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THE TAXATION OF CLOUD COMPUTING AND DIGITAL CONTENT
by David J. Shakow*

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I. INTRODUCTION

“Cloud computing” raises important and difficult questions in state tax law, and for Federal taxes, particularly in the foreign tax area. As cloud computing solutions are adopted by businesses, items we view as tangible are transformed into digital products. In this article, I will describe the problems cloud computing poses for tax systems. I will show how current law is applied to cloud computing and will identify the difficulties current approaches face as they are applied to this developing technology.

My primary interest is how Federal tax law applies to cloud computing, particularly as the new technology affects international transactions. I am not so interested in the current state of the law as I am in identifying the problems confronting tax administrators as technology creates a changed economic system. After identifying the problems, I will suggest that cloud computing (like other technological changes) is not always compatible with current rules for taxing activities in multiple jurisdictions. Therefore, tax fairness may require that new standards be used to allocate income among jurisdictions.

But beyond that, I hope to explain some of the particulars of the cloud structure. In doing so, it will become apparent that the significance of cloud computing goes beyond the local and international tax areas that have been identified as problem areas in the past.

II. WHAT IS CLOUD COMPUTING

A report of the National Institute of Standards and Technology (“NIST”) defines cloud computing:

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.¹

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If the above definition is helpful to you, you can skip the next few paragraphs.

One way to understand a major part of the cloud computing structure is to think of “time sharing,” which allows many people to share a computer. In the 1960s, when computers were big and expensive, and commercially-available personal computers did not exist, large entities (such as universities) wanted to allow many users to share their few computers. A user who was not located at the site of a computer could communicate with a computer using what was essentially a keyboard tied to the main computer by a telephone connection. The user could instruct the computer to run programs that were resident on the computer, manipulating data that was stored on the computer. The results of the computer operations might be available only at the computer site, or might, perhaps, be sent back to the user to be printed on a printer attached to the telephone connection.

The development of the personal computer and its easy availability made this structure obsolete. Each user could have a sufficiently powerful machine with its own software and immediate access to data. The idea of timesharing faded from view.

Changes in people’s needs have taken computer users back to the time sharing model, brought up to date. Much of the development is, again, a response to the needs of large organizations. The personal computer model requires the same software on every computer for each person in an organization. If the software changes, the changes must be made on each of the organization’s computers. If new software is adopted, the new software must be installed on each computer. If a computer crashes, the software must all be reinstalled on its replacement, along with the data that was on the old computer, if it can be recovered. In addition, many people in an organization may work on a single project. If more than one person works on a project, the developing output has to be shared explicitly with each member of the group. If a person wants to work on a project outside the office, either the person’s computer or, at least, the developing results, must be carried around by the person. If the user loses the file, days of revisions may be lost.

But if the software is on only one computer, and if the developing output resides on that computer, and if everyone in the organization has access to that computer from wherever they are located, then the problems described above can be eliminated. Upgrading, changing, or adding software need be done on only one computer. Changes to workproduct are immediately available to all members of a working group. And everyone can access the software and workproduct from wherever they are located.

That’s what the NIST definition calls “ubiquitous, convenient, on-demand network access.” Users have “convenient” access to their computer resources when they want it (“on demand”), and generally at all times from wherever they are (“ubiquitous”). A system that provides ubiquitous, convenient, on-demand network access raises difficult questions for the tax law, which the authorities are only beginning to confront.

But the definition also speaks of “a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.” That means that the

¹ U.S. Dept. of Commerce, Mell and Grance, “The NIST Definition of Cloud Computing” (Special Publication 800-145) at 2 (September 2011), available at csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf (“NIST Report”).

hardware resources that are being accessed are not all on one computer. Instead, they are on many computers that are available to everyone who has access to this “cloud” of computing power. The program administering the cloud allocates computer resources to a user whenever a request from the user comes in, based on which hardware is available at the time. This is an efficient way of deploying computer resources. Each user can get access to a large amount of computer resources when needed, and only when needed. Unrelated groups can use computers without being aware that they are sharing hardware resources.² The service provider’s system assures each user access to hardware resources when needed.

If a user is to have efficient access to a machine when needed, there must be some way to be sure that the user’s software and data are available on any actual machine to which the user is directed. To assure this result, the system copies each user’s data and software preemptively to other servers. This allows the system to allocate requests for hardware resources to whatever physical location can most efficiently satisfy the demand. In other words, if the data is located on, say, five different servers, a request from a user to access that data can be directed to whichever of the five servers has the most capacity at the time. This redundancy also insures that a disaster on one machine will not lead to the loss of any data or software.

To those who have some familiarity with the deployment of computer resources, this brings up images of “server farms,” remote locations where thousands of computers are kept for the benefit of many users. From the perspective of the tax law, many computers in one location do not pose different issues than one computer in that location.

That is not the only type of “shared pool of configurable computing resources,” though. For it is possible for computer resources to be “rapidly provisioned and released with minimal management effort or service provider interaction” even if the computers are in different locations. Some could be in Idaho, some in Iowa, some in Iceland, and some in Indonesia.³ And as those computer resources are being “rapidly provisioned and released,” the heads of tax authorities in Idaho, Iowa, Iceland, Indonesia—and in Washington—should be rapidly spinning also.

The above describes the most comprehensive sort of cloud computing model, Infrastructure as a Service (IaaS).⁴ A much more limited form of cloud computing—but a very common one—is Software as a Service (“SaaS”), where a provider allows the user to access

² This article does not touch on the significant ethical issues that are raised by this structure. See, e.g., Florida Bar, Proposed Advisory Opinion 12-3 (1/25/13) (summarizing other states’ opinions), available at [http://www.floridabar.org/TFB/TFBResources.nsf/Attachments/186D086CDDCBF92F85257B01007A5091/\\$FILE/12-03%20PAO.pdf?OpenElement](http://www.floridabar.org/TFB/TFBResources.nsf/Attachments/186D086CDDCBF92F85257B01007A5091/$FILE/12-03%20PAO.pdf?OpenElement)

³ To be clear, the varied locations of the cloud’s servers are not necessarily a function of attempts to create problems for tax administrators. For example, the cost of electricity to run a computer over its lifetime is a significant portion of its lifetime cost. Locations are chosen, among other reasons, based on the cost of electricity to run the computers.

⁴ The NIST Report, *supra* note 1, describes IaaS as follows:

Infrastructure as a Service (IaaS). The customer obtains processing, storage, networks, and other fundamental computing resources where the customer can run its own software, including operating systems and applications. The customer has control over operating systems, storage, and deployed applications; and may be given limited control of select networking components (e.g., host firewalls).

some type of software (e.g. TurboTax’s tax preparation software) from anywhere.⁵ In the middle is Platform as a Service (PaaS), where a provider furnishes information and programming tools, allowing the user to develop its own applications and analyses using the tools and information in the provider’s system.⁶

III. WHAT PROBLEMS DOES CLOUD COMPUTING RAISE?

The taxation of cloud computing exacerbates the difficulties that already infuse the taxation of digital content. As we will discuss in more detail below, each aspect of the digital transactions that are effected through the cloud raise significant questions.

What makes the taxation of cloud computing so difficult? First, taxation often depends on identifying the nature of the item generating the income: is it tangible property or is it an intangible? Is the item itself being transferred, or is it just the right to use it? If the item itself is not transferred, is the right to use it properly thought of as a lease or as an arrangement subject to royalty payments?

If we have determined the answer to those questions, we may have to locate the transaction—whatever it is, where does it take place. Moreover, do we know where the seller (provider) is? And do we know where the buyer (user) is? To further complicate matters, any attempt to pin down the location of the buyer or the seller with a simple rule is an invitation to tax manipulation.

The underlying concern presumably motivating these questions is where is it most appropriate to tax the transaction. But the difficulty of identifying what activities generated the transaction’s profit, and the related difficulty of identifying where those activities took place, make the whole project seem, at times, futile.

How is cloud computing, a fine arrangement from a business standpoint, to mesh with a tax system that depends on categorizing transactions in particular ways and pinpointing their location? This is just the latest difficulty posed as the tax law had had to deal with the development of computer technology and digital content. A review of the issues that the tax law has faced in connection with state and local taxes will help put the issues surrounding cloud computing in perspective.

IV. STATE TAXATION

⁵ The NIST Report, *supra* note 1, defines SaaS as follows:

Software as a Service (SaaS). Provides the customer with software applications running in the cloud. The applications are accessible from many of the customer’s devices (e.g. all its employees’ computers). Access may be through the Internet or a special program installed on the various customer devices. The customer generally does not manage or control the underlying network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of any special customer-specific software installed in the cloud.

⁶ The NIST Report, *supra* note 1, defines PaaS as follows:

Platform as a Service (PaaS). Allows the customer to deploy onto the cloud applications it has created or acquired using programming languages, libraries, services, and tools supported by the provider. As with SaaS, the customer does not manage or control the network, servers, operating systems, or storage, but it has control over the applications.

A. DEALING WITH NEW TECHNOLOGY

The treatment by the states of internet sales and computer programs illustrates how, when tax authorities first confront a new technology, they attempt to fit it within a category whose treatment is already determined. The development of state taxation in these areas suggests how tax authorities may approach the taxation of cloud services.

As technology develops, its tax treatment may change. This could be partly because tax authorities come to understand it better, and partly because the original treatment leaves too large a loophole in the jurisdiction's general taxing scheme. Accordingly, I will examine not only how cloud services are currently taxed but what reasonable alternatives are available to taxing authorities in the future.

B. INTERNET SALES

Of particular importance in the context of state sales and use taxes is the power of states to tax sellers from outside the state who are selling property to state residents. Internet sales of tangible personal property raise some questions about the applicability of a sales or use tax. They raise more serious questions regarding the power of states to impose tax-related obligations on sellers.

E-commerce sales in the United States have grown (on a year-to-year basis) in almost every quarter of the 21st Century. They were about 1% of total retail sales in 2001 and are now almost 5.5%.⁷ As with the sale of items embodied *in* electronic media (discussed below), sales effected *through* electronic media have caused problems for state tax authorities.

Some of the issues states have faced in connection with sales and use taxes on Internet sales relate to how their statutes are drafted. In addition, the Supreme Court has put restrictions on the power of states to tax entities that are out of state, and Congress has also imposed a limitation.

1. CONSTITUTIONAL LIMITATIONS

The Supreme Court has decided two cases that are particularly relevant to this issue. In *National Bellas Hess, Inc. v. Department of Revenue of Illinois*,⁸ the Supreme Court held that an out-of-state mail order seller that communicated with customers only through the mail and common carriers could not be required to collect use taxes from its customers. The decision was based on both Due Process and the Commerce Clause, in light of the seller's lack of physical presence in the state.

In *Quill Corp. v. North Dakota*,⁹ the Court again concluded that the out-of-state seller could not be required to collect use taxes. However, it rejected the Due Process analysis of *National Bellas Hess*. It held unanimously, following its own intervening precedents, that Due

⁷ U.S. Census Bureau, Estimated Quarterly U.S. Retail Sales, Total and E-Commerce, Revised as of February 15, 2013, available at <http://www.census.gov/retail/mrts/www/data/excel/tsadjjustedsales.xls> (adjusted sales figures).

⁸ 386 U.S. 753 (1967).

⁹ 504 U.S. 298 (1992).

Process only required the out-of-state seller to have “minimum contacts” with the state. Quill satisfied that test because

it “purposefully directed its activities at North Dakota residents,”

“the magnitude of those contacts are more than sufficient for due process purposes,” and

“the use tax is related to the benefits Quill receives from access to the State.”¹⁰

However, a majority of the Court held that the Commerce Clause required “substantial nexus” to force a seller to collect taxes for a state where it is not physically located. This standard allows out-of-state sellers to avoid state-imposed obligations even if they have greater contacts with the state than the “minimum contacts” level that satisfies the Due Process requirement. The Court affirmed the bright line test in *Bellas Hess* that “created a safe harbor for vendors ‘whose only connection with customers in the [taxing] State is by common carrier or the United States mail.’”¹¹ The Court invited Congress to legislate in this area, since Congress would be able to determine, on a national basis, when a state could impose a tax on an out-of-state vendor. Congress has yet to act on this issue.¹²

This situation could change if the Marketplace Fairness Act of 2013¹³ makes headway in Congress this year. The bill, which has bipartisan support (and bipartisan opposition), authorizes a state to require remote sellers to collect its sales and use taxes. The requirement will apply only to sellers with more than \$1 million of sales in the preceding year. The states must provide remote sellers with free software that will calculate the tax on transactions and file sales and use tax returns.

