Directive 17-1: Requirement that Out-of-State Internet Vendors with Significant Massachusetts Sales Must Collect Sales or Use Tax

I. PURPOSE

This purpose of this Directive is to explain the application of the general sales and use tax jurisdictional standard set forth in chapters 64H and 64I of the General Laws to Internet vendors, taking into consideration the relevant provisions of the U.S. Constitution.[1] As further explained below, for clarity and administrative simplicity, this Directive adopts an administrative bright line rule, rather than applying the state's sales and use tax collection requirements on a case by case basis.

II. ISSUE

Under what circumstances is an Internet vendor with a principal place of business located outside the state required to register, collect and remit Massachusetts sales or use tax as set forth in General Laws chapters 64H and 64I?[2]

III. DIRECTIVE

An Internet vendor with a principal place of business located outside the state is required to register, collect and remit Massachusetts sales or use tax with respect to its Massachusetts sales[3] as follows.

a. For the six-month period, July 1, 2017 to December 31, 2017, if during the preceding 12 months, July 1, 2016 to June 30, 2017, it had in excess of $500,000 in Massachusetts sales and made sales for delivery into Massachusetts in 100 or more transactions.

b. For each calendar year beginning with 2018 if during the preceding calendar year it had in excess of $500,000 in Massachusetts sales and made sales for delivery into Massachusetts in 100 or more transactions.

IV. DISCUSSION[4]

A vendor that is engaged in making taxable sales in the commonwealth or that sells taxable products for use in the commonwealth is subject to a sales or use tax collection duty when it is "engaged in business in the commonwealth" within the meaning of M.G.L. c. 64H, § 1 and it meets the constitutional requirements as discussed in *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992). The provisions of M.G.L. c. 64H, § 1 are to be "enforced to the extent allowed under [the] constitutional limits." *See* TIR 96-8.

a. M.G.L. c. 64H, § 1; "engaged in business in the commonwealth"

General law chapter 64H, section 1 states a series of broad jurisdictional standards that, if met, cause a vendor to be "engaged in business in the commonwealth" for purposes of the state's sales or use tax collection requirements. *See generally* M.G.L. c. 64H and 64I. For example, a vendor is "engaged in business in the commonwealth" when it has "a business location in the commonwealth." M.G.L. c. 64H, § 1. Also, a vendor is "engaged in business in the commonwealth" when it "regularly or systematically solicit[s] orders for the sale of services to be performed within the commonwealth or for the sale of tangible personal property for delivery to destinations in the commonwealth" or "otherwise exploit[s] the retail sales market in the commonwealth through any means whatsoever, including, but not limited to, salesmen, solicitors or representatives in the commonwealth … [and] computer networks or … any other communications medium." *Id.* Further, a vendor is "engaged in business in the commonwealth" when it is "regularly engaged in the delivery of property or the performance of services in the commonwealth." *Id.* An Internet vendor with significant Massachusetts sales meets the section 1 requirement because, *inter alia*, it is exploiting the state's retail sales market through "computer networks" and "other communications medium."

b. *Quill Corp. v. North Dakota;* constitutional requirements

In the 1992 case, *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992), the United States Supreme Court evaluated the U.S. constitutional limits that apply to a state's assertion of a sales or use tax collection duty with respect to a mail order vendor whose only contacts with the state are by mail or common carrier. *Quill* concluded that for the imposition of a sales or use tax collection duty to be valid as imposed upon a mail order vendor, the tax must meet the requirements of the Due Process Clause and the Commerce Clause of the U.S. Constitution.

i. Due process requirement

Quill considered the due process standard that applies when a state seeks to impose a sales or use tax collection duty on a mail order vendor. For due process purposes, the state sales or use tax jurisdictional standard is met when such a vendor "purposefully avails itself of the benefits of an economic market in the forum State." 504 U.S. at 307. Therefore, a mail order vendor meets the due process requirement when it is "engaged in continuous and widespread solicitation of business within a State." *Id.* at 307-308. An Internet vendor with significant Massachusetts sales meets this requirement because it has "purposefully availed itself of the benefits of the state's economic market" by, *inter alia*, engaging in "continuous and widespread solicitation of business" in the state.

