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## Internet Jurisdiction: Using Content Delivery Networks to Ascertain Intention

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## ABSTRACT

Still unresolved is the question of whether and how Internet contacts with a state could hale a person into the jurisdiction of that state's courts. As it stands, most courts adopt one or a combination of the following two tests: (i) the targeting test, which asks whether the Internet activity was aimed at, and had its effects in, the forum, and (ii) the "*Zippo*" test, which asks whether a website or application is passive, active, or interactive. But these tests, perhaps owing to their discretionary and balancing-of-factors nature, tend to beget inconsistent, and therefore, unpredictable, results. Further limiting is that both tests appear only to enquire at the content level of the Internet. Little or nothing has been done to look beyond the content layer to the architectural backbone of the Internet in this context. I propose that the use of content delivery networks constitutes an additional factor for analyzing personal specific jurisdiction. I demonstrate that the purposeful availment test (one dimension of specific jurisdiction) is satisfied if a person intentionally uses a content delivery network to exploit a state forum. My approach not only gives courts a predictable method for ascertaining personal jurisdiction on the Internet, but also equips them with new facility to confront Internet jurisdiction through technological lenses.

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## INTRODUCTION

Specific jurisdiction in civil litigation centers on the rather general, yet immutable, concept of intention.<sup>1</sup> Although the word “intention” does not surface prominently in the personal jurisdiction case law,<sup>2</sup> it is clearly intrinsic to the concept of “purposeful availment.”<sup>3</sup> On the Internet, however, intention is hard to ascertain: how does a court, for example, determine whether the defendant intended that its website, application, or advertisement within a mobile application should end up in the forum state?<sup>4</sup> In answering such a question, courts have historically used one of two approaches to establish intent: (i) a targeting test<sup>5</sup> or (ii) a degree of activity

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<sup>1</sup> See generally *Asahi Metal Indus. Co. v. Superior Court*, 480 U.S. 102, 115 (1987); *J. McIntyre Machinery, Ltd. v. Nicastro*, 564 U.S. 873 (2011).

<sup>2</sup> I have introduced the term “intention” or “intentional” to be used interchangeably with “purpose” or “purposeful” for two reasons. First, its usage foreshadows a later discussion of whether Internet users *intend* to use a content delivery network. It seems cumbersome to ask, instead, whether internet users “purposefully use” or “use on purpose” a content delivery network. Such usage appears stylistically grating. Second, “intention,” as a general legal concept is more intuitively relatable to the legally-versed reader than “purposeful.” The term intention surfaces in many contexts, such as criminal intent (*mens rea*) in criminal law, the intention to create legal relations in contract law, or certainty of intention in trusts law.

<sup>3</sup> *Burger King Corp. v. Rudzewicz*, 471 U.S. 462, 479 (1985) (noting that the due process analysis requires the court to determine “whether the defendant *purposefully* established minimum contacts”) (emphasis added).

<sup>4</sup> See UTA KOHL, *JURISDICTION AND THE INTERNET: REGULATORY COMPETENCE OVER ONLINE ACTIVITY* 96 (1st ed. 2007) (noting that mere accessibility of content does not appear to be sufficient to attract jurisdiction). See also JOANNA KULESZA, *INTERNATIONAL INTERNET LAW* 87–97 (1st ed. 2012) (discussing generally the U.S. approaches to personal jurisdiction on the Internet).

<sup>5</sup> See *Calder v. Jones*, 465 U.S. 783 (1984) (representing the U.S. Supreme Court’s seminal case on the targeting test); see also *Mecklermedia Corp. v. D.C. Congress GmbH* [1998] 1 All ER

test.<sup>6</sup> Both tests require courts to examine the *content* of the defendant's website: while the former asks whether a defendant aimed its website at the forum, the latter asks whether a website is passive, interactive or active.

No court, however, has looked “under the hood,”<sup>7</sup> at the Internet backbone itself, to establish whether a defendant is using the technological infrastructure of the Internet to purposefully avail itself of—and thereby establish minimum contacts with—the forum.<sup>8</sup> This article fills that gap: I propose that the purposeful availment test—a necessary element for specific jurisdiction—is satisfied when a defendant employs a *content delivery network* (“CDN”) to exploit a forum market (a mechanism I will refer to as “the CDN approach”).<sup>9</sup> A CDN is a geographically distributed system of physical servers that make websites and other content available to users across the world. I argue that, if a defendant elects to use a CDN in the forum, then purposeful availment is most likely established. If a defendant does not elect to use a CDN, then purposeful availment is not established, except if intention

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148 (representing an early decision made outside the U.S. that considered the targeting test).

<sup>6</sup> See *Zippo Manufacturing Co. v. Zippo Dot Com Inc.*, 952 F. Supp. 1119 (W.D. Pa. 1997) (articulating what has often been called the “*Zippo*” test or “sliding scale” method).

<sup>7</sup> This is true to my knowledge and at the time of writing this article. But to the extent that courts have addressed the technological architecture of the Internet in their analyses, those technological aspects discussed do not seem to feature in the same manner as proposed by this paper. See generally *Plixer Int'l, Inc. v. Scrutinizer GmbH*, 293 F. Supp. 3d 232, 238–40 (D. Me. 2017) (summarizing the various Circuit Court tests for personal jurisdiction on the Internet).

<sup>8</sup> E.g., *Bensusan Restaurant Corp. v. King*, 937 F. Supp. 295 (S.D.N.Y. 1996); *Cybersell Inc. v. Cybersell*, 130 F.3d. 414, 418 (9th Cir. 1997); *Millennium Enters, Inc. v. Millennium Music, LP*, 33 F. Supp. 2d. 907 (D. Or. 1999); *Inset Systems Inc. v. Instruction Set Inc.*, 937 F. Supp. 161 (D. Conn. 1996); *Toys “R” Us, Inc. v. Step Two, S.A.*, 318 F.3d 446, 454 (3d Cir. 2003).

<sup>9</sup> Content delivery networks are sometimes called content “distribution” networks.

is imputable on the defendant. Without that exception, the CDN approach would apply only to a narrow universe of cases.

Part I of this article canvasses the specific personal jurisdiction framework. Part II sets forth the CDN approach and integrates it with purposeful availment. In Part III, I discuss the feasibility of imputing intention and conclude that purposeful availment demands strict intention, which limits the scope of the CDN approach. Nevertheless, in Part IV, I maintain that, regardless of whether there is an intention requirement, the CDN approach will bring certainty to personal jurisdiction because people either use a CDN or they do not. Part V concludes that the CDN approach will give courts improved facility to assess personal jurisdiction for Internet related cases.

From the outset, however, there are two caveats. First, although this article focuses on only one technological factor for determining minimum contacts, I do not foreclose the likelihood that there is now, or in the future will be, technological indicia other than CDNs that would aid a minimum contacts analysis on the Internet.<sup>10</sup> On a similar matter of scope, this article only deals with CDNs as they relate to specific jurisdiction (as opposed to general jurisdiction) in civil matters (as opposed to criminal matters). Second, this article does not claim that the CDN approach supersedes existing minimum contacts and purposeful availment doctrine. Rather, I argue that the intentional use of CDNs constitutes purposeful availment. The CDN approach, therefore, complements rather than supersedes the prevailing jurisprudence.

## **I. U.S. PRIVATE INTERNATIONAL LAW FRAMEWORK**

### **A. General and Specific Jurisdiction**

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<sup>10</sup> Other technological factors to explore may include the use of metadata in targeted advertising.

Although the following discussion sets out U.S. private *international* law on jurisdiction, the principles discussed and the CDN approach proposed are equally applicable to domestic cases. The terms “general” and “specific” jurisdiction refer to a civil procedure distinction within U.S. private international law for personal jurisdiction.<sup>11</sup> General jurisdiction allows a court to adjudicate any claim against a defendant who has a certain close and enduring relationship with the forum through indicia such as nationality, domicile, incorporation or conduct by which a defendant is “at home” in the forum.<sup>12</sup> It is hard to envision how virtual “presence” through Internet activity would alone render a nonresident defendant “at home” for general jurisdiction. Accordingly, most Internet jurisdiction cases involve specific jurisdiction.<sup>13</sup>

Specific jurisdiction concerns claims that arise out of or are related to a defendant’s activities in the forum state.<sup>14</sup> The traditional test for establishing specific personal jurisdiction over a non-resident defendant has two prongs comprising of statutory and constitutional criteria: the satisfaction of (i) the state long-arm statute and (ii) due process.<sup>15</sup>

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<sup>11</sup> HENRIK SPANG-HANSEN, *PUBLIC INTERNATIONAL COMPUTER NETWORK LAW ISSUES* 118-119 (1st ed. 2006); *see also* GARY B. BORN & PETER B. RUTLEDGE, *INTERNATIONAL CIVIL LITIGATION IN UNITED STATES COURTS* 88 (6th ed. 2018); RAYMOND S. R. KU & JACQUELINE D. LIPTON, *CYBERSPACE LAW CASES AND MATERIALS* 28 (2nd ed. 2006); Jeanne Huang, *Chinese Private International Law and Online Data Protection*, 15 *J. PRIVATE INT’L L.* 186, 189 (2019) (discussing rules of personal jurisdiction in Chinese law in contrast with U.S. rules).

<sup>12</sup> *Daimler AG v. Bauman*, 134 S. Ct. 746, 751 (2014) (finding that the petitioner, Daimler, was not at home in the forum, California, and could not be sued there).

<sup>13</sup> *E.g.*, *Holland Am. Line, Inc. v. Wartsila N. Am., Inc.*, 485 F.3d 450, 460 (9th Cir. 2007).

<sup>14</sup> *Bristol-Myers Squibb Co. v. Superior Court of California*, 137 S. Ct. 1773 (2017).

<sup>15</sup> *International Shoe Co. v. Washington State.*, 326 U.S. 310, 316 (1945) (holding that due process requires the defendant, if not present in the forum, to have certain minimum contacts with the

## 1. Long-Arm Statute

An extraterritorial claim must be captured by the forum state's long-arm statute.<sup>16</sup> Each state in the U.S. has its own rules on when its courts may serve process on a nonresident defendant, including foreign defendants.<sup>17</sup> Considering that service of process perfects a court's jurisdiction over a person,<sup>18</sup> long-arm statutes provide the threshold bases for a state forum's assertion of extraterritorial jurisdiction.<sup>19</sup> Some long-arm statutes, such as those of New York, Utah, and Texas, clearly delineate the circumstances in which state courts may assert personal jurisdiction.<sup>20</sup>

Other states, such as California, provide broad and amorphous long-arm statutes under which a court may, for example, "exercise jurisdiction on any basis not inconsistent with the constitution of this state or of the United States."<sup>21</sup> Since there is no federal long-arm statute, in federal cases, a

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forum such that the maintenance of the suit does not offend traditional notions of fair play and substantial justice); *see also* GEORGE A. BERMAN, *TRANSNATIONAL LITIGATION IN A NUTSHELL* 40 (1st ed. 2003).