2. P.L. 86-272

In 1959, the Supreme Court decided *Northwestern States Portland Cement Co. v. Minnesota*.¹⁴ The Court held that states had the power to tax income generated from interstate

¹⁰ *Quill*, 504 U.S. at ____.

¹¹ *Quill*, 504 U.S. at 315, quoting *Bellas Hess*, 386 U.S. at 758. Significantly, the Court went on to note that, in some situations, it has “decided to replace such tests with more contextual balancing inquiries.” The Court observed that the *Bellas Hess* rule “has engendered substantial reliance and has become part of the basic framework of a sizeable industry.” The reference is to the mail order catalog industry. To a great extent, that industry has been replaced by Internet

¹² From our narrow perspective, focusing on the effects of software on the taxability of an out-of-state vendor, it is worth noting that the Supreme Court said twenty years ago:

In addition to its common-carrier contacts with the State, Quill also licensed software to some of its North Dakota clients. . . . The State “concedes that the existence in North Dakota of a few floppy diskettes to which Quill holds title seems a slender thread upon which to base nexus.” Brief for Respondent 46. We agree. Although title to “a few floppy diskettes” present in a State might constitute some minimal nexus, in *National Geographic Society v. California Bd. of Equalization*, 430 U.S. 551, 556 (1977), we expressly rejected a “slightest presence standard of constitutional nexus.” We therefore conclude that Quill’s licensing of software in this case does not meet the “substantial nexus” requirement of the Commerce Clause.

504 U.S. at 315 n.8.

¹³ S. 743. For text of bill, go to <http://www.gpo.gov/fdsys/pkg/BILLS-113s743pcs/pdf/BILLS-113s743pcs.pdf>.

¹⁴ 358 U.S. 450 (1959).

commerce. In response to that opinion, Congress passed P.L. 86-272.¹⁵ That law limits the power of states to tax out-of-state retailers who do little in a state except send sales representatives into the state. All sales must be finalized outside the state, and shipment must be made from outside the state.¹⁶

As the nature of interstate commerce has developed, the precise rules of P.L. 86-272 do not necessarily fit current business practices. On the one hand, it is quite easy for out-of-state businesses to sell to residents of other states— as Internet selling has grown, there isn't a need to send even catalogs to potential customers, let alone actual sales persons. On the other hand, national businesses have difficulty limiting their activities to the particular activities that P.L. 86-272 allows. Nevertheless, P.L. 86-272 remains the major foray of Congress in this area.

3. “AMAZON” LAWS

States have attempted to get around the Constitutional restrictions and the limits of P.L. 86-272 by passing so-called “Amazon” laws. They have taken two approaches. In New York, an out-of-state retailer is compelled to collect New York sales or use taxes on the basis that the out-of-state retailer paid a New York resident a commission for “referring” customers to it. The “referrals” were so-called “click through” sales—sales made by the out-of-state entity as a result of a customer clicking on a link on the Web site of the otherwise unrelated New York resident. The state successfully argued that such a connection was sufficient to give it jurisdiction over the out-of-state seller based on a (rebuttable) presumption that the New York site owners solicit users to “click through” to the seller’s sites and thus generate income for them.¹⁷

Colorado required any retailer “doing business” in the state to send its Colorado customers a list of their purchases during the year, and to provide the Colorado Department of Revenue with a statement showing the customer’s purchases. For this purpose, “doing business” includes “soliciting . . . by use of . . . any . . . means whatsoever, of business from persons residing in” Colorado and as a result receiving orders from persons residing in Colorado.¹⁸ Thus, anyone selling to someone residing in Colorado would be subject to this law. A Federal District Court has declared this law violated the dormant Commerce Clause.¹⁹ It based its decision on

¹⁵ P.L. 86-272, 73 Stat. 555 (1959) (codified at 15 U.S.C.A. sections 381-384 (West 2010)).

¹⁶ Under P.L. 86-272, a state cannot impose its income tax on an out-of-state seller if:

the only business activities within such State by or on behalf of such person during such taxable year are either, or both, of the following:

(1) the solicitation of orders by such person, or his representative, in such State for sales of tangible personal property, which orders are sent outside the State for approval or rejection, and, if approved, are filled by shipment or delivery from a point outside the State; and

(2) the solicitation of orders by such person, or his representative, in such State in the name of or for the benefit of a prospective customer of such person, if orders by such customer to such person to enable such customer to fill orders resulting from such solicitation are orders described in paragraph (1).

¹⁷ *Amazon.com LLC v. New York State Department of Taxation & Finance*, 81 A.D.3d 183, 913 N.Y.S.2d 129 (Sup. Ct. App. Div. 2010), *aff'd sub. nom. Overstock.com Inc. v. Dep't of Taxation and Finance*, 913 N.Y.S. 2d 129 (Ct. App. 3/28/13). As the court viewed it, the statute reasonably contemplated that a school, for example, would urge its supporters to make purchases through a link on its web site. *Overstock.com, Inc.*, at 139.

¹⁸ Colo. Rev. Stat. Ann. § 39-21-112(8).

¹⁹ *Direct Marketing Association v. Huber*, ___ F.Supp. 2d ___ (D. Colo. 3/30/2012).

the discrimination against interstate commerce and the lack of sufficient presence under the *Quill* doctrine.²⁰ Note that the Colorado law was struck down although it did not require the out-of-state retailers to collect a tax. Note, too, that the provision was not deemed a violation of Due Process. Thus, if Congress were to impose an information reporting obligation on those selling over the Internet, this would not violate the Constitution. Of course, that leaves open the question how practically one can impose such a burden on every entity that makes sales over the Internet through Web sites available all over the world.²¹

The treatment of identifiable out-of-state sellers has been a major concern to state taxing authorities, and they have been addressing how they might deal with this problem. But the issues that they raise are more straightforward than the ones that arise when what is being sold is more ephemeral.

C. EVOLUTION OF STATE TAXATION OF SOFTWARE AND HOSTING SERVICES

When digital property is sold, the basis for a state to impose a sales tax becomes more difficult to identify. Since many states apply their sales tax to tangible property, not intangible property, property in electronic form may not be subject to the tax. Thus, in part, the treatment of software and hosting services under state law is a function of the particular language of each state's law, as well as Constitutional limitations of nexus and the statutory rules of P.L. 86-272.

1. SALES TAXATION OF SOFTWARE

To appreciate how the sale of digital property is taxed now, consider the evolution of state sales taxation of computer software. If a state levies sales taxes on tangible property but not intangibles or services, is computer software to be considered tangible personal property? Since much of the effort that goes into developing the software stored on a computer disk is intangible, and the disk itself is worth little without the software, one might want to say that it is an intangible. But many items that seem obviously like tangible personal property are much more valuable than the material parts they consist of—think of a painting by Rembrandt. In fact, the earliest decisions involving computer software treated software as an intangible.²² But as the volume of computer software sales grew, all states ultimately concluded that prepackaged software sold on disks could be treated as tangible personal property.²³

²⁰ The decision, which has been appealed to the Tenth Circuit, has been the subject of criticism. See Hellerstein, *State Taxation*, ¶ 19.02[7][b]; David Gamage & Darien Shanske, “The Saga of State ‘Amazon’ Laws: Reflections on the Colorado Decision,” *State Tax Notes*, July 16, 2012, p. 197.

²¹ This question is implicit in Justice Breyer's opinion in *J. McIntyre Machinery*, discussed below, text at note 42, *infra*.

²² E.g., *District of Columbia v. Universal Computer Assoc., Inc.*, 465 F.2d 615 (D.C. Cir. 1972); *Commerce Union Bank v. Tidwell*, 538 S.W.2d 405 (Tenn. 1976).

²³ Hellerstein, *State Taxation* ¶ 13.06[3]; see *id.* at ¶ 12.02, Table 12.11; for one such case, see *South Cent. Bell Tel. Co. v. Barthelemy*, 643 So. 2d 1240 (La. 1994) (the program “is transformed into physical existence and recorded in physical form”). In many states, custom software, even if embodied on a physical disk, is treated as a service, and is not taxed in states that do not tax services. Hellerstein, *State Taxation* ¶ 12.02. The jurisdictions that tax some customized software include Arkansas, Connecticut, the District of Columbia, Hawaii, Kansas, Mississippi, Nebraska, South Carolina, South Dakota, Tennessee, Texas. *Id.* at ¶12.02 (Table 12.9A), from RIA All States Tax Guide, ¶ 259-A.

States that concluded that computer software was tangible (in order to justify taxing its transfer) initially based that conclusion on the recording of that software on a tangible disk. But software does not have to be conveyed on a disk. One way software can be transferred is by the “load and leave” method. The seller comes to the buyer’s location and installs the software on the buyer’s machines. The seller then departs, without leaving with the buyer anything tangible (such as backup disks or manuals). Since nothing tangible is conveyed to the buyer, some states exclude from the sales tax on tangible personal property software conveyed that way.²⁴ Other states have moved to tax software delivered using the load and leave method,²⁵ and we can expect that the number will increase in light of states’ fiscal problems.²⁶

What about software downloaded directly over the Internet? The states have had more difficulty deciding whether there is something tangible for them to tax, and many have excluded such sales of software from the sales tax base.²⁷ The states that tax software when it is downloaded concluded that the software exists in the taxing jurisdiction when it is recorded electronically in the user’s machine.²⁸ At that point, it “takes up space on the hard drive and can be physically perceived by checking the computer’s files.”²⁹

That is not the only way to view the physical phenomenon, however. As a dissenting judge in one case argued:

“Licensed preprogrammed software does not add a thing to a computer—the software merely rearranges what is already there. It does not, as many jurists have incorrectly stated, ‘take up space on the hard drive.’ Those electrons the software reorganized do exist there, but they *already* existed—they have just been reconfigured without addition. The way the computer operates has been changed, but it has not been

²⁴ Ark. Reg. GR-25B; Ark. SST Tax Matrix (Sept. 2011) (canned software delivered by “load and leave” method is not taxable); Cal. Reg. 1502(f)(1)(D) (canned software delivered by “load and leave” method is not taxable); Colorado Department of Revenue, “FYI Tax Publication Sales” 89 (July 1, 2011) (canned software delivered by “load and leave” method is not taxable); Ga. Reg. 560-12-2-.111(6)(a) (canned software delivered by “load and leave” method is not taxable); Nev. Admin. Code 372.880; Va. Rul. Of Tax Comm., P.D. 96-143 (6/20/96).

²⁵ Mo. TPN 16 (Jan. 9, 2004) and L.R. 1724 (Nov. 21, 2003)); “Important Notice—Computer Software,” N.C. Dept. of Revenue (February 2010), accessed at <http://www.dornrc.com/taxes/sales/impnotice0210.pdf>; Nebraska Sales and Use Tax Guide (July 2011), accessed at <http://www.revenue.ne.gov/info/6-511.pdf>; Mass. Dept. of Rev., TIR 05-15, accessed at <http://www.mass.gov/dor/businesses/help-and-resources/legal-library/tirs/tirs-by-years/2005-releases/tir-05-15-transfers-of-prewritten-computer.html> (change in state law to tax load and leave) (“Massachusetts TIR”).

²⁶ See Carolyn Kranz and Iris Kitamura, “Taxing Software and Cloud Computing: Yesterday’s Law, Today’s Technology,” 62 State Tax Notes 737, 739 (Dec. 12, 2011)

²⁷ *Id.* See also Hellerstein, State Taxation ¶ 13.06[6].

²⁸ E.g., *South Central Bell Telephone Co. v. Barthelemy*, *supra* note 23; *Dechert LLP v. Commonwealth of Pennsylvania*, 606 Pa. 334, 998 A.2d 575 (2010). Some states have imposed the tax by statute. See, e.g., N.C. Gen. Stat. 105-164.13(43a); Mass. Dept. of Rev. TIR 05-15, accessed at <http://www.asaltgroup.com/TIR%2005-15%20Transfers%20of%20Prewritten%20Computer%20Software.pdf> (describing change in law).

²⁹ *Dechert*, *supra* note 28, 998 A.2d at 583.

given any additional electrons—its existing dormant electrons have been given a new purpose.”³⁰

Just as states overcame their concerns with taxing prepackaged software although it didn’t quite fit as tangible personal property, they may ultimately decide to tax software however delivered, even if their courts won’t hold that the software is tangible.