ii. Commerce Clause requirement

(A) In general

Quill also considered the jurisdictional standard that applies under the dormant Commerce Clause when a state seeks to impose a sales or use tax collection duty on a mail order vendor. A prior Supreme Court decision, *National Bellas Hess, Inc. v. Department of Revenue of Ill.*, 386 U.S. 753 (1967), had determined that a mail order vendor could not be made subject to a state's sales or use tax collection duty when it limited its in-state contacts to mail and common carrier. Subsequent legal and commercial developments had rendered the analysis in *Bellas Hess* questionable, but *Quill* re-affirmed the holding in that prior case.[5]

The underlying logic in *Quill* was primarily that mail order vendors had reasonably relied upon the Court's prior decision in *Bellas Hess,* and that the doctrine of *stare decisis* applies with greater force when a taxpayer has reasonably relied upon a prior Supreme Court precedent. *See, e.g., Direct Marketing Assn. v. Brohl*, 135 S.Ct. 1124, 1134 (2015) (Kennedy, J., concurring) (stating that 25 years after *Bellas Hess*, *Quill* "relied on stare decisis to reaffirm the physical presence requirement and to reject attempts to require a mail-order business to collect and pay use taxes").[6] In contrast, Internet vendors were not the subject of *Quill* and Internet commerce was an unknown phenomenon at the time of the case. *See, e.g., Direct Marketing Assn.*, 135 S.Ct. at 1135 (Kennedy, J., concurring) ("[i]n 1992, the Internet was in its infancy").

The specific standard that *Quill* articulated was that a vendor can be made subject to a state's sales or use tax collection duty when it has an in-state "physical presence." Because *Quill* specifically intended to reaffirm *Bellas Hess* in the context of a fact pattern pertaining to a mail order vendor, the case made clear that a vendor that limits its in-state contacts to those of mail or common carrier does not have an in-state physical presence. However, *Quill* did not otherwise define this term. Rather, *Quill* made clear that the determination of the existence of a vendor's in-state physical presence is to be evaluated on a case by case basis. Also, *Quill* made clear that this determination is to be informed by the Supreme Court's precedent, and that physical presence includes the situation where a vendor owns, leases or licenses in-state property,[7] or relies upon one or more in-state representatives "to establish and maintain a market" in the state for its sales.[8]

(B) As applied to Internet vendors

The business and activities of Internet vendors are factually distinguishable from the business and activities of mail order vendors. Internet vendors do not limit their contacts with the state to mail and common carrier. Further, modern-day Internet vendors with a large volume of in-state sales ("large Internet vendors") invariably have one or more contacts with the state that will constitute an in-state physical presence, as discussed in greater detail below. *See Direct Marketing Assn.*, 135 S.Ct. at 1135 (Kennedy, J., concurring) ("Today buyers have almost instant access to most retailers via cell phones, tablets, and laptops. As a result, a business may be present in a State in a meaningful way without that presence being physical in the traditional sense of the term.").

(1) In-state software and "cookies"

Large Internet vendors almost invariably own software that is downloaded and used by in-state customers on their computers and communications devices ("in-state software") that functions to facilitate or enhance the vendor's in-state sales. This software may be affirmatively downloaded, as in the case of "native" or "mobile" apps, or may be downloaded as the result of the user's general exploration of the vendor's website, as in the case of "browser" or "web" apps.[9] Among other things, Internet vendors use "apps" to implement web-based shopping carts,[10] to permit customers to compare products and evaluate product reviews,[11] and to track their customers' preferences and locations.[12]

Software is generally considered to be tangible personal property. Specifically, software is generally considered to be tangible personal property under this term's common law definition[13] and under the sales tax law of most states,[14] including Massachusetts.[15] As noted by one state supreme court, "When stored on magnetic tape, disc, or computer chip, this software, or set of instructions, is physically manifested in machine readable form by arranging electrons, by use of an electric current, to create either a magnetized or unmagnetized space." *South Cent. Bell Tel. Co. v. Barthelemy*, 643 So. 1240, 1246 (La. 1994). Software "is not merely knowledge, but rather is knowledge recorded on physical form which has physical existence, takes up space on the tape, disc, or hard drive, makes physical things happen and can be perceived by the senses." *Id.*[16]