<sup>16</sup> *See* Peter Levitt, *The Extraterritorial Assertion of Long-Arm Jurisdiction and the Impact on the International Commercial Community: A Comment and Suggested Approach*, 9 U. PA. J. INT'L L. 713 (1987).

<sup>17</sup> *See* Fed. R. Civ. P. 4(K)(1)(A); *Helicopteros Nacionales de Colombia, S.A. v. Hall*, 466 U.S. 408 (1984).

<sup>18</sup> *See* E. Merrick Dodd, *Jurisdiction in Personal Actions*, 23 ILL. L. REV. 427 (1929); *see also* *Soltex Polymer Corp. v. Fortex Indus., Inc.*, 590 F.Supp. 1453, 1456 (E.D.N.Y. 1984) (noting that personal jurisdiction comprises of amenability to jurisdiction and notice to the defendant through valid service of process).

<sup>19</sup> *E.g.*, New York Civil Practice Law and Rules § 303 (providing for service of process once the long arm statute is satisfied).

<sup>20</sup> *E.g.*, New York Civil Practice Law and Rules § 302(a) (permitting the exercise of personal jurisdiction as to a cause of action arising from acts such as: a business transaction within the state, a tortious act in the state (except defamation), a tortious act in the state causing injury to person or property).

<sup>21</sup> Cal. Civ. Proc. Code § 410.10 (2016).



court will apply the long-arm statute of the state in which that federal court is sitting.

## 2. Due Process

Even if the state long-arm statute were satisfied, Fifth and Fourteenth Amendment considerations may preclude the exercise of jurisdiction over a nonresident defendant.<sup>22</sup> These Amendments essentially provide that no person shall be deprived of life, liberty or property without due process of the law,<sup>23</sup> and have been interpreted to, in turn, require a two-pronged enquiry of minimum contacts and reasonableness.<sup>24</sup>

First, a nonresident defendant must have minimum contacts with the forum before it can be subjected to the forum's jurisdiction.<sup>25</sup> The minimum contacts test is satisfied if the defendant purposefully avails itself of the privilege of doing business in the forum state.<sup>26</sup> Purposeful availment is a way of operationalizing and giving measure to the concept of minimum contacts. The purposeful availment test focuses on the defendant's intention and is only satisfied when the defendant directs its activity toward the forum state so that the

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<sup>22</sup> *International Shoe*, 326 U.S. at 316.

<sup>23</sup> U.S. CONST. amend. V (applying to the federal government); U.S. CONST. amend. XIV § 1 (applying to the states).

<sup>24</sup> *World-Wide Volkswagen Corp. v. Woodson*, 444 U.S. 286 (1980) (setting out a two-part test where jurisdiction can only be asserted if (i) the defendant has minimum contacts with the forum as a result of purposefully availing itself of the benefits and protections of the forum law and (ii) the exercise of jurisdiction would be reasonable). *See also* *Mason v. F. LLI Luigi & Franco Dal Maschio Fu G.B.*, 832 F.2d 383, 386 (7th Cir. 1987); *Oaswalt v. Scripto, Inc.*, 616 F.2d 191, 201-202 (5th Cir. 1980).

<sup>25</sup> *World-Wide Volkswagen*, 444 U.S. 286 (1980).

<sup>26</sup> *Id.* at 297-98. *See also* JULIA HORNLE, *LAW AND THE INTERNET* 144 (Lilian Edwards & Charlotte Waelde eds., 3rd ed. 2009); Faye Fangfei Wang, *Obstacles and Solutions to Internet Jurisdiction: A Comparative Analysis of the EU and US Laws*, 3 J. INT'L COM. L. & TECH. 233 (2008).

defendant should expect, by virtue of the benefit it receives, to be subject to the forum's jurisdiction.<sup>27</sup>

Second, the reasonableness test requires that the exercise of jurisdiction does not offend traditional notions of fair play and substantial justice.<sup>28</sup> The reasonableness test is not mechanical.<sup>29</sup> Rather, a court will take into account a variety of factors such as: the extent of the defendant's purposeful interjection into the forum state's affairs,<sup>30</sup> the defendant's burden of litigating the claim,<sup>31</sup> the forum state's interest in adjudicating the dispute,<sup>32</sup> the plaintiff's interest in obtaining effective relief,<sup>33</sup> the interstate judicial system's interest in obtaining the most efficient resolution of controversies,<sup>34</sup> and

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<sup>27</sup> *United States v. Swiss American Bank, Ltd.*, 274 F.3d 610, 623-24 (1st Cir. 2001).

<sup>28</sup> *International Shoe*, 326 U.S. at 316.

<sup>29</sup> *Insurance Company of North America v. Marina Salina Cruz*, 649 F.2d 1266, 1270 (9th Cir. 1981).

<sup>30</sup> *E.g.*, *Cabbage v. Merchant*, 744 F.2d 665 (9th Cir. 1984), *cert. denied*, 470 U.S. 1005 (1985).

<sup>31</sup> *World-Wide Volkswagen*, 444 U.S. at 292.

<sup>32</sup> *E.g.*, *Hirsh v. Blue Cross, Blue Shield*, 800 F.2d 1474, 1481 (9th Cir. 1986) (noting that the forum state, California, had a strong interest in ensuring that its residents have appropriate redress against insurers who refuse to pay claims); *Rocke v. Canadian Auto. Sport Club*, 660 F.2d 395, 399 (9th Cir. 1981) (finding against jurisdiction even though the forum state had some interest in the adjudication of the dispute).

<sup>33</sup> *World-Wide Volkswagen*, 444 U.S. at 292.

<sup>34</sup> *E.g.*, *Cabbage* 744 F.2d at 671. The "efficient resolution interest" might emphasize the location of evidence and witnesses, often preferring the forum where the injury occurred or where the witnesses reside. It would tend also to counsel against piecemeal litigation. These considerations would also appear to overlap with the convenience considerations of *forum non conveniens*, and, indeed, Justice O'Connor in *Asahi* appeared to take into account some factors which would overlap with convenience in her analysis of reasonableness.

the states' shared interest of advancing fundamental substantive social policies.<sup>35</sup>

### **B. Recent Supreme Court Approaches to Specific Jurisdiction**

While the Supreme Court has narrowed general jurisdiction,<sup>36</sup> it has hinted at the expansion of specific jurisdiction.<sup>37</sup> To set the stage for a discussion of specific jurisdiction on the Internet, it would be fruitful to survey three recent Supreme Court cases on specific jurisdiction. All three cases respond in some way to the splintered decision in *Asahi Metal Industry Co. v. Superior Court of California*.<sup>38</sup> The common thread among all ensuing cases is that mere foreseeability or awareness that a product might enter a forum's "stream of commerce" is not enough to attract jurisdiction. Rather, the defendant must have indicated its intent to enter the forum by establishing minimum contacts.

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<sup>35</sup> *Asahi*, 480 U.S. at 115 (finding that, on a case-by-case basis, a court should examine the policies of other states or nations whose interests are affected if the forum were to accept jurisdiction).

<sup>36</sup> *E.g.*, *Daimler AG v. Bauman*, 134 S. Ct. 746, 760 (2014). Justice Ginsburg took the view that broad personal general jurisdiction would threaten comity and foreign relations. Accordingly, general personal jurisdiction should be limited. *See also* Bernadette B. Genetin, *The Supreme Court's New Approach to Personal Jurisdiction*, 68 SMU L. REV. 107 (2015) (discussing the Court's narrowing of the scope of general jurisdiction); Charles W. "Rocky" Rhodes & Cassandra Burke Robertson, *Toward a New Equilibrium in Personal Jurisdiction*, 48 U.C. DAVIS L. REV. 207, 230–35 (2014) (arguing that *Daimler* and *Walden* shift the balance of litigation power from plaintiffs to defendants).

<sup>37</sup> *Daimler*, 134 S. Ct. at 758 n.10 (stating that specific jurisdiction has "flourished" in recent decades).

<sup>38</sup> 480 U.S. 102 (1987).

## 1. *Asahi*

In *Asahi*, the Supreme Court offered several theories on the stream of commerce doctrine.<sup>39</sup> At issue was whether the minimum contacts test was satisfied if a defendant were aware that its products could end up in the forum. The court was unanimous in its decision, but fractured in its reasoning.

Justice O'Connor, joined by three other justices, propounded the “stream of commerce—plus” test, which stated that placing a product into the stream of commerce without “something more”—such as evidence of intention to serve the forum market—does not constitute purposeful availment. The defendant’s mere awareness that the stream will or may sweep the product into the forum is not enough to demonstrate intent to do business in the forum market.<sup>40</sup>

By contrast, Justice Brennan, joined by three other justices, proposed the broader “stream of commerce only” test, which stated that “as long as a participant in this process is aware that the final product is being marketed in the forum State, the possibility of a lawsuit there cannot come as a

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<sup>39</sup> In *Asahi*, a Taiwanese distributor purchased a valve (for the manufacture of motorcycle wheels) from a Japanese corporation – Asahi. One of these valves were alleged to have caused an accident in California. The victim sued the Taiwanese company in California and the Taiwanese company sought indemnification from Asahi. The California Supreme Court accepted personal jurisdiction over Asahi on the basis that Asahi was aware that its products, distributed internationally, would be swept in the stream of commerce to the United States. The Supreme Court found against jurisdiction.

<sup>40</sup> *Id.* at 112. Justice O'Connor, writing for the plurality, provided several examples of “additional conduct” that would be sufficient to establish minimum contacts: designing the product for the market in the forum State, advertising in the forum State, establishing channels for providing regular advice to customers in the forum State, or marketing the product through a distributor who has agreed to serve as the sales agent in the forum State.

surprise.”<sup>41</sup> Nonetheless, Justice Brennan found that jurisdiction would violate fair play and justice, and arrived at the same result as did Justice O’Connor.<sup>42</sup> This sense of fairness appeared to have driven Justice Stevens, who found that unreasonableness alone, without further consideration of minimum contacts, was enough to reject jurisdiction. But to the extent that minimum contacts should be considered, Justice Stevens suggested that whether placement of a product into the stream of commerce satisfied minimum contacts turns on “the volume, the value, and the hazardous character” of the product.<sup>43</sup>

## 2. *Nicastro*

Twenty-four years after the split decision in *Asahi*, the Supreme Court had the opportunity to clarify the standing of the stream of commerce doctrine in *J. McIntyre Machinery v. Nicastro*. Again, however, the court delivered a splintered decision. Although this decision is frequently criticized for leaving the stream of commerce doctrine unsettled,<sup>44</sup> it actually provides more certainty than is initially apparent. Justice Ginsburg, although dissenting, appears to apply Justice O’Connor’s “stream of commerce—plus” test, as did the majority in *Nicastro*.<sup>45</sup> This unified approach suggests that the

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<sup>41</sup> *Asahi*, 480 U.S. at 116-17. In Justice Steven’s view, whether conduct rises to the level of purposeful availment requires a fact-specific, particularized determination that considers the volume, value, and hazardous character of the products at issue. *Id.* at 122. (Stevens, J., concurring in part and concurring in the judgment).