More and more items are subject to electronic delivery. Besides computer programs, music, reading material, and movies can now be downloaded.³¹ Some states have included delivery of software by download as taxable sales,³² while others have excluded them.³³ They will have to deal with other electronically deliverable items, and the amounts involved are not trivial.³⁴

2. TAXATION OF SOFTWARE IN THE CLOUD

The net step is into the cloud. When users do not own software, but instead access it in the cloud, the software is never located on the user’s machine. It remains resident on the servers that are part of the cloud. It has been recognized that this structure could raise new issues. As a New Orleans court that ruled in favor of taxing downloaded software almost twenty years ago noted:

³⁰ *Dechert*, supra note 28, 998 A.2d at 588 (Justice Eakin, dissenting). Viewed this way, the majority position could lead one to conclude that a sales tax could be imposed on someone who got a tattoo. Carried to its extreme, states could argue that a traveler returning from a trip to London could be subject to the use tax on a performance at a West End theater because the performance now resides in the traveler’s memory. See generally, Michael Kahana, *FOUNDATIONS OF HUMAN MEMORY* (Oxford 2012).

³¹ The states recognize this development. North Carolina, for example, imposes its sales tax on digital property in the following categories: an audio work, an audiovisual work, a book, a magazine, a newspaper, a newsletter, a report or another publication, a photograph or greeting card. N.C. Gen Stat. 105-164.4(a)(6b), effective January 1, 2010.

³² E.g. Massachusetts 830 CMR 64H.1.3, section (a)(3), available at <http://www.mass.gov/dor/businesses/help-and-resources/legal-library/regulations/64h-00-sales-and-use-tax/830-cmr-64h13-computer-industry-services-and.html>:

Taxable transfers of prewritten software include sales effected in any of the following ways regardless of the method of delivery, including electronic delivery or load and leave: licenses and leases, transfers of rights to use software installed on a remote server, upgrades, and license upgrades.

However, Massachusetts continues to exempt “[d]igital products delivered electronically, including but not limited to music, video, reading materials or ring tones.” See MA TIR 05-8, available at <http://www.mass.gov/dor/businesses/help-and-resources/legal-library/tirs/tirs-by-years/2005-releases/tir-05-8-taxation-of-internet-access.html>

³³ Cal. Code Reg. § 1502(f)(1)(D); Cal. Code Regs. Tit. 18, section 1502(f)(1)(D); Colorado Dept of Revenue, “FYI Tax Publication Sales” 89 (7/1/11);

³⁴ The Bureau of Labor Statistics, in its Consumer Expenditure Survey, tracks sales of streaming and downloading video, and streaming and downloading audio. (It does not track electronic sales of software.) The video category grew from about \$124 million in 2007 to almost \$480 million in 2011; audio grew from about \$442 million to more than \$1.176 billion; online gaming services grew from \$186 million to almost \$378 million; a new category, applications, games, ringtones for handheld devices had expenditures of more than \$447 million in 2011. The total in 2011 was close to \$2.5 billion. The three categories for which we have data for both years grew from \$752 million to \$2.034 billion, an increase of about 170% over four years. Email from Vera Crain, BLS, April 18, 2013. The BLS does not publish this data because some of the data are subject to very large standard errors due to the small sample size associated with some categories.

“We need not address the issue of whether use of software, through telephonic transmission, which is never reduced to physical recordation and at rest in the City of New Orleans, is subject to the City's use tax, as that issue is not raised by the facts of this case.”³⁵

How will states deal with software that is never delivered at all? What happens when a consumer who wants to use the software simply has a license to make use of it, even though the “it” is not located on the user's computers?³⁶ Will the use tax then apply? If so, do we treat the use as occurring at the location of the end user or at the location of the server where the software is installed?

States have only begun to confront these issues. In one ruling, Massachusetts imposed a sales tax on the provision of Web-based software to Massachusetts customers.³⁷ The seller is not located in Massachusetts, but does have one employee in Massachusetts.

Utah imposed a tax on the sale of software to Utah customers that allows the customers to access all computers in its own system and to conduct webinars, on the theory that the main object of the transaction was the provision of canned software, which the Tax Commission holds is taxable.³⁸ The ruling was based on Utah law, which now locates the sales of Web services based on the address of the purchaser.³⁹ The ruling does not indicate whether Utah's jurisdiction over the seller is based on anything other than the conclusion that the sales are deemed to take place in Utah.

3. WHAT IS THE THERE THERE?⁴⁰

As the substance of what is being used becomes more ephemeral, the application of doctrines developed in a more reified time becomes problematic. This was reflected in the

³⁵ *South Central Bell Telephone*, *supra* note 23, at 1248 n.7.

³⁶ Such a situation can arise not only when software otherwise available for installation on individual machines is, instead, stored in the cloud. Software has also been developed that operates exclusively in the cloud. See, e.g., Quentin Hardy, “Google Apps Challenging Microsoft in Business,” *N.Y. Times*, p. B1 (12/25/12 (New York edition)) (it is estimated that Google Apps generated \$1 billion of Google's \$37.9 billion of income in 2011).

³⁷ Mass. Dept. of Rev., Letter Ruling 12-13 (11/9/12), available at <http://www.mass.gov/dor/businesses/help-and-resources/legal-library/letter-rulings/letter-rulings-by-years/2012-rulings/lr-12-13.html>. The software, among other things, allows customers to use a Web-based portal to communicate automatically with their own customers and to give their employees access to various services from smartphone Web browsers. The software is not transferred to the customer's computers.

³⁸ Utah Tax Commission, Letter Ruling 10-011 (10/8/12), available at <http://tax.utah.gov/commission/ruling/10-011.pdf>. New Mexico has ruled, on virtually identical facts, that the out-of-state provider of these services is subject to its gross receipts tax, because these activities constitute doing business in the state. New Mexico Taxation and Revenue Department, Ruling 401-12-2 (9/28/12) available at <http://www.tax.newmexico.gov/Rulings%20Document%20Library/401-12-02.pdf>.

³⁹ Previously, Utah had located sales based on the location of the sellers' servers. Pennsylvania has made a similar shift from locating the sale at the seller's location to locating it with the buyer. Compare PA SUT-12-001 (5/31/12), with PA SUT-10-005 (11/8/10). In contrast, New Jersey generally won't tax cloud services where nothing is transferred to the user's machine. New Jersey TB-72, 7/3/13, available at <http://www.state.nj.us/treasury/taxation/pdf/pubs/tb/tb72.pdf>.

⁴⁰ See Michael Geist, “Is There a There There? Toward Greater Certainty for Internet Jurisdiction,” 16 *Berkeley Technology Law Journal* 1345 (2002).

discussion of tangible personal property, above, and raises questions of the jurisdiction to tax. An opinion by Justice Breyer in a recent Supreme Court case dealing with jurisdiction to bring suit hints at problems that may be lurking just below the horizon on this issue.

In *J. McIntyre Machinery, Ltd. v. Nicaastro*,⁴¹ an individual injured because of alleged negligence by a UK machinery manufacturer sued the manufacturer in a New Jersey court. The Supreme Court concluded that a New Jersey court could not exercise jurisdiction over the foreign defendant, but there was no majority opinion—a four judge plurality was joined by Justices Breyer and Alito to reach a decision. The plurality opinion rejected the argument that the manufacturer was subject to state court jurisdiction because it had introduced its machinery into the “stream of commerce.” It reasoned that the New Jersey court could not exercise jurisdiction, since the manufacturer did not intend to “submit to the power of a sovereign.” Justice Breyer argued that this was too broad a view, which would “implicate modern concerns” without a sufficient factual record on which to base any conclusions. He argued:

The plurality seems to state strict rules that limit jurisdiction where a defendant does not “inten[d] to submit to the power of a sovereign” and cannot “be said to have targeted the forum.” . . . But what do those standards mean when a company targets the world by selling products from its Web site? And does it matter if, instead of shipping the products directly, a company consigns the products through an intermediary (say, Amazon.com) who then receives and fulfills the orders? And what if the company markets its products through popup advertisements that it knows will be viewed in a forum? Those issues have serious commercial consequences but are totally absent in this case.⁴²

In other words, Justice Breyer is concerned that the advertising commonly done on the Internet could give a state jurisdiction over the seller. Perhaps that could be enough to give the state the power to tax also,⁴³ although Justice Breyer’s concerns relate to jurisdiction generally. Justice Breyer’s concern is at the center of the question how taxing jurisdictions can fairly allocate the tax burden of income derived from digital content and digital delivery.

4. WHERE IS THE THERE THERE?

Let us consider the practical application of some of the rules that were developed before. Suppose we want to tax electronically downloaded software. It is easy to say that State A can require Seller in State A to collect a tax when its server is in State A and Buyer is also in State A. But what if Seller and its server are in State B? If we think of the analogy of tangible personal property, this case is like Amazon in Washington State selling tangible property to a buyer in Pennsylvania and shipping it into Pennsylvania. In that case, the buyer, if not subject to a sales tax, would be subject to the use tax in Pennsylvania. If Pennsylvania were successful in applying an “Amazon law” to the transaction, it might expect Amazon either to collect the tax or to report

⁴¹ 131 S.Ct. 2780 (2011).

⁴² 131 S.Ct. at 2793.

⁴³ An analysis of the interaction between personal jurisdiction and Internet use was set forth by the court in *Zippo Manufacturing Co. v. Zippo Dot Com, Inc.*, 952 F.Supp. 1119 (W.D. Pa. 1997). Judge Bredar, in *Windsor v. Spinner Industry Co., Ltd*, 825 F.Supp. 2d 632 (D. Md. 2011), suggests that the development of commercial activity on the Internet may well lead to expanded views of personal jurisdiction, but he ruled more narrowly in the case before him because of the current state of authorities.

its Pennsylvania sales to Pennsylvania's tax authorities. Otherwise, the states must rely on the willingness of taxpayers to pay the use tax. While states have begun more serious efforts to collect that tax,⁴⁴ which depends heavily on self-reporting, I think that resistance to paying that tax suggests the difficulties states will have as they try to tax digital products.

Suppose such an Amazon law is on the books. How will a seller know what state the buyer is in? When physical goods are purchased, we can identify the address to which the goods are shipped. But the "address" to which an electronic item is delivered is not unambiguously associated with a particular geographic location. The seller can start by asking for the address of the buyer's credit card, for example, but there is no reason to think that address will be the actual location of the buyer. Indeed, as more financial entities push for "paperless" relationships with their clients, the credit card company may be less concerned with the customer's address. Someone who wants to escape paying sales and use tax can have credit card bills sent to an address in Delaware, a state with no sales tax. A simpler solution would be to pay with PayPal—the seller would know nothing about the buyer's location.⁴⁵

The difficulty of applying an "Amazon" law is particularly pronounced when software is downloaded to a mobile device. The Bureau of Labor Statistics recently began tracking expenditures for "Applications, games and ringtones for handheld devices" and estimated \$447 million of expenditures in that category in 2011.⁴⁶ Where does the sale of such items take place? Which state should be allowed to tax its use?

If we despair of locating an elusive buyer, we might want to locate the buyer based on the location of the buyer's email account. It may be possible to determine the geographic origin of an email message or of a computer that has connected to a site on the Internet. That allows Web sites and advertisers to target your computer with ads and content specific to your location.⁴⁷ But these methods are not foolproof. More to the point, anyone who is interested can mask their location. So-called "anonymizer" sites mask the origin of communications over the Internet.⁴⁸ Since such technologies can be used to shield criminal activities and espionage, progressively more sophisticated methods have been developed to increase anonymity and to unmask it. Presumably, though, it would not be worthwhile for taxing authorities to develop elaborate methods to unmask sales tax cheaters. This would seem to leave a significant hole in attempts to recruit Internet sellers to enforce state use tax laws.

5. HOSTING AND OTHER SERVICES

⁴⁴ States now often include a use tax schedule on their income tax returns. See, Manzi "Use Tax Collection on Income Tax Returns in Other States," Policy Brief, Minn. House of Rep. (April 2012), available at <http://www.house.leg.state.mn.us/hrd/pubs/usetax.pdf> ("most of the states that have an income tax and a sales tax are taking steps to make individual taxpayers aware of use tax obligations, either by providing for payment through the income tax or by providing information on how to file an individual use tax return").

⁴⁵ Of course, Congress could respond by insisting that PayPal associate a jurisdiction with the payments, but that would presumably lead back to the problems suggested above regarding credit card addresses.

⁴⁶ See note 34, *supra*.

⁴⁷ For example, you can go to <http://www.lawrencegoetz.com/programs/ipinfo/> and see where someone who was interested would think your computer was located.

⁴⁸ For a discussion of anonymizer sites, go to http://www.livinginternet.com/i/is_anon_work.htm.

