CONSIDERING CLOUD FROM A LEGAL STANDPOINT

Scott Meyer

The term "Cloud" seems to have become ubiquitous as our data is routinely "synched," "backed-up," and "stored" into the Cloud.[1] However, this catch-all term also seems to have obscured what it actually is: a varied set of services with on-demand availability. While it may be a lawyer's nature to eschew the trappings of technology, it is important to understand the fundamentals of how this technology works given how expansive it has become.[2]

THE CLOUD GENERALLY

It is important to note that the Cloud is, in fact, a misnomer. Any data, or solution, or application that is housed in the Cloud is actually stored here on *terra firma*. There is no literal Cloud up in the sky that contains information from which devices to access it. Instead, the Cloud can be thought of as a way to access things that are stored elsewhere. The term itself apparently originates from the Cloud symbol used by flow charts and diagrams to symbolize the Internet.[3]
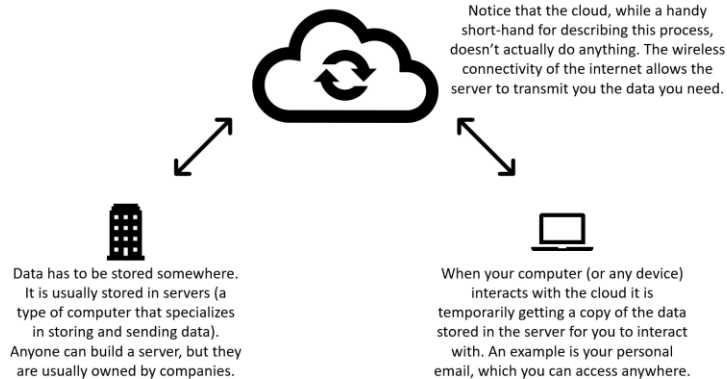
The Cloud

Notice that the cloud, while a handy short-hand for describing this process, doesn't actually do anything. The wireless connectivity of the internet allows the server to transmit you the data you need.

Data has to be stored somewhere. It is usually stored in servers (a type of computer that specializes in storing and sending data). Anyone can build a server, but they are usually owned by companies.

When your computer (or any device) interacts with the cloud it is temporarily getting a copy of the data stored in the server for you to interact with. An example is your personal email, which you can access anywhere.

Figure 1

---

[1] *See, e.g.*, *Sign in to iCloud*, APPLE, https://www.icloud.com/; Google Drive, GOOGLE, https://www.google.com/drive/. Both are examples of Cloud storage services that consumers can use.

[2] *See, e.g.*, Katie Costello, *Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17.5 Percent in 2019*, GARTNER (Apr. 2, 2019), https://www.gartner.com/en/newsroom/press-releases/2019-04-02-gartner-forecasts-worldwide-public-cloud-revenue-to-g.

[3] Mark Koba, *Cloud Computing: CNBC Explains*, CNBC (June 29, 2011), https://www.cnbc.com/id/43483060.

The Internet allows the transmission of data from disparate locations directly to your device. As showed in Figure 1, the Cloud is simply a method of accessing resources (e.g., data) located elsewhere via the Internet.

Take the example of a Gmail account. This account can be accessed anywhere in the world where the user's device has access to the Internet. Continuously, emails are received and stored on Google's email servers. When the user goes to "gmail.com" via a web browser, Google sends necessary data the browser needs to display emails for the user to manage. If the user did not have Cloud-based email services available, then all the emails would have to be managed on the user's computer at all times. This would not only require storage and a constant Internet connection on the user's device but also the user management of email software. Additionally, if all of the emails are stored physically on the user's device, then any data loss incident that happens to that device might make them irretrievable.[4] By having a Cloud-service provider like Google manage emails, the user does not have to dedicate resources for maintaining the email service. *See* Figure 2.
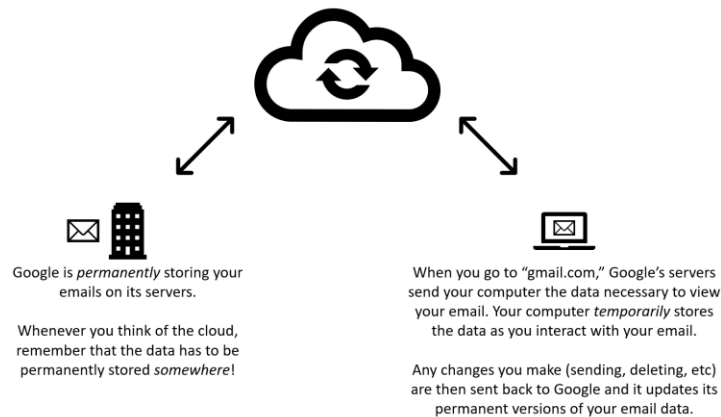
Gmail Example

