⁷² 35 U.S.C. § 103.

The question of obviousness is one of law based on the following underlying factual inquiries: (a) determining the scope and content of the prior art; (b) ascertaining the differences between the claimed invention and the prior art; and (c) resolving the level of ordinary skill in the pertinent art.³⁷³ After evaluating these factual inquiries, a determination of obviousness is made, which must be supported by articulated reasons.³⁷⁴

Many commenters highlighted the importance of continuing to apply the non-obviousness requirements to NFT-related inventions.³⁷⁵ For example, one commenter stressed that while “[i]t is important to reward novel and non-obvious inventions in the NFT space with patents . . . doing an old idea with blockchain when using well known blockchain functionality and components for its expected purpose” should not be sufficient.³⁷⁶

3. Inventorship

Under 35 U.S.C. § 100(f), an inventor is defined as “the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.”³⁷⁷ In *Thaler v. Vidal*,³⁷⁸ the Federal Circuit found that, based on Supreme Court precedent, an “individual” ordinarily means a human being unless Congress provided some indication that a different meaning was intended.³⁷⁹ Based on the finding that there is nothing in the Patent Act to indicate Congress intended a different meaning, and that the Act includes other language to support the conclusion that an “individual” in the Act refers to a natural person, the court concluded that an inventor must be a natural person.³⁸⁰ The court explained, however, that it was not confronted with “the question of whether inventions made by human beings with the assistance of [artificial intelligence] are eligible for patent protection.”³⁸¹

As with other digital products, NFTs and their underlying assets can be generated using artificial intelligence (AI). Some commenters provided views on whether inventions based on

³⁷³ *Graham v. John Deere Co.*, 383 U.S. 1 (1966); see also *KSR Int’l Co. v. Teleflex Inc.*, 550, U.S. 398, 404; MPEP § 2141 (9th ed., Rev. 07.2022, Feb. 2023).

³⁷⁴ *KSR*, 550 U.S. at 418; MPEP § 2141 (9th ed., Rev. 07.2022, February 2023).

³⁷⁵ Gatto Comments at 8 (“If a blockchain solution implements a . . . non-obvious consensus mechanism, Layer-2 solution or other technology this can be patentable . . . [s]ome wallets implement a . . . non-obvious approach and this can be patentable.”); Kasdan Comments at 6; Kiribex (personal) Comments at 2–3 (“I also implore the USPTO to execute a diligent consideration of the public space and avoid lowering the bars for novel, non-obvious, and other requirements”); Patent Roundtable Tr. at 10:8–16 (Jan. 26, 2023) (Joseph Wolfe, DLA Piper).

³⁷⁶ Kasdan Comments at 6.

³⁷⁷ 35 U.S.C. § 100(f).

³⁷⁸ *Thaler v. Vidal*, 43 F.4th 1207 (Fed. Cir. 2022).

³⁷⁹ *Thaler*, 43 F.4th at 1210–1211.

³⁸⁰ *Id.*

³⁸¹ *Id.* at 1213.

AI-generated NFTs and AI-generated digital assets could qualify for patent protection. Two stakeholders stated that digital assets associated with NFTs—to the extent they are produced by AI tools—would not be eligible for patent protection.³⁸² Another commenter, noting the tension between the human inventorship requirement and the fact that many NFTs and associated assets are generated by AI, described patent protection as “an incredibly uncomfortable fit” for such AI-generated products.³⁸³

4. Are New Laws Necessary?

As discussed, *supra*,³⁸⁴ several stakeholders provided views on whether existing laws are sufficient to protect IP rights in the context of NFTs. However, most of those comments either discussed IP laws generally or specifically focused on trademark and copyright laws. As discussed above in this section, comments specific to patent laws primarily addressed the application of existing laws and requirements to NFT-related inventions, and not whether revisions to the law are necessary.

C. Potential USPTO Use of NFTs in the Patent Context

Some commenters suggested that the USPTO could utilize NFTs and blockchain technology in the patent application, issuance, and maintenance processes. Some suggested the USPTO could use NFT and blockchain technologies to reduce applicants’ costs and the complexity associated with obtaining patents.³⁸⁵ One commenter indicated that by reducing such barriers to entry, NFT and blockchain technologies could encourage more inventors to file applications for patents.³⁸⁶ Another commenter stated that USPTO office actions could be authenticated using blockchain.³⁸⁷ Others suggested that the USPTO could use blockchain to record and validate patent assignments.³⁸⁸

³⁸² Wang & Lee Comments at 7; INTA Comments at 23.

³⁸³ Patent Roundtable Tr. at 45:24–30 (Jan. 26, 2023) (Mikal-Ellen S. Bennett, Kindcaid & Associates).

³⁸⁴ See sections II.B and III.D.3.

³⁸⁵ ABA-IPL Comments at 9 (“The Section recognizes the possibilities for blockchain technologies to modernize the recordkeeping process for digital assets and the potential for integration into the application, registration, and similar filing processes with the Offices. Not only could the metadata be fully imported to satisfy the information needed for applications and registrations, but the minting process could be helpful as a method of more accurately determining who was first to create a work, use a mark, or develop an invention.”); Patent Roundtable Tr. at 61:13–15, 20–23 (Jan. 26, 2023) (Dorothy Haraminac, GreenVets LLC and Kiribex).

³⁸⁶ *Id.* at 61:12–23 (Jan. 26, 2023) (Dorothy Haraminac, GreenVets LLC and Kiribex).

³⁸⁷ Lootsma Comments at 1.

³⁸⁸ ABA-IPL Comments at 9 (“[C]hains of title when updated in the relevant office could be updated in the blockchain associated with the NFT.”); Patent Roundtable Tr. at 21:18–23 (Jan. 26, 2023) (Mark Stignani, Barnes and Thornburg) (“Rather than signing an assignment that they register, their assignment of rights in the blockchain at that point in time. This would also be available early on to validate whether or not the company has adequately assigned rights. I think that the registration recordation of all entities that own patents would be a valid use of blockchain for the USPTO as well.”).

In addition, some commenters expressed the view that the USPTO could potentially issue patents as NFTs and record them on a blockchain network.³⁸⁹

However, many commenters cautioned against the wholesale utilization of NFTs to represent the ownership of patent rights. One commenter suggested that efforts to address perceived problems in the patent application process should be focused on enhancing existing systems, not on utilizing NFTs.³⁹⁰ Another questioned whether an NFT-centered patent assignment system would be redundant to the USPTO's existing database.³⁹¹ In addition, one commenter cautioned that the benefits of adopting this new technology should be balanced against the risks.³⁹²

D. Summary

Stakeholders generally agreed that NFTs and blockchain technology present new opportunities for patent holders to: aggregate and communicate more complete information about patents with lower transaction costs; manage patent rights; track and collect royalties; and commercialize and monetize patents. Many commenters also noted that patent protection for NFT-related inventions is important to encourage continued innovation in this space and provided views on how various patent law requirements apply, or should apply, to NFT-related patent claims.

³⁸⁹ See, e.g., ABA-IPL Comments at 9 (“It is likely premature, but the certificates of registration associated with . . . issued letters patent could themselves be minted as NFTs. . . . Doing so could assist in authenticating the ownership of at least U.S. IP rights in the context of due diligence for mergers and acquisitions and in recording licenses as smart contracts associated with the NFT assets.”); Patent Roundtable Tr. at 55: 20–27 (Jan. 26, 2023) (Joel Bock, Dentons US) (“I mean that potentially NFTs could be used to represent an issued patent. In the future, the PTO can issue NFTs instead of distributing physical copies of patents.”).

³⁹⁰ Gatto Comments at 17.

³⁹¹ Patent Roundtable Tr. at 39:29–30 (Jan. 26, 2023) (Dov Greenbaum, Reichman University (IDC) Herzliya; Yale University) (“On the downside of this of course, is will such a system be redundant with the USPTO's already [existing] database?”).

³⁹² *Id.* at 63:21–23 (Jan. 26, 2023) (Dorothy Haraminac, GreenVets LLC and Kiribex).