The treatment of hosting services—the provision of space on a physical computer for the customer’s information—has not received as much attention as the transfer of software. Since hosting does not involve any transfer of tangible items, a state that relies on such a transfer does not tax hosting services,⁴⁹ although it might treat hosting as the provision of services or the rental of property.⁵⁰

If a state taxes hosting services provided by those resident *in* the state, will it tax nonresidents who provide hosting on out-of-state servers to residents? Utah has held that a company providing hosting services from servers located in Utah is leasing tangible personal property in Utah.⁵¹ It would seem to follow that Utah would not tax an entity providing these services to residents of Utah from servers located elsewhere. Chicago appears to take a similar approach.⁵² However, it will tax time sharing of a computer if the device from which the computer is accessed is located in Chicago.⁵³ Connecticut,⁵⁴ Ohio,⁵⁵ and the District of Columbia⁵⁶ appear to source data processing services depending on where the benefit of the services is received, without reference to where the provider’s servers are located. On the other hand, Texas has passed legislation which explicitly provides that a company providing hosting services is not engaged in business in Texas if its “only activity” in Texas is operating a server for the purpose of Internet hosting.⁵⁷

Indiana issued a ruling that imposes a use tax not only on software available through the cloud but also on services such as LexisNexis.⁵⁸ The ruling takes the position that the data that a

⁴⁹ E.g., Rev. Rul. 01-10-2 (Neb. Dep’t of Rev. 3/1/10), available at <http://www.revenue.ne.gov/legal/rulings/rr011002.pdf>; Rev. Rul. 2008-16ST (11/14/08) (IN DOR; hosting fees are a service charge and not taxable).

⁵⁰ See rulings discussed below.

⁵¹ Utah. Op. No. 06-004 (7/27/06). Since this ruling deals with the lease of space on a computer located in Utah, it does not necessarily conflict with Utah’s current position that sales of software are located at the address of the buyer, even if the software is never transferred to the buyer’s computers. See ruling cited at note 38, *supra*.

⁵² Chicago Mun. Code §§ 3-32-030, et seq.; Transaction Tax Ruling No. 5 (6/1/04), available at http://www.cityofchicago.org/dam/city/depts/rev/supp_info/TaxRulingsandRegulations/TransTaxRuling5.pdf (storage of information).

⁵³ Transaction Tax Ruling No. 9 (6/1/04), available at http://www.cityofchicago.org/dam/city/depts/rev/supp_info/TaxRulingsandRegulations/TransTaxRuling9.pdf. The value of time sharing comes from the use of a computer’s processing power (accessed through a local device) rather than the storage of data on the remote computer.

⁵⁴ Conn. Gen. Stat. sections 12-407(a)(2)(1), 12-407(a)(37), and 12-408(1); Conn. Agencies Regs. section 12-426-27; *Cummings & Lockwood v. Commr. of Revenue Services*, 12 Conn. L. Rptr. 84, 1994 WL 388558 (Conn. Super. Tax 1994); and Policy Statement 2006(8), Connecticut Dep’t of Revenue Services, Mar. 23, 2007.

⁵⁵ Ohio Rev. Code Ann. sections 5739.01(B)(3)(e) and 5739.01(Y)(1); Ohio Admin. Code section 5703-9-46.

⁵⁶ D.C. Code Ann. sections 47-2001(n)(1)(N) and 47-2201(a)(1)(K); 9 D.C. Mun. Regs. sections 474.1, 474.2, 474.3, 474.5, 474.6, 474, 460.7.

⁵⁷ House Bill 1841.

⁵⁸ Indiana DOR, Letter of Findings Number: 04-20110421, 2012 STT 88-22, also says explicitly that use of software in the cloud is taxable. See also Arizona Taxpayer Information Ruling LR10-007 (Mar. 24, 2010) (a taxpayer who licenses software supported on servers in Arizona is deemed to be engaged in the licenses of tangible personal property and the gross receipts from those transactions are subject to the transaction privilege tax); Kansas

lawyer accesses is tangible personal property that is being transferred to the Indiana user. Data processed by an out-of-state provider will be free of the use tax only if the out-of-state entity is processing data that was supplied by the Indiana user. This approach is potentially quite far-reaching, but it appears that Indiana's current position is not to tax such services.⁵⁹

You can read these authorities as moving towards a system where the user would be taxed rather than the remote provider. But what if the service provided is not software but simply storage of information? In that case, the local governments seem to be prepared to tax the local provider of data storage.

What if the remote entity is a service, like Google? If we are tempted to bring within a state's taxing jurisdiction entities that make software available to residents of the state, would it follow that Google is doing business in every state? On the other hand, if Google moved its servers and programmers out of the United States, would we be happy to say Google is doing no business in the United States? This issue is implicated in the statement from Justice Breyer's concurrence in *J. McIntyre Machinery, Ltd. v. Nicastro*, quoted above.

D. TRYING TO APPLY THE PRINCIPLES: A PENNSYLVANIA CLOUD COMPUTING RULING

A ruling by the Pennsylvania Department of Revenue⁶⁰ begins to confront some of these questions and helps illustrate some of the problems with taxing cloud activities. The taxpayer was apparently a Pennsylvania provider of cloud computing services. Taxpayer purchased and installed software on its servers and made the software available to its employees, whether inside or outside Pennsylvania. Taxpayer also installs software that is accessible by its customers, who either pay a subscription fee or pay on a pay-per-use basis. Thus, it appears that the taxpayer does not convey any software to any end user but merely makes the software available to them.

The Department of Revenue first concluded that the charge for accessing the software is taxable under the Pennsylvania use tax, citing 72 P.S. § 7201(o)(1) (definition of use). It argued:

Opinion Letter No. O-2010-005 (June 22, 2010) (separately stated fees such as recurring monthly charges, setup fees, support fees, training fees, and so on charged by ASPs to their customers for ASP services are not subject to sales tax); Texas Policy Letter Ruling No. 201004665L (Apr. 29, 2010) (software as a service is a taxable data processing service). LexisNexis could operate by having its data stored in a multijurisdictional cloud structure. However, it appears that its two data centers are both located in Ohio. <http://www.lexisnexis.com/presscenter/mediakit/datacenter.asp>.

⁵⁹ Sales Tax Information Bulletin #8 (November 2011), 2011 STT 224-11 (11/1/11) suggests that treating LexisNexis services as tangible personal property is contrary to Section 333 of the Streamlined Sales and Use Tax Agreement (SSUTA), of which Indiana is a signatory. Under the SSUTA, a state should not "include any product transferred electronically in its definition of 'tangible personal property.'" The earlier Indiana ruling relied on a prior version of Sales Tax Information Bulletin #8 (May 2002). The 2011 Information Bulletin is probably a more accurate statement of Indiana's current position than the Letter of Findings cited above. Telephone call with Jeff Rainey, Indiana Department of Revenue, Tax Policy Division, (2/20/13). This is confirmed in Revenue Ruling #2011-05 ST (10/11/11), 2011 STT 240-12 (11/30/11), which holds that providing access to an online database via the Internet is not subject to Indiana's sales and use tax. This ruling notes Indiana's compliance with the SSUTA. The SSUTA is available at <http://www.streamlinedsalestax.org/uploads/downloads/Archive/SSUTA/SSUTA%20As%20Amended%205-24-12.pdf>.

⁶⁰ PA SUT-12-001, 2012 STT 110-34 (5/31/12); the full text of the ruling can be accessed through http://www.revenue.state.pa.us/portal/server.pt/community/letter_rulings/14831/sales___use_tax/602562.

In light of recent case law and technological advances, the Department concludes that because computer software is tangible personal property, the charge for electronically accessing taxable software is taxable. In accessing taxable software the user is exercising a license to use the software, as well as control or power over the software, at the user's location.

This seems to be saying that Pennsylvania will impose its use tax on domestic users.⁶¹

The ruling holds that a use tax is due when the software is used by the taxpayer's employees in Pennsylvania.⁶² If the billing address for the purchase of the software is in Pennsylvania, it is presumed that all users are located in Pennsylvania. A taxpayer can file an exemption certificate indicating the percentage of users who are located in Pennsylvania.⁶³ Presumably, an exemption certificate would be filed for the year the software was first purchased. This is conceptually problematic, since those using the software in the first year are not necessarily representative of those who will be using it subsequently. The percentage of Pennsylvania users might change subsequently. If the amount involved were large enough, a taxpayer might tailor its use in the year of purchase to minimize its tax liability. In like manner, a business operating near a state with no sales tax might be tempted to establish a minimal connection with that state and register all its cars there.⁶⁴

The ruling provides generally that if the end user is not located in Pennsylvania, the sale and use of software is not subject to sales tax even if the server that hosts the software is in Pennsylvania. "However, if the end user is located in Pennsylvania, tax is due regardless of the location of the seller or server." Pennsylvania apparently concludes that the location of the server is immaterial, suggesting that the tax that the ruling refers to is a use tax, and it holds that the use is treated as taking place where the user is located.

⁶¹ The ruling then says:

In the case of taxable canned software accessed remotely that is sold to Taxpayer's customers, Taxpayer is required to collect sales tax from customers when the user is located in Pennsylvania.

It is not clear what this sentence refers to, since the statement of facts does not describe any software that was conveyed to customers. If there were such sales, the Department is correct, since the Pennsylvania Supreme Court's decision in *Dechert LLP v. Pennsylvania*, *supra* note 28, which the Department of Revenue cites in its ruling, supports imposing a *sales* tax on any situation in which the software is conveyed to the customer.

⁶² It appears the ruling discusses the use tax because the software was bought from an out-of-state seller.

⁶³ Similarly, Massachusetts, for example, allows taxpayers to file a "Multiple Points of Use Certificate," which commits the taxpayer to report and remit tax to jurisdictions where the software is used. Mass. Dept. of Rev. Form ST-12, Exempt Use Certificate, accessed at <http://www.mass.gov/dor/docs/dor/forms/wage-rpt/pdfs/st-12.pdf>. This approach also appears to depend on the usage in the year of purchase. The same problem would seem to arise under Nebraska's recently enacted legislation relating to the sourcing of "application services." Neb. Rev. Stat. Sec. 77-2734.14(3)(b).

⁶⁴ It is interesting to note that Delaware, the physically smallest state with no sales tax, has a much higher number of vehicles per 1,000 residents than its surrounding states. Delaware ranks eighth among all states in this category; Maryland is 39th, Pennsylvania is 35th, and New Jersey is 43rd. Perhaps Delaware's rate is so high because people look to avoid the sales tax by buying and keeping cars in Delaware. Data is from Wikipedia, http://en.wikipedia.org/wiki/List_of_U.S._states_by_vehicles_per_capita. The link given there back to the original data is not currently functioning.

In light of our earlier discussions, it is interesting to see how, as a practical matter, the ruling sidesteps some otherwise intractable issues. By focusing the taxing burden on the location of the actual use of the software, the ruling can relieve the provider of the software service with the need to determine the location of the user. Simple rules, looking to the billing address of the user, make the provider's burden much lighter.

But, by putting pressure on the use tax, the state is ignoring the problems of enforcement. States have begun to realize that the use tax must be enforced if it is to collect what it needs to support its activities and apportion its tax burden fairly.⁶⁵ The ability to enforce the use tax is aided if states are permitted to apply “Amazon”-type laws.

That works well when the items in question are physically shipped to a buyer. However, where the item is transferred electronically, it is relatively easy for a buyer to hide its location from sellers, as explained above. Even a taxpayer with no avoidance intent might limit use to a low-tax jurisdiction if the tax was based on use only in the year of purchase. As more items become available for sale as electronic downloads, this leaves an enormous hole for the states to try to fill.

E. STATE INCOME TAXATION

The application of state corporate income tax rules to cloud computing structures is not as developed as the sales tax issues. A very useful and comprehensive article by Professor Hellerstein and Jon Sedon⁶⁶ identifies issues that arise in this area.

States apportion a business's total income based on the portion of certain factors that are located in the state. The uniform law uses three factors, weighted equally: sales, property, and payroll.⁶⁷ Quite a few states have abandoned this structure, and base their allocations mainly or solely on the sales factor.⁶⁸

If the provider is giving access to software to the buyer,⁶⁹ and we characterize the transaction as the transfer of tangible personal property, then the states will generally treat the sale as taking place at its destination.⁷⁰ Unfortunately, as discussed before in connection with the Pennsylvania ruling, we don't know whether this should be based on where the buyer is incorporated, where its main operations are, or where its employees actually use the software (in the year of the purchase). If the sale is of an intangible, the uniform law would source the sale based on where the greatest proportion of the income-producing activity related to the software

⁶⁵ Thus, for example, Pennsylvania in 2011 added a form to its income tax return requiring taxpayers to self-assess their use tax obligations. See generally Manzi, *Use Tax Collections on Income Tax Returns*, 65 *State Tax Notes* 23 (July 2, 2012).

⁶⁶ Walter Hellerstein and Jon Sedon, “State Taxation of Cloud Computing: A Framework for Analysis,” 117 *J. Tax'n* 11, 13 (July 2012) (hereafter cited as “Hellerstein & Sedon”).