Google is *permanently* storing your emails on its servers.

Whenever you think of the cloud, remember that the data has to be permanently stored *somewhere*!

When you go to "gmail.com," Google's servers send your computer the data necessary to view your email. Your computer *temporarily* stores the data as you interact with your email.

Any changes you make (sending, deleting, etc) are then sent back to Google and it updates its permanent versions of your email data.

Figure 2

CLOUD COMPUTING

So, "the Cloud" refers to servers providing on-demand services and resources which can be accessed over the Internet.[5] However, anyone can still deploy a server and self-manage the same

---

[4] For example, if your computer's hard drive becomes corrupted (unusable), the files on it are lost to you.

[5] *But see* Kirk Kardashian, *What if we put servers in space?*, FORTUNE (Jan. 29, 2015), https://fortune.com/2015/01/29/connectx-space-data/ (hypothesizing that servers could be stored in space).

type of services and resources that are offered by Cloud services.[6] What then makes the Cloud so useful?

One answer is Cloud computing. Cloud computing allows users to harness economies of scale when accessing Cloud resources. Cloud computing uses virtualization technology to provide on-demand services and resources. Virtualization is the creation of resources, such as virtual machines,[7] that are not physical. For example, virtual machines are computer(s) within a computer. To illustrate, imagine logging onto a computer that uses Windows 10 and then opening a window that internally runs a separate system running Windows XP. In that example, you have two operating systems running on the same machine.[8] By loading multiple virtual machines onto one physical host, a single physical server can become multiple virtual servers.

To analogize, consider a paper copy of a book and an eBook reader, such as a Kindle.[9] The paper copy of the book can only ever be that one book. However, the eBook reader can store and display many different books as long as they have been stored on the device. Now, imagine that the eBook Reader could be used simultaneously by multiple people reading different books using split-screen technology. In this extended example, the paper book is a regular server which can only display a single book worth of content. The eBook reader is a server with many virtual machines, represented by the many different books displayed to the users.

The benefit of the Cloud model is the economies of scale. By being able to use simultaneously the same physical server for multiple services ("reuse the eBook reader for multiple books"), Cloud-based services lowers the cost of hosting services on the Internet. Imagine a business wanting to set up a website. It may choose to buy its own server and then collocate the server in a data center, where the business's website will be hosted on that server. However, servers and their associated maintenance are expensive. Instead, the business can go to a Cloud-service provider and rent virtualized webhosting resources at a cheaper cost. Now, the business does not have to worry about maintaining the physical server, because the business is paying both for the server's resources

---

[6] *See, e.g.*, Pamela Statz, *Set Up a Home Server*, WIRED (Feb. 15, 2010), https://www.wired.com/2010/02/set-up-a-home-server/.
[7] *See, e.g.*, *What is a virtual machine?*, MICROSOFT AZURE, https://azure.microsoft.com/en-us/overview/what-is-a-virtual-machine/.
[8] In that example, the Windows XP virtual machine is accessed through Windows 10. However, there could be a situation where the two operating systems are completely separate and do not interact with each other.
[9] Or any device that can read books, such as an iPad, Nook, etc.