V. CONCLUSION

The Offices appreciate the thoughtful contributions by participants in this Study, which represent a broad spectrum of perspectives across numerous IP-related fields. Overall, as with many emerging technologies, Study participants identified both opportunities and risks with the development of NFTs. Most expressed enthusiasm for the new possibilities NFTs and blockchain technology may offer for licensing IP-protected materials, including their potential to give individual rightsholders greater control over the use of their IP and a larger share of associated revenues. Many also hoped that the key technological features of NFTs—such as the creation of an immutable record of transactions on the blockchain—could aid enforcement by providing evidence of an item’s authenticity, provenance, or registration history.

Others cautioned, however, that the same concerns over piracy, infringement, and counterfeiting that have long existed in the online space are equally present in the context of NFTs. They noted that while NFTs can help to track possession of a particular copy of an asset, the technology does nothing to prevent the creation and dissemination of unauthorized copies. Moreover, the same features of blockchain technology used to support IP enforcement may sometimes have the opposite effect. For example, the immutability of blockchain records can impede the correction of fraudulent or inaccurate entries, while the decentralized and sometimes anonymous nature of NFT storage may hamper the identification and removal of infringing copies.

Notwithstanding these challenges, Study participants generally agreed that changes to IP laws are not currently necessary to address the use of NFTs. The Offices agree with this assessment. NFT technology is currently changing rapidly, and new laws unique to NFT issues would likely be premature. In addition, while NFT transactions may require the application of IP laws in new factual contexts, the legal issues implicated generally are not novel ones. Participants did raise important concerns relating to consumer confusion—for example, where NFT purchasers may incorrectly believe they are acquiring IP rights in an associated asset. But those issues are better addressed through educational or consumer protection measures than through changes to IP laws. Similarly, some participants highlighted potential questions concerning the legal status of smart contracts, but such issues are primarily ones of contract law.

Finally, the Offices received some suggestions as to ways in which NFT or blockchain technology could be used to improve registration or recordation practices. No specific proposal, however, received significant support from commenters. The Offices conclude that such proposals are premature. The Offices will, however, continue to explore potential uses of emerging technologies to enhance agency operations as needed. The Offices will also continue to work with stakeholders to identify additional opportunities for education and training on NFT-related IP issues.

APPENDIX A PARTICIPANTS IN THE ROUNDTABLE ON
TRADEMARKS AND NFTS

Roundtable Participants
 Trademarks and NFTs
 January 24, 2023

<u>Technologists (alphabetical by last name)</u>	
1	Thomas Barrett, EnCirca, Inc.
2	David A. Callner, M9 Solutions
3	Elizabeth Grabowski, Unstoppable Domains, Inc.
4	Dorothy Haraminac, GreenVets, LLC and Kiribex
5	Svetlana Ilnitskaya, Corsearch
6	Kary Oberbrunner, Igniting Souls & Blockchain Life
7	Morgan Reed, ACT The App Association
<u>Academics and Association Representatives</u>	
8	Thomas Brooke, International Trademark Association (INTA)
9	Thad Chaloeontiarana, American Bar Association (ABA)
10	Joshua Fairfield, Washington and Lee University School of Law
11	Brian L. Frye, University of Kentucky College of Law
12	Maria A. Scungio, International Association for the Protection of Intellectual Property (AIPPI)
13	Victoria Sheckler, Recording Industry Association of America (RIAA)
14	Susan Stearns, International Trademark Association (INTA)
15	Rebecca Tushnet, Harvard Law School
<u>Brand Owners and IP Practitioners</u>	
16	Natalia C. Aranovich, Aranovich Law Firm, PC
17	Michael A. Geller, DLA Piper
18	Joe Guagliardo, Dentons US, LLP
19	Peter K. Jackson, Greenberg Glusker, LLP
20	Mark Jansen, Fenwick
21	Angela S. Kalsi, Greensfelder, Hemker & Gale, PC
22	Addam Kaufman, Oracle
23	Jacquelyn Knapp, ASICS America Corporation
24	Giulia Maienza, Herbert Smith Freehills
25	Kimberly M. Maynard, Frankfurt, Kurnit, Klein & Selz, PC
26	Nedeen Nasser, Nasser Law
27	Jessica Neer McDonald, Neer McD PLLC / Blockish IP
28	Moish E. Peltz, Falcon, Rappaport & Berkman, LLP
29	Justin Pierce, Venable LLP
30	Frederic Rocafort, Harris Bricken
31	Alfred Steiner, Meister & Steiner, PLLC
32	Eliana Torres, Nixon Peabody

Trademarks and Non-Fungible Tokens Roundtable

Recording available at:

<https://uspto.cosocloud.com/pl1ozvaepgh8/>

Agenda available at:

<https://www.uspto.gov/ip-policy/trademark-policy/roundtable-trademarks-and-non-fungible-tokens>

10:00 – 10:10: Opening remarks

- Kathi Vidal, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

10:10 – 11:45: Technologist panel

- David A. Callner, M9 Solutions
- Dorothy Haraminac, GreenVets, LLC
- Ram Shanmugam, Heera Digital
- Svetlana Ilnitskaya, Corsearch
- Kary Oberbrunner, Igniting Souls & Blockchain Life
- Elizabeth Grabowski, Unstoppable Domains, Inc.
- Bennett Collen, Endstate
- Morgan Reed, The App Association (ACT)
- Thomas Barrett, EnCirca, Inc.

11:45 – 12:15: Break

12:15 – 1:30: Academic and associations panel

- Brian L. Frye, University of Kentucky College of Law
- Thad Chalomentiarana, American Bar Association (ABA)
- Rebecca Tushnet, Harvard Law School
- Joshua Fairfield, Washington and Lee University School of Law
- Maria A. Scungio, International Association for the Protection of Intellectual Property (AIPPI)
- Victoria Sheckler, Recording Industry Association of America (RIAA)
- Thomas Brooke, International Trademark Association (INTA)
- Susan Stearns, International Trademark Association (INTA)

1:30 – 2:00: Break

2:00 – 4:30: Brand owners and practitioners panel

- Jessica Neer McDonald, Neer McD PLLC / Blockish IP
- Nedeen Nasser, Nasser Law
- Michael A. Geller, DLA Piper
- Moish E. Peltz, Falcon, Rappaport & Berkman, LLP
- Frederic Rocafort, Harris Bricken
- Alfred Steiner, Meister & Steiner, PLLC
- Raj Abhyanker, LegalForce RAPC Worldwide, PC
- Peter K. Jackson, Greenberg Glusker, LLP
- Natalia C. Aranovich, Aranovich Law Firm, PC
- Jacquelyn Knapp, ASICS America Corporation
- Angela S. Kalsi, Greensfelder, Hemker & Gale, PC
- Joe Guagliardo, Dentons US, LLP
- Kimberly M. Maynard, Frankfurt, Kurnit, Klein & Selz, PC
- Mark Jansen, Fenwick
- Eliana Torres, Nixon Peabody
- Addam Kaufman, Oracle
- Giulia Maienza, Herbert Smith Freehills
- Justin Pierce, Venable LLP

APPENDIX B PARTICIPANTS IN THE ROUNDTABLE ON
PATENTS AND NFTS

Roundtable Participants

Patents and NFTs

January 26, 2023

<u>IP Practitioners (alphabetical by last name)</u>	
33	Mikal-Ellen S. Bennett, Kindcaid and Associates, PLLC
34	Joel Bock, Dentons US LLP
35	Ryan Chowdhury, Fish & Richardson P.C.
36	Giovanna Fessenden, Hamilton, Brook, Smith & Reynolds, P.C.
37	Dov Greenbaum, Yale University; Reichman University (IDC) Herzliya
38	David Hardoon, Wang Hardoon P.C.
39	Michael Kasdan, Wiggin and Dana LLP
40	Kristopher Kastens, Kramer Levin Naftalis & Frankel LLP
41	Nelson M. Rosario, Rosaria Tech Law LLC
42	Mark Stignani, Barnes and Thornburg LLP
43	Mauricio Uribe, Knobbe Martens
44	Joseph Wolfe, DLA Piper
<u>Industry Representatives</u>	
45	Dorothy Haraminac, GreenVets LLC
46	Lucinda Lewis, Car Culture, Inc.
47	Patricia MacKenzie, independent creator
48	Cleve Mesidor, The Blockchain Foundation
49	Robert Mowry, Rekttech
50	Pamela Norton, TitleChain
51	Kary Oberbrunner, Igniting Souls & Blockchain Life
52	Merav Ozair, Wake Forest University, Emerging Technologies Mastery
53	Leann Pinto, IPwe, Inc.