⁶⁷ UDITPA § 9, available at <http://www.uniformlaws.org/shared/docs/uditpa/uditpa66.pdf>.

⁶⁸ E.g. Iowa Code § 422.33(2) (relying solely on sales factor).

⁶⁹ Such as in the SaaS structure, for example, a cloud version of TurboTax.

⁷⁰ This would follow under the Uniform Division of Income for Tax Purposes Act (UDITPA), section 16, as discussed in Hellerstein & Sedon at 28.

takes place.⁷¹ If, instead, we treat the provision of the software as a service, should we associate the income with the location where the provider has most of its expenditures—where its servers are—or in the state where its specialists who help customers with their software are located? Those possibilities would be open if the test is a function of where the income is produced.

On the other hand, if the test is “market-based,” the question is where the customer receives the benefit. Again, as already discussed in connection with the Pennsylvania use tax ruling, this may be difficult to determine, and could vary substantially from year to year. Remember, though, that, for purposes of the sales factor, the seller would have to determine this based on how its customers are using the software. At the same time, the purchaser might have to make a similar calculation to determine its property factor. If it is viewed as purchasing the software, it would have to decide where the software was used. If it were treated as leasing the software, or if it was obtaining a service from the provider, the states where the servers were located might argue that the activity was taking place there.

If the cloud provider furnishes space on its servers, states could treat this for income tax purposes as the lease of tangible personal property or the provision of a service. The lease would be where the servers are located, but the service might be there or where the customer is, or where the provider’s employees are. For the customer, treating this as a lease could, in theory, mean that it had operations in the location of the provider’s servers, a result that may seem bizarre to many taxpayers.

If a seller’s servers are in low-tax states, it could draft its contracts to support the position that it is providing services in the location of its servers. How it would draft a contract would not necessarily depend on the tax rate in the jurisdiction of its customer. Since the states do not have a uniform approach to the taxation of cloud services, the decision as to how to characterize the transaction under the contract with the customer could simply depend on how the state in which the customer is located characterizes the transaction. If the state has concluded that it will not tax the cloud services that are being provided, the contract could be drafted to take that into account.

From the customer’s perspective, similar considerations could come into play. Consider how the property factor is affected by cloud transactions. From the standpoint of the provider, there is not much of a question, since a company that has computers located in a state will have to consider those computers as part of its assets in the state.⁷² The treatment of the software is less clear, since states usually include in assets only real property and tangible personal property.⁷³ However, in light of the way software has been treated for sales tax purposes, software that is not custom software may be included in a business’s assets.⁷⁴ When a business leases computers rather than owning them outright, the general rule is that it must include in its assets eight times the amount it is paying in rent for leased property.⁷⁵ To the extent that states

⁷¹ UDITPA, section 17, discussed in Hellerstein & Sedon at 28.

⁷² But see the Texas law mentioned at note 57, *supra*.

⁷³ This follows UDITPA section 10.

⁷⁴ However, Hellerstein and Sedon argue that the characterization of an item for sales tax purposes does not necessarily mean that it should be characterized the same way for income tax apportionment purposes. Hellerstein & Sedon, *supra* note 66, at 27.

⁷⁵ UDITPA section 11.

treat lease of space on a server as the lease of tangible personal property, customers might decide to use cloud service providers with servers in low-tax (or foreign) jurisdictions. However, there might be economic reasons that a cloud provider would have some servers in high-tax jurisdictions. This leaves open the theoretical possibility that a cloud service provider might be able to vary the usage of servers in different locations for different customers, so that a customer for whom the issue was important could have most of its cloud services provided from low-tax locations. As mentioned earlier, once a rule is formulated, we can expect taxpayers to plan around it.

V. ON THE INTERNATIONAL SIDE

A. THE ADDITIONAL ISSUES

The discussion above raises a number of questions, which generally have yet to be resolved on the domestic side.

Which jurisdiction can tax the remote use of software: where the machine on which the software is loaded is located, where the user of the software is located, or where the entity that acquired the right to use the software is located?

Which of these jurisdictions can tax the provision of storage for data and software?

Does a nonresident's remote use of computer resources in a location subject the nonresident to taxation there?

Even if we have an initial answer to those questions, we will have to pursue their application further:

If we want to allow the jurisdiction where the computer is located to impose a tax, how will we deal with a cloud structure where the location of the computer providing the usage can vary from moment to moment?

If we want to impose tax based on where the user is located, how can we determine that location, particularly if either the user is peripatetic or the user wishes to mask his location?

If we want to base a tax on the location of the user, how do we deal with year-to-year changes in that location? For example, if we impose a sales tax on a transfer of software, how do we deal with the fact that the users of the software in the year of sale may not be the same as those in later years?

Now translate those questions into the international context. While the issues are similar the answers may be different. Some questions relate to how the United States will treat activities in the cloud. Other questions relate to the power foreign countries have to tax various activities.

B. TREASURY REGULATION § 1.861-18

Discussions reported in the tax press have noted the possible application, at least by analogy, of section 1.861-18 of the regulations.⁷⁶ That section deals with transactions involving computer programs. It divides transactions involving the transfer of a computer program into four categories:

- a transfer of a copyright right in the program;
- a transfer of a copy of the program;
- the provision of services for developing or modifying the program;
- the provision of know-how relating to programming techniques.

How might these categories of international transfers be applied to cloud services? Although, as noted above, some state tax authorities have extended the rules of computer programs to the access of programs in the cloud, the IRS seems to recognize that no actual “transfer” occurs when the use of software is through the cloud. The views expressed at an ABA meeting by a senior counsel in the IRS Office of Associate Chief Counsel (International) were reported as follows:

“‘The reg [1.861-18] does require a transfer,’ Shelburne said, adding that because a transfer is presumed, the reg has limited service application.”⁷⁷

This approach sticks closer to the text than some of the state decisions discussed above. But, if cloud services are not taxed by analogy to the section 1.861-18 regulations, on the basis that they involve no “transfer,” they surely can’t be ignored. How might cloud services be taxed?

C. THE NORMAL APPROACH TO INTERNATIONAL TAXATION

Under the standard model of U.S. taxation, if a foreign entity is paid for cloud services, and the entity is not doing business in the United States, the payments will be subject to a 30% withholding tax if they are U.S.-source income, as long as the payments are fixed and determinable, annual and periodic income (FDAP). The FDAP category normally excludes capital gain income, but not much business income. The income might be considered royalty income, or rental income, among other categories. If the U.S. user has no contact with the foreign entity other than through the Internet, the entity might not be doing business in the U.S. under current authorities. The classification of the income might be relevant because income tax treaties reduce the withholding tax rates on some categories of income.

Would the income be U.S. source? It depends what kind of income it is. If it is income for provision of services, it might be sourced to the U.S. if the servers were located in the U.S. But, in the context of cloud computing, the servers could be located in many places, with no particular concern of anybody (other than the tax authorities) as to which server was used when and by whom. If the cloud service provider can avoid having any U.S. servers, the foreign entity would have a good argument that it was not U.S. source income. If it is rental income, the

⁷⁶ E.g., Sapirie, *The Challenges of Taxing Cloud Computing*, 137 *Tax Notes* 823 (Nov. 19, 2012), 2012 *TNT* 223-1 (11/19/12).

⁷⁷ Kristen A. Parillo and Randall Jackson, “ABA Meeting: Government Welcomes Input on Cross-Border Tax Issues of Cloud Computing,” 2012 *TNT* 93-17 (May 14, 2012).

source should be outside the United States, as long as the servers were not in this country. If it is a royalty, the royalty in that case does not relate to a United States asset.

If the provider of cloud services is engaged in a U.S. trade or business (because of the location in the United States of some of its servers), it must determine how much of its income is U.S. source. Does the cloud provider have to keep track of the relative use of its United States servers as opposed to its other servers? If it does, the portion of the income allocable to the U.S. could be a function of relative capacity in its “cloud” that is physically located in the U.S. But capacity does not translate directly into costs (servers in one location may be more costly to run than those in other locations), nor does it translate into use (capacity in some locations may be used more intensely than in others). Perhaps countries could reach an agreement that would allow for workable allocation rules. But, there are other aspects of the provider’s business, including development of the software needed to operate in the cloud environment and servicing of equipment, that should be taken into account and allocated to different locations to determine how much income was earned where.

If the entity is engaged in a U.S. trade or business, treaty considerations would also have to be taken into account. If the foreign entity doing business in the United States did not have a permanent establishment in the U.S., treaties would generally exempt its income from U.S. tax.⁷⁸ Here, again, the entity would be encouraged to avoid having U.S. servers since, in the absence of U.S. servers (and other possible indicia of a U.S. permanent establishment), current approaches would conclude that it has no permanent establishment and thus could avoid U.S. tax. However, as in the case of software sales subject to state sales taxes, as the technology becomes more pervasive, and becomes a greater portion of total economic activity, the view of what constitutes presence in a country could change. Taxing authorities have begun to ask whether a company that makes millions of dollars of income through activities conducted solely over the Internet is not present in the locations of its customers.⁷⁹

The issue of how the activities of a cloud provider should be allocated has not received much attention. Last year, KPMG published a very useful summary of the law in eighteen different countries relating to taxing the cloud.⁸⁰ Yet an examination of the individual country write-ups shows that only one, the one for the United Kingdom, acknowledges the special problems that the cloud structure may raise, beyond the already difficult, and hardly well-defined, answers to how use of fixed remote servers should be treated. The other write-ups assume that the server in a cloud structure will be in a single location. When the full capabilities

⁷⁸ See U.S. Model Tax Treaty (2006), Article 7.1: “The profits of an enterprise of a Contracting State shall be taxable only in that State unless the enterprise carries on business in the other Contracting State through a permanent establishment situated therein.” <http://www.treasury.gov/press-center/press-releases/Documents/hp16801.pdf>. Article 7.1 of the OECD Model Tax Convention is virtually identical. http://www.keepeek.com/Digital-Asset-Management/oecd/taxation/model-tax-convention-on-income-and-on-capital-condensed-version-2010_mtc_cond-2010-en.

⁷⁹ See discussion in Part D.4, text at notes 96 ff.

⁸⁰ The main page, which has links to the 18 country reports, can be found at “Country perspectives on taxing the cloud,” <http://www.kpmg.com/global/en/issuesandinsights/articlespublications/taxing-the-cloud/pages/default.aspx>.

of the cloud structure are taken into account, with the changing locations of the physical servers which customers are using, the already-present difficulties are exacerbated.⁸¹

D. EFFECT OF CLOUD COMPUTING ON THE DEFINITION OF A PERMANENT ESTABLISHMENT

1. THE OECD MODEL TREATY

The Model Tax Convention of the Organization for Economic Co-Operation and Development (“OECD”) plays a major role in shaping tax conventions. The OECD has focused on the effects of electronic commerce on treaty rules. Let us look at the approach that it has taken and how its solutions mesh with the cloud computing structure.

Traditionally, the permanent establishment principle is intended to identify when the activities of an entity in a foreign country are significant enough to allow that foreign country to tax some of its profits (its “effectively connected” income). Tying that rule to a concept of a permanent establishment provides something of a bright line to distinguish the activities of different taxpayers from each other. The “permanent” nature of a business’s activities may be relatively insignificant, when a foreigner (such as an athlete) has a very short relationship with a country.

The OECD commentary focuses on what constitutes a permanent establishment, including issues relating to electronic commerce.⁸² The OECD considered a number of possibilities as it developed its current position on e-commerce.⁸³ Some of the proposals considered would not require a fundamental modification of existing rules. These include, for example, a provision that a server cannot, in itself, constitute a permanent establishment, and modification of the existing rules to add a “force-of-attraction” rule to deal with e-commerce.⁸⁴

⁸¹ This is not to say that sophisticated observers haven’t realized the depth of this problem. As Professor Hellerstein and Jon Sedon (who is a manager in KPMG’s National Tax office) observe in their very comprehensive and useful article on state taxation and cloud computing:

The very notion that taxpayers and tax administrators will be capable of deconstructing cloud computing transactions for purposes of our existing tax rules, based on the characterization and location of software and hardware, for a “transaction” that involves computing resources that “are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand,” and with simultaneous interactions between cloud providers and purchasers employing multiple servers located throughout the country if not the world, borders on the fanciful.

Hellerstein and Sedon, *supra* note 66, at 13. I must note, though, that much of the technology that is commonplace today would have seemed fanciful not too long ago.