and the physical server management services from the Cloud-service provider. *See* Figure 3.
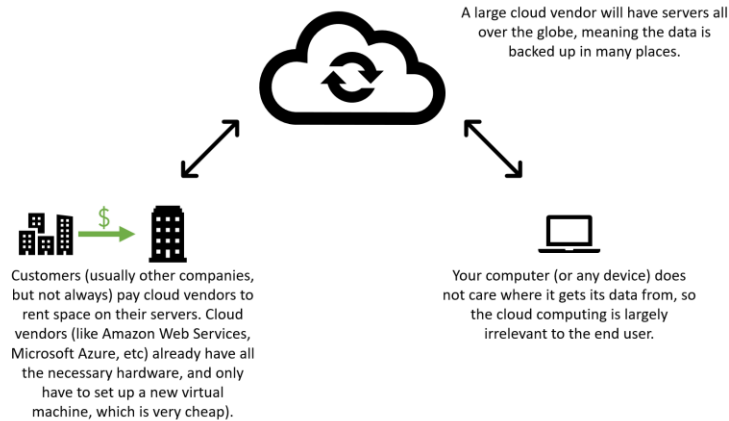
Cloud Computing

A large cloud vendor will have servers all over the globe, meaning the data is backed up in many places.

Customers (usually other companies, but not always) pay cloud vendors to rent space on their servers. Cloud vendors (like Amazon Web Services, Microsoft Azure, etc) already have all the necessary hardware, and only have to set up a new virtual machine, which is very cheap).

Your computer (or any device) does not care where it gets its data from, so the cloud computing is largely irrelevant to the end user.

Figure 3

Consider again the analogy of the eBook. Imagine a friend wanting to store an eBook on your device (setting aside issues of licensing). You already own your eBook Reader, so the only cost to you is getting the book set up and the allocating data storage on the device. The cost to you is minimal, much less than making your friend go out and buy their own eBook Reader.[10] The benefits of Cloud computing are very similar. The economy of scale makes it much cheaper to rent resources from a large Cloud vendor than setting up a dedicated server.[11] Additionally, reputable Cloud services have high uptime reliability, because Cloud infrastructures generally implement multiple levels of system redundancy.[12]

The alternative to Cloud computing is dedicating physical resources from servers. *See* Figure 4. This model is potentially more costly to clients and would likely be a competitively disadvantage option (i.e., cost-wise) for many use cases. Additionally, dedicated physical resources do not have the same level of system redundancy and on-demand resource allocation as the Cloud model. With a

---

[10] The analogy is imperfect since eBook Readers are neither prohibitively expensive nor require a great deal of maintenance. Still, this analogy identifies the economies of scale that benefit companies renting server space instead of setting up their own servers.

[11] *See also Top Benefits of Cloud Computing*, MICROSOFT AZURE, https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/#benefits.

[12] *See, e.g., AWS Service Health Dashboard*, AMAZON WEB SERVICES, https://status.aws.amazon.com/ (showing current status of Amazon Web Service's service health); Slavik Dimitrovich, *High Availability for Mere Mortals*, AWS STARTUPS BLOG (May 14, 2015), https://aws.amazon.com/blogs/startups/high-availability-for-mere-mortals/.

single server hardware failure, websites may easily go down and key services would not be available.[13] Businesses and individuals using the dedicated resource model face constant maintenance to ensure the reliability of services. This costly maintenance requirement, when compared to the ease of delegating server maintenance and related risks to a Cloud service provider, highlights why the Cloud has become the dominant model.
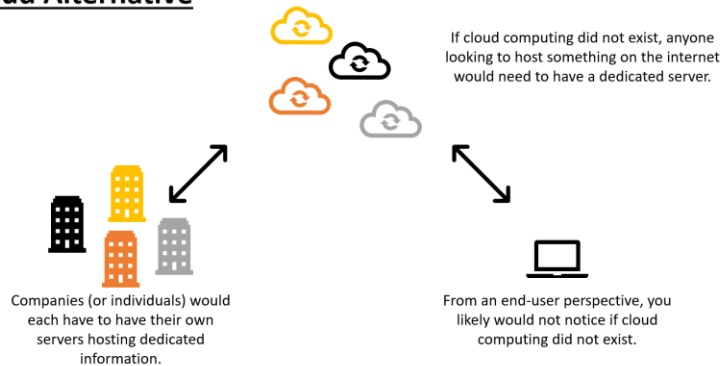
Cloud Alternative

If cloud computing did not exist, anyone looking to host something on the internet would need to have a dedicated server.

