**Your on the Street Reporter**

**Uyless Black**

# The Cloud

**The Cloud, Part I[1]**

**February 16, 2014, September 7, 2014**

Hello from Your on the Street Reporter. This report continues the series on Internet privacy and security. The subject for this article is *The Cloud*. It is an often-cited term, even appearing in evening news broadcasts such as those on FOX and CBS.

The idea of a data communications cloud came about in the 1970s. During that time, computer networks were coming into being. The corporate world and governments had begun to use them for their distributed operations. Distributed in that two or more facilities, such as factories and offices, were located in different places, yet had to communicate with one another. For this discussion, these organizations are called computer network *users*.

A problem immediately presented itself to the network providers: The users' computers were manufactured by different vendors, such as IBM, Honeywell, DEC, and UNIVAC. Each had a different method (a different protocol) for sending and receiving data between distant points. Thus, the builders of these emerging computer networks faced a formidable problem of providing support for scores of different vendors' machines and protocols that were connecting to their networks. The idea is shown in Figure 1. The *user-network interface* (UNI) varied among the vendors. IBM's computer communications "language" (its protocol) was not the same as DEC's "language."



**Figure 1. Origins of the network cloud.**
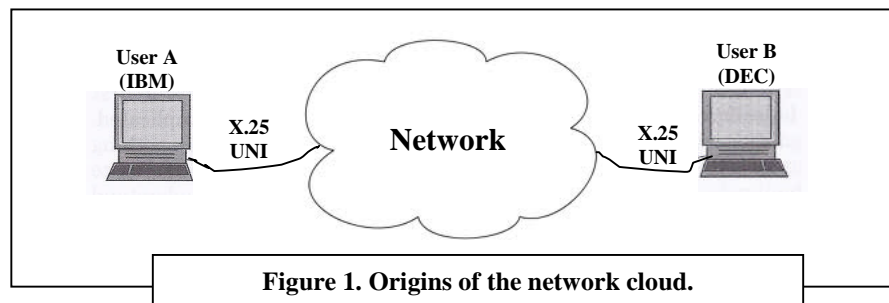
The problem for the network providers was akin to a delegate-to-United Nations (UN) interface: supporting many different languages. But what if the network providers (the UN in this analogy) could convince the network users (the delegates in this analogy) to speak the same language (English, for example)? If the UN members agreed (and many did), the interface problem would go away. This approach would free the network provider from taking on the cost of providing a language interpretation service (in network words: a protocol converter) between what might be hundreds of different computer network "languages."

Just as was done in the UN, with many delegates agreeing to use English, that is what happened with the emerging data networks. Working in conjunction with the (now named) International

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[1] Image of cloud in thought cloud on cover is courtesy of Google.

Telecommunications Union, the network providers developed a standard for a user network interface protocol (a UNI). The computer vendors embraced it. The protocol was named X.25.[2]

*As shown in Figure 1, a cloud image was used to convey the idea that the users of a network were not concerned with the operations of the network itself. They were provided services and did not care about how the services were provided. The complex details inside the network cloud remained out of sight and out of mind. The principal requirement placed on the users was to agree to use a common language (protocol) at the UNI for "talking" with the network cloud (the network provider).*

The older clouds' principal responsibilities were two-fold:  First, they checked if the users were using the correct (standard) protocols at the UNI. Using a postal service analogy for this discussion, the operation was similar to the post office making sure an envelope was properly sealed, in good shape, and the addresses understandable.  Second, they isolated the users from complex routing problems that took place inside the cloud to transfer the traffic to the proper destination.  Again, the postal service does not burden us with how our letter is transferred through its "cloud" to the final destination.

These older network clouds did not offer the services that modern clouds do, such as backing up user files, storing user address directories, furnishing a word processing program, etc. Nonetheless, the italicized print above also applies to the use of today's modern Internet "cloud," but one with more services

Figure 2 expands on the cloud idea. The Internet is a network of millions of networks (clouds, if you will). They are connected with agreed-upon languages (protocols). But the common language is no longer X.25. It has been replaced with the Internet standards, commonly called the Internet Protocol (IP) suite.[3]

For clarification, the World Wide Web and the "cloud" are not isolated networks unto themselves. They are an assemblage of millions of computers, operating within their own networks. For example, Google is a website and a network---the Google cloud---that operates within the confines of Internet protocols (and other conventions). Nonetheless, when using Google, a Dell PC can communicate with a Toshiba smart phone because all manufacturers use the same protocol suite for sending and receiving files and emails.