<sup>42</sup> *Id.* at 104.

<sup>43</sup> *Id.* at 121-22 (Stevens, J., concurring in part and concurring in the judgment).

<sup>44</sup> Kaitlyn Findley, *Paddling Past Nicastro in the Stream of Commerce Doctrine: Interpreting Justice Breyer’s Concurrence as Implicitly Inviting Lower Courts to Develop Alternative Jurisdictional Standards*, 63 EMORY L. J. 695 (2014) (stating that *Nicastro* represented a disappointing split decision that prompted law reviews and courts alike to adopt divergent perspectives on the stream of commerce doctrine).

<sup>45</sup> 564 U.S. 873 (2011).

“stream of commerce—plus” test is the yardstick against which any new doctrine, including the CDN approach, should be compatible.

In *Nicastro*,<sup>46</sup> four justices found that placing a product into the stream of commerce, by itself, was not enough to establish jurisdiction. Rather, McIntyre, the petitioner who manufactured allegedly faulty products, needed to have targeted the forum.<sup>47</sup> Justice Kennedy, writing for a plurality, focused on whether McIntyre had any contacts with New Jersey. Justice Kennedy found that although McIntyre had targeted the entire U.S. market through a distributor, it had not specifically targeted New Jersey and, accordingly, jurisdiction was not established.<sup>48</sup>

Justice Ginsburg, with whom Justice Sotomayor and Justice Kagan joined in dissent, found that McIntyre had purposefully availed itself of the forum by promoting and selling its machines to the U.S. market nationwide, thereby obtaining the benefit of all states in which its products were sold. Justice Ginsburg’s view may, at first inspection, sound like Justice Brennan’s view in *Asahi*. Justice Ginsburg’s characterization of the case may appear to relinquish the need for any purposeful availment:

A foreign-country manufacturer engages a U.S. company to promote and distribute the manufacturer’s products, not in any particular State, but anywhere and everywhere in the United States the distributor can attract purchasers.<sup>49</sup>

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<sup>46</sup> *Id.*

<sup>47</sup> *Id.* at 878. In *Nicastro*, a scrap metal worker in New Jersey had injured his hand with a metal-shearing machine. McIntyre, an English corporation, had made the machine in England and sold it to the U.S. through a distributor.

<sup>48</sup> *Id.* at 885-86.

<sup>49</sup> *Id.* at 902 (Ginsburg, J., dissenting).

Here, Justice Ginsburg may, at first glance, be misconstrued as suggesting that targeting the U.S. at-large is the same as targeting a U.S. state.

Upon further inspection, however, Justice Ginsburg's view is actually more similar to Justice O'Connor's "stream of commerce—plus" doctrine. Justice Ginsburg distinguished *Asahi* on the basis that *Asahi*, unlike McIntyre, did not seek out customers and advertise its products in the forum. Unlike Justice Brennan in *Asahi*, who did not require evidence of purposeful availment (merely entering the stream of commerce was enough), Justice Ginsburg did require purposeful availment. It so happened that McIntyre purposefully availed itself of the entirety of the U.S., including New Jersey.

Accordingly, Justice Ginsburg still focused her analysis on the question of whether McIntyre had established minimum contacts with New Jersey. In the circumstances, she found that the product had arrived in New Jersey "not randomly or fortuitously," but as a result of McIntyre's deliberate distribution system.<sup>50</sup> Justice Ginsburg applied the same test as the plurality, only to reach a different conclusion.

### 3. *Walden*

Although *Walden v. Fiore* was not a product liability case, it established a proposition in similar spirit to Justice O'Connor's "stream of commerce—plus" doctrine.<sup>51</sup> For the *Walden* court, an action having effects in the forum was not enough to attract jurisdiction.<sup>52</sup> In an unanimous decision, the court found that *Walden*, a government agent who had seized the respondent in Georgia, was not subject to the Nevada court

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<sup>50</sup> *Id.* at 898 (Ginsburg, J., dissenting).

<sup>51</sup> *Walden v. Fiore*, 134 S. Ct. 1115 (2014).

<sup>52</sup> *Id.* at 1117. In *Walden*, two professional gamblers had their belongings, including cash, seized in Atlanta by *Walden* and other DEA agents. Eventually, the U.S. Attorney in Georgia found no probable cause and ordered the money to be returned. The gamblers sued *Walden* in Nevada, alleging unlawful search, unlawful seizure of funds, and submission of a false affidavit.

because he had not established any contacts with Nevada. The minimum contacts test looks at the defendant's contacts with the forum state, not the defendant's contacts with the persons who reside there.<sup>53</sup>

#### 4. *Bristol-Myers Squibb*

In *Bristol-Myers Squibb v. Superior Court*, Bristol-Myers Squibb ("BMS") made a drug that was sold nationwide.<sup>54</sup> In this case, 86 California residents and 575 non-California residents joined in suing BMS in California, alleging, among other things, injuries associated with the use of a drug BMS sold. BMS is incorporated in Delaware, has its headquarters in New York, and maintains five offices and about 250 representatives in California. Justice Alito, joined by seven other justices, found against specific jurisdiction because the case did not sufficiently arise out of or relate to the defendant's forum activities. Many of the plaintiffs were not California residents and did not suffer harm there.

The majority essentially solidified the contacts-based approach to specific jurisdiction and clarified the standard of the nexus required between the defendant and the forum. The court found that there must be an affiliation between the forum and the underlying controversy; principally, there must be an activity or an occurrence that takes place in the forum state and is therefore subject to the state's regulation.<sup>55</sup>

#### 5. Foreshadowing the CDN Approach

The above string of cases make clear the enduring role of a defendant's intention. Mere awareness of entry into a forum, or simply making contact with people in the forum, is not enough. Specific jurisdiction is founded on the intentional establishing of contacts with a forum, even if those same contacts were established with other states. As discussed later,

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<sup>53</sup> *Id.* at 1122.

<sup>54</sup> *Bristol-Myers Squibb v. Superior Court*, 137 S. Ct. 1773 (2017).

<sup>55</sup> *Id.* at 1780.



prioritizing intention will limit the scope of the CDN approach. Fortuitous use of a CDN is not enough to draw a defendant into the forum courts. Only the intentional deployment of a CDN for the purpose of exploiting the forum market will bring a defendant within the forum's jurisdiction.

### C. Specific Jurisdiction on the Internet Now

Although none of the above cases dealt with specific jurisdiction on the Internet, in some instances, the Court had the Internet in mind. In *Nicastro*, the plurality had found that no jurisdiction would be established if a defendant did not intend to submit itself to the power of a sovereign or could not be said to have targeted the forum. But Justice Breyer may have been cognizant of the Internet when he refrained from announcing “a rule of broad applicability” that may not align with “modern-day consequences” given the “increasingly fast-paced globalization of the world economy.”<sup>56</sup> Justice Breyer asked how personal jurisdiction applies “when a company targets the world by selling products from its Web site.”<sup>57</sup> In *Walden*, the court touched on this question but did not answer it: “this case does not present the very different questions whether and how a defendant’s virtual ‘presence’ and conduct translate into ‘contacts’ with a particular State [...] We leave questions about virtual contacts for another day.”<sup>58</sup>

While this question has remained unanswered by the Supreme Court, commentators and lower courts have adopted diverse views.<sup>59</sup> Some argue that the existing private international law rules on jurisdiction are enough to deal with

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<sup>56</sup> *Nicastro*, 564 U.S. at 887 (Breyer, J., concurring).

<sup>57</sup> *Id.* at 890.

<sup>58</sup> *Walden*, 134 S. Ct. at 1126.

<sup>59</sup> *E.g.*, Steven M. Bellovin, *Jurisdiction and the Internet*, 15 IEEE SECURITY & PRIVACY 96 (2017) (arguing that an ideal solution to Internet jurisdiction should be intuitive, resist easy manipulation by suspects or law enforcement and respect user privacy).

the emerging problems of the Internet.<sup>60</sup> Others believe that the Internet represents a different creature that warrants different treatment, perhaps by the imposition of a cyber-dedicated legislation.<sup>61</sup> Those in the middle stop short of proposing revolutionary legislative solutions, but advocate for tweaks to existing principles.<sup>62</sup> Courts have also struggled to

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<sup>60</sup> *E.g.*, Alan M. Trammell & Derek E. Bambauer, *Personal Jurisdiction and the “Interwebs”*, 100 CORNELL L. REV. 1129, 1167 (2015) (arguing that virtual conduct does not create any meaningful connection with a forum); A. Benjamin Spencer, *Jurisdiction and the Internet: Returning to Traditional Principles to Analyze Network-Mediated Contacts*, 1 U. ILL. L. REV. 71 (2006) (arguing for the reinstatement of traditional territorial principles to analyze Internet contacts in light of current technology that enables Internet actors to restrict the geographical reach of their virtual activities); Anne McCafferty, *Internet Contracting and E-Commerce Disputes: International and U.S. Personal Jurisdiction*, 2 GLOBAL BUS. L. REV. 95 (2011) (proposing a broad model statute – in the form of a federal long-arm statute – which would enable, subject to due process, jurisdiction on the basis of transaction with any business in the U.S.).

<sup>61</sup> *See, e.g.*, David R. Johnson & David Post, *Law and Borders – The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996) (arguing that the Internet requires rules distinct from the laws that regulate physical, geographically defined territories – cyberspace is a unique space, bounded by screens, passwords, and IP addresses, that deserves different rules); Damon C. Andrews & John M. Newman, *Personal Jurisdiction and Choice of Law in the Cloud*, 73 MD. L. REV. 313, 364–71 (2013) (arguing for the creation of a distinct jurisdiction, free from geographic boundaries, for cloud-computing); Stephen E. Sachs, *How Congress Should Fix Personal Jurisdiction*, 108 NW. U. L. REV. 1301, 1301 (2014) (arguing for the imposition of a nationwide framework of federal personal jurisdiction in order to relieve federal courts of their jurisdictional dependence on state borders); BRIAN FITZGERALD & SAMPUNG XIAOXIANG SHI, COPYRIGHT LAW, DIGITAL CONTENT AND THE INTERNET IN THE ASIA-PACIFIC (Brian Fitzgerald, Fuping Gao, Damien O’Brien & Sampung Xiaoxiang Shi eds., 1st ed. 2008) (arguing for international revision and harmonization of the rules of personal jurisdiction, especially among China, Australia and the US).

<sup>62</sup> Adam R. Kleven, *Minimum Virtual Contacts: A Framework for Specific Jurisdiction in Cyberspace*, 116 MICH. L. REV. 785

find a clear test to determine what sort and level of Internet activity will cause a defendant to have established minimum contacts with the forum. Within this struggle, two strands of jurisprudence have emerged: the degree of activity test and the targeting test.