Companies (or individuals) would each have to have their own servers hosting dedicated information.

From an end-user perspective, you likely would not notice if cloud computing did not exist.

Figure 4

BROAD LEGAL CONSIDERATIONS OF THE CLOUD

The Internet has undeniably changed the way people interact. It can be used to edit documents in real-time with others,[14] back-up data,[15] run programs that are too complex for the computing capacities of your personal computer,[16] and more. However, all that power means a veritable minefield of legal problems. With the introduction of Cloud computing, questions of ownership across the Internet has become even more complex.

OWNERSHIP

Let us consider the previous Gmail example. If a user goes to gmail.com and starts drafting an email, the user is technically creating a document using Google's technology. Does that mean the user owns the email or Google? Additionally, what about the emails

---

[13] For example, imagine a Florida company had two servers, and both were in Florida. If a hurricane destroyed both those servers, that company's website would be down until they could figure out an alternative. Of note, the Florida company could invest in many servers and have them all across the country to avoid this problem, but as stated above, that is a very expensive option.

[14] *See, e.g.*, *Google Docs*, GOOGLE, https://www.google.com/docs/about/.

[15] *See, e.g.*, DROPBOX, https://www.dropbox.com/.

[16] *See, e.g.*, *What is Cloud Computing*, MICROSOFT AZURE, https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/.

that are just sitting on Google's servers when the user is not accessing them? What about emails that are sent to the user by other people?

Currently, these questions are almost exclusively answered by contract law. As in, by those Terms of Service Agreements that pretty much no one reads.[17] In the case of Gmail, the Terms of Service Agreement appears to let users own the content they create, while Google also maintains certain rights regarding how that data is used.[18] Whether contract law, and specifically Service Agreements, are the best vehicle to make these decisions is an open question.

Consider the impact of COVID-19, which shut down many economies across the globe and drove a number of employers to promote work-from-home options.[19] As Cloud resources became essential to support that transition, the idea that business contracts, and user agreements, are the sole basis of legal guidelines in this realm becomes more unsettling.[20] For instance, returning to the Gmail example, what if Google altered their terms of service to claim that they owned the content of any email the user wrote if the email stayed on Google's servers for three or more years? Could Google then choose to hand over that information to anyone the company wanted?[21] An even more extreme example: could Google

---

[17] *See* Caroline Cakebread, *You're not alone, no one reads terms of service agreements*, BUSINESS INSIDER (Nov. 15, 2017), https://www.businessinsider.com/deloitte-study-91-percent-agree-terms-of-service-without-reading-2017-11 (estimating that over 90% of users agree without reading terms and conditions); Matthew S. Schwartz, *When Not Reading the Fine Print Can Cost Your Soul*, NPR (Mar. 8, 2019), https://www.npr.org/2019/03/08/701417140/when-not-reading-the-fine-print-can-cost-your-soul (describing various hijinks companies have included in their terms of service agreements knowing they will not be read).

[18] *Google Terms of Service*, GOOGLE, https://policies.google.com/terms ("Some of our services give you the opportunity to make your content publicly available . . . [s]ome of our services include content that belongs to Google . . . .").

[19] *See* Laurel Farrer, *Remote Work Advocates Warn Companies About COVID-19 Work-From-Home Strategies*, FORBES (Mar. 5, 2020), https://www.forbes.com/sites/laurelfarrer/2020/03/05/ironically-remote-work-advocates-warn-companies-about-covid-19-work-from-home-strategies/#2fcf1f512051.

[20] *See, e.g.*, Rae Hodge, *Zoom: Every security issue uncovered in the video chat app*, CNET (Apr. 9, 2020), https://www.cnet.com/news/zoom-every-security-issue-uncovered-in-the-video-chat-app/. Zoom is a video conference tool that became ubiquitous as schools and businesses turned to remote options in the wake of Covid-19. This heightened user base also led to a scrutinization of its security. Using Zoom as an exemplary hypothetical, should a tool that is suddenly integral to the running of schools/businesses be able to control its liability through its terms of service? Does the sophistication of whoever is using the platform matter?