⁸² Are the Current Treaty Rules for Taxing Business Profits Appropriate for E-Commerce?, Organisation for Economic Co-operation and Development, Technical Advisory Group on Monitoring the Application of Existing Treaty Norms For Taxing Business Profits, Public Discussion Draft (Nov. 26, 2003), available at <http://www.oecd.org/tax/taxtreaties/35869032.pdf>; (“E-Commerce”) Interpretation and Application of Article 5 (Permanent Establishment) of the OECD Model Tax Convention (Public Discussion Draft 2012), available at <http://www.oecd.org/tax/taxtreaties/48836726.pdf> (“OECD Commentary”). In particular, paragraphs 42.1-42.10 of the commentary to Article 5 of the OECD Model Tax Convention (the article that defines a permanent establishment) discusses electronic commerce.

⁸³ E-Commerce, *supra* note 82, Section 4 (“Some Alternatives to the Current Treaty Rules for Taxing Business Profits”).

⁸⁴ Such a rule would include in the profits of an enterprise operating in a foreign country the profits derived from selling through a web site goods similar to those sold by the entity through a permanent establishment. This

Other changes that were considered would require “fundamental modification of existing rules.” These include imposing a withholding tax on sales into a country even if the seller has no physical presence there, and creating nexus through an “electronic (virtual) permanent establishment.” As of now, these suggestions have, for the most part, been rejected.

Section 42 of the OECD commentary to Article 5 of its model treaty makes clear that use of a server at a location will not, in itself, give the user a permanent establishment. The commentary says:

“[A]n Internet web site, which is a combination of software and electronic data, does not in itself constitute tangible property. It therefore does not have a location that can constitute a ‘Place of business’ as there is no ‘facility such as premises or, in certain instances, machinery or equipment’ . . . as far as the software and data constituting that web site is concerned.”⁸⁵

An Internet Service Provider (“ISP”) that owns the servers on which other businesses’ web sites are located will itself likely have a permanent establishment in the location of the servers. However, even an entity that owns (or leases) a server and maintains its Web site on it may not have a permanent establishment in that location. That is because paragraph 4 of the model treaty provides that “preparatory or auxiliary activities” do not create a permanent establishment. Thus, merely advertising, or supplying a catalog and other information on the web site would not create a permanent establishment, even if the seller owns the servers on which the web site is located. However, if “the typical functions related to a sale” are performed at that location, so that “the conclusion of the contract with the customer, the processing of the payment and the delivery of the products are performed automatically through the equipment located there,” that could well create a permanent establishment.⁸⁶ The distinctions drawn in the Model Treaty are similar to the tests of P.L. 86-272, and, like the rules of P.L. 86-272, it may not be hard to comply with them. It would appear to be a fairly simple programming exercise to have the automatic processing and delivery of an electronic product effected in whatever location was most beneficial for the seller.

2. THE UNITED NATIONS MODEL TREATY

The UN model treaty, whose commentary reproduces paragraphs 42.1-42.10 from the OECD Commentary, adds the following:

37. The Committee of Experts notes that the OECD Commentary, in paragraph 42.3, draws a distinction between a contract with an Internet Service Provider and one with a place of business at the disposal of the enterprise. In this regard, the Committee recognizes that some businesses could seek to avoid creating a permanent establishment by managing the contractual terms in cases where the circumstances would justify the

gives a result similar to what states have done in requiring mail order sellers to collect sales taxes when a related party makes similar sales in the state. E.g., *SFA Folio Collections, Inc. v. Tracy*, 652 N.E. 2d 693 (Ohio 1995); *Bloomington’s By Mail, Ltd. v. Commonwealth*, 567 A.2d 773 (Pa. Commw. Ct. 1989).

⁸⁵ OECD Commentary, *supra* note 82, ¶ 42.2.

⁸⁶ *Id.*, ¶ 42.9.

conclusion that a permanent establishment exists. Such abuses may fall under the application of legislative or judicial anti-avoidance rules.⁸⁷

This comment suggests that, while there is a legitimate distinction between an entity that maintains a server whose use is provided to others for a fee (which may create a permanent establishment), and merely maintaining a web site on that server (which does not), an entity that tries to avoid creating a permanent establishment through contractual arrangements will not succeed.

3. AN EXAMPLE

How does this approach to the permanent establishment issue apply to a web-based business? Consider a company that, like iTunes, sells music over the Internet.⁸⁸ At one time, a business selling recorded music would have had a stock of physical items to sell, which it would have to store and ship. Some human intervention would be required, although, if the analogy is to an enterprise selling CDs by mail (such as BMG Music), as opposed to a record store (such as Sam Goody), much of what would have to be done could be automated. The physical media on which the music is stored would give the company physical presence in particular jurisdictions. Moreover, it could not easily locate where it chose to for tax purposes, because it would have to take into account the distance between where it stored its goods and where its customers were, in order to minimize shipping costs and shipping time.

When the music can be downloaded electronically, the situation changes drastically. Such a business has been called a “bit vendor—a merchant that deals strictly in digital products and services and, in its purest form, conducts both sales and distribution over the web.”⁸⁹ The location from which the music, in electronic form, is downloaded, is of no consequence, and little human intervention is needed on a day-to-day basis. The company just needs capacity on computers, which could be located anywhere.

It has been estimated that, of the 99 cents paid for an iTunes selection, 70% goes to the entity that created the selection, 5% goes for network fees (maintaining the selections in electronic form and delivering them to customers), 10% goes for transaction fees (such as fees to credit card companies), 5% is for operating expenses and 10% is profit.⁹⁰

⁸⁷ U.N. Economic and Social Council, Committee of Experts on International Cooperation in Tax Matters, “Definition of Permanent Establishment: finalized amendments to current Commentary on article 5 – permanent establishment” at 47 (Geneva, 20-24 October 2008) (E/C.18/2008/CRP.10),.

⁸⁸ This is a big business. iTunes Store revenues were \$1.9 billion and \$1.8 billion in the second and third quarters of 2012, while payments to developers were \$4 billion and \$5.5 billion in those two quarters. <http://venturebeat.com/2012/07/24/itunes-store-revenue-down-100m-in-q3-app-sales-slowing/>. If we double the revenue figures to get a rough approximation of annual revenues, \$7.4 billion, that would put iTunes, as a standalone entity, around number 340 on the Fortune 500 list. However, the payments to developers should probably be added to the “revenues” figure, which brings the total to \$26.4 billion, which would put iTunes around number 110. For the latest Fortune 500 listing, go to http://money.cnn.com/magazines/fortune/fortune500/2012/full_list/.

⁸⁹ Michael Rappa, “Managing the Digital Enterprise: Business Models on the Web” (2010), <http://digitalenterprise.org/models/models.html>, accessed on 12/13/12.

⁹⁰ Eric Savitz, “Apple: Subscription Music Service Seems Inevitable (4/24/07), <http://seekingalpha.com/article/33231-apple-subscription-music-service-seems-inevitable>, accessed on 12/13/12, based on analysis by Andy Hargreaves of Pacific Crest Securities. In a telephone conversation on December 13, 2012, Mr. Hargreaves indicated that the figures remain mostly accurate today, although prices have changed, and the

Who should tax this enterprise? The entity is incorporated in a jurisdiction, but there is no reason to think that it has any significant connection to that jurisdiction. The software that runs the web site must be maintained, but those working on the programming need not be located in one place, and they won't necessarily be working in a single location maintained by the entity. There is significant bookkeeping involved to be sure that the entity is paid for all the songs that are downloaded, but the people doing that work (who presumably are overseeing and checking the automatic billing process) may not be in one place, and they may not all be employees of the entity. Customer service must be provided, but that may be done in random locations or may simply be outsourced. Some persons must be involved in developing and maintaining relations, contractual and business, with the sources of the music being sold. A group of managers should be involved in planning how the entity will continue to expand and develop, and they may well be located in one central place. The structuring of new programming capabilities to match the ideas generated by the planning group may well involve additional persons at the headquarters where planning is done, but actual programming need not be done there.

Two sources that generate income must still be accounted for. The original idea and associated planning for its implementation represent a significant value in the form of intellectual capital. If the geographic source of that intellectual property can be pinpointed, the question of whether a proper price is being paid for that could well arise. Legislative proposals by the Obama administration focus on transfers of intangible property.⁹¹ Such proposals have in mind the transfer of patent rights, for example. Here, the profit is coming from a process, and it is more difficult to identify the source of the process (which may well have been developed internationally) and what constitutes its transfer.⁹²

Secondly, there is major computer power that must be relied on to run this business. We would expect that those computers, at least, would lead to physical presence of the entity in a jurisdiction that would attract a tax liability. But, if the computer capability is in a public cloud structure, that need not be so.⁹³ Particularly in light of the position taken by the OECD and the UN, which is reflected in treaties that are in force, using another entity's server will rarely, if ever, lead to the creation of a permanent establishment.⁹⁴ This has two consequences. First,

percentage that goes to the originator will vary depending on the size and clout of the originator. In addition, to reduce transaction fees, a customer's credit card is not charged immediately, but purchases are aggregated for a week and then submitted. This could increase iTunes' losses from collections.

⁹¹ Department of the Treasury, "General Explanations of the Administration's Fiscal Year 2014 Revenue Proposals" 48-51 (April 2013) ("Tax Currently Excess Returns Associated with Transfers of Intangibles Offshore"; "Limit Shifting of Income through Intangible Property Transfers"). These proposals were made in prior years also.

⁹² In a recent speech, Danielle Rolfes, Treasury's International Tax Counsel, suggested that value in a digital business was created where the algorithms were written, "probably the residence country of the company." Lee Sheppard, "Offshored Intangibles and the OECD Base Erosion Project," Tax Notes, April 22, 2013, p. _____. This reflects the U.S. view that income should be sourced to the company's residence.

⁹³ Under the approach taken by the OECD and the UN, a permanent establishment would be created only if the business owned the servers constituting the cloud structure. For example, Apple has an iCloud structure. If iTunes used the iCloud servers through a contractual arrangement, in order to avoid having iTunes itself having a permanent establishment in the location of the servers, legislative or judicial anti-avoidance rules might be applied to give iTunes a permanent establishment even under the current treaty structure. See paragraph 37 of the UN commentary, text at note 87.

⁹⁴ Compare the Utah ruling, note 51, which holds that use of a server in Utah by an out-of-state entity is the lease of tangible personal property in Utah.

those computers will generate income taxable in the jurisdiction where they are located solely to the extent their owner receives payments for the use of the computers. Second, unlike many other assets that promote profitability of the enterprise, the computers need not be located anywhere near where the value of the enterprise is generated. When Apple assembles its iPads in China, using parts manufactured in other countries, its profit arises from each of the components that go into the final product. Business considerations, as well as tax considerations, will drive the decision as to where each component is made. The profit from the product is divided up among all the jurisdictions in which the components are manufactured. In the case of an enterprise like iTunes, when a significant part of the business is dependent on sheer computer power, the decision as to where that computer power is to be located is much more obviously a function of cost. Other than cost, it is of no moment where the computer that is being used is located—no operational considerations require the computers to be physically close to any other part of the business. Tax consideration certainly play a role in the location of physical activities, but there is greater flexibility in locating electronic items.

In summary, on the one hand we can think of an old-style business with substantial physical inventory, warehouses to store the inventory, employees to package items that are ordered and make sure they are sent to customers, as well as managers to oversee current operations and plan for the future, customer service representatives, an accounting department to make sure that customers pay for what they receive, personnel to deal with returns of items sent to customers, and a treasurer to husband the company's resources. On the other hand, the more modern operation holds its inventory electronically, and much of its dealings with its customers are done electronically. Moreover, what it does electronically may be done on computers that it does not own.

Should this trouble us? If the outside parties that are providing services for the corporation conducting the business are unrelated to the corporation, we can be confident that an arms' length price is being paid for the services provided. If customer service is outsourced, it is being paid for; if much of the programming for the software running the operation is outsourced, a proper price is being paid for that. If the computer power is provided in the cloud, that too is paid for at a market price. The entities that provide the outsourced customer service and programming, and the entity that provides the cloud services, are presumably paying an appropriate tax to the jurisdictions in which they are located.

Still, by separating out the parts of this business, what is left generates a significant profit, but its operations are not necessarily tied to any particular place. Whatever physical aspects remain of this business may be highly mobile, since they are not tied to any significant physical aspect of the business.

The cloud structure thus exacerbates a problem that was lurking in the development of this virtual business in any event. What really is generating the profits here is the original idea for the business and its continued development. That is, it is the intellectual property that creates the profit, and pinning it down to a particular location is not easy. The mobility of intellectual property makes its taxation in the international context perennially difficult.⁹⁵ The addition of cloud computing options simply exaggerates the issue, taking yet another major aspect of a business and separating it from the core of the business and from the location of its operations.