Further, the ownership of in-state software by large Internet vendors would apparently constitute an in-state physical presence within the meaning of *Quill*. *Quill* recognized that "title to a few floppy diskettes present in a State might constitute some minimal nexus" but concluded that "the existence in [a state] of a few floppy diskettes to which [the vendor] holds title" does not result in nexus because it would represent a mere de minimis or "slightest presence." *See* 504 U.S. at 315 n.8. In contrast, large Internet vendors own software that exists on the computers or other devices of all or substantially all of their in-state customers – software that is instrumental in the creation of the vendor's in-state sales.[17] A vendor's in-state software is often the means itself of significant in-state business activity on the part of the vendor, which is also a stark difference from the facts of *Quill*.[18]

As in the case of software, large Internet vendors also enhance their customer sales through the complementary use of text data files, or "cookies." Cookies are not software but as in the case of software are present in the state and serve to facilitate such vendor's in-state sales. Large Internet vendors store cookies on their customers' computers and communication devices when the customers visit the vendor's website.[19] These files are stored locally on the customer's computer or device the first time he or she visits the site and identify the customer on each subsequent visit.[20] These files include "session cookies," which are erased when a browser is closed, and "persistent cookies," which are preserved across multiple browser sessions.[21] Cookies facilitate sales by customizing the shopping experience and allowing each customer to readily log into his or her account, store items in a shopping cart, etc.[22] Cookies also enable a vendor to track their customers' behavior over time and to deliver ads that are specific to each customer.[23] Vendors own the proprietary cookies that they place on their customers' computers and devices.[24] As in the case of in-state vendor software, the ownership and use of these in-state cookies results in in-state business activity by such vendor that distinguishes such vendors from the mail order vendors that were evaluated by *Quill*.[25]

(2) Content distribution networks

Large Internet vendors routinely contract with providers of content distribution networks ("CDNs") to use local servers to accelerate the delivery of their web pages to their customers.[26] CDN servers are computer hardware that is housed in geographically distributed data centers.[27] A CDN is an organized network of such servers that are generally placed in close proximity to Internet users.[28] CDNs operate to hasten the delivery of Internet vendors' web pages to nearby customers.[29] By allowing Internet vendors to deliver web page content to their local customers more quickly and efficiently, CDNs ensure that the vendors' customers are less likely to exit the vendors' web pages without making a purchase and increase the likelihood that the customers will return for future business.[30] Consequently, the CDNs perform local activities "on behalf of the [vendor that] are significantly associated with the [vendor's] ability to establish and maintain a market" for its sales. *See Tyler Pipe*, 483 US at 251. When that activity takes place in Massachusetts it establishes an in-state physical presence on behalf of such vendor. *See id.*[31]

(3) Other representative contacts

Large Internet vendors may also utilize other persons as in-state representatives that result in the creation of an in-state physical presence. For example, large Internet vendors commonly sell goods through third-party agreements with companies that are often referred to as "online marketplaces."[32] These online

marketplaces, which offer a range of potential services through employees or other contract personnel, benefit the client-vendor by, among other things, enhancing its name recognition and creating consumer confidence with respect to its products.[33] These arrangements may vary in form. Many of these agreements allow the Internet vendor to post goods for sale on a website operated by the online marketplace, with orders and payment then processed through that website (with subsequent order fulfillment completed by the individual Internet vendor). Other agreements may provide for increased services by the employees or other personnel of the online marketplace, which may include order fulfillment, return processing, access to the online marketplace's customer service team, and the preparation of sales reports or other analytics. In either instance, although the website maintained by the online marketplace on which the vendor's products are sold is "virtual," some of the various services provided by the online marketplace in connection with the sale of the vendor's products will be physical in nature. Because these latter, physical services operate to establish and maintain the Internet vendor's market, these services, when performed in the state, will result in an in-state physical presence on the part of such vendor. *See Tyler Pipe*, 483 US at 251.