[21] *See, e.g.*, Chris Matyszczyk, *Google sees alleged child porn in man's email, alerts police*, CNET (Aug. 3, 2014), https://www.cnet.com/news/google-sees-alleged-child-porn-in-mans-email-alerts-police/.

publish a collection of the user's emails as a book and begin profiting from its sales?[22]

PRIVACY AND THIRD-PARTY DOCTRINE

Consider the third-party doctrine in an era where your data is routinely held by someone other than yourself.[23] We know from *Carpenter v. United States* that cell site location data requires a warrant, even if cell phone companies would happily provide it.[24] However, it is unclear how the warrant requirement for cell-site location information applies to other third party carriers. It is yet to be clarified what carried the weight of the decision in *Carpenter* the "location," "the unique nature of cell phones," or something else entirely. For example, in a situation where a person runs an illegal online gambling website using Amazon-owned servers, can Amazon choose to provide that information to the police? Alternatively, consider if some of Amazon's servers storing the illegal gambling website are outside of the United States, does that matter? Many law review articles have written about the courts' grappling with modern technology.[25] However, Figure 5 identifies some tangible examples stemming from Cloud computing.

---

[22] *See, e.g.*, Scott Goodson, *If You're Not Paying For It, You Become The Product*, FORBES (Mar. 5, 2012), https://www.forbes.com/sites/marketshare/2012/03/05/if-youre-not-paying-for-it-you-become-the-product/ (discussing that there is a hidden cost to "free" online services).

[23] Generally, the third-party doctrine is the idea that third parties may disclose information to law enforcement on the theory that a person does not have an expectation of privacy in such situations. *See e.g.*, Smith v. Maryland, 442 U.S. 735, 743-44 (1979) ("This Court consistently has held that a person has no legitimate expectation of privacy in information he voluntarily turns over to third parties.").

[24] Carpenter v. United States, 138 S. Ct. 2206 (2018). *Carpenter* involved a series of store robberies. The FBI worked with wireless carriers to get location data from the cellphones of suspects by noting what cell towers those phones connected to. The Supreme Court ruled that even though the location data was held by the wireless carriers, an individual still maintains a legitimate expectation of privacy in the records.

[25] *See, e.g.*, Jeffrey Bellin, *Fourth Amendment Textualism*, 118 MICH. L. REV. 233 (2019).

Example Cloud Legal Considerations

If I use a video conferencing application (ie: Skype, Zoom, FaceTime, etc), is the application provider obligated to ensure my video is secure?

Could an email client (ie: Gmail, Yahoo, Comcast, etc) change their terms of service to claim they own my emails?

If my car comes with software, am I entitled to receive updates? Is the car company obligated to make sure those updates are secure?

If a business develops their product to run on the cloud (ie: using Amazon Webservices), what obligations does each have to customer data?

If a business uses cloud storage for its accounting data, and then goes bankrupt, who owns the data? What if, instead, the cloud storage company goes bankrupt?

Figure 5

JURISDICTION AND CHOICE OF LAW

It is worth briefly considering the impact of the Internet and Cloud technology on jurisdiction. First, "Choice of Law" and "Jurisdiction" are not the same thing. Jurisdiction is the power to exercise legal authority or judgments over something.[26] Choice of Law, or private international law, is the set of rules to determine which jurisdiction's law applies.[27]

To see why both are relevant to a discussion of the Internet, imagine the following scenario: a malicious actor, living in Russia, sends an email to John Doe, living in Minnesota, threatening to post photoshopped pictures of John on the Internet if he does not pay a ransom. John refuses, the fake photos are released, and John wants to sue the malicious actor for various tort claims, including defamation and intentional infliction of emotional distress.

Assuming John sues in a Minnesota court, does the Minnesota court have jurisdiction over a Russian national residing in Russia? If not, what court does have jurisdiction? Next, if the Minnesota court proceeds anyway, what law applies? For example, does Russian law apply since the email originated in Russia? Does Minnesota law apply since the email was opened in Minnesota? What if the malicious actor released the fake photos using a social media platform that was incorporated in Delaware? Does Delaware

---

[26] *See, e.g.*, Int'l Shoe Co. v. Washington, 326 U.S. 310, 316 (1945) ("Historically the jurisdiction of courts to render judgment *in personam* is grounded on their de facto power over the defendant's person. Hence his presence within the territorial jurisdiction of a court was prerequisite to its rendition of a judgment personally binding him.")