### 1. The Degree of Activity Test

The degree of activity test, also known as the “*Zippo*” test, after the case *Zippo Manufacturing Co. v. Zippo Dot Com, Inc.*,<sup>63</sup> assumes that due process is proportionate to the nature and extent of commercial activity over the Internet.<sup>64</sup> *Zippo* categorizes a website in one of three ways. Passive websites, such as those that contain only information and advertisements, do not attract the jurisdiction of the fora in which they are accessible.<sup>65</sup> Active websites, such as those that clearly do business over the Internet, will attract the jurisdiction of the fora in which they are found.<sup>66</sup> Between passive and active websites is the middle category of interactive websites, such as those on which users can exchange information with the host.

A website designed to facilitate or conduct business transactions will often be characterized as interactive. Interactive websites may or may not attract the jurisdiction of the fora in which they are found.<sup>67</sup> Whether a court can exercise jurisdiction over an interactive website is taken on a

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(2018) (arguing that the present framework need not be overhauled, but modified: for Internet cases, courts should consider a defendant’s technological sophistication and the frequency with which it engages in tortious conduct. Also, the reasonableness test should be simplified and applied seriously).

<sup>63</sup> *Zippo Manufacturing Co. v. Zippo Dot Com, Inc.*, 952 F. Supp. 1119 (W.D. Pa. 1997).

<sup>64</sup> *Zippo*, 952 F. Supp. at 1124-8.

<sup>65</sup> *JB Oxford Holdings, Inc. v. Net Trade, Inc.*, 76 F. Supp. 2d 1363, 1367 (S.D. Fla. 1999) (describing a passive site as a website where users merely view advertisements for products and services).

<sup>66</sup> *See CompuServe, Inc. v. Patterson*, 89 F.3d 1257, 1263 (6th Cir. 1996).

<sup>67</sup> *Zippo*, 952 F. Supp. at 1123 – 1124.

discretionary, case-by-case basis depending on the level of interactivity and commerciality. As discussed later, the category of interactive websites has been criticized for generating ambiguous decisions.<sup>68</sup>

## 2. The Targeting Test

The targeting test, sometimes called the effects test, is drawn from *Calder v. Jones*, which established that a forum court has personal jurisdiction over a nonresident defendant that (i) commits an intentional act expressly aimed at the forum where (ii) that act causes harm (a) felt primarily in the forum and (b) the defendant knew that harm is likely to be suffered in the forum.<sup>69</sup> Although itself not an Internet case, *Calder* inspired courts to apply the targeting test to the Internet. As a

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<sup>68</sup> *E.g.*, Jason Green, *Is Zippo's Sliding Scale a Slippery Slope of Uncertainty? A Case for Abolishing Web Site Interactivity as a Conclusive Factor in Assessing Minimum Contacts in Cyberspace*, 34 J. MARSHALL L. REV. 1051 (2001) (arguing that the passive/interactive distinction is insufficient because only those entirely passive or entirely commercial websites can properly assess potential amenability to suit in the forum); Emily Ekland, *Scaling Back Zippo: The Downside to the Zippo Sliding Scale and Proposed Alternatives to Its Uses*, 5 ALB. GOV'T L. REV. 380 (2012) (noting that uncertainty results from *Zippo's* refusal to place websites with multiple interactive features in the "active" category); Catherine Ross Dunham, *Zippo-ing the Wrong Way: How the Internet Has Misdirected the Federal Courts in Their Personal Jurisdiction Analysis*, 43 U.S.F. L. REV. 559 (2009) (arguing that the *Zippo* test was a premature, non-functional and destabilizing reaction to the Internet).

<sup>69</sup> *Calder v. Jones*, 467 U.S. 783, 789-90 (1984). In *Calder*, Jones resided in California and her television career was centered there. An allegedly libelous article was written by someone residing in Florida with few contacts with California. The article was drawn from California sources and the magazine had its largest circulation in California. The Supreme Court held that "California is the focal point both of the story and of the harm suffered," so based on the "effects" of the defendants' Florida conduct in California, California could exercise personal jurisdiction over the defendant.

result, courts in various circuits have phrased the test slightly differently.<sup>70</sup> In the Internet context, courts appear to have focused more on the “targeting” aspect of the test and less on the effects component.<sup>71</sup> For example, the Fourth Circuit in *Young v. New Haven Advocate* adapted the *Calder* test by simplifying the question to “whether the [defendants] manifested an intent to direct their website content [...] to a Virginia audience.”<sup>72</sup> In that context, the effects component of the targeting test was diminished—what matters is only whether the defendant targeted the forum.

It bears noting that there arises a question of whether the targeting test requires the defendant to have targeted a forum exclusively. Considering that contemporary Internet use often involves the dissemination of content and applications across the world,<sup>73</sup> an exclusivity requirement would dull the targeting test’s utility. The better position, I argue, is that the targeting test sets forth a standard (say, the intentional use of

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<sup>70</sup> *E.g.*, *Carefirst of Md., Inc. v. Carefirst Pregnancy Ctrs., Inc.*, 334 F.3d 390, 398 n.7 (4th Cir. 2003) (finding that the following elements must be satisfied: (1) the defendant committed an intentional tort; (2) the plaintiff felt the brunt of the harm in the forum, such that the forum can be said to be the focal point of the harm; and (3) the defendant expressly aimed his tortious conduct at the forum, such that the forum can be said to be the focal point of the tortious activity). *See also* *Tamburo v. Dworkin*, 601 F.3d 693, 703 (7th Cir. 2010) (requiring (1) intentional conduct (or intentional and allegedly tortious conduct); (2) expressly aimed at the forum state; (3) with the defendant’s knowledge that the effects would be felt—that is the plaintiff would be injured—in the forum state).

<sup>71</sup> Perhaps this was done to prevent a nonresident defendant from being amenable to suit anywhere effects are alleged to be felt.

<sup>72</sup> *Young v. New Haven Advocate*, 315 F.3d 256, 263 (4th Cir. 2002).

<sup>73</sup> *Digital Equip. Corp. v. Altavista Tech., Inc.*, 960 F. Supp. 456, 462 (1997) (stating poetically that “[t]he Internet has no territorial boundaries. To paraphrase Gertrude Stein, as far as the Internet is concerned, not only is there perhaps ‘no there there,’ the ‘there’ is everywhere where there is Internet”).

CDNs in the forum). Once that standard is met, the targeting test is satisfied regardless of whether it may also apply to other fora in any given case. This view is not without judicial support. As outlined above, Justice Ginsburg, at least, would likely agree that the targeting test applies as long as a defendant has aimed its activities at the forum irrespective of whether other fora are also targeted.<sup>74</sup>

Some courts have combined the *Zippo* and targeting tests. *ALS Scan, Inc. v. Digital Service Consultants, Inc.* finds that a state may, consistent with due process, exercise jurisdiction over a nonresident defendant when (i) the defendant directs electronic activity into the state, with (ii) the intention of engaging in business or other interactions within that state, and (iii) when that activity creates, in a person within the state, a potential cause of action cognizable in the state's courts.<sup>75</sup>

ALS Scan, Inc. ("ALS"), a corporation in Maryland, claimed that Alternative Products had reproduced and distributed ALS's intellectual property on the Internet without permission.<sup>76</sup> ALS also implicated Digital, Alternative Product's Internet service provider, because Digital had provided the service necessary to maintain Alternative Product's websites, which published the allegedly infringing material. Digital, a Georgia corporation having no contacts in Maryland, argued that the district court in Maryland lacked personal jurisdiction.<sup>77</sup> The district court granted Digital's motion to dismiss and ALS appealed to the Fourth Circuit, which ultimately affirmed.

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<sup>74</sup> Nicastro, 564 U.S. at 905-06 (arguing that McIntyre UK, by dealing with the U.S. as a single market, was subject to suit in the forum as well as every other U.S. state where its products were sold).

<sup>75</sup> *ALS Scan, Inc. v. Digital Service Consultants, Inc.*, 293 F.3d 707, 714 (4th Cir. 2002).

<sup>76</sup> *Id.* at 709. The intellectual property in controversy was adult photographs.

<sup>77</sup> *Id.* at 709.

In its *de novo* review, the Fourth Circuit appeared to welcome a technological approach to the ways in which people show intent to enter a forum. The Fourth Circuit noted that:

[T]he argument could still be made that the Internet's *electronic signals* are surrogates for the person and that Internet users *conceptually enter a State* to the extent that they send their electronic signals into the State, establishing those minimum contacts sufficient [to justify personal jurisdiction].<sup>78</sup>

The words “electronic activity” in the *ALS Scan* test demonstrates that the court was thinking not only of content tailored to the forum, but also of electronic activity, which would include technological activity beneath the content layer of the Internet.<sup>79</sup>

Recognizing the gravity of the changes imposed by the Internet, the Fourth Circuit also foreshadowed that “advances in technology” would one day inspire the Supreme Court to reconceive and rearticulate personal jurisdiction.<sup>80</sup> Clearly, the Fourth Circuit was not only alive to the challenges precipitated by the Internet but also the need for new doctrine commensurate with emerging technologies. Yet, somewhat anticlimactically, the Fourth Circuit did not take this analysis further. Just what constitutes “electronic signals” or conceptually entering a state was never developed. And so, without deeply considering what it means to “electronically transmit” content into a forum, the Fourth Circuit simply stated

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<sup>78</sup> *Id.* at 712 (emphasis added).

<sup>79</sup> Content based tests focus on what users see on the face of a website or application. Content based tests would look, for example, at whether a website markets material specific to a forum or adopts the dominant language of the forum. By contrast, a technological approach looks at factors agnostic to content, such as the use of content delivery networks which, by their very name, are the conduits of web content.

<sup>80</sup> *ALS Scan*, 293 F.3d at 713.

that too broad an approach to minimum contacts would result in an objectionable form of universal jurisdiction.<sup>81</sup>

Although the Fourth Circuit intuited the need for a technological approach, it lacked the vocabulary to make one. Instead, the Fourth Circuit engaged in a rudimentary and cursory consideration of telephones and computers.<sup>82</sup> The CDN approach, therefore, picks up where *ALS Scan* left gaps. I articulate an approach that will show what it means to “conceptually” enter a forum using “electronic signals” as “surrogates” for the person.<sup>83</sup>

## II. CONTENT DELIVERY NETWORKS AS NEW INDICIA FOR SPECIFIC JURISDICTION

### A. What are CDNs?

A CDN is an infrastructure placed on top of the Internet that pushes content closer to users.<sup>84</sup> It is a large distributed system of multiple servers deployed all over the world, sometimes called edge or cache servers.<sup>85</sup> Such nomenclature is self-illuminating. Consider, for example, a typical home or office layout where computers, mobile phones, and tablets are connected to the Internet. These devices are connected to the same local network. To connect to a different network, a connector, such as a router, is required. Alternatively, a server can be placed at the edge of the network so that content can be

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<sup>81</sup> *Id.* at 712-13.

<sup>82</sup> *Id.* at 713 (stating that “even though the medium is still often a telephone wire, the breadth and frequency of electronic contacts through computers has resulted in billions of interstate connections and millions of interstate transactions entered into solely through the vehicle of the Internet”).

<sup>83</sup> *Id.* at 712.