Also, large Internet vendors may utilize delivery services that exceed the type of delivery services that were evaluated by *Quill*. *Quill* held that a state could not impose a sales or use tax collection duty on vendors that limit their contacts with the state to the contacts of mail and common carrier. In contrast, large Internet vendors may utilize delivery services that provide not merely product delivery, but additional services that may include logistics, order fulfillment, storage, return processing and order management.[34] In general, these additional services operate to enhance the vendor's sales. Therefore, these services, when performed in the state, will result in an in-state physical presence on the part of such vendor. *See Tyler Pipe*, 483 US at 251.[35]

c. Conclusion

This Directive explains the application of the general sales and use tax jurisdictional standard set forth in chapters 64H and 64I of the General Laws to Internet vendors, taking into consideration the relevant provisions of the U.S. Constitution. The application of the Commerce Clause of the U.S. Constitution prevents the state from applying the provisions of section 1 to a mail order vendor under certain circumstances as explained by the U.S. Supreme Court in *Quill Corp. v. North Dakota,* 504 U.S. 298 (1992). However, the business and activities of Internet vendors are factually and legally distinguishable from those of mail order vendors. As explained above, an Internet vendor with significant Massachusetts sales meets the statutory and constitutional standards that apply for purposes of the imposition of the commonwealth's sales or use tax collection duty. For clarity and administrative simplicity, this Directive adopts an administrative bright line rule, rather than applying the sales and use tax collection requirements on a case by case basis. Specifically, as noted, the Massachusetts sales and use collection requirements will generally apply to an Internet vendor that in the prior taxable year had greater than $500,000 in Massachusetts sales and made sales for delivery into Massachusetts in 100 or more transactions.[36]

/s/Michael J. Heffernan
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Commissioner of Revenue

MJH:RHF:mtf

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[1] *Cf.* Directive 96-2 (explaining the application of the corporate excise jurisdictional standard to corporations that own and use intangible property in the state). *See also Geoffrey, Inc. v. Comm'r of Revenue*, 453 Mass. 17, 26 (2009) (noting the use of Directive 96-2 to explain the Commissioner's position as to when certain activities create corporate excise jurisdiction).

[2] In general, the scope of this Directive is focused upon vendors that have a principal place of business located outside Massachusetts and that have a large volume of Internet sales but no traditional in-state business presence, e.g., an office, warehouse, in-state real or tangible property and/or sales or sales-related representatives (including related parties). The Directive addresses when the in-state activities of such Internet vendors will create a Massachusetts sales or use tax collection duty notwithstanding the absence of such traditional in-state business presence. Nevertheless, in principle, an Internet vendor that has a principal place of business located outside Massachusetts may have in-state contacts other than, or in addition to, the contacts referenced in section IV.b.ii(B) of this Directive (e.g., inventory physically maintained in the state), in which case such contacts may independently establish state tax jurisdiction, without regard to the volume of the vendor's Massachusetts sales. In any instance in which an Internet vendor may have previously had contacts with the state other than as referenced in section IV.b.ii.(B) in prior tax years, the vendor may seek to use the Department of Revenue's voluntary disclosure program for such prior years. *See* http://www.mass.gov/dor/businesses/filing-and-reporting/voluntary-disclosure.html. In any instance in which an Internet vendor's only contacts with the state in prior tax years were those referenced in section IV.b.ii.(B) of this Directive and that vendor complies with the terms of this Directive, the state will not seek back tax filings pursuant to this Directive.

[3] For purposes of this Directive, "Massachusetts sales" are all sales made by the vendor of tangible personal property or services delivered into the state, however consummated.

[4] Note that the analysis set forth in this section is not intended to be exhaustive. The Directive does not address all theories of state tax jurisdiction and should not be understood as restricting the Commissioner from asserting any jurisdictional principles, as appropriate, in litigation or otherwise.

[5] The Court in *Quill* made repeated references to the "*Bellas Hess* rule," and concluded by noting that the "*Bellas Hess* rule remains good law" and that it is not "time . . . to renounce the bright-line test of *Bellas Hess*." 504 U.S. at 317-318. *See also id.* at 315 (*Bellas Hess* "created a safe harbor for vendors 'whose only connection with customers in the [taxing] State is by common carrier or the United States mail'").

[6] *See also Quill,* 504 U.S. at 317 (noting that "the *Bellas Hess* rule has engendered substantial reliance and has become part of the basic framework of a sizable industry"); *id.* at 320 (Scalia, J., concurring) (agreeing with this statement and noting that "the demands of the [stare decisis] doctrine are at their acme . . . where reliance interests are involved").