Patents and Non-Fungible Tokens Roundtable

Recording available at:

<https://uspto.cosocloud.com/pvu6nxbzm642/>

Agenda available at:

<https://www.uspto.gov/ip-policy/patent-policy/roundtable-patents-and-non-fungible-tokens>

10:00 - 10:10 Opening remarks

- Kathi Vidal, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

10:10 - 12:10 IP practitioners

- Nelson M. Rosario, Rosaria Tech Law LLC
- Joseph Wolfe, DLA Piper
- Giovanna Fessenden, Hamilton, Brook, Smith & Reynolds, P.C.
- Mark Stignani, Barnes and Thornburg LLP
- David Hardoon, Wang Hardoon P.C.
- Ryan Chowdhury, Fish & Richardson P.C.
- Michael Kasdan, Wiggin and Dana LLP
- Dov Greenbaum, Yale University; Reichman University (IDC) Herzliya
- Mikal-Ellen S. Bennett, Kindcaid and Associates, PLLC
- Kristopher Kastens, Kramer Levin Naftalis & Frankel LLP
- Mauricio Uribe, Knobbe Martens
- Joel Bock, Dentons US LLP

12:10 - 12:30 Break

12:30 - 2:30 Industry representatives

- Dorothy Haraminac, GreenVets LLC
- Leann Pinto, IPwe, Inc.
- Robert Mowry, Rekttech
- Kary Oberbrunner, Igniting Souls Publishing Agency
- Cleve Mesidor, The Blockchain Foundation
- Lucinda Lewis, Car Culture, Inc.
- Patricia MacKenzie, Independent Creator
- Merav Ozair, Wake Forest University, Emerging Technologies Mastery
- Ram Shanmugam, Heera Digital
- Pamela Norton, TitleChain

APPENDIX C PARTICIPANTS IN THE ROUNDTABLE ON
COPYRIGHTS AND NFTs

Roundtable Participants
 Copyrights and NFTs
 January 31, 2023

<u>List of Participants (alphabetical by first name)</u>	
54	Aarthi Anand, Cahill Gordon & Reindel
55	Abby North, North Music Group
56	Alfred Steiner, Meister & Steiner, PLLC
57	Althea Erickson, Sol Center for Liberated Work, Center for Cultural Innovation
58	Ash Kernen, Kernen Law
59	Ashley Joyce, National Music Publishers' Association
60	Cesar Fishman, Pex
61	Dan Schmerin, Metaversal
62	Daniel Uribe, GenoBank.io
63	Dov Greenbaum, Yale University; Reichman University (IDC) Herzliya
64	Edward Lee, Chicago Kent College of Law and NOUNFT.COM
65	Emilio Cazares, independent contributor to the SuperRare dial and a former representative of SuperRare Labs
66	George Johnson, singer-songwriter
67	Gina Moon, OpenSea
68	Hillary Brill, Decentralized Future Council
69	James Gatto, American Intellectual Property Law Association
70	James Grimmelmann, Cornell Law School and Cornell Tech
71	Jean-Marc Deltorn, European Observatory on Emerging Technology, European Union Intellectual Property Office and the Center for International IP Studies (CEIPI) at the University of Strasbourg
72	Jeff Gluck, Gluck Law Firm
73	Jeff Sedlik, Art Center College of Design and PLUS Coalition
74	Jennifer Pariser, Motion Picture Association (MPA)
75	Jeremy Goldman, Frankfurt Kurnit Klein & Selz PC
76	John Strohm, Frost Brown Todd
77	Jordan Bromley, Manatt Entertainment
78	Joseph Gratz, Morrison & Foerster
79	Kat Walsh, Creative Commons
80	Kayvan Ghafferi, MakersPlace
81	Kevin Madigan, Copyright Alliance
82	Kofi Mensah, Sagos Distro
83	Marta Belcher, Filecoin Foundation
84	Megan Noh, Pryor Cashman
85	Michael Lewan, Recording Academy
86	Mike Charles Nahounou, musician

87	Richard James Burgess, American Association of Independent Music (A2IM)
88	Ryan Wright, Stealth Startup and Missouri's Chapter of Blockchain in Healthcare Today
89	Sarah Odenkirk, Cowan DeBaets Abrahams & Sheppard
90	Shekinah Apedo, Deadfellaz NFT Project
91	Stephen Kelly, Cypress
92	Steve Krause, Dapper Labs
93	Susan Chertkof, Recording Industry Association of America
94	Tonya Evans, Penn State Dickinson Law School
95	Umair Kazi, The Authors Guild
96	Vickie Nauman, CrossBorderWorks
97	Yayoi Shionoiri, Chris Burden Estate and the Studio of Nancy Rubins
98	Zachary L. Catanzaro, St. Thomas University College of Law

Copyright and Non-Fungible Tokens Roundtable

Recording available at:

<https://www.copyright.gov/policy/nft-study/roundtables/>

Agenda available at:

<https://www.copyright.gov/policy/nft-study/2023-NFT-Study-Roundtable-Agenda.pdf>



Agenda

10:00AM – 10:10AM EST **OPENING & WELCOME REMARKS**
Shira Perlmutter, Register of Copyrights and Director, U.S. Copyright Office

10:10AM – 11:40AM EST **SESSION 1: NFT TECHNOLOGICAL PROCESSES**

Panelists	Organization	Representative
	American Intellectual Property Law Association	James Gatto
	Copyright Alliance	Kevin Madigan
	Cornell Law School	James Grimmelmann
	Decentralized Future Council	Hillary Brill
	Filecoin Foundation	Marta Belcher
	Frost Brown Todd	John Strohm
	Meister & Steiner	Alfred Steiner
	Morrison & Foerster	Joseph Gratz
	North Music Group	Abby North
	Pryor Cashman	Megan Noh
	Reichman University (IDC) Herzliya; Yale University	Dov Greenbaum

11:40AM – 12:00PM EST **BREAK**

12:00PM – 1:30PM EST **SESSION 2: USE OF NFTs IN THE CREATIVE SECTOR**

Panelists	Organization	Representative
	*	George Johnson, Songwriter
	City Lights Law	Yayoi Shionoiri
	Creative Commons	Kat Walsh
	CrossBorderWorks	Vickie Nauman

Dapper Labs	Steve Krause
Deadfellaz	Shekinah Apedo
Frankfurt Kurnit Klein & Selz	Jeremy Goldman
Manatt, Phelps & Phillips	Jordan Bromley
National Music Publishers' Association	Ashley Joyce
Penn State Dickinson Law	Tonya Evans
PLUS Coalition	Jeff Sedlik
The Authors Guild	Umair Kazi

1:30PM – 2:15PM EST **BREAK**

2:15PM – 3:45PM EST **SESSION 3: NFTs AND IP MANAGEMENT & ENFORCEMENT**

Panelists	Organization	Representative
	*	Emilio Cazares, Contributor to the SuperRare Ecosystem
	A2IM	Richard James Burgess
	Center for Cultural Innovation	Althea Erickson
	Cowan DeBaets Abrahams & Sheppard	Sarah Odenkirk
	IIT Chicago-Kent College of Law; Nou NFT	Edward Lee
	CEIPI, the International IP Studies Centre of the University of Strasbourg	Jean-Marc Deltorn
	MakersPlace	Kayvan Ghaffari
	Metaversal	Dan Schmerin
	NVG	Josh Hurvitz
	OpenSea	Gina Moon
	Pex	Cesar Fishman
	Recording Industry Association of America	Susan Chertkof

3:45PM – 4:00PM EST **BREAK**

4:00PM – 5:00PM EST

SESSION 4: REFLECTION AND OPEN MIC

4:00PM – 4:30PM EST

REFLECTION

Organization

Representative

Cahill Gordon & Reindel

Aarthi Anand

Cypress

Stephen Kelly

GenoBank.io

Daniel Uribe

Gluck Law Firm

Jeff Gluck

Motion Picture Association

Jennifer Pariser

Recording Academy

Michael Lewan

St. Thomas University, College of Law

Zachary L. Catanzaro

4:30PM – 5:00PM EST

OPEN MIC

Current as of January 26, 2023

APPENDIX D NOTICE OF INQUIRY – STUDY ON NON-
FUNGIBLE TOKENS AND RELATED
INTELLECTUAL PROPERTY LAW ISSUES
(NOVEMBER 23, 2022)

check the agenda on the OEAB website to confirm the public comment period schedule.