<sup>84</sup> Benjamin Molina et al., *A Closer Look at a Content Delivery Network Implementation*, 2 PROCEEDINGS OF THE 12TH IEEE MEDITERRANEAN ELECTROTECHNICAL CONFERENCE 685 (2004).

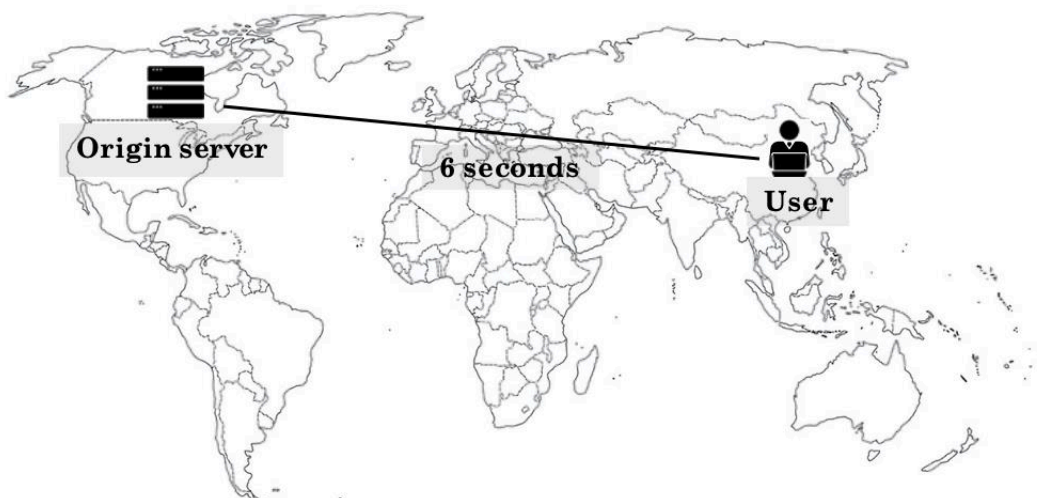
<sup>85</sup> CLOUDFLARE, *What is a CDN?*, <https://www.cloudflare.com/learning/cdn/what-is-a-cdn/> (last visited Mar. 19, 2020).



loaded onto it and made available to another network, hence the name edge server.<sup>86</sup>

A CDN allows people and businesses—or, the defendant, for the purposes of this discussion—to deliver content faster and more reliably to target locations.<sup>87</sup> It accelerates the delivery of websites and applications by caching content, hence the name “cache” server, which means it stores replicas of text, images, audio, and videos so that when a user requests certain data, that request can be served by a nearby server rather than a far-off origin server.<sup>88</sup> The figures below demonstrate the effect of a CDN in reducing the time data would otherwise take to travel from an origin server to the user.

*Figure 1. Transmitting Content Without a CDN.*<sup>89</sup>



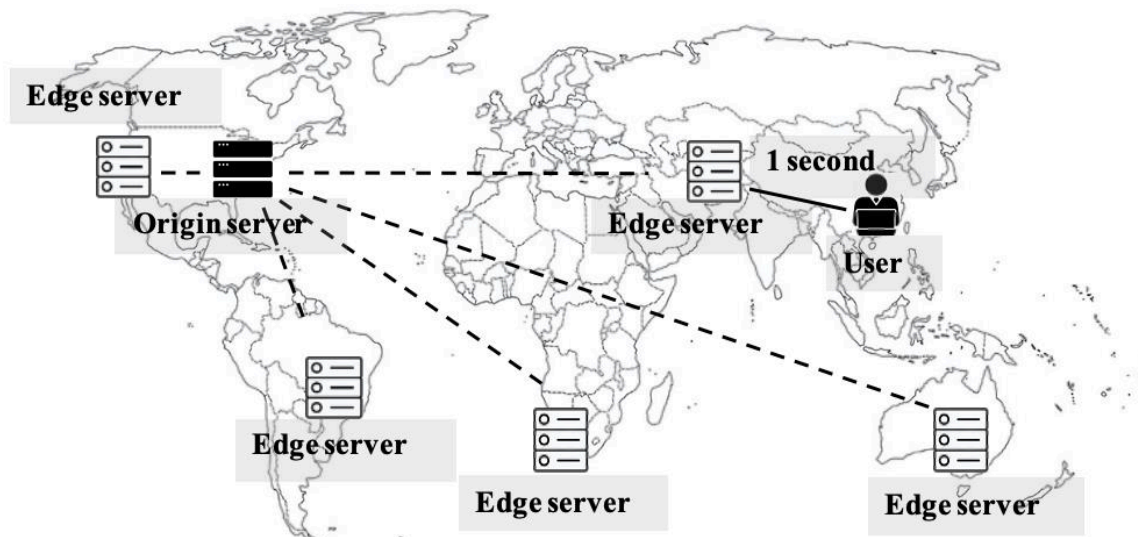
<sup>86</sup> *What is an Edge Server*, CLOUDFLARE <https://www.cloudflare.com/learning/cdn/glossary/edge-server/> (last visited Apr. 10, 2020).

<sup>87</sup> *Content Distribution Networks*, AKAMAI, <https://www.akamai.com/us/en/resources/content-distribution-network.jsp> (last visited Mar 19, 2020).

<sup>88</sup> *Id.*

<sup>89</sup> IMPERVA, *What is a CDN?*, <https://www.imperva.com/learn/performance/what-is-cdn-how-it-works/> (last visited Mar. 20, 2020). Note that the numerical figures provided are for reference only.

Figure 2. *Transmitting Content With a CDN.*<sup>90</sup>



CDNs are an important component of today's Internet infrastructure.<sup>91</sup> Akamai, one of the two largest CDN providers in the world (the other being Cloudflare) has more than 240,000 servers in over 130 countries around the world.<sup>92</sup> Because an edge server located close to a client will reduce end-to-end latency,<sup>93</sup> a company or individual may elect to use a CDN in, or close to, the forum so that people located in the forum will have faster,<sup>94</sup> more reliable and better quality

<sup>90</sup> *Id.*

<sup>91</sup> Sipat Triukose, Zhihua Wen & Michael Rabinovich, *Measuring a Commercial Content Delivery Network*, PROCEEDINGS OF THE 20TH INTERNATIONAL CONFERENCE ON WORLD WIDE WEB 467 (2011).

<sup>92</sup> AKAMAI, <https://tinyurl.com/qmwo2wk> (last visited Mar. 23, 2020).

<sup>93</sup> Anne Edmundson, Paul Schmitt, Nick Feamster & Jennifer Rexford, *OCDN: Oblivious Content Distribution Networks* (2017), arXiv:1711.01478 (last visited Mar. 23, 2020).

<sup>94</sup> Arwen Price, *Web Performance Impacts Conversation Rates*, LOADSTORM (Apr. 9, 2014) <http://loadstorm.com/2014/04/infographic-web-performance-impacts-conversion-rates/> (claiming that 25 percent of users will abandon a website if it takes longer than 4 seconds to load, 74 percent of users will abandon a mobile site if it takes longer than

access to that company's content.<sup>95</sup> I argue that an entity's intentional use of a CDN in a specific location constitutes an additional factor in determining purposeful availment.<sup>96</sup>

## **B. Mapping the CDN Approach on Purposeful Availment**

### **1. "CDN with Intention" Fits with Purposeful Availment**

Courts may employ the CDN approach if the defendant had instructed, or otherwise elected, for a CDN to be used in the forum. Such instruction or election constitutes intention and, by extension, purposeful availment. When people, whether individuals or companies, want to set up websites, they usually contract with a web hosting service, which is a company that provides space on a server (which it either owns or rents).<sup>97</sup> The web hosting service stores a person's website on a server and makes it available on the Internet.<sup>98</sup> But who chooses the CDN? Is it the user (the person who makes the website) or is it the web hosting service? Some web hosting services, or CDN providers, give their customers the option to serve a particular state, country, or geographic region. Proof of this choice is critical to the applicability of the CDN approach. Whether that choice was exercised in any given case shall be

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5 seconds to load, and 46 percent of users will not return to poorly performing sites).

<sup>95</sup> Anna MacLachlan, *Why You Should Use a Content Delivery Network*, FASTLY (Mar. 2, 2015), <https://www.fastly.com/blog/why-you-should-use-content-delivery-network> (noting that the farther away customers are from a company's CDN, the slower that website or application will load, tending to frustrate customers).

<sup>96</sup> IMPERVA, *The Essential CDN Guide*, <https://www.imperva.com/learn/performance/what-is-cdn-how-it-works/> (last visited Mar. 19, 2020) (noting that most people will use a CDN whether they know it or not).

<sup>97</sup> See, e.g., Nick Schaferhoff, *How to Create a Website*, WEBSITESSETUP (Mar. 11, 2020), <https://websitesetup.org>.

<sup>98</sup> WEBSITE.COM LEARNING CENTER, *What is Web Hosting?*, <https://www.website.com/beginnerguides/webhosting/6/1/what-is-web-hosting?.ws> (last visited Mar. 19, 2020).

an enquiry taken on a case-by-case basis as a question of evidence. Fact-dependency notwithstanding, there are at least two general situations in which the intentional use of a CDN to enter a forum may be established.

First, some popular web hosting services, such as Pair, and some CDN service providers, such as CloudFront—Amazon's web service offering the provision of CDNs—grants its clients the option to serve, or not serve, particular countries through the provision of a “geo-restriction” feature. CloudFront’s website makes this express:

[T]he Geo Restriction feature lets you specify a list of countries in which your users can access your content. Alternatively, you can specify the countries in which your users cannot access your content. In both cases, CloudFront responds to a request from a viewer in a restricted country with an HTTP status code 403 (Forbidden).<sup>99</sup>

Similarly, Pair offers its customers the option to use a CDN. For an additional cost, Pair customers can use Pair’s CDN to target certain geographic regions in North America or Europe.<sup>100</sup>

In yet another example, Cloudflare allows its corporate clients to select which edge servers they wish to use. In 2014, Cloudflare entered into an agreement with Baidu (the Chinese equivalent of Google), under which Cloudflare used its CDN to enable websites to load more quickly across certain regions in China.<sup>101</sup> In a period of 24 hours, it was estimated that the

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<sup>99</sup> See FAQ, AMAZON CLOUDFRONT, <https://aws.amazon.com/cloudfront/faqs/> (last visited Mar. 23, 2020).

<sup>100</sup> PAIR, <https://www.pair.com/solutions/content-delivery-network/> (last visited Mar. 19, 2020) (offering to deal with customers who wish to directly serve certain geographic zones).

<sup>101</sup> Paul Mozur, *Baidu and Cloudflare Boost Users Over China’s Great Firewall*, N.Y. TIMES (Sept. 13, 2015),

service saved a total of about 243 years that users in China would have otherwise spent waiting for websites to load.<sup>102</sup> The existence and exercise of these options is critical to implementing the CDN approach. Since a CDN allows people (or defendants) to “push” their content into the forum faster and more reliably, this intentional use, once established, represents a commercial advantage capable of constituting purposeful availment.