The user pays for cloud services. The fee may not be in dollars, although many users pay a fee to an Internet Service Provider (ISP), such as AOL. for access to the Internet. The user may be subjected to advertisements and having the user's information potentially exposed to examination. In return, the users do not have to be concerned with the troublesome details of making sure their movies of mom and dad, their family photos, etc. are not lost to a computer crash. The cloud provides the back up.

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[2] In 1990, the IEEE Computer Society asked me to write a book about X.25. Beginning in the mid-1970s, X.25 had become the preferred method (protocol) to define this common way of "speaking" to a data network. I wrote *X.25 and Related Protocols* (1991). It is antiquated now, but X.25 systems can still be found…hanging on because it is a software pain in the coding to get rid of them.

[3] The Internet Protocol (IP) suite encompasses thousands of Internet standards and millions of Internet implementations of those standards.

In essence, services that have normally been embedded into user machines are moved out of these machines into machines that belong to a network cloud provider.

### The Internet
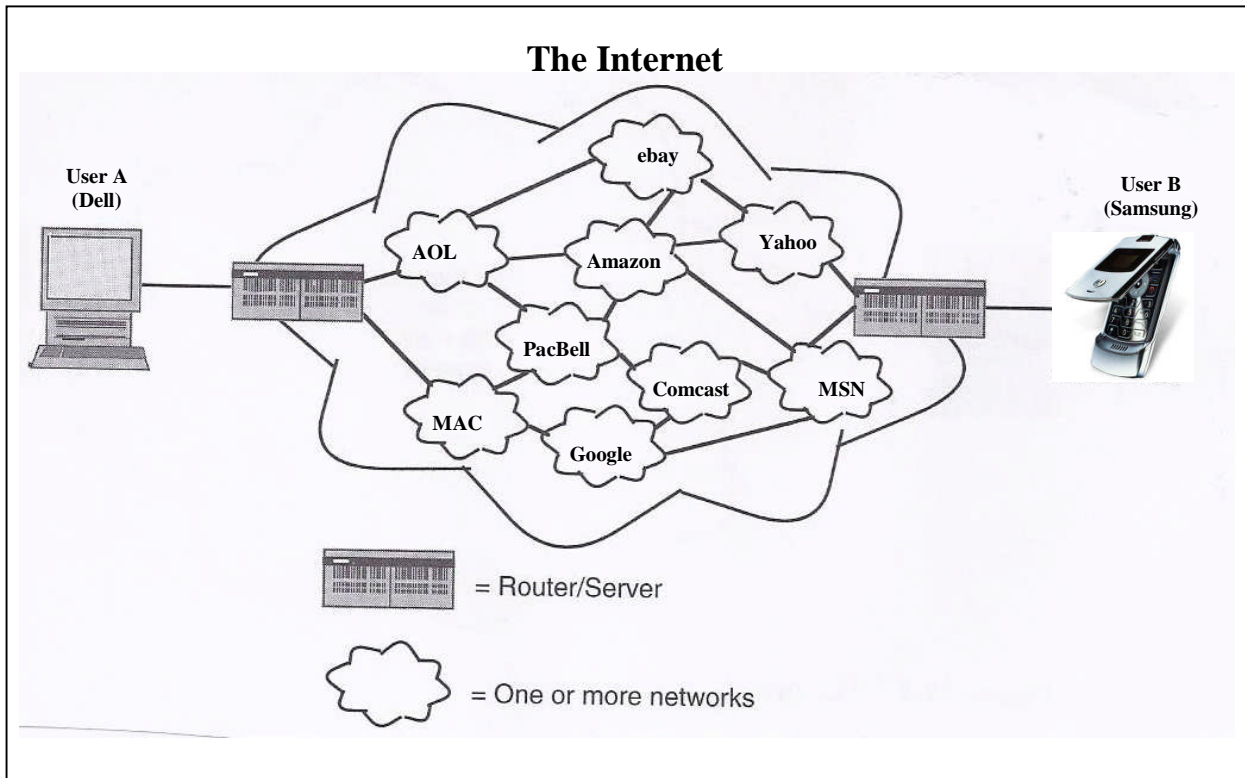


Even more, users increasingly do not have to worry about keeping their Word, Excel, Adobe, and PowerPoint applications up to date. The cloud will likely (and eventually) provide support for almost all applications. Thus, the user is granted isolation from the details of backup and recovery, as well as keeping applications current to the latest version. It is possible (probable) that these kinds of applications will not reside permanently in user machines. They could be downloaded from a cloud each time a user wishes to use them.