The OEAB expects that public statements at its meetings will not be repetitive of previously submitted verbal or written statements. In general, each individual or group making a verbal presentation will be limited to three minutes. The Designated Federal Officer must receive written comments by November 27, 2022, to provide sufficient time for OEAB review. Written comments received after November 27, 2022, will be distributed to the OEAB but may not be reviewed prior to the meeting date. Comments should be submitted to Designated Federal Officer david.turner@noaa.gov.

Special Accommodations: Requests for sign language interpretation or other auxiliary aids should be directed to the Designated Federal Officer by November 22, 2022.

David Holst,

Chief Financial and Administrative Officer,
Office of Oceanic and Atmospheric Research,
National Oceanic and Atmospheric
Administration.

[FR Doc. 2022-25530 Filed 11-22-22; 8:45 am]

BILLING CODE 3510-KA-P

DEPARTMENT OF COMMERCE

Patent and Trademark Office

LIBRARY OF CONGRESS

United States Copyright Office

[Docket No.: PTO-C-2022-0035]

Study on Non-Fungible Tokens and Related Intellectual Property Law Issues

AGENCY: United States Patent and Trademark Office, Department of Commerce; United States Copyright Office, Library of Congress.

ACTION: Notice of inquiry; notice of public roundtables.

SUMMARY: The United States Patent and Trademark Office (USPTO) and the United States Copyright Office (USCO) (collectively, the Offices) are conducting a joint study regarding issues of intellectual property (IP) law and policy associated with non-fungible tokens (NFTs). The Offices seek public comments on these matters to assist in their work on IP policy related to NFTs and in conducting the study. In addition, the Offices are announcing a series of three public roundtables to allow them to gather further input.

DATES:

Written comments: Public comments must be received no later than 11:59 p.m. Eastern Time on January 9, 2023.

Public roundtables: Roundtable 1: Patents and NFTs. Roundtable 1 will be held on Tuesday, January 10, 2023. Requests to participate as a panelist must be received by 11:59 p.m. Eastern Time on December 21, 2022.

Roundtable 2: Trademarks and NFTs. Roundtable 2 will be held on Thursday, January 12, 2023. Requests to participate as a panelist must be received by 11:59 p.m. Eastern Time on December 21, 2022.

Roundtable 3: Copyright and NFTs. Roundtable 3 will be held on Wednesday, January 18, 2023. Requests to participate as a panelist must be received by 11:59 p.m. Eastern Time on December 21, 2022.

ADDRESSES:

Submission of written comments: For reasons of Government efficiency, comments must be submitted through the Federal eRulemaking Portal at www.regulations.gov. To submit comments via the portal, enter docket number PTO-C-2022-0035 on the homepage and click "Search." The site will provide a search results page listing all documents associated with this docket. Find a reference to this request for information and click on the "Comment Now!" icon, complete the required fields, and enter or attach your comments. Attachments to electronic comments will be accepted in ADOBE® portable document format (PDF) or MICROSOFT WORD® format. Because comments will be made available for public inspection, information that the submitter does not desire to make public, such as an address or phone number, should not be included. Visit the Federal eRulemaking Portal for additional instructions on providing comments via the portal. If electronic submission of comments is not feasible due to a lack of access to a computer and/or the internet, please contact the Offices using the contact information below for special instructions on how to submit comments by other means.

Submission of business confidential information: Any submissions containing business confidential information must be marked "confidential treatment requested" and submitted through the Federal eRulemaking Portal. Submitters should provide an index listing the document(s) or information they would like the Offices to withhold. The index should identify the confidential document(s) by document number(s) and document title(s) and should identify the confidential information by

description(s) and relevant page number(s) and/or section number(s) within a document. Submitters should provide a statement explaining their grounds for requesting non-disclosure of the information to the public as well. The Offices also request that submitters of business confidential information include a non-confidential version (either redacted or summarized) that will be posted on www.regulations.gov and available for public viewing. In the event that the submitter cannot provide a non-confidential version of their submission, the Offices request that the submitter post a notice in the docket stating that they have provided the Offices with business confidential information. Should a submitter fail either to docket a non-confidential version of their submission or to post a notice that they have provided business confidential information, the Offices will note the receipt of the submission on the docket with the submitter's organization or name (to the degree permitted by law) and the date of submission.

Anonymous submissions: The Offices will accept anonymous submissions. Enter "N/A" in the required fields if you wish to remain anonymous.

Public roundtables: The roundtables will be conducted virtually. Roundtable 1 (patents) and Roundtable 2 (trademarks) will be conducted using the Webex videoconferencing platform. Roundtable 3 (copyright) will be conducted using the Zoom videoconferencing platform. Requests to participate as a panelist at one or more of these roundtables must be submitted via email to NFTStudySpeakingRequests@uspto.gov and must be received by the dates listed above (at **DATES**). Requests to participate as a panelist at a roundtable made in any other form, including as part of comments submitted via the Federal eRulemaking Portal, will not be considered. If email submission of requests to participate as a panelist is not feasible, please contact the Offices using the contact information below for special instructions. The submission of written comments in response to this notice is not a prerequisite to participation as a panelist in a roundtable. Please note that the Offices will review all requests to participate and will endeavor to invite participants representing diverse viewpoints on the subject matter discussed at each roundtable. The Offices may not be able to accommodate all requests.

FOR FURTHER INFORMATION CONTACT: Kevin R. Amer, Senior Level Attorney, USPTO, kevin.amer@uspto.gov, 571-

272–9300; Branden Ritchie, Senior Level Attorney, USPTO, branden.ritchie@uspto.gov, 571–272–9300; Andrew Foglia, Senior Counsel, USCO, afoglia@copyright.gov, 202–707–8350; or Jenée Iyer, Counsel, USCO, jiyer@copyright.gov, 202–707–8350.

SUPPLEMENTARY INFORMATION: The USPTO and the USCO have been consulting with stakeholders and working on both U.S. and international policy relating to emerging technologies, such as NFTs. These efforts have been collaborative, and each office also engages in its own activities impacting its respective responsibilities. For example, USPTO’s work in this area is being done as part of the USPTO’s AI and Emerging Technology Partnership, see <https://www.uspto.gov/initiatives/artificial-intelligence/ai-and-emerging-technology-partnership-engagement-and-events>, and as part of separate consultations and collaborations. The USCO continues to examine copyright issues arising from emerging technologies such as NFTs, software-enabled devices, and artificial intelligence. On June 9, 2022, Senators Patrick Leahy and Thom Tillis sent a letter to the USPTO and the USCO requesting that the Offices conduct a joint study addressing various IP law and policy issues associated with NFTs. The letter urged the Offices to “consult with the private sector, drawing from the technological, creative, and academic sectors.” USPTO and USCO responded on July 8, 2022, stating that “we will indeed conduct the study.” The Senators’ letter, and the agencies’ response, is at <https://www.copyright.gov/laws/hearings/response-to-june-9-2022-letter.pdf>.

In furtherance of the study and consultations, the Offices request public comments on the questions provided below. Commenters need not respond to every question and may provide comments that are relevant to the subject matter of this study but that are not encompassed by the questions. Following the close of the public comment period, the Offices will hold a series of three public roundtables to allow members of the public to provide further input.

I. Topics for Public Comment

Note Regarding the Use of the Term “NFT”: Merriam-Webster defines “non-fungible token” and “NFT” as “a unique digital identifier that cannot be copied, substituted, or subdivided, that is recorded in a blockchain, and that is used to certify authenticity and ownership (as of a specific digital asset

and specific rights relating to it).”¹ The terms “NFT” and “NFTs” in the questions below should be read consistently with this general definition. Accordingly, for purposes of the questions below, the terms “NFT” and “NFTs” do not refer to the underlying asset,² but rather to the unique identifier.

To the extent that your responses contemplate a definition different from the Merriam-Webster definition, please provide your definition before answering the questions, and explain how it is relevant to your answers.