Second, individuals and companies having the appropriate resources and know-how can host their own websites without the need to employ a web hosting service. Those self-hosting entities would naturally have to select their own CDNs and determine the reach of that network by contracting directly with CDN providers in a manner that stipulates the location of the edge servers to be used. In rare situations, the self-hosting entities are the CDN providers themselves that physically establish data centers around the world in which edge servers are housed.

Once intention is established, the CDN approach comports entirely with the prevailing view on purposeful availment, namely Justice Ginsburg’s approach in *Nicastro*, which, although a dissenting view, actually reflects Justice O’Connor’s sensible and generally accepted plurality view in *Asahi*. In *Asahi*, Justice O’Connor wrote:

The “substantial connection” between a defendant and the forum State necessary for a finding of minimum contacts must derive from an action purposely directed toward the forum State, and the mere placement of a product into the stream of commerce is not such an act, even if done with an awareness that the stream will sweep the product into the forum State absent

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<https://www.nytimes.com/2015/09/14/business/partnership-boosts-users-over-chinas-great-firewall.html>.

<sup>102</sup> *Id.*

additional conduct indicating an intent to serve the forum state market.<sup>103</sup>

The “CDN with intention” approach accords with Justice O’Connor’s view, because deliberately using a CDN to direct content towards the forum evinces “something more” than awareness and therefore constitutes a “substantial connection.” As long as a defendant intentionally chooses to use a CDN to enter a forum, the CDN approach will work.

Comparing this approach again with Justice Ginsburg’s dissent in *Nicastro*, using a CDN with intention is similar to making a “marketing arrangement” with a company to “promote and distribute” content “anywhere and everywhere in the United States the distributor can attract purchasers.”<sup>104</sup> A web hosting service is analogous to a distributor in product liability cases such as *Asahi* and *Nicastro*. The defendant is making an arrangement with a service provider to distribute web content or applications throughout the world, including the forum. Although the CDN approach works where there is intention, what of the counterfactual in which a website maker is merely aware that its content would be available across the world, but never intended to deploy CDNs in a particular place or at all?

## 2. “CDN without Intention” Does Not Fit with Purposeful Availment

Unlike Pair, CloudFront, and Cloudflare, many other service providers do not appear to offer their users the option to target regions. WP Engine, another web hosting service, simply states that users can pay more money to utilize a “global CDN” network.<sup>105</sup> In such a case, presumably, WP Engine will determine which CDNs are to be used based on where the user’s site receives the most traffic. To be clear, in order to be faithful to purposeful availment, I do not propose that those

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<sup>103</sup> *Asahi*, 480 U.S. at 103-04.

<sup>104</sup> *Nicastro*, 564 U.S. at 902.

<sup>105</sup> *E.g.*, WP ENGINE, <https://wpengine.com> (last visited Mar. 19, 2020) (offering certain packages with a “global CDN”).

who simply contract with a web hosting service, but do not know that they have used a CDN in a certain place, have purposefully availed themselves of the forum that the CDN serves. I maintain that the CDN approach should apply only to those who have intended to use a CDN to target a forum. Intention is a question of evidence demonstrated by the production of correspondence or an agreement revealing that a defendant had elected, or instructed its service provider, to use a certain CDN.

### **III. CDN'S WEAKNESS: NARROW APPLICABILITY IF STRICT INTENTION IS REQUIRED**

The above discussion throws into relief the weaknesses of the CDN approach. Remaining faithful to purposeful availment means that the CDN approach only applies in the few cases where people chose to use a particular CDN to target a forum. Anecdotal experience counsels that most individuals, whether they post content on social media platforms such as Instagram, or make their own websites for a blog or small business, do not know the intricacies of CDN technology, let alone make a choice as to its geographic use. Even sophisticated corporations that use websites to market their goods and services may not necessarily know whether they are using a CDN in a particular forum.

A trade-off subsists between the interests of the plaintiff and the defendant. Remaining faithful to purposeful availment, and thereby narrowing the scope of the CDN approach, favors the defendant's interests and abates those of the plaintiff. Expanding purposeful availment to include imputed intention promotes the plaintiff's interest and diminishes those of the defendant. The prevailing jurisprudence favors the former, yet the CDN approach—seeking expansive utility—prefers the latter.

#### **A. Circumventing the Weakness: Arguing for Imputing Intention**

Surrendering strict faithfulness to purposeful availment achieves broader applicability to the CDN approach. This does

not necessarily entail abandoning intention or purposeful availment altogether. Rather, it requires redefining intention to encompass imputed intention. In one view, it is reasonable to argue that intention should be imputed on the defendant when it enters into an agreement with a web hosting or CDN provider, regardless of whether the defendant had chosen to target a region or use a particular CDN. If people engage the service of a web hosting or CDN provider, they should know or be expected to discover where their content is delivered, and the locales, if any, that are given special focus through the use of CDNs.

The fiction that obligations might arise not by express consent, but by operation of law, is not novel.<sup>106</sup> Many legal topics bear such a pedigree, for example: knowing receipt, where liability arises for the receipt of monies paid by mistake;<sup>107</sup> equitable contribution, where an insurer seeks reimbursement from its co-insurers after the first insurer pays more than its share; marshalling,<sup>108</sup> where a junior creditor subrogates to the position of a senior creditor to satisfy the former's debt.<sup>109</sup> These scenarios have in common the lack of

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<sup>106</sup> See, e.g., William Swadling, *The Fiction of the Constructive Trust* 64 CURRENT LEGAL PROBLEMS 399 (2011).

<sup>107</sup> E.g., *Houghton v. Fayers* [2000] 1 B.C.L.C. 511 (C.A.) (Nourse L.J.) (indicating that a defendant would be liable if he knew, or ought to have known, that he had received either funds which were misapplied in the breach of duty, or their proceeds); see also *El Ajou v. Dollar Land Holdings plc* [1993] EWCA Civ 4 (finding that constructive knowledge concerning the receipt of property in breach of trust was sufficient).

<sup>108</sup> E.g., *Travelers Ins. Co. v. Gen. Accident, Fire & Life Assurance Corp.*, 322 N.Y.S. 2d 704, 707 (1971) (finding for a general right of contribution where there is concurrent insurance, even if the policy does not include an express provision for apportionment).

<sup>109</sup> E.g., *Sowell v. Federal Reserve Bank*, 268 U.S. 449, 457 (1925); *Miles v. The Official Receiver* (1963) 109 C.L.R. 50; *Szepietowski v. The Serious Organised Crime Agency* [2013] UKSC 65. See also William Gummow & John Stumbles, *Marshalling, the Personal Property Securities Act 2009 and Third Party Securities: Highbury and Szepietowski – New Applications*



a contract bearing the hallmarks of party autonomy and express consent. Expansion of purposeful availment to include constructive intention or knowledge, therefore, would cohere with, and at least not rebuke, well-established themes in Anglo-American jurisprudence.

Closest to imputing intention to use a CDN is perhaps the doctrine of imputed knowledge as applied to corporations, under which notice to an agent acting within the scope of its authority is imputed to the principal.<sup>110</sup> Arguably, when a defendant contracts with a service provider to disseminate the defendant's content to the world, the provider occupies a position akin to an agent, and the defendant is akin to the principal. On this analysis, even if the defendant did not know which CDN it was using—or whether it was using a CDN at all—the service provider's knowledge shall be imputed on the defendant.

Pro-plaintiff policy considerations favor this view. A plaintiff would likely be perfectly content for knowledge to be imputed because it probably commenced proceedings in the forum to its advantage. Whatever advantage that may be—convenience, the location of assets upon which to lay claim, or the availability of more favorable remedies—there exists a general presumption to respect the plaintiff's choice of forum; granted, however, that less deference is generally given to a foreign plaintiff.<sup>111</sup> This view may gain some persuasive, but

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*of Enduring Principles*, 25 J. BANKING & FIN. L. & PRACTICE 106 (2014).

<sup>110</sup> *In re Hopper-Morgan Co.*, 158 Fed. 351, 354 (D.C. 1908); *see also Strickland v. Capital City Mills*, 74 S.C. 16, 26 (1906) (applying the rule to attorneys and their clients).

<sup>111</sup> *See Koster v. (Am.) Lumbermens Mut. Cas. Co.*, 330 U.S. 518, 524 (1947) (finding for a strong presumption of convenience where the plaintiff has brought an action in its home forum). *But see Piper Aircraft Co. v. Reyno*, 454 U.S. 235 (1981) (stating that a foreign plaintiff's choice of a U.S. forum receives less deference than the same choice by a U.S. national or resident. Foreigners are more likely to sue in the U.S. for strategic reasons, such as contingency agreements, involved discovery processes, and higher damage levels).

far from binding, support from recent Supreme Court case law in *BMS*, wherein Justice Sotomayor's dissent was clearly motivated by due process for the plaintiffs.<sup>112</sup>

### **B. The Weakness Prevails: Arguing Against Imputing Intention**

Nevertheless, policy considerations cut both ways. The defendant may have contracted with a service provider and entrusted the decisions pertaining to CDN allocation to the service provider precisely because the defendant had no subject matter expertise in the matter. Technical knowledge is required to understand the Internet infrastructure and the use of CDNs.<sup>113</sup> Even if the service provider occupied the position of an agent, its special relation to the subject matter may be one that renders disclosure unwarranted and, therefore, imputed intention inappropriate.

An expansive approach to intention is also doctrinally objectionable because it comes dangerously close to the generally rejected “stream of commerce only” approach.<sup>114</sup> As

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<sup>112</sup> *Bristol-Myers Squibb*, 137 S. Ct. at 786 (Sotomayor, J., dissenting) (stating that the Court's opinion in this case will make it profoundly difficult for plaintiffs who are injured in different States by a defendant's nationwide course of conduct to sue that defendant in a single, consolidated action).

<sup>113</sup> For a technical look at traffic engineering and CDN use, see Wenjie Jiang, Rui Zhang-Shen, Jennifer Rexford & Mung Chiang, *Cooperative Content Distribution and Traffic Engineering in an ISP Network*, PROCEEDINGS OF THE 11TH INTERNATIONAL JOINT CONFERENCE ON MEASUREMENT AND MODELING OF COMPUTER SYSTEMS 239 (2009).

<sup>114</sup> An expansive approach also comes dangerously close to the rejected “foreseeability” approach. Foreseeability is associated with “stream of commerce—only.” Indeed, the latter grew out of the former. In *World-Wide Volkswagen*, Justice Blackmun in dissent argued for a foreseeability approach. In his view, it is foreseeable that a car will wander far from its place of license or distribution. This view was rejected by the *World-Wide Volkswagen* majority, which found that foreseeability is not a touchstone of personal jurisdiction. See *World-Wide Volkswagen*, 444 U.S. at 287 (1980) (stating that foreseeability alone is not a

discussed in Part I, Justice Brennan advocated for the “stream of commerce only” view:

A defendant who has placed goods in the stream of commerce benefits economically from the retail sale of the final product in the forum State, and indirectly benefits from the State’s laws that regulate and facilitate commercial activity [...] Accordingly, most courts and commentators have found that jurisdiction premised on the placement of a product into the stream of commerce is consistent with the Due Process Clause, and have not required a showing of additional conduct.<sup>115</sup>

A proponent of Justice Brennan’s view might argue that a defendant who has placed a website or application on the Internet and contracted with a hosting service to disseminate its content using a “global CDN” service that targets the world-at-large is reaping the commercial benefits of entering the forum state. As long as the defendant is aware that it had chosen the “global CDN” option, it should be aware that its content would likely be swept (by the “stream of commerce”) into the forum state.

