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Cloud Computing - An Ephemeral Concept

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Cloud computing has been around for quite some time. It just wasn't called Cloud computing until recently. Although, the term "Cloud Computing" is relatively new, references to "Cloud Computing" can be found as early as the mid-90s. But the term seems to have become popularized sometime in the mid-2000s. In 2008, Steve Jobs of Apple fame, developed his vision of the cloud as a "digital hub for all your digital content". His idea was that a person's digital content (pictures, documents, videos, music) would be stored on a remote server, managed by a trusted company, making that content available for that person to use on any device, anywhere, anytime.
The "cloud" is really just a metaphor for the Internet. It goes back to the days when engineers made presentations that referred to the internet, they pictured the large amorphous infrastructure of the Internet as a puffy, white cloud. This cloud would accept requests for data and provide information and answers. If you are wondering if you ever use Cloud Computing, think about this. If you have ever searched for a gift on-line, ordered it from Amazon, and tracked its progress using the supplied tracking information, you were doing Cloud Computing. You were using applications hosted on someone else's server to accomplish your task.

In the simplest terms, cloud computing just means storing and accessing data and programs over the Internet instead of using only your computer's hard drive or local storage. When you run programs from your local hard drive and store the data on your local hard drive you are doing local computing. Everything you need is physically close by. Local computing is how we have functioned for many years and it has some obvious benefits, like speed, but cloud computing expands your computing reach beyond your local resources.

So, if the cloud is really the internet, let's look at a brief history of the internet. The internet had its beginnings in the development the ARPAnet network that was funded, in the late 1960s, by an agency of the Department of Defense, Defense Advanced Research Projects Agency. DARPA is responsible for the development of new technologies for use by the military, but in this case non-military commerce has greatly benefited. Some brief technical considerations shows that the internet has no real structure, there are no plans or schematics that define the internet, only the implementation of packet switching and an agreed-upon set of communications protocols, called TCP/IP. Packet switching is a digital networking communications method that groups all data messages, regardless of content, type, or structure, into uniformly sized packages or packets. TCP/IP provides the protocols that specify how data should be formatted, addressed, transmitted, routed and received at the destination. Packet switching and the use of TCP/IP is what makes the internet so

amorphous and yet extremely resilient. Amorphous in that you do not know what path a packet will take to get to its destination, and resilient in that if part of the network is unusable, the packets will go via alternate routes. A complete message will consist of from one to many packets. A complete message can be reconstructed when all the packets are received because the packets include the address of the intended receiver, the address of the sender, the body of information, and a set of check characters used to prove the correctness of the received data.

So because the cloud is really the internet, we all have been doing cloud computing for quite some time and we didn't even know it. Google searches, email, Netflix movie streaming, Carbonite backup, Pandora music, YouTube videos, Facebook sharing, Twitter tweeting, and Google Earth mapping, are all examples of cloud computing. Once the internet was established as a communications pathway to anyone who could operate a personal computer, commerce began to take advantage of its reach. Think about the reach of the highway system in the 60s and 70s. The highway system brought people and commerce together. Shopping malls were easy to get to and they became the place to purchase goods. Now with the internet, people can visit (cyber) stores without even having to use the transportation highways (though the products do have to be delivered and that must be done over the highways). Commercial establishments have built large websites to accommodate the large number of people attempting to use the internet for these commercial activities. Some websites were set up just to search out information that was available from other websites. Does Google come to mind? Other websites were developed to provide the communications capability that has become email. What would we do without email? Still others like Facebook and Twitter provide a forum for social interactions. Many websites were developed to provide the news that would normally be sent to people by the newspapers, and so news websites and news readers became available. Financial institutions realized that they could interact with their customers via the internet and so they created financial websites. Financial websites give the user instant access to their financial information and allow them to buy and sell financial instruments from their home computer. I'm sure you could come up with many more types of internet websites. The last time I looked, there were over 800 million websites connected to the internet. That's a pretty big cloud.

The point of all this is that websites are hosted on computers.

Website computers provide the Server portion of the Client –Server operation. (Your browser provides the "Client" side.) Large websites are not hosted by a single computer. Large websites may employ a network of hundreds of computers. So the bigger the website, the more computers are needed to host that website. The need for these networks of computer servers has evolved into website companies building large "Server Farms". These server farms may have hundreds, if not thousands, of computers networked to act as website servers. Many of the companies with large server farms have set aside a portion, of their cloud, for use by the public. Typically, the first small amount of storage (3 – 7 GB) is free, with larger amounts at a cost. Think, iCloud, OneDrive, Google Drive, and Dropbox.