Questions for Public Comment: The Offices welcome comments from members of the public on any issues relevant to the subject matter of this study, and are particularly interested in answers to the following questions. To the extent practicable, in your written response, please identify which questions you are answering.

1. Please describe:

a. The current uses of NFTs in your field or industry, including the types of assets associated with NFTs (e.g., digital assets, physical goods, services); and

b. Potential future applications of NFTs in your field or industry, including the types of assets that could be associated with NFTs (e.g., digital assets, physical goods, services).

2. Please describe any IP-related challenges or opportunities associated with NFTs or NFT markets.

3. Please describe how NFT markets affect the production of materials subject to IP protection.

4. Please describe whether, how, and to what extent NFTs are used by or could be used by IP rights holders (including those who hold trademarks, patents, and/or copyrights) to:

a. Document the authenticity of an asset;

b. Document the seller’s ownership of or authority to sell an asset;

c. Document the seller’s authority to transfer any relevant or necessary IP rights associated with an asset; and

d. Document any limitations related to IP rights surrounding the sale, or the purchaser’s use, of an asset.

5. Please describe whether, how, and to what extent NFTs present challenges for IP rights holders, or those who sell assets using NFTs, with respect to the activities described in Question 4 above.

6. Please describe whether, how, and to what extent NFTs are used by, could be used by, or present challenges or

opportunities for IP rights holders (including those who hold trademarks, patents, and/or copyrights) to:

a. Obtain their IP rights;

b. Transfer or license their IP rights;

c. Exercise overall control and management of their IP rights (e.g., digital rights management tools, mechanisms to facilitate the payment of royalties, etc.); and

d. Enforce their IP rights, including any mechanisms that could mitigate infringement or help ensure compliance with contractual terms associated with the sale of an asset.

7. Please describe how and to what extent copyrights, trademarks, and patents are relied on, or anticipated to be relied on, in your field or industry to:

a. Protect assets that are associated with NFTs;

b. Combat infringement associated with NFT-related assets offered by third parties; and

c. Ensure the availability of appropriate reuse of NFT-related assets.

8. Are current IP laws adequate to address the protection and enforcement of IP in the context of NFTs? If not, please explain why, including any gaps in current IP laws, and describe any legislation you believe should be considered to address these issues.

9. Please describe any IP-related impacts those in your field or industry have experienced in connection with actual or intended uses of NFTs. When relevant, please describe any legal disputes that have arisen in the following contexts, and the outcome of such disputes, including citations to any relevant judicial proceedings:

a. The relationship between the transfer of an NFT and the ownership of IP rights in the associated asset;

b. The licensing of IP rights in the asset associated with an NFT;

c. Infringement claims when either (i) an NFT is associated with an asset in which another party holds IP rights, or (ii) IP rights in the asset associated with an NFT are owned by the NFT creator;

d. The type and/or scope of IP protection afforded to the NFT creator, including when that party is not the creator of the associated asset; and

e. The application of one or more of the exclusive rights under 17 U.S.C. 106 to transactions involving NFTs.

10. Please describe any instances you have observed in which a party has sent or received:

a. A notification of claimed copyright infringement, counternotice or material misrepresentation, pursuant to 17 U.S.C. 512, in connection with an NFT; and

b. Other IP-related legal claims seeking the removal or reinstatement of NFT-associated materials.

¹ Merriam-Webster. (n.d.). NFT. Merriam-Webster.com dictionary, available at www.merriam-webster.com/dictionary/NFT.

² The Offices here use the word “asset” broadly and take no position on its meaning in the context of NFTs in other bodies of law.

For each such instance, please describe the nature and outcome of this claim or process, including whether the material was ultimately removed, and if so, whether the material subsequently reappeared. If an infringement or 17 U.S.C. 512(f) action was filed, please provide citations to the court docket and any relevant judicial decisions.

11. Please describe the extent to which adjustments are being made to IP portfolio planning and management in light of the emergence of NFTs.

12. Please describe any experiences in seeking IP protection for, or use of, assets associated with NFTs in foreign jurisdictions.

13. Please identify any additional IP issues associated with NFTs that you believe the Offices should consider in conducting this study.

II. Public Roundtables

The Offices will hold three public roundtables focused, respectively, on copyrights, patents, and trademarks. The roundtables are not expected to address broad topics in cryptocurrency or decentralized systems generally, but rather only IP considerations as they relate to NFTs.

Members of the public interested in participating as a panelist in one or more roundtables must submit such a request to *NFTStudySpeakingRequests@uspto.gov* and provide their name, professional affiliation, and contact information, and designate the roundtable(s) at which they wish to speak. Such requests must be submitted by the dates listed above (at **DATES**). Please note that written comments should not be submitted to this address; any such comments will not be considered.

The Offices will make every effort to ensure a broad range of stakeholder views are represented on the panels but may not be able to accommodate every request to participate. The Offices may also invite participation from individuals and entities who have not requested to participate. The submission of written comments in response to this notice is not a prerequisite to participation as a panelist in a roundtable.

The Offices will contact individuals selected to participate as panelists at the roundtables for additional information to aid in preparing for the roundtables. A tentative agenda for each roundtable will be posted at <https://www.uspto.gov/ip-policy/joint-study-intellectual-property-rights-and-non-fungible-tokens> and <https://copyright.gov/policy/nft-study> approximately one week before it takes place.

The roundtables will be livestreamed, and the Offices will post a link and instructions for members of the public to register to view them live. The USPTO will host Roundtable 1 (patents) and Roundtable 2 (trademarks).

Additional information regarding these roundtables and instructions for registering to view them will be posted at <https://www.uspto.gov/ip-policy/joint-study-intellectual-property-rights-and-non-fungible-tokens>. The USCO will host Roundtable 3 (copyrights).

Additional information regarding this roundtable and instructions for registering to view it will be posted at <https://copyright.gov/policy/nft-study>. The roundtables will also be video-recorded and transcribed, and copies of the recordings and transcripts will be available on the above USPTO and USCO websites.

Katherine K. Vidal,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

Dated: November 9, 2022.

Shira Perlmutter,

Register of Copyrights and Director, United States Copyright Office.

[FR Doc. 2022-25211 Filed 11-22-22; 8:45 am]

BILLING CODE 3510-16-P; 1410-30-P

BUREAU OF CONSUMER FINANCIAL PROTECTION

[Docket No. CFPB-2022-0078]

Agency Information Collection Activities: Comment Request

AGENCY: Bureau of Consumer Financial Protection.

ACTION: Notice and request for comment.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (PRA), the Consumer Financial Protection Bureau (Bureau or CFPB) is requesting the Office of Management and Budget's (OMB's) approval of a new information collection titled "Generic Information Collection Plan for Foundational Research about Consumer Credit Markets and Household Financial Decision-Making."

DATES: Written comments are encouraged and must be received on or before January 23, 2023 to be assured of consideration.

ADDRESSES: You may submit comments, identified by the title of the information collection, OMB Control Number (see below), and docket number (see above), by any of the following methods:

- *Federal eRulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.

- *Email:* PRA_Comments@cfpb.gov. Include Docket No. CFPB-2022-0078 in the subject line of the email.

- *Mail/Hand Delivery/Courier:* Comment Intake, Consumer Financial Protection Bureau (Attention: PRA Office), 1700 G Street NW, Washington, DC 20552. Because paper mail in the Washington, DC area and at the Bureau is subject to delay, commenters are encouraged to submit comments electronically.

Please note that comments submitted after the comment period will not be accepted. In general, all comments received will become public records, including any personal information provided. Sensitive personal information, such as account numbers or Social Security numbers, should not be included.

FOR FURTHER INFORMATION CONTACT:

Documentation prepared in support of this information collection request is available at www.regulations.gov. Requests for additional information should be directed to Anthony May, PRA Officer, at (202) 435-7278, or email: CFPB_PRA@cfpb.gov. If you require this document in an alternative electronic format, please contact CFPB_Accessibility@cfpb.gov. Please do not submit comments to these email boxes.

SUPPLEMENTARY INFORMATION:

Title of Collection: Generic Information Collection Plan for Foundational Research about Consumer Credit Markets and Household Financial Decision-Making.

OMB Control Number: 3170-00XX.