[7] *See* 504 U.S. at 307.

[8] *Quill* repeatedly cited *Tyler Pipe Industries v. Washington Dep't of Revenue,* 483 U.S. 232, 249-251 (1987), which determined that in-state activities performed on behalf of a taxpayer by one or more independent contractors establish nexus when those activities benefit the vendor by maintaining and improving "name recognition, market share, goodwill, and individual customer relations."

[9] An "app" -- which is the common shorthand term for a software application -- is a program that facilitates performance of a task or the retrieval of information. *See* David Bell and Hope Hughes, *One Bad App Spoils the Bunch: Brand Protection in the App Era*, 74 Tex. B. J. 218, 219 (2011). *See Web Applications: What are They? What of Them?",* http://www.acunetix.com/websitesecurity/web-applications/ (noting that web applications are computer programs allowing website visitors to submit and retrieve data to or from a database over the Internet using their preferred web browser, which is then presented to them as web content) (last visited March 26, 2017).

[10] *See, e.g.,* Richard M. Smith, *Internet Privacy: Who Makes the Rules?,* 3 Yale J. L. & Tech. 2 (2001).

[11] *See, e.g.,* J.T. Campbell, et al., *Enhanced Discovery Computers @2017: Tools, Apps, Devices and the Impact of Technology*, at 178 (2016).

[12] *See, e.g.,* Sougata Mukherjea, *Mobile Application Development, Usability and Security*, at 236 (2017).

[13] Black's Law Dictionary defines tangible personal property to be "personal property that can be seen, weighed, measured, felt, or touched or is in any other way perceptible to the senses." Black's Law Dictionary (9th ed. 2009). Numerous state and federal cases have construed this definitional language or elements of this definitional language to include software. *See, e.g., South Cent. Bell Tel. Co. v. Barthelemy*, 643 So. 1240, 1243-1246 (La. 1994) (applying a Louisiana statute embodying this standard to software); *Margae, Inc. v. Clear Link Technologies, LLC*, 620 F. Supp. 2d 1284, 1288 (D. Utah 2009) (noting "software has a physical presence on [a] computer drive, causes tangible effects on computers, and can be perceived by the senses").

[14] *See, e.g.,* NY CL Tax § 1101; Tex. Tax Code § 151.009; Ohio R.C. § 5739.01(YY). The Streamlined Sales and Use Tax Agreement, which has been adopted by 24 states, defines tangible personal property to include prewritten computer software, however transferred. A current version of that agreement can be found at http://www.streamlinedsalestax.org/.

[15] *See* M.G.L. c. 64H, § 1 (definition of tangible personal property).

[16] Numerous other state courts are in accord. *See, e.g., South Central Utah Telephone Association v. Auditing Division*, 951 P.2d 218, 223-224 (Utah 1997) ("software is information recorded in a physical form which has a physical existence, takes up space on the tape, disc, or hard drive, makes physical things happen, and can be perceived by the senses"); *Graham Packaging Co., LP v. Commonwealth*, 882 A.2d 1077, 1085 (Pa. Comm. Ct. 2005) (software is "ultimately recorded and stored in physical form upon a physical object" in a manner that a computer can use; it "is not merely an incorporeal idea to be comprehended, and would be of no use if it were … [it] is given physical existence to make certain desired physical things happen"); *Andrew Jergens Co. v. Wilkins*, 109 Ohio St. 3d. 396, 399 (Ohio 2006) (software is encoded instructions that "are stored on the hard drive of the purchaser's computer to enable the computer to perform the desired operation[; …] the encoded instructions are always stored on a tangible medium that has physical existence. The magnetic or other coding on a medium is in a sense a form of writing that can be copied into and physically stored in the computer and then read by the computer as instructions on how to perform a given application").

[17] Cf. Comptroller Decision Nos. 106,632 and 108,626, 2014 Tex. Tax LEXIS 70 (Sept. 19, 2014) (vendor software delivered electronically into the state establishes a physical presence nexus within the meaning of *Quill*); Comptroller Decision No. 36,237, 1998 Tex. Tax LEXIS 207 (July 21, 1998) (vendor's ownership of licensed in-state software establishes a physical presence nexus within the meaning of *Quill*).