However, as discussed in Part I, the Supreme Court has not adopted Justice Brennan’s “stream of commerce—only” approach. Instead, recent cases only emphasize the continuing importance of purposeful availment. Until further decisions seek to eschew or loosen purposeful availment, I maintain—as I have from the outset—that the CDN approach should only apply to the narrow set of cases for which intention can be demonstrated.

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sufficient benchmark for personal jurisdiction under the Due Process Clause).

<sup>115</sup> *Asahi*, 480 U.S. at 117.

#### IV. REJOINDER: PREDICTABLE AND MEASURABLE

##### A. Predictability: The Certainty of a Binary Test

Whatever a strict intention requirement might do to besmirch the CDN approach's scope is supplanted by the benefits occasioned. Regardless of whether the CDN approach demands intention, it brings every advantage of a binary test. People either use a CDN or they do not. Of those who do, they either use a CDN in, or near, the forum or they do not. Unlike the targeting and *Zippo* tests, the CDN approach does not invite the court to engage in a discretionary, multifactorial balancing exercise. By presenting a binary test, the CDN approach avoids any ambiguity about whether purposeful availment has been established. While a binary test may not have the flexibility of a multifactor approach, parties to a litigation at least have greater certainty and confidence as to the likely outcome. A survey of lower court decisions in the U.S., and even in other jurisdictions, reveals inconsistent, and at times confused, applications of the degree of activity and targeting tests—something that can be avoided with the CDN approach.<sup>116</sup>

One of the many complaints levied against the *Zippo* test is that the middle category of interactive websites is so nebulous that it fails to give website hosts proper notice about when they might be amenable to the fora in which their content is found.<sup>117</sup> Similarly, the targeting test ascertains a defendant's subjective intention by attaching—at times inappropriate—

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<sup>116</sup> *E.g.*, *CoolSavings.com, Inc. v. IQ.Commerce Corp.*, 53 F. Supp. 2d 1000, 1003 n.3 (N.D. Ill. 1999) (finding such difficulty with *Zippo*'s three-category test that the court declined to apply the test altogether); *see also* *Hurley v. Cancun Play Oasis Int'l Hotels*, 1999 WL 718556 (E.D. Pa. 1999) (rejecting jurisdiction with respect to a website allowing customers making hotel reservations); *but see* *Decker v. Circus Hotel*, 49 F. Supp. 2d 743, 750 (D.N.J. 1999) (finding a similar website to be commercial and presumably "active," yet also declining to accept jurisdiction).

<sup>117</sup> Emily Ekland, *Scaling Back Zippo: The Downside to the Zippo Sliding Scale and Proposed Alternatives to Its Uses*, 5 ALB. GOV'T L. REV. 380 (2012).

weight to factors that may have really just arisen out of custom or fortuity. Both approaches call on a judge to “throw a heap of factors on a table and then slice and dice to taste,” with a different recipe potentially emerging for every other meal.<sup>118</sup>

### 1. The *Zippo* Test’s Uncertainty

Recall from Part I that *Zippo* characterizes a website in one of three ways: passive, interactive, or active. While passive and active websites may be relatively easy to ascertain,<sup>119</sup> interactive websites, which occupy disproportionately vast ground compared with passive and active websites, are far more difficult to assess.<sup>120</sup> Interactive websites include websites that do one or more of the following: contain hyperlinks, invite email communication, provide enquiry forms, facilitates the posting of comments, make claims, offer downloads free-of-charge, gain advertising revenue or even engage in the silent collection of user information, such as browsing habits.<sup>121</sup> This is a non-exhaustive list of things that could bring an otherwise passive website into the purview of interactivity.<sup>122</sup> Most websites today are likely to have at least

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<sup>118</sup> See *Reins. Co. of Am., Inc. v. Administratia Asigurarilor de Stat*, 902 F.2d 1275, 1284 (7th Cir. 1990) (stating, in the context of an extraterritorial discovery case, “I would be most reluctant to accept an approach that calls on the district judge to throw a heap of factors on a table and then slice and dice to taste”).

<sup>119</sup> But note that even the distinction among passive, active and interactive websites seems arbitrary – passive websites are equally as capable of committing, for example, fraud, defamation, or trademark infringement as active websites.

<sup>120</sup> Dennis T. Yokoyama, *You Can't Always Use the Zippo Code: The Fallacy of a Uniform Theory of Internet Personal Jurisdiction*, 54 DEPAUL L. REV. 1147 (2005) (noting that the middle ground has produced a black hole of confusion and left courts struggling with whether interactive sites constitute purposeful availment).

<sup>121</sup> LILIAN EDWARDS & JORDAN HATCHER, *CONSUMER PRIVACY LAW 2: DATA COLLECTION, PROFILING AND TARGETING* 511 (Lilian Edwards & Charlotte Waelde eds., 3rd ed. 2009).

<sup>122</sup> *Zippo* provided scant guidance on assessing the middle ground. “Interactivity” means that a website allows the user to

one of these factors. Accordingly, jurisdiction over most websites or applications is effectively a matter of judicial discretion, at least under the *Zippo* test. Discretion begets unpredictability. For example, the confusion engendered by the *Zippo* test, and its incompatibility to the nuances of the Internet, is played out in the recent case of *Seaver v. Estate of Cazes*.<sup>123</sup>

*Seaver* involved a Massachusetts defendant, the Tor Project, Inc. (“Tor”), which creates software enabling access to the Darknet—portions of the Internet not readily accessible to the public.<sup>124</sup> Tor’s website allows the world-at-large to download free software called the Tor Browser, an application similar to Google Chrome, Safari, or Firefox (in fact, it is a customized version of Firefox), which allows people to access the Darknet.<sup>125</sup> Grant Seaver, then aged 13, overdosed after ingesting a synthetic opioid allegedly obtained from an e-commerce website called Alhabay on the Darknet.<sup>126</sup> His

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exchange information with the defendant. Courts should also take into account the commercial nature of the information exchanged. *See Zippo*, 952 F. Supp. at 1124.

<sup>123</sup> *Seaver v. Estate of Cazes*, No. 2:18-CV-712-DB, 2019 WL 2176316 (D. Utah May 20, 2019).

<sup>124</sup> Darren Guccione, *What Is the Dark Web? How to Access It and What You’ll Find*, CSO ONLINE (Mar. 5, 2020), <https://www.csoonline.com/article/3249765/what-is-the-dark-web-how-to-access-it-and-what-youll-find.html>. Note that the definition of Darknet has not received universal consensus. Accordingly, we might alternatively say that the Tor Project enables access to “Tor hidden services” instead of the “Darknet.”

<sup>125</sup> The Tor Browser hides a user’s identity and location by directing that user’s Internet traffic through layers of random relays hosted by other Tor Browser users. As traffic enters one relay, one layer of encryption is stripped and sent to the next relay. Eventually, when the traffic exits the last relay to the user’s desired target, that last relay has no information about the origins of user’s traffic except for the very last relay from which the packet came.

<sup>126</sup> Alhabay was an online Darknet market that was shut down in 2017.

bereaved parents sued Tor for products liability, negligence and civil conspiracy.

On the question of minimum contacts, the district court in Utah applied *Zippo's* degree of activity test to conclude that Tor is a commercial interactive website that attracts Utah's jurisdiction. The court's basis for so finding was that Tor enables commercial transactions on the Darknet that would not otherwise be possible. But such reasoning conflates the distinction between a *website* (Tor's website, which offers Tor Browser for download) and a web browsing *application* (the Tor Browser itself, an intermediary that facilitates access to other websites). Asserting jurisdiction over Alphabay,<sup>127</sup> the Darknet website that allegedly sold the drug to Grant, would have been more appropriate.

Not only was the court's application of the *Zippo* test technically unsound, it was also objectionable on policy grounds. The court effectively held that Tor was subject to the jurisdiction of any fora in which its users conduct Darknet transactions. Such a result is as absurd as a suggestion that Google Chrome is liable for faulty products purchased on Amazon.

## 2. The Targeting Test's Uncertainty

Like the *Zippo* test, the targeting test suffers from unpredictable and, at times, incoherent application. Consider, for example, the multifactorial approach taken in *Football Dataco, Ltd. v. Sportradar GmbH*.<sup>128</sup> The European Court of Justice ("ECJ") applied the targeting test and found that the English High Court, representing the forum in which the relevant data was received, had jurisdiction.

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<sup>127</sup> See Seaver, 2019 WL 2176316. Alphabay's founder, Alexandre Cazes, died from apparent suicide. Presumably, the court was so adamant on analyzing jurisdiction over Tor for the very reason that both Alphabay and its founder were unavailable.

<sup>128</sup> *Football Dataco, Ltd. v. Sportradar GmbH* (Case C-173/11, 2012).

The ECJ noted, first, that the subject matter of the data—English and Scottish football league matches—was likely of interest to the UK public. Second, the defendant’s website operator knew that the data would likely be accessed by the UK public. Third, the defendant provided access to its football data in English, which suggest an intention to target the UK.

But how compelling are these factors? The English and Scottish football league possibly attracts fans from all over the world.<sup>129</sup> Although a language such as Japanese, which is primarily spoken in Japan, might be an appropriate indicator of targeting, the use of English—the most prevalent language in the world and the dominant language of the Internet—could hardly counsel towards a finding of personal jurisdiction. Arguably, the factors here did not compellingly suggest that the defendant had targeted U.K. audiences. The downside of a multi-factor targeting test is that it can be manipulated to achieve certain results.

### **B. Measurability: Determining Whether the Defendant Is Using a CDN**

The CDN approach avoids the uncertainty of unpredictable results and the controversy of discretionary opinions. It is also easily measurable. Inferring whether someone is using a CDN is not difficult. Nearly every computer is capable of determining whether a user adopted a CDN to send data to a particular location. While, today, most computer users rely on a graphic interface, with menu-driven interactions such as emails, Internet browsers, and word processors, other computer functions can be performed with a “command line” interface. A command line interface processes commands to the computer in lines of texts, as opposed to, for example, clicking an icon on a desktop or clicking “send” to dispatch an email. This command line interface—“Terminal,”

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<sup>129</sup> *Where to Watch the Premier League on US TV and Streaming*, WORLDSOCCERTALK (Oct. 10, 2019), <https://worldsoccertalk.com/watch-premier-league-on-us-tv-internet/>.



as it is known on Apple’s Macintosh Operating System—can be used to infer whether a company is using a CDN in the forum.