Type of Review: New collection.

Affected Public: Individuals or households; private sector: businesses or other for-profits; not-for-profits institutions.

Estimated Number of Respondents: 48,000.

Estimated Total Annual Burden Hours: 24,000.

Abstract: Under the Dodd-Frank Wall Street Reform and Consumer Protection Act, the Bureau is tasked with researching, analyzing, and reporting on topics relating to the Bureau's mission, including developments in markets for consumer financial products and services, consumer awareness, and consumer behavior. Under this generic information collection plan, the Bureau collects data through qualitative and quantitative methods, including focus groups, interviews, and controlled trials in field and laboratory settings. The primary purpose of research carried out under this generic clearance is for foundational research of an exploratory nature. This foundational research will be used for developmental and

APPENDIX E

NOTICE OF INQUIRY – STUDY ON NON-
FUNGIBLE TOKENS AND RELATED
INTELLECTUAL PROPERTY LAW ISSUES
(DECEMBER 21, 2022)

TABLE 2—TOTAL BURDEN HOURS AND HOURLY COSTS TO INDIVIDUAL AND HOUSEHOLD RESPONDENTS

Item No.	Item	Number of respondents (a)	Responses per respondent (b)	Number of responses (a) × (b) = (c)	Estimated response time (hours) (d)	Estimated annual burden hours (c) × (d) = (e)	Rate ² (\$/hr) (f)	Total hourly cost burden (e) × (f) = (g)
2	Application by Law School Faculty Member to Become a Faculty Clinic Supervisor.	10	1	10	1	10	\$62.89	\$629
3	Application for Limited Recognition for Law Students.	750	1	750	0.5	375	27.19	10,196
6	Certification and Request to Make Special under the Law School Program.	5	1	5	1	5	62.89	314
Total		765		765		390		11,139

Estimated Total Annual Respondent Non-hourly Cost Burden: \$46.

There are no maintenance costs, capital start-up costs, or recordkeeping costs associated with this information collection. However, the USPTO estimates that the total annual (non-hour) cost burden for this information collection, in the form of postage is \$46.

Postage

The USPTO does not presently use automated or other technological information collection techniques for the items in this collection of information, but submissions are accepted electronically through email. Submissions are also accepted via postal mail and hand delivery. The USPTO expects that only five (5) submissions will be submitted through the U.S. Postal Service. The remaining items will be submitted electronically. The average USPS postage cost for a mailed submission, using a Priority Mail flat rate legal envelope is \$9.25. Therefore, the USPTO estimates that the total postage costs for the mailed submissions in this information collection will total \$46.

¹ The USPTO expects that university faculty members will complete most of the items in this information collection at an estimated rate of \$62.89 per hour. The faculty rate is found in the Occupational Employment and Wage Statistics (25-1112 Law Teachers, Postsecondary (<https://www.bls.gov/oes/current/oes251112.htm>)). While no exact number is listed as a mean hourly wage, USPTO reached the estimated rate by taking the mean annual wage (\$130,820) and dividing it by 2,080, which is the number of annual work hours based on a 40-hour work week. Faculty members serving as Clinic Supervisors must be practicing attorneys (and registered with the Patent Bar for those schools handling patent matters before the USPTO on behalf of applicants).

The cost for law students applying to participate in the program is estimated to be at the 50% hourly rate for legal occupations (BLS 23-0000 Legal Occupations) which is \$27.29 per hour (<https://www.bls.gov/oes/current/oes230000.htm>). This accounts for law students' possible employment in various entry level legal positions.

² Ibid.

IV. Request for Comments

The USPTO is soliciting public comments to:

(a) Evaluate whether the collection of information is necessary for the proper performance of the functions of the Agency, including whether the information will have practical utility;

(b) Evaluate the accuracy of the Agency's estimate of the burden of the collection of information, including the validity of the methodology and assumptions used;

(c) Enhance the quality, utility, and clarity of the information to be collected; and

(d) Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

All comments submitted in response to this notice are a matter of public record. USPTO will include or summarize each comment in the request to OMB to approve this information collection. Before including an address, phone number, email address, or other personally identifiable information (PII) in a comment, be aware that the entire comment—including PII—may be made publicly available at any time. While you may ask in your comment to withhold PII from public view, USPTO cannot guarantee that it will be able to do so.

Justin Isaac,

Information Collections Officer, Office of the Chief Administrative Officer, United States Patent and Trademark Office.

[FR Doc. 2022-27677 Filed 12-20-22; 8:45 am]

BILLING CODE 3510-16-P

DEPARTMENT OF COMMERCE

Patent and Trademark Office

LIBRARY OF CONGRESS

Copyright Office

[Docket No. PTO-C-2022-0035]

Study on Non-Fungible Tokens and Related Intellectual Property Law Issues

AGENCY: United States Patent and Trademark Office, Department of Commerce; United States Copyright Office, Library of Congress.

ACTION: Notice of inquiry; extension of written comment period and date change for public roundtables.

SUMMARY: The United States Patent and Trademark Office (USPTO) and United States Copyright Office (USCO) (collectively, the Offices) published a request for comments in the **Federal Register** on November 23, 2022, seeking comments from the public on various intellectual property (IP) law and policy issues associated with non-fungible tokens (NFTs). Through this notice, the Offices are extending the period for written public comment until February 3, 2023. In addition, the Offices are changing the dates of the public roundtables in this study.

DATES:

Written comments: Written comments must be received by 11:59 p.m. Eastern Time on February 3, 2023.

Public roundtables: The roundtable on *Trademarks and NFTs* will now be held on Tuesday, January 24, 2023; the roundtable on *Patents and NFTs* will now be held on Thursday, January 26, 2023; and the roundtable on *Copyrights and NFTs* will now be held on Tuesday, January 31, 2023. The deadline for requests to participate as a panelist in one or more of the roundtables is unchanged. Such requests must be

received by 11:59 p.m. Eastern Time on December 21, 2022.

ADDRESSES:

Submission of written comments: For reasons of Government efficiency, comments must be submitted through the Federal eRulemaking Portal at www.regulations.gov. To submit comments via the portal, enter docket number PTO–C–2022–0035 on the homepage and click “Search.” The site will provide a search results page listing all documents associated with this docket. Find a reference to this request for information and click on the “Comment Now!” icon, complete the required fields, and enter or attach your comments. Attachments to electronic comments will be accepted in ADOBE® portable document format (PDF) or MICROSOFT WORD® format. Because comments will be made available for public inspection, information that the submitter does not desire to make public, such as an address or phone number, should not be included. Visit the Federal eRulemaking Portal for additional instructions on providing comments via the portal. If electronic submission of comments is not feasible due to a lack of access to a computer and/or the internet, please contact the Offices using the contact information below for special instructions on how to submit comments by other means.

Submission of business confidential information: Any submissions containing business confidential information must be marked “confidential treatment requested” and submitted through the Federal eRulemaking Portal. Submitters should provide an index listing the document(s) or information they would like the Offices to withhold. The index should identify the confidential document(s) by document number(s) and document title(s) and should identify the confidential information by description(s) and relevant page number(s) and/or section number(s) within a document. Submitters should provide a statement explaining their grounds for requesting non-disclosure of the information to the public as well. The Offices also request that submitters of business confidential information include a non-confidential version (either redacted or summarized) that will be posted on www.regulations.gov and available for public viewing. In the event that the submitter cannot provide a non-confidential version of their submission, the Offices request that the submitter post a notice in the docket stating that they have provided the Offices with business confidential information. Should a submitter fail

either to docket a non-confidential version of their submission or to post a notice that they have provided business confidential information, the Offices will note the receipt of the submission on the docket with the submitter’s organization or name (to the degree permitted by law) and the date of submission.

Anonymous submissions: The Offices will accept anonymous submissions. Enter “N/A” in the required fields if you wish to remain anonymous.

Public roundtables: The roundtables will be conducted virtually. Requests to participate as a panelist at one or more of these roundtables must be submitted via email to NFTStudySpeakingRequests@uspto.gov and must be received by 11:59 p.m. Eastern Time on December 21, 2022. Requests to participate as a panelist at a roundtable made in any other form, including as part of comments submitted via the Federal eRulemaking Portal, will not be considered. If email submission of requests to participate as a panelist is not feasible, please contact the Offices using the contact information below for special instructions. The submission of written comments in response to this notice is not a prerequisite to participation as a panelist in a roundtable. Please note that the Offices will review all requests to participate and will endeavor to invite participants representing diverse viewpoints on the subject matter discussed at each roundtable. The Offices may not be able to accommodate all requests.