[27] *See generally* Stephen M. Sheppard, *Choice of Law (Choice of Governing Law or Choice-of-Law Rules or Choice of Laws)*, THE WOLTERS KLUWER BOUVIER LAW DICTIONARY (Desk ed. 2012).

law apply? What if the social media platform's servers were located in Iowa? The rabbit hole can go on forever as the hypothetical raises relevant details.[28]

This example is meant to be a brief glance at some of the difficulties in how the Internet and Cloud technology interact with jurisdiction and choice of law problems. The hypothetical does not even consider criminal law, federal law, or possible international treaties that may abrogate or alter these considerations, especially given that real disputes are highly fact-intensive. Additionally, this example does not account for the choice of law and forum selection clauses that may be inserted in contracts, explicitly defining what law the parties think should be used.[29]

However, despite those limitations, where an attorney cannot possibly know everything about a field of law, knowing what questions to ask can often point the way, especially in the continually expanding realm of the Internet.

CONCLUSION

The Cloud itself is not overly complex. It is simply a shorthand way of identifying resources being stored somewhere else and then accessing via the Internet. Cloud computing is the process of using virtualized resources to provide services to multiple clients without using more dedicated hardware. What is far more complicated is the legal implications of having something intangible, such as data, stored by a third party. Today, the great majority of Cloud solutions are dictated by service agreements written by large companies, which are largely ignored by the general public. Whether the legal power imbalance from those agreements continues as the Internet becomes even more ubiquitous is something that legislatures and courts will have to decide.

---

[28] *See* Symeon Symeonides, *Choice of Law in the American Courts in 2019: Thirty-Third Annual Survey*, 68 AM. J. COMP. L. 235 (2020), https://ssrn.com/abstract=3511163 (surveying the many different approaches states take to choice of law problems).

[29] *See, e.g.*, GOOGLE, *supra* note 18 ("California law will govern all disputes arising out of or relating to these terms, service-specific additional terms, or any related services, regardless of conflict of laws rules. These disputes will be resolved exclusively in the federal or state courts of Santa Clara County, California, USA, and you and Google consent to personal jurisdiction in those courts.").

CLOUD TERMINOLOGY APPENDIX

Term	Description	Example
Cloud	A catch-all term for solutions that take advantage of the Internet. Information is stored in one place, and then accessed through the Internet. When thinking about Cloud, remember that the data has to be physically stored somewhere.	Email, online-backups, anything with the word Cloud in it.
Cloud Computing	The delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet.

Most Cloud computing falls into the broad categories of SaaS, IaaS, and PaaS. | Cloud Computing Vendors such as Microsoft Azure, Amazon Webservices, and Google Cloud. |
SaaS (Software as a Service)	A third party owns an application (the software), and makes it available through the Internet.	An online email service (like Gmail). Google owns and manages the Gmail application, but you can access it over the Internet.
IaaS (Infrastructure as a Service)	Identical to Software as a Service but the third party provides infrastructure instead of software. This would normally be used by businesses not consumers.	A business renting a server from Amazon instead of buying their own. The server might sit somewhere completely different than the business, but that does not matter since it is accessed through the Internet.
PaaS (Platform as a Service)	Identical to Software as a Service, but the third party provides a platform instead of software. A platform can be thought of as a place tools can be built. Think of your	A business renting Microsoft Azure as a PaaS. The business builds applications in the platform, but Microsoft is responsible for ensuring the underlying building

Term	Description	Example
	computer's operating system (likely Microsoft Windows or MacOS). You can use your operating system to open applications that are stored on it, or even created applications on it. A platform is similar to the concept of an operating system (but at a large scale).	blocks (i.e.: networks, storage, databases, etc.). *If you feel IaaS and PaaS sound very similar, do not worry, they are!*