One of the farthest internationally recognizable landmarks from New York City is the Sydney Opera House in Sydney, Australia. Most people can appreciate its geographic distance, considering that the travel time by flight is over 20 hours.<sup>130</sup> The following steps may be taken to ascertain whether the Sydney Opera House is using a CDN to enable New Yorkers to have efficient access to Opera House content.

First, Terminal can provide information about the website address, [www.sydneyoperahouse.com](http://www.sydneyoperahouse.com).<sup>131</sup> Typing the command “dig” into Terminal will yield information about the website’s host address, mail exchange, name server, and other related information.<sup>132</sup> For present purposes, the most relevant information is the “CNAME,”<sup>133</sup> which suggests that the Sydney Opera House is using CloudFront CDN services. As

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<sup>130</sup> Scott McCartney, *The New York-to-Sydney Flight That Redefines Long Haul*, WALL ST. J. (Oct. 21, 2019), <https://www.wsj.com/articles/the-new-york-to-sydney-flight-that-redefines-long-distance-11571670328>.

<sup>131</sup> Joseph Mays, *How to Use Dig*, LIQUID WEB (Feb. 14, 2020), <https://www.liquidweb.com/kb/how-to-use-dig/>.

<sup>132</sup> *Id.*

<sup>133</sup> See Paul Mockapetris, *Domain Names – Concepts and Facilities*, INTERNET ENG’G TASK FORCE (Nov. 1987), <https://tools.ietf.org/html/rfc1034>. CNAME means Canonical Name record. It refers to a record in the Domain Name System database that indicates the true host name of the computer to which the record is associated. The CNAME is essentially an alias. For example, if both “columbia.edu” and “www.columbia.edu” refer to the same website hosted by the same server, then, to link these two websites together, a CNAME record might be created for “www.columbia.edu” pointing it to “columbia.edu.” Further note: the Domain Name System refers to the naming system for computers and other devices connected to the Internet. It translates domain names to Internet Protocol (IP) addresses, which is analogous to a street address. Just as a street address determines where a letter should be sent, an IP address identifies computers on the Internet.

discussed above, CloudFront is a CDN offered by Amazon with 205 edge servers located on five continents, spanning Europe (United Kingdom, Ireland, the Netherlands, Germany and Spain), Asia (Hong Kong, Singapore, Japan, Taiwan and India), Australia, and South America, as well as several major cities in the United States.<sup>134</sup> The figure below demonstrates Terminal command results suggesting that the Sydney Opera House is using a CloudFront CDN (note the words “cloudfront” under the subheading “ANSWER SECTION” below).

*Figure 3. Dig Command Result for www.sydneyoperahouse.com*

```

Patricks-Air:~ patricklin$ dig www.sydneyoperahouse.com
; <<> DiG 9.10.6 <<> www.sydneyoperahouse.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 49023
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0,
ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.sydneyoperahouse.com. IN A

;; ANSWER SECTION:
www.sydneyoperahouse.com.132          IN          CNAME
d3gdbrxsb9xhmf.cloudfront.net.
d3gdbrxsb9xhmf.cloudfront.net. 60 IN      A      13.225.212.48
d3gdbrxsb9xhmf.cloudfront.net. 60 IN      A      13.225.212.119
d3gdbrxsb9xhmf.cloudfront.net. 60 IN      A      13.225.212.124
d3gdbrxsb9xhmf.cloudfront.net. 60 IN      A      13.225.212.118
;; Query time: 17 msec
;; SERVER: 192.168.10.1#53(192.168.10.1)
;; WHEN: Mon Mar 23 16:40:36 EDT 2020
;; MSG SIZE rcvd: 160
Patricks-Air:~ patricklin$

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The next question is whether the Sydney Opera House management even knows that it is using a CloudFront CDN with an edge server likely close to New York (inferring the location of the CDN will be addressed below). It appears that

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<sup>134</sup> AMAZON CLOUDFRONT KEY FEATURES, AMAZON <https://aws.amazon.com/cloudfront/features/> (last visited Mar. 19, 2020).

CloudFront, by default, provides its customers access to its entire global CDN infrastructure.<sup>135</sup> Accordingly, the Sydney Opera House is not necessarily aware that it is using a CDN so that New Yorkers can have better access to [www.sydneyoperahouse.com](http://www.sydneyoperahouse.com). If that lack of knowledge were the case, then the CDN approach applies only if the court one day accepts imputed intention (per Part III.A). The ensuing analysis is still applicable to other cases, however marginal, where a user did specifically ask for a CDN in the forum to be used.

Second, running a “ping” command will confirm that the CDN server is close. The ping command sends packets of data to a specific Internet protocol (“IP”) address and reports on how long it took to transmit the packet and receive a response.<sup>136</sup> The figure below indicates the results of a ping command. Note that the ping command will continuously send out packets until it is asked to stop; therefore, the number of entries in the figure below is arbitrary.

*Figure 4. Ping Results for www.sydneyoperahouse.com*

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Patrick-Air:~ patricklin$ ping www.sydneyoperahouse.com
PING d3gdbrxsb9xhmf.cloudfront.net (99.84.126.117): 56 data
bytes
64 bytes from 99.84.126.117: icmp_seq=0 ttl=237 time=2.944 ms
64 bytes from 99.84.126.117: icmp_seq=1 ttl=237 time=13.935 ms
64 bytes from 99.84.126.117: icmp_seq=2 ttl=237 time=11.155 ms
64 bytes from 99.84.126.117: icmp_seq=3 ttl=237 time=11.786 ms
64 bytes from 99.84.126.117: icmp_seq=4 ttl=237 time=3.193 ms
64 bytes from 99.84.126.117: icmp_seq=5 ttl=237 time=13.795 ms
64 bytes from 99.84.126.117: icmp_seq=6 ttl=237 time=7.572 ms
64 bytes from 99.84.126.117: icmp_seq=7 ttl=237 time=7.883 ms
64 bytes from 99.84.126.117: icmp_seq=8 ttl=237 time=63.087 ms
64 bytes from 99.84.126.117: icmp_seq=9 ttl=237 time=100.622 ms
64 bytes from 99.84.126.117: icmp_seq=10 ttl=237 time=132.436 ms
64 bytes from 99.84.126.117: icmp_seq=12 ttl=237 time=2.427 ms
64 bytes from 99.84.126.117: icmp_seq=13 ttl=237 time=2.772 ms
64 bytes from 99.84.126.117: icmp_seq=14 ttl=237 time=11.785 ms
64 bytes from 99.84.126.117: icmp_seq=15 ttl=237 time=17.982 ms
64 bytes from 99.84.126.117: icmp_seq=16 ttl=237 time=17.181 ms

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<sup>135</sup> *Id.*

<sup>136</sup> Brady Gavin, *How to Use the Ping Command to Test Your Network*, HOW TO GEEK (Jun. 21, 2018), <https://www.howtogeek.com/355664/how-to-use-ping-to-test-your-network/>.

When running a ping command, the most accurate time is the minimum time in a sample. The fastest entry of 2.427 milliseconds is therefore the most accurate referent in the sample size.<sup>137</sup> The speed of light in a vacuum is 299,792,458 meters/second. In fiber optic cables, light travels at about 200,000,000 meters/second, depending on the type of fiber that is used.<sup>138</sup> Accordingly, it is safe to infer, based on the following calculations, that [www.sydneyoperahouse.com](http://www.sydneyoperahouse.com) is using an edge server close to New York:

2.427 milliseconds x 200,000,000 meters/seconds (the speed of light)

= 485,400 meters = 485.4 kilometers  $\approx$  301.6 miles

Accordingly, the edge server from which [www.sydneyoperahouse.com](http://www.sydneyoperahouse.com) is delivering its content to someone at Columbia University in New York is located less than 500 kilometers, approximately 300 miles, away. In reality, the edge server is likely much closer, because most of the 2.427-millisecond transmission time is potentially a result of lag from the computer that sent the packet, the computer that received it, or any delay that occurred along the route.<sup>139</sup> Taking that into account, it is certain that the packet is not travelling all the way to Sydney, Australia, but likely somewhere in the United States, close to or in New York.

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<sup>137</sup> Many things can cause a packet to be delayed, such as congestion, whether on the network generally or on the user's computer.

<sup>138</sup> See Kevin Miller, *Calculating Optical Fiber Latency*, M2 OPTICS, INC. (Jan. 9, 2012), <https://www.m2optics.com/blog/bid/70587/Calculating-Optical-Fiber-Latency>.

<sup>139</sup> Steven M. Bellovin, *A Best-Case Network Performance Model* (Feb. 12, 1992), <https://doi.org/10.7916/D8TX3N2P> (identifying at least two sources of delay: propagation delay, referring to the time it takes for the head of a signal to travel from a sender to receiver; and serialization delay, referring to the time it takes to put a packet in a wire).

There is evidence that the Sydney Opera House uses an edge server in a CDN to deliver content more efficiently to U.S. audiences. Whether such a decision was intentional is another question. The likely answer, given CloudFront's business model, appears to be that it was not volitional on Sydney Opera House's part; rather, it was probably its web hosting provider's doing. Nonetheless, the same analysis can be applied to other users for which there was intention to enter the forum market or where the service provider's volition may be imputed on a potential defendant.

In a personal jurisdiction matter, the above two-pronged process can take place to (i) ask whether the non-resident defendant entered into an agreement with its hosting service or CDN provider to specifically target a certain region or forum and (ii) investigate and infer, using any computer's command line function as outlined above, whether a CDN in or close to the forum is in fact being used (if this cannot be inferred it would be a matter of evidence). If both questions are answered in the affirmative, then purposeful availment may be established.

## V. CONCLUSION

Despite developments in the technology and use of the Internet, prevailing U.S. approaches to Internet jurisdiction still bear the pre-millennial pedigree of the targeting and *Zippo* tests, which are largely agnostic to how a defendant engages with the Internet backbone. The Supreme Court, while aware of the challenges posed by the Internet, has not settled the question of when a defendant's activities on the Internet will be enough to attract personal jurisdiction.<sup>140</sup>

Beneath the content layer of the Internet—that is, the websites, blogs, images, emails, and social media applications—are data routes by which information is transmitted. The same year *Zippo* was handed down, the Clinton Administration issued a Presidential Directive calling

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<sup>140</sup> *Walden v. Fiore*, 571 U.S. 277, 290 n.9 (2014).

for the Federal Government and its laws to “recognize the unique qualities of the Internet including its decentralized nature and its tradition of bottom-up governance.”<sup>141</sup> Observing that limited or no enquiry has taken place into the technological backbone of the Internet, I have argued that the defendant’s intentional use of CDN in a forum will almost certainly establish purposeful availment. The CDN approach is not only a predictable binary test, but also gives courts the facility to confront Internet jurisdiction through technological lenses.

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<sup>141</sup> United States, Office of the Press Secretary, *Presidential Directive on Electronic Commerce* (July 1, 1997), <https://fas.org/irp/offdocs/pdd-nec-ec.htm>.