⁹⁵ Hence, the desire to legislate changes relating to the international transfer of intangibles. See, e.g., pthe Administration's proposals cited in note 91, *supra*.

What remains of the business's operations is potentially mobile, and tax considerations will play a role in determining where those remaining operations are located.

4. APPROACHES TO THE PERMANENT ESTABLISHMENT PROBLEM

If the mobility of what remains part of very profitable businesses is considered a problem, are there ways to reduce that problem? Given the nature of a cloud-based business, it would seem that basing taxation on a permanent establishment is inconsistent with a sensible allocation of income to different countries. Interestingly, even as harsh a critic of the permanent establishment concept (and of the *status quo* generally) as Lee Sheppard has conceded: "Multinationals cannot do business in a country solely with computer servers."⁹⁶ Yet the description above of a company like iTunes suggests that, in a significant sense, it certainly could. The question is whether that activity should be enough to attract taxation. If the answer is no, we must then determine where those profits are equitably located.

The answer may be that taxing an entity where its computer capabilities are located could well be down the road, although the road ahead still looks pretty long. Tax planning, particularly in the European Union, has led to structures in which sales are made locally by entities that are legally "commissionaires," an agent that formally cannot bind its principal (although the agency relationship may be unknown to customers). As a practical matter, the principal regularly accepts its commissionaire's arrangements. For example, Dell set up a major production facility in low-taxed Ireland, with sales through local commissionaires in other countries. Although the contracts for sales of computers were standard contracts, and Dell never rejected its commissionaire's sales, the Norwegian Supreme Court reversed a lower court and held that the commissionaire did not create a permanent establishment in Norway.⁹⁷ A French court reached a similar decision regarding a British company with a dependent agent.⁹⁸ However, the Spanish Central Economic Administrative Court ruled in two cases that the commissionaire structure does lead to a permanent establishment for the manufacture. One case involved Dell.⁹⁹

India may be more aggressive in its approach, as evidenced by its taxation of Seagate (the hard drive manufacturer).¹⁰⁰ Seagate applied for an advance ruling from India's Authority for Advanced Rulings (AAR). It proposed to hire independent service providers who would store disks for Seagate and deliver them to Indian customers. Seagate would continue to own the disks, which would be held in a bonded warehouse operated by the service providers. Seagate

⁹⁶ Sheppard, "Services PE Upsets Presumptions," *Tax Notes International*, November 5, 2012, 533, 534.

⁹⁷ A Google translation of the opinion is available through <http://itatonline.org/archives/index.php/dell-products-vs-state-supreme-court-norway-in-absence-of-legal-right-to-bind-principal-dependent-agent-is-not-permanent-establishment/>.

⁹⁸ *Societe Zimmer Limited*. The text of the case (in French) can be found at <http://www.legifrance.gouv.fr/affichJuriAdmin.do?oldAction=rechExpJuriAdmin&idTexte=CETATEXT000022057617&fastReqId=1681614043&fastPos=1>.

⁹⁹ See Martinez-Matosas & Calderon, "Spanish Court Rules on Permanent Establishments in *Dell*," *Tax Notes Int'l*, Oct. 22, 2012, p. 385. The other case involved Roche Vitamins. Interestingly, Dell closed its Irish manufacturing plant in 2009 and moved its production activities to Poland. Nevertheless, it reportedly continues to book sales through Ireland, treating the activities in Poland as part of its costs of production. http://www.finfacts.ie/irishfinancenews/article_1025198.shtml

¹⁰⁰ Seagate Singapore International Headquarters Private Ltd. (2/25/10), available at http://aarrulings.in/it-rulings/uploads/pdf/1267183846_seagate.pdf

would have the right to enter the warehouse to inspect the premises and carry out a physical inventory. When a customer of Seagate requested a disk, the service providers would provide it to the customer and inform Seagate. Seagate would then bill the customer. The service providers had no contractual relationship with Seagate's customers. The AAR concluded that the warehouse was a "fixed place of business" (and thus a permanent establishment) of Seagate because it was "the focal point of its business operations in India." It did not matter that Seagate did not own or operate the facility, although the AAR noted that there was space demarcated for use by Seagate.

In contrast, the Mumbai Income Tax Appellate Tribunal has held that a company that provides replacement parts for airlines does not have a permanent establishment. In *Airline Rotables Ltd. (ARL)*,¹⁰¹ the British taxpayer repaired airline parts and provided airlines with replacement parts in the interim. Some of those parts came from inventory stored with the airline in India. The airline was a bailee of these parts, and could not loan, pledge, sell, or exchange them. It did have a right to use replacement parts under its agreement with ARL. The Mumbai Tribunal overturned the position of the Indian tax officer and ruled that ARL's parts did not constitute a permanent establishment in India.

These foreign cases all involve physical items, although the existence of electronic inventorying and monitoring makes it easier for these arrangements to be established. Particularly interesting to us is another ruling of the Mumbai Tribunal in a case involving the taxation of eBay.¹⁰² The Tribunal first found that eBay's income was from "business profits" and not from "fees for technical services." Since technical services are all assumed to involve activity by technical persons directly in the business, eBay's activities failed this test. No thought seems to have been given to the argument that the automatic activities of eBay's system were successful because of the technical activities that produced its system. No matter how smart the software is, the taxing authorities apparently will continue to look to actual human intervention in eBay's interaction with its customers if the activities are to be considered technical.

The Tribunal next turned to the question of whether eBay India or eBay Motors, which were Indian entities, might give eBay itself a permanent establishment in India. Although both entities were clearly dependent agents of eBay, since they provided services to no one but eBay, the Tribunal concluded that they were not a permanent establishment of eBay. To be a permanent establishment, they had to negotiate or enter into contracts for eBay, maintain a stock of goods for eBay, or manufacture or process good belonging to eBay. Since all the activities of eBay are virtual, only the first option was possible, and the Tribunal found that the two companies did not enter into contracts on behalf of eBay.

Given the current state of the law, it is difficult to fault the Tribunal in the eBay case for finding that eBay was not taxable. Yet eBay is surely generating a lot of income in India from the sales made through its web site. The question that international authorities will have to

¹⁰¹ Case reproduced at <http://indiankanoon.org/doc/73225816/>.

¹⁰² *eBay International AG v. Assistant Director of Income-tax* (9/21/12), available at http://www.google.com/#hl=en&output=search&client=psy-ab&q=eBay+india+income+tax&rlz=1R2AURU_enUS498&oq=eBay+India+tax&gs_l=hp.1.2.0j0i22i30i3.312.790.1.1.11493.14.14.0.0.0.140.1279.11j3.14.0.crnk_timepromotionb.0.0...1.1.8.hp.L2QQ_PQUTxM&psj=1&bav=on.2.or_r_qf.&bvm=bv.44770516,d.dmQ&fp=d3341e0de40fcd15&biw=1024&bih=592.

confront is whether they can continue relying on physical presence as the touchstone for creation of a permanent establishment, allowing eBay and its brethren to escape local taxation.

5. A RECENT FRENCH APPROACH

In January, a report dealing with taxation of the digital economy that was commissioned by the French Government was issued.¹⁰³ The report takes a novel approach by focusing on data collection that provides value for many businesses. The Report's particular focus is on information gathered through web sites that monitor the responses of users of the web sites. To the extent the aggregation of this information provides significant value to those running the Web sites, the line between consumers and producers is blurred—the sites create value by gathering information from users of the sites.

In order to translate this observation into the structure of our current tax system, the report suggests that the definition of a permanent establishment be modified to take account of the value that Web sites obtain from the input of consumers. If the role of these consumers as producing value for the owners of the Web sites is taken into account, it could justify the conclusion that the consumers are creating a permanent establishment for those who own the Web site. However, an English article on the report, written by one of the report's authors,¹⁰⁴ does not explain how the government where the consumers are located could gain any power to enforce a tax on the owners of the Web site.

This approach echoes the approach New York State has taken in developing its Amazon law.¹⁰⁵ In an attempt to develop some legal hook into activities that clearly re generating income in their jurisdiction, authorities focus on the activities of their local residents. This reflects the observation of Justice Breyer in *McIntyre Machinery, Ltd.*, but leaves open the missing link—how can the jurisdiction assert the power to enforce a tax liability on the entity whose local residence is only on the Internet. Since the economic activity is real and growing, we can expect movement towards asserting the power to tax these activities.

E. FOREIGN TAX CREDITS

When a corporation pays taxes on its foreign income, it is permitted to take a credit against its United States taxes in respect of those foreign taxes paid.¹⁰⁶ There are some limitations on the ability to take those credits. Most generally, the taxpayer cannot use a credit from taxes on its foreign-source income in excess of the United States tax that is attributable to the portion of the taxpayer's income that is foreign-source.¹⁰⁷ That rule is then applied

¹⁰³ The 150-page report, plus appendices, can be accessed at http://www.redressement-productif.gouv.fr/files/rapport-fiscalite-du-numerique_2013.pdf. The report is in French.

¹⁰⁴ The article can be accessed at the Forbes Web site. <http://www.forbes.com/sites/singularity/2013/01/28/corporate-tax-2-0-why-france-and-the-world-need-a-new-tax-system-for-the-digital-age/> (Nicolas Colin, "Corporate Tax 2.0: Why France and the World Need a New Tax System for the Digital Age"). My summary is based on this article.

¹⁰⁵ See text at note 17.

¹⁰⁶ I.R.C. §§ 901-909.

¹⁰⁷ I.R.C. § 904(a).

separately to “passive category income” and “general category income.”¹⁰⁸ Passive category income includes income which would be “foreign personal holding company income” (“FPHCI”).¹⁰⁹ FPHCI includes rents.¹¹⁰ Rents are excluded from FPHCI if they are derived in the active conduct of a trade or business, but only if they are received from someone who is not a related person.¹¹¹ Foreign tax credits are peculiarly important in United States taxation; many countries do not tax residents’ income earned outside their borders.

The basic structure of the foreign tax credit regime leads to significant tax planning opportunities. A corporation can be in an “excess credit” position, where it pays foreign taxes at a rate that exceeds the United States tax rate. In that case, it would look for opportunities to generate foreign income taxed at a lower rate. On the other hand, if the rate of its foreign taxes overall is less than the United States tax rate, it may want to generate foreign income taxed at a rate higher than the United States rate.

Attempts to manipulate foreign taxes for those in excess credit positions often involve manipulations of transfer prices between related parties.¹¹² However, if a product is manufactured in India and sold to a related company in the United States, it is straightforward for tax authorities in those two countries to focus on the price charged in that transaction. There is little likelihood that, if the companies are dissatisfied with the transfer price reached¹¹³ that they will immediately close operations in India and move it somewhere else.

Consider, in contrast, the application of foreign tax credit rules to a multinational entity whose computer resources are located in private clouds that are run by its foreign affiliates. The cloud provider can operate computers in a number of jurisdictions and pay taxes in each jurisdiction based on the profits generated by the servers actually located there. If it separates its activities into two separate cloud entities, one with computers in countries with tax rates higher than that in the United States, and one with tax rates lower, the United States entity could choose each year which entity would be better for it to use from a tax standpoint and favor that entity.¹¹⁴ This surely does not exhaust the types of tax planning that would be available to such a multinational enterprise.

¹⁰⁸ I.R.C. § 904(d).

¹⁰⁹ I.R.C. § 904(d)(2)(B)(i). FPHCI is defined in I.R.C. § 954(c).

¹¹⁰ I.R.C. § 954(c)(1)(A).

¹¹¹ I.R.C. § 954(c)(2)(A).

¹¹² See, e.g., Joint Committee on Taxation, *PRESENT LAW AND ISSUES IN U.S. TAXATION OF CROSS-BORDER INCOME* (JCX-42-11) 43-45 (2011).

¹¹³ Through the “competent authority” provisions in many tax treaties, the two companies may be able to get the tax authorities in the two countries involved to agree on a consistent transfer price. E.g., United States-India Income Tax Treaty Art. XXVII.

¹¹⁴ This suggestion assumes that the multinational group, as a whole, would not duplicate its operations in both entities since that would result in its acquiring substantial unnecessary capacity. I assume that the multinational entity, as a whole, has the amount of overcapacity befitting the total volume of resources it provides through its cloud operations. However, the two entities could provide backup capacity for each other. Accordingly, if the parent chooses to contract with the low-tax entity, the entity would generate most of the income; if the parent contracts with the other entity, it would generate most of the income.

The point to be appreciated is that the flexibility available in moving digital-based operations among various locations with no significant change in hardware investment provides enormous flexibility for the international tax planner.