FOR FURTHER INFORMATION CONTACT:

Kevin R. Amer, Senior Level Attorney, USPTO, kevin.amer@uspto.gov, 571-272–9300; Branden Ritchie, Senior Level Attorney, USPTO, branden.ritchie@uspto.gov, 571–272–9300; Andrew Foglia, Senior Counsel, USCO, afoglia@copyright.gov, 202–707–8350; or Jenée Iyer, Counsel, USCO, jiyer@copyright.gov, 202–707–8350.

SUPPLEMENTARY INFORMATION: On November 23, 2022, the Offices published a notice in the **Federal Register** announcing that the Offices are conducting a joint study regarding issues of intellectual property (IP) law and policy associated with non-fungible tokens (NFTs) in response to a June 9, 2022 request from Senators Patrick Leahy and Thom Tillis. See Notice of inquiry; notice of public roundtables, 87 FR 71584 (Nov. 23, 2022). In that notice, the Offices indicated that they are seeking public comments on these matters to assist in their work on IP policy related to NFTs and in conducting the study. To assist in

gathering public input, the Offices published questions and sought focused written public comments on various (IP) law and policy issues associated with NFTs. The notice requested written public comments be submitted on or before January 9, 2023. In addition, the Offices announced a series of three public roundtables to allow them to gather further input.

Through this notice, the Offices are extending the period for written public comments until February 3, 2023, to give interested members of the public additional time to submit comments. Previously submitted written comments do not need to be resubmitted.

The Offices are also changing the dates of the three public roundtables. The roundtable on *Trademarks and NFTs* will now be held on Tuesday, January 24, 2023; the roundtable on *Patents and NFTs* will now be held on Thursday, January 26, 2023; and the roundtable on *Copyrights and NFTs* will now be held on Tuesday, January 31, 2023. The deadline for requests to participate as a panelist in one or more of the roundtables is unchanged. Such requests must be received by 11:59 p.m. Eastern Time on December 21, 2022.

All other information and instructions to commenters provided in the November 23, 2022, notice remain unchanged.

Katherine K. Vidal,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

Shira Perlmutter,

Register of Copyrights and Director, United States Copyright Office.

[FR Doc. 2022–27694 Filed 12–20–22; 8:45 am]

BILLING CODE 3510–16–P; 1410–30–P

COMMITTEE FOR PURCHASE FROM PEOPLE WHO ARE BLIND OR SEVERELY DISABLED

Quarterly Public Meeting

AGENCY: Committee for Purchase From People Who Are Blind or Severely Disabled.

ACTION: Notice of public meeting.

Date and Time: January 31, 2023, from 1 p.m. to 4 p.m., ET.

Place: The meeting will be virtual only via Zoom webinar.

FOR FURTHER INFORMATION CONTACT: Angela Phifer, 355 E Street SW, Suite 325, Washington, DC 20024; (703) 798–5873, or CMTEFedReg@AbilityOne.gov.

SUPPLEMENTARY INFORMATION:

Background: The Committee for Purchase From People Who Are Blind

APPENDIX F

PARTIES WHO SUBMITTED COMMENTS IN
RESPONSE TO THE NOVEMBER 23, 2022, NOTICE
OF INQUIRY, EXTENDED BY THE DECEMBER 21,
2022, NOTICE OF INQUIRY

**Parties Who Submitted Comments
in Response to the Nov. 23, 2023, Notice of Inquiry, extended by the December 21, 2022,
Notice of Inquiry (alphabetical by first name)**

Comments are available at:

<https://www.regulations.gov/docket/PTO-C-2022-0035/comments> and
<https://www.regulations.gov/docket/COLC-2022-0005/comments>.

1. ACT | The App Association ("App Association")
2. Adam Sherman and Maureen Kelly, Vorys, Sater, Seymour and Pease LLP
3. Amalyah Keshet
4. Amanda Sharp
5. American Association of Independent Music (A2IM), the Recording Industry Association of America, Inc. (RIAA) and Screen Actors Guild - American Federation of Television and Radio Artists (SAG-AFTRA) (together "A2IM et al.")
6. American Bar Association, Section of Intellectual Property Law (ABA-IPL)
7. American Intellectual Property Law Association ("AIPLA")
8. Anoop Bungay
9. Aon plc
10. Art Blocks, Inc.
11. Botond Breszkovics
12. Brian L. Frye, University of Kentucky College of Law
13. Callum Lootsma
14. Charles Weinacker
15. Christopher Thomas Deeton
16. Computer & Communications Industry Association ("CCIA")
17. Copyright Alliance
18. Corsearch
19. Creative Commons

20. CrossBorderWorks
21. Dapper Labs Inc.
22. Decentralized Future Council
23. Dorothy Haraminac, GreenVets, LLC and Kiribex
24. Edward Lee and Nelson Rosario, Illinois Tech Chicago-Kent College of Law,
25. Entertainment Software Association ("ESA")
26. Eoin Jennings
27. Fédération Internationale des Conseils en Propriété Intellectuelle ("FICPI")
28. Frederick Pina
29. Graphic Artists Guild, Inc.
30. Hayleigh Boshier, Senior Lecturer in Intellectual Property Law and Associate Dean (Professional Development and Graduate Outcomes) at Brunel University London
31. Huski.ai
32. Ian Morris
33. International Trademark Association ("INTA")
34. Internet Archive
35. Inventiv Foundation
36. Jakub Wyczik
37. James Gatto, Shepphard Mullen
38. Jason Sean Richard Wright, Calexit LLC
39. Jayaram Law
40. Joshua Durham
41. Kary Oberbrunner, Igniting Souls and Blockchain Life
42. Matthew McCarter
43. Michael Kasdan, Wiggin and Dana LLP and Adjunct Professor at NYU School of Law
44. Motion Picture Association, Inc. ("MPA")
45. Music Artists Coalition ("MAC")
46. NamerTips LLC

47. National Music Publishers' Association ("NMPA")
48. New York Intellectual Property Law Association ("NYIPLA")
49. Nifty Universe
50. Patricia MacKenzie
51. Pex
52. Power Patent
53. Remaster Inc.
54. Robert Paul
55. Runhua Wang, University of Science and Technology Beijing and Jyh-An Lee, The Chinese University of Hong Kong Faculty of Law
56. Scott Pollan
57. Sol Center for Liberated Work, Center for Cultural Innovation
58. Tavarus Blackmon Art LLC
59. Willis Grajales

APPENDIX G

SAMPLE DEFINITIONS AND EXPLANATIONS OF
NFTs FROM DOMESTIC AND INTERNATIONAL
GOVERNMENT MATERIALS AND RESOURCES

Country of Origin	Agency / Association / IPO Office	Source	Definition or Explanation
US - Federal			
US	Congressional Research Service	Non-Fungible Tokens (NFTs) page 2	<p>NFTs are often compared to digital certificates of ownership. The certificate, in the form of data recorded on a blockchain, signifies ownership of an associated digital item not contained in the data itself....</p> <p>There are two parts to an NFT:</p> <ul style="list-style-type: none"> • NFT item. The digital item associated with an NFT is described in an NFT's metadata (see next bullet). These items are typically stored off-chain, meaning the item is not directly stored on a blockchain. • NFT metadata (called a token). NFT metadata is stored on a blockchain and typically includes information identifying the underlying NFT item, its location online, its ownership, and transaction information.
US	Congressional Research Service	Web3: A Proposed Blockchain-Based, Decentralized Web page 1	Non-Fungible Tokens (NFTs) are unique and noninterchangeable assets recorded on a blockchain that can be used to represent the ownership of physical or digital items.
US	Congressional Research Service	Pandemics, Payments, and (Digital) Property page 2	[N]onfungible tokens (NFTs) . . . allow people to purchase the rights to digital assets such as photographs, videos, highlights, and music without the need for a third party to validate the contractual transfer of property.
US	Department of Homeland Security (as part of the 2022 Public-Private Analytic Exchange Program)	Tips for a Safe Non-Fungible Tokens (NFTs) Experience	A non-fungible token (NFT) is a cryptocurrency token that is indivisible and unique. One NFT cannot be interchanged with another NFT, and the whole cannot be broken down into smaller parts and used.
US	Department of Justice	The Role of Law Enforcement in Detecting, Investigating, and Prosecuting Criminal Activity Related to Digital Assets page 11	NFTs are digital assets, often associated in recent years with a piece of digital artwork, with a unique identifier, as opposed to units of digital currencies that are meant to be interchangeable. The design features of NFTs facilitate their use as certificates of ownership applicable to a wide range of digital and physical assets such as artwork and collectibles. NFTs are frequently built on blockchains like Ethereum or Solana, and are bought and sold on specialized online marketplaces.