[18] *See, e.g*., Hemant Bhargava, et al., *The Move to Smart Mobile Platforms: Implications for Antitrust Analysis of Online Markets in Developed and Developing Countries,* 16 U.C. Davis Bus. L.J. 157, 180 (2016) ("Conducting business via mobile apps enables the [retailer] to leverage information on the consumer's location and social circle to provide customized product recommendations and timely promotions notifications"); Federal Trade Commission, *Consumer Information: Understanding Mobile Apps* (Sept., 2011), https://www.consumer.ftc.gov/articles/0018-understanding-mobile-apps (noting that some mobile apps may be able to access, among other things, your phone and email contacts; call logs; Internet data; calendar data and data about the device's location); *Recent Case: Statutory Interpretation -- The Video Privacy Protection Act – Eleventh Circuit Limits the Scope of "Subscriber" for VPPA Protections*, 129 Harv. L. Rev. 2011, 2017 (2016) ("Installed applications indicate permanence: the application is a dedicated platform to view a particular provider's content that has become, quite literally, a part of one's phone.").

[19] *Mount v. Pulsepoint, Inc*., 2016 U.S. Dist. LEXIS 112315 (S.D.N.Y. 2016*); In re Nickelodeon Consumer Privacy Litig*., 827 F.3d 262, 268 (3d Cir. 2016). When a user accesses a website through a web browser, the web browser submits a request to the website server to load the website and in the process, downloads cookies associated with the website. *In re Hulu Privacy Litig.,* 2014 U.S. Dist. LEXIS 83661, at 15 (N.D. Cal. 2014).

[20] Julia N. Mehlman, *If You Give a Mouse a Cookie, It's Going to Ask for Your Personally Identifiable Information: A Look At the Data-Collection Industry and a Proposal for Recognizing the Value of Consumer Information*, 81 Brooklyn L. Rev. 329, 333 (2015).

[21] *Pulsepoint*, 2016 U.S. Dist. LEXIS 112315, at 3-4.

[22] *Id. See Hulu*, 2014 U.S. Dist. LEXIS 83661, at 14-15; *In re Facebook Internet Tracking Litig.*, 140 F. Supp. 3d 922, 926 (N.D. Cal. 2015).

[23] *See* Federal Trade Commission, *Consumer Information: Online Tracking* (June, 2016), https://www.consumer.ftc.gov/articles/0042-online-tracking.

[24] *See In re Doubleclick Privacy Litig.,* 154 F. Supp. 2d 497, 513 (S.D.N.Y. 2001) (holding that the identification numbers contained in cookies reflect the internal communications both of, and intended for, the entity that placed the cookie).

[25] A vendor may also allow other entities, such as advertisers or data brokers, to set third party cookies on customers' devices through the vendor's website. Mehlman, *supra* note 20, at 333-334. Third party cookies are usually persistent cookies that track the customer across multiple sites. Eoin Carolan & M. Rosario Castillo-Mayen, *Why More User Control Does Not Mean More User Privacy: An Empirical (and Counter-Intuitive) Assessment of European E-Privacy Laws,* 19 Va. J.L. & Tech. 329, 334 (2015); *In re: Google Inc. Cookie Placement Consumer Privacy Litigation,* 806 F.3d 125 (2015). For example, if the cookie is set by an advertiser and the customer goes to another website with the same entity's advertisements, the customer will be tracked by the advertiser's cookies. *Google*, 806 F.3d at 131. Data brokers collect this third party information and compile it for the vendor so that they may promote their products to customers more effectively providing a more customized user experience. Mehlman, *supra* note 20 at 334.

[26] *See* Tammy Everts, *New findings: Retail sites that use a CDN are slower than sites that do not** (April, 2014), http://www.webperformancetoday.com/2014/04/22/new-findings-retail-sites-use-cdn-slower-sites/ (stating that approximately 75% of the top retail websites use CDNs).

[27] *See* Vimal Matthew, Ramesh K. Sitaraman, & Prashant Shenoy, *Energy-Aware Load Balancing in Content Delivery Networks*, https://arxiv.org/abs/1109.5641 (last visited March 29, 2017).

[28] Dirk Grunwald, *The Internet Ecosystem: The Potential for Discrimination*, 63 Fed. Comm. L.J. 411, 426 (2011).