What does the user lose? Privacy (possibly). Loss of control. Dependency on someone else. These losses may not be of importance to some users. However, they are important to me. I do not use cloud services. I do not want my family photos, personal emails to loved ones, tax returns, etc. stored and cared-for by strangers.

But my bias stems from rolling-my-own for many years. For general, non-technically oriented users, the cloud notion is a good idea. Furthermore, many companies are moving to use public clouds with the goal of reducing the overhead of maintaining their own private clouds. The computers and personnel needed to maintain a company's data files can be very expensive. The cloud concept offers economies of scale: A system designed specifically to support many users' data.

**Convenience vs. Loss of Control and Privacy**

In any case, my preferences for control and privacy are going the way of hard copy books and bookstores. If you stand in my corner on this issue, you will be in the same boat as I: forced to use the cloud. That is, forced to use services that will no longer be embedded into our computers, tablets, and phones.

Still, if I decide to move toward social networking and texting, Apple's iCloud is enticing. I can use an iPhone, iPad, an Apple PC and let the iCloud take care of syncing my machine's systems to one another; of taking care of those troublesome software upgrades, not to mention backups. The same idea applies to Google's cloud and Android devices.

But there are troublesome aspects to this evolution to cloud dependency. Here is one example:

> Did you know that you can no longer sync your computer's calendar or address book with your Apple phone or tablet over cable? Starting with this year's version of the Mac operating system, Mavericks, you can sync them only wirelessly and only through an iCloud account.[4]

The same sort of no-option features are appearing in other vendor products. Windows 8 from Microsoft makes it more difficult for users to obtain some services unless a cloud account has been established.

But more disturbing, at least in relation to privacy, is the fact that the U.S. Government can tap into these public clouds. And it has done so. Companies, such as Google and Verizon, have had to turn over billions of records to Uncle Sam under Section 702 of the FISA Amendments Act of 2008. Yahoo attempted to resist but was threatened with fines, and also lost an appeal before a special court.

**The Cloud will Dominate**

The Law of Creeping Momentum is taking hold. As time passes, users will gradually witness more services being moved to the cloud. Slowly, our options will be curtailed. Eventually, the machines we use, be they phones or tablets, will be empty hardware vessels, waiting at the dock to be loaded with the vendors' software and services.

Unlike some cloud services today, rest assured those software and services will not be free. The user will pay a fee for the cloud's clout, or will be required to watch advertisements before the cloud grants the user access to his/her *own* information.

Today, almost all advertisements can be turned-off by clicking a cancel button. As the Law of Creeping Momentum gains hold, those cancel buttons will---ever so incrementally but with certainly---disappear from our screens. We will be forced to watch the advertisements in order to proceed to perform the task that led us to logon on in the first place.

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[4] David Pogue, "The Curse of the Cloud," *Scientific American*, February 2014, 28.

## The Cloud, Part II

**February 16, 2014, September 7, 2014**

Since posting Part I of this article, I have received feedback from a number of readers informing me the so-called cloud is not quite so mysterious anymore. That is good news. The bad news is that I may have done my readers a disservice by inadvertently implying the emerging public clouds (such as iCloud from Apple) take complete care of your email, videos, and photos. They do not.

I did state that these clouds offer backup of users' data, and some of my readers may have inferred that the clouds protect their data from hackers. They do, but only to a limited extent.

The watchwords are: *If you use a public cloud (again, such as iCloud), make certain you are remain diligent in creating and keeping secret your user ID and password to access your files that are stored in the cloud. The cloud is not able to secure your files if you do not secure them yourself.*

Case in point: The iCloud stores customers' data. As Apple candidly explains, it does not do any double checking of people who are accessing the data, because it places the responsibility onto the user. If the user does not use a solid password and user ID, the user is more vulnerable to being hacked.

Nonetheless, I suspect public clouds such as iCloud are going to be attacked more often than the clouds that reside in our smart phones and computers. Yes, your personal system, with Wi-Fi, an Internet connection, Blue-tooth, Cable TV/or DSL is a "cloud." It is a personal cloud over which you have control.

The organizations that run public clouds provide their customers with easy-to-read tutorials on how to create passwords and user IDs. If you decide to use one of these services, make certain you read and adhere to these simple instructions.