US	Department of the Treasury	Crypto-Assets: Implications for Consumers, Investors, and Businesses page 5; 23	<p>Non-fungible tokens (NFTs) are crypto-assets that are created using software code that is not fungible with other software code. NFTs purport to represent a claim or receipt on an asset or object that has inherently unique characteristics or that differs from similar assets in some distinguishable way. Although NFTs are tradeable, they are not interchangeable.</p> <p>...</p> <p>Whereas some activities involving crypto-assets rely on fungible coins and tokens that are interchangeable with one another, a class of crypto-assets (NFTs) has developed that allows the tokenization of distinct characteristics such that each token is unique and distinguishable from any other.</p>
US	Department of the Treasury	Study of the Facilitation of Money Laundering and Terror Finance Through the Trade in Works of Art page 25–26	<p>NFTs are digital units, or tokens, on an underlying blockchain that represent ownership of images, videos, audio files, and other forms of media or ownership of physical or digital property. They are bearer instruments that codify the ownership of a unique digital asset, such as a piece of high-value digital art and are managed (e.g., minted, held, transferred, and destroyed) via smart contracts and digital wallets. The exchange of an NFT transfers that ownership between digital wallets or smart contracts, and because they are blockchain-based, NFTs are publicly verifiable, auditable, and digitally unique due to being derived cryptographically. A</p>
US	Internal Revenue Service	Notice 2023-27 page 1	<p>An NFT is a unique digital identifier that is recorded using distributed ledger technology and may be used to certify authenticity and ownership of an associated right or asset. Ownership of an NFT may provide the holder a right with respect to a digital file (such as a digital image, digital music, a digital trading card, or a digital sports moment) that typically is separate from the NFT. Alternatively, NFT ownership may provide the holder a right with respect to an asset that is not a digital file, such as a right to attend a ticketed event, or certify ownership of a physical item.</p>

US	U.S. Government Accountability Office	Science & Tech Spotlight: Non-Fungible Tokens GAO-22-105990 (PDF) page 1	<p>A non-fungible token (NFT) is a digital identifier, similar to a certificate of ownership, that represents a digital or physical asset. In general, a non-fungible asset is unique and not interchangeable with others. An NFT, like an original painting, has its own unique value. By contrast, fungible assets are interchangeable, like dollar bills or units of a cryptocurrency.</p> <p>...</p> <p>Most NFTs are not the asset itself. In the case of a physical asset, they represent ownership of the asset. For digital assets, they represent ownership of the unique code linked to or associated with the asset’s metadata— information about the asset, such as the creation date, size, or where it is stored on the internet. In the case of a digital image, others may be able to see the asset or even download a copy, but the NFT proves which digital image is the original and can, in conjunction with other information, show who owns the NFT.</p>
US - State			
US	Arizona Revised Statutes	ARIZ. REV. STAT. § 43–1028(3) 2022 AZ H.B. 2204 [effective 1/1/2023]	“Non-fungible token” means a non-fungible cryptographic asset on a blockchain that possesses unique identifiers or other metadata that distinguishes the asset from another token or asset in a manner that makes the asset irreplaceable and non-exchangeable for a similar token or asset.
US	Manhattan District Attorney’s Office	NFT Scams and Frauds	NFTs refer to unique bits of code (hashed “smart contracts”) that are typically (though not always) stored on the publicly-accessible Ethereum blockchain. These “smart contracts” in turn point to content (e.g., an artist’s digital painting, a sports highlight) that resides at a location on the internet (and which can be viewed). The provenance of these NFTs can then be tracked across the public blockchain, providing end-purchasers with a built-in chain of authenticity. <i>However, because of the nature of blockchain transactions, if an NFT is compromised or stolen, it may not be recoverable by the rightful owner. It is therefore important to take even greater caution with these assets than with traditional online accounts. It is best to view NFTs as more closely akin to a physical piece of artwork than to an online bank account.</i>

US	Pennsylvania – Department of Revenue	Non-Fungible Tokens (NFTs)	A non-fungible token, or NFT, is a unique set of software codes recorded on a blockchain, which is used to certify authenticity and ownership of a digital representation of something of value that can be bought, sold, and traded.
US	Tennessee Code	TENN. CODE § 9-3-602(4) [repealed effective 6/30/2025]	“Non-fungible token” means a non-fungible cryptographic asset on a blockchain that possesses unique identifiers or other metadata that distinguishes the asset from another token or asset in a manner that makes the asset irreplaceable and non-exchangeable for a similar token or asset
US	Washington State – Department of Revenue	Interim statement regarding the taxability of non-fungible tokens (NFTs)	<p>Non-fungible tokens (NFTs) are digital code on a blockchain comprised of unique identification codes and metadata that distinguish them from one another.</p> <p>...</p> <p>A non-fungible token (NFT) is a unique digital identifier that cannot be copied, substituted, or subdivided, that is recorded in a blockchain, and that is used to certify authenticity and ownership of a specific type of product. NFTs are distinguishable from cryptocurrency, which is fungible, based in part on the unique nature of NFTs.</p> <p>In addition to the NFT itself, purchasers of an NFT may also be entitled to receive other types of products or services, including (but not limited to): a) digital products, such as music, visual, video works, or video games, b) admissions to non-retail sales taxable events, such as tickets to clubs, sporting events, or concerts, c) prepared foods and beverages served by restaurants, or d) tangible personal property, such as memorabilia, collectibles, or apparel. NFTs are taxed based on the character of the underlying products (goods and services) included in the sale.</p>
International			
Int'l	World Trade Organization	The Promise of Tradetech: Policy Approaches to Harness Trade Digitalization (PDF) page 37	Non-fungible tokens (NFTs) . . . represent a physical or digital asset (e.g. a document of title) and can be used for trade documents which are assets (e.g. account receivable or bills of lading) and can be traded on secondary markets.

Int'1	World Intellectual Property Organization	Blockchain technologies and IP ecosystems: A WIPO white paper (PDF) page 23; 40	<p>Non-fungible tokens (NFTs) are a type of cryptographic token that represents assets that can be commercialized in a digital way. They function as verifiable proofs of authenticity and ownership within a blockchain network, bearing several characteristics such as scarcity, uniqueness and non-fungibility. In particular, NFTs allow their owner to possess the (digital/virtual) representation of a unique object unequivocally associated to their wallet or user in the virtual space. Scarcity is another crucial characteristic, since it is the direct consequence of uniqueness; as NFTs are associated to one digital or physical object they provide scarcity in the market. Last but not least, fungibility is an important aspect of NFTs—and part of the acronym. Fungibility represents the possibility of interchanging items, whereas non-fungibility does not. A non-fungible token is not replaceable, whereas a fungible token is In the simplest terms, NFTs transform digital works into one-of-a-kind, verifiable assets that are easy to trade on the blockchain.</p> <p>...</p> <p>NFTs are intangible and represent unique digital items, meaning that such digital work is unique, original and no other item will bear such characteristics or attributes.</p> <p>...</p> <p>NFTs can be anything physical or digital, “minted” (“uploaded,” encrypted and associated with a unique identifier) on the blockchain.</p>
Int'1	Financial Action Task Force	Updated Guidance for a Risk-Based Approach for Virtual Assets and Virtual Asset Service Providers (PDF) § 53, page 24	<p>Digital assets that are unique, rather than interchangeable, and that are in practice used as collectibles rather than as payment or investment instruments, can be referred to as non-fungible tokens (NFT) or crypto-collectibles.</p>