As mentioned before, most countries do not tax income earned by residents abroad. However, as taxing authorities become frustrated by their inability to identify permanent establishments of foreign entities earning substantial income locally through Internet activities, they may be forced to consider taxing their own residents on their worldwide Internet-based profits. Unfortunately, as just described, the mobility of Internet activities may make it harder to keep their residents resident.

F. HOW CAN COUNTRIES APPROACH THIS PROBLEM?

It is a lot easier to describe the problems raised by the cloud computing structure than to point to practical solutions.

1. THE PROVIDER

Consider first the provider of cloud computing services. That person will certainly have substantial numbers of computers in order to provide those services. It would seem easy for the jurisdiction in which those computers are located to assert a tax liability on the provider.

The first problem will be deciding how to allocate the cloud providers' income to the servers in that jurisdiction. In other words, how will countries determine how much of a cloud providers income is allocated to the servers in each country where they are located. This is like a section 482 allocation problem, yet it occurs within a single entity. If there is no international consensus as to how this is to be done, the cloud provider's tax obligation will not be fairly assessed.

Even if there is a consensus as to how much of the provider's income is allocated to a particular country's servers, there must also be a decision as to whether the income generated by the use of those servers is properly sourced to the location of the servers. To the extent the customers are located outside of the country in which the computers are located, which is very likely, the answer could be no. The cloud provider may well be viewed as providing a service to the customer where the customer is located. That could be particularly relevant if the country in which the servers are located does not tax income earned abroad, or provides a foreign tax credit for any taxes paid. If, like the U.S., foreign income is taxed, the question of what deductions can be taken against that income, and where those deductions are treated as located, would arise. Section 199 of current law suggests that additional thought is needed in this area. That section allows a deduction in respect of certain items sold to foreigners, and section 199(c)(5) includes computer programs within the category of items with respect to which the deduction can be taken. But the cloud service provider who allows users to make use of software located on its servers is not selling computer programs. Moreover, other services, such as hosting, provided by a cloud provider, are not included within the statute's definition.

Suppose, instead, that the cloud provider is viewed as collecting a royalty. Then, while the practical difference between characterizing the payment as one for royalties rather than services may not be great, the tax law, particularly in the international arena, views those two types of income very differently.

Can the provider be taxed in the country where its services are actually being used, as opposed to where its servers are located? As a practical matter, the location of the servers may be based on the costs of running a lot of computers, and is substantially unrelated to the other activities of the provider that are generating income. If the benefit that is provided were something tangible, it would be reasonable to associate it with the location where the item ended up, although mechanical rules that determine situs based on the formality of where title is transferred continue to govern in this area.

The practical consequence of associating the income with the location of the cloud providers' servers is that it will encourage providers to locate their servers in a location that has little or no tax. Combining this fact with the rule that determines the location of a sale based on the legal niceties in the contract of sale threatens to remove much of the income of this activity from taxation.

The alternatives are not easy to enforce, however. One could certainly argue that the cloud service provider—indeed, anyone that provides a benefit over the Internet—should be treated as located where the customer is located. After all, in most cases, the customer will have entered into the transaction through a computer sitting in its local office, and that is where the benefit will be obtained. While the law and the courts have shied away from this approach, it has conceptual attraction. What it lacks, though, is practical applicability. If the cloud provider or Internet seller has no physical attachment to the location of the customer, how is the tax to be enforced? The only thing that the government in that location has any power over is the payment by its resident. But, unless every customer is to become a withholding agent, the ability to exercise its power over that payment will not do it much good. More generally, any proposal in this area must cope with the problems of enforcement in a world where there is a limit on the burden that can be placed on the actions of local citizens and on their willingness to be cooperative.¹¹⁵

2. THE USER

Consider next the user of cloud services. The expenditures it makes for cloud services presumably are expenses of its business. But where are those expenditures located? As discussed above in connection with the provider, there is certainly an argument that the economic activity is taking place at the user's location. But, as indicated above, it is unlikely that the jurisdictions where the hardware is located, and where the maintenance and development of the systems running the cloud structure, will give up their right to assert that the activity is taking place in their territory. Those jurisdictions don't care about the deduction, of course but logically, the place of the deduction would seem to be the place where the income is earned also. That being the case, it may be difficult to maintain that all the use of the cloud structure is taking place where the user is located.

¹¹⁵ In this regard, it is worth remembering the evolution of the home office deduction. Courts allowed all taxpayers to take deductions for their use of home offices. Conceptually, this was a reasonable result. However, as a practical matter, there was no way for the IRS to check on the bona fides of every taxpayer. Moreover, even taxpayers whose intentions were only honorable would be hard pressed not to take an optimistic view of their use of space in their homes or apartments. In desperation, Congress limited the home office deduction to those persons who made exclusive use of a portion of their homes, and only under certain circumstances. Even so, it is likely that more deductions are taken in this area than might be justified under a comprehensive IRS audit.

Besides that, the location of the user is not easy to identify. As discussed at some length in connection with the application of state taxation to cloud applications, where a large corporation, with itinerant employees can be said to be using the cloud structure it has access to is not easy to determine. The United States has the possibility of resolving this issue if Congress awakens the dormant Commerce Clause and applies a uniform system that all states must accept. In the international arena, a solution will certainly be harder to come by. In the interim, countries may well adopt approaches that are incompatible with each other. This will undoubtedly create problems for multinational companies trying to comply with a vast array of structures and attempting to determine how it can credit one country's taxes against its liabilities in other countries. However, tax administrators should also be aware that, if a uniform approach is not adopted, international planners will do their best to minimize their overall tax liabilities.

VI. TWO ANCILLARY ISSUES

A. COLLECTING TAX JUDGMENTS IN A FOREIGN COURT

Suppose the continued rise of business transactions over the Internet led to attempts by governments to tax businesses that were not physically located within their borders. Would such judgments be enforceable in the residence countries of those that the first country decided to tax?

The generally accepted answer to that question currently is no. Unless a treaty provides otherwise, "courts of one country will not enforce the governmental policies of another . . ." ¹¹⁶ Some egregious cases have led to special taxes imposed in the case of expatriation, ¹¹⁷ but such rules can be imposed only on an entity that is already resident in the taxing jurisdiction. There have been those who have argued for a more flexible rule, but no change seems to be in the offing. ¹¹⁸

One of the strongest opponents of the current state of the law is Professor Andreas Lowenfeld. He has argued that the presumption should be in favor of enforcement, subject to the usual constraints relating to the violation of public policy in the enforcement of the foreign judgment. ¹¹⁹ He admits that his view remains a minority position, noting as a small victory for his position the comment in Restatement (Third) of Foreign Relations Law:

¹¹⁶ Gerhard Walter and Samuel P. Baumgartner, "General Report: The Recognition and Enforcement of Judgments Outside the Scope of the Brussels and Lugano Conventions," in Walter & Baumgartner, eds., *Recognition and Enforcement of Foreign Judgments Outside the Scope of the Brussels and Lugano Conventions*, 1, 13 (Kluwer 2000).

¹¹⁷ Under the Code, sections 877, 877A, 2107. In Great Britain, section 80 T.G.T.A. 1992 (migration charge on trusts), cited in Grossman, note 118, below.

¹¹⁸ See Andrew Goodman, *Conflicts in Cross-border Enforcement of Tax Claims*, available at http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=andrew_grossman&sei-redir=1&referer=http%3A%2F%2Fwww.google.com%2Furl%3Fsa%3Dt%26rct%3Dj%26q%3Denforcement%2520foreign%2520tax%2520judgments%26source%3Dweb%26cd%3D2%26ved%3D0CD8QFjAB%26url%3Dhttp%253A%252F%252Fworks.bepress.com%252Fcgi%252Fviewcontent.cgi%253Farticle%253D1000%2526context%253Dandrew_grossman%26ei%3Dt3FfT8yXJYPW2gX26q2WCA%26usg%3DAFQjCNHq8XRdt4bHIGb7jHHgFNI n2filhGQ#search=%22enforcement%20foreign%20tax%20judgments%22.

¹¹⁹ Andreas Lowenfeld, *International Litigation and the Quest for Reasonableness* 117-119 (1996).

“No rule of United States law or of international law would be violated if a court in the United States enforced a judgment of a foreign court for payment of taxes or comparable assessment that was otherwise compatible with the standards [for recognition and enforcement of foreign country judgments].”¹²⁰

Given the flexibility businesses have in shifting digital activities, particularly when they can move their operations from one cloud provider to another, it seems likely that this enforcement issue will become a more serious problem than it is currently. A “solution” would require countries where those sheltering their activities from international taxation are located to employ their sovereign power to enforce tax judgments of other countries. The success the United States has had in breaking through bank secrecy in other countries suggests that such a result may be possible. I think it also suggests how unlikely it is that that change will occur any time soon.

B. INTERNATIONAL TAX NEUTRALITY AND CLOUD COMPUTING

Analysis of neutrality in international taxation usually focuses on a number of different guiding principles, none of which is fully satisfactory.

Capital Export Neutrality (CEN) is a system under which a business’s tax burden will be the same no matter where it makes its investments. One way to effect this result is to allow investors in foreign countries a credit for the foreign tax they pay, so that their home country tax burden is only the excess over the tax already paid in the foreign country. Logically, if the foreign tax rate is greater than the domestic tax rate, CEN can be achieved only if the taxpayer is given a credit against domestic taxes for the excess tax paid to the foreign country.¹²¹

Capital Import Neutrality (CIN) is a system under which a business’s tax burden on an investment in a particular location is the same no matter where the business making the investment is located. Thus, if a company makes an investment in a foreign country, CIN is satisfied if the company is taxed only in the foreign country and no additional domestic tax is imposed.

Capital Ownership Neutrality is a system under which the ownership of an asset in a particular location is unaffected by the identity of the owner.

I do not attempt to evaluate the merits of these various approaches to neutrality in the international arena. It is worth noting, though, that the various approaches assume that the location of investment is relatively easy to identify and is not totally mobile. The cloud structure, and the growing digital economy generally, suggests that this may not hold true for all businesses. To the extent there is growth in Internet-based businesses that deal with information

¹²⁰ Restatement (Third) of Foreign Relations Law § 483, quoted *id.* at 119. The United States cases Professor Lowenfeld cites in support of the current view (cases which he sharply criticizes) are *Her Majesty the Queen in Right of Province of British Columbia v. Gilbertson*, 597 F.2d 1161 (9th Cir. 1979), and *Moore v. Mitchell*, 30 F.2d 600, 604 (2d Cir. 1929) (L. Hand, J., concurring).

¹²¹ Not surprisingly, no country grants a credit to its own taxpayers for taxes paid in excess of its own tax rate. Michael Graetz & Alvin Warren, “Income Tax Discrimination: Still Stuck in the Labyrinth of Impossibility,” Harvard Law School Public Law & legal Theory Working paper Series, paper No. 11-24, at 6 and 13 (Draft of 9/6/11), available at <http://ssrn.com/abstract=1923809>.

and products that are electronically provided, attempts at creating neutral systems may be compromised by the mobility of such businesses.

VII. WHAT ABOUT THE REST OF THE CODE?

The focus of discussions of cloud computing and digital content has been in the state and local area, on the one hand, and in the international area, on the other. But the change in business structures that is reflected in cloud computing and digital content has implications in the operation of the Code in domestic taxation.

As more items are embodied in digital form, and those digital assets and the associated hardware capabilities are situated in the cloud, the conventional analysis of many businesses will change. There may not be much of an operational difference between a company which owns many computers and buys its own software and one that relies on access through the cloud. But when the company is acquired in a section 338 transaction, the allocation of basis could be quite different. Similarly, changing the mix of tangible assets and cloud based intangibles could affect what constitutes substantially all of a corporation's assets for purposes of section 368(a)(1)(C).

The option of transforming significant capital investment into reliance on the cloud affects tests that attempt to identify the size of a business. Section 1202(d), which defines a "qualified small business" for purposes of giving special treatment to "qualified small business stock" bases its test on aggregate gross assets of the business. A business that is close to the line may be able to reduce the amount of its assets by moving some of its activities into the cloud.

Because the cloud still seems like an amorphous mystery, the extent to which this transformation of economic activity will affect the application of Code provisions is still unclear. But it is unlikely that such a significant change will not play out in unexpected ways as taxpayers and practitioners become more familiar with the reality of cloud computing.

VIII. CONCLUSION

It seems clear that technological developments are running well ahead of tax administrators at this time. I have tried to suggest some of the problems that elaborate cloud structures raise, particularly in the international tax environment. I have also attempted to suggest what solutions are more likely to succeed in this new environment. Finally, I have suggested that cloud computing, and digital content, may affect how the domestic Federal tax system is applied. We can certainly expect that these issues will not be resolved—or even confronted—soon.