[29] CDNs typically employ two methods to reduce the loading time of Internet vendors' web pages for their Massachusetts customers. To speed the delivery of static web content, such as images, audio, and video, CDNs retrieve and store such content on numerous geographically distributed servers in order to send the content to the vendors' customers from local CDN servers, thereby decreasing the travel distance of such content. *See Akamai Techs., Inc. v. Limelight Networks, Inc*., 629 F.3d 1311, 1314-1316 (Fed. Cir. 2010), *rev'd on other grounds*, 692 F.3d 1301, 1305-06 (Fed. Cir. 2012) (en banc) (per curiam); Sheraz Syed, *Prioritizing Traffic: The Internet Fast Lane,* 25 DePaul J. Art Tech. & Intell. Prop. L. 151, 176 (2014). Also, CDNs facilitate the delivery of dynamic web content, which typically consists of web content that is specific and personal to the user/customer, generated in real-time, and stored only on the vendors' (and not the CDNs') servers. *See* Al-Mukaddim Khan Pathan & Rajkumar Buyya, *A Taxonomy and Survey of Content Delivery Networks*, http://www.cloudbus.org/reports/CDN-Taxonomy.pdf (last visited March 26, 2017); Mukaddim Pathan, et al., *Advanced Content Delivery, Streaming, and Cloud Services* (Wiley) § 1.4.1 (2014). When Massachusetts customers access Internet vendors' web pages, they are directed to local CDN servers, which search the CDN in its entirety for pathways that may deliver the content from the vendors' servers to the customers faster than the default route. *See id.*

[30] According to a Google study of aggregated Google data, 53% of visits are abandoned if a mobile web page takes more than three seconds to load. Also, the study found that one out of two people expect a page to load in less than two seconds. *See The Need for Mobile Speed: How Mobile Latency Impacts Publisher Revenue,* https://www.doubleclickbygoogle.com/articles/mobile-speed-matters/ (Sept., 2016). A study by one CDN provider found that each second of reduced web page loading time increases sales by 3% per customer. *See e-Commerce Retailers: The Next Billion $ Opportunity. Are We Ready?*, http://www.cdnetworks.com.sg/resources-whitepapers/e-commerce-retailers-the-next-billion-opportunity-are-we-ready (last visited March 26, 2017).
[31] Several leading CDN providers have noted that they maintain CDN server locations in Massachusetts. *See, e.g.,* http://www.fastly.com/network-map (last visited March 29, 2017); http://www.cloudflare.com/network (last visited March 29, 2017); http://wwwnui.akamai.com/gnet/globe/index.html (last visited March 29, 2017).
[32] *See* Arizona Transaction Privilege Tax Ruling "TPR" 16-3 (Sept 20, 2016). *See also* Barak Y. Orbach, *Indirect Free Riding on the Wheels of Commerce: Dual-Use Technologies and Copyright Liability*, 57 Emory L.J. 409, 432 (2008); *Tiffany (NJ) Inc. v. eBay, Inc.,* 600 F.3d 93, 97 (2nd Cir. 2010).
[33] *See What is an Online Marketplace*, https://tipalti.com/customers/online-marketplaces-tipalti/what-is-an-online-marketplace/ (last visited March 26, 2017) (noting that that online marketplaces provide "customer service (and other services) to the people ordering from their website, which is important because, as far as the consumers are concerned, the online marketplace is the store that they are buying from").
[34] *See, e.g.,* Jeffrey B. Graves, *Maximizing Productivity in E-commerce Warehousing and Distribution Operations*, http://www.inboundlogistics.com/cms/article/maximizing-productivity-in-e-commerce-warehousing-and-distribution-operations/ (last visited March 26, 2017).
[35] *See Furnitureland South v. Comptroller of the Treasury*, No. C-97-37872 OC (Md. Cir. Ct Aug. 13, 1999*), rev'd on other grounds*, 771 A.2d 1061 (Md. 2001) (post-sale delivery services provided by a vendor's representative distinguish that representative from the common carrier in *Quill* and establish an in-state physical presence on the part of such vendor).
[36] *Cf.* M.G.L. c. 63, § 1 (stating a similar jurisdictional standard for financial institutions with respect to the Massachusetts corporate excise).