Net Neutrality: Who will control the Internet?
Part One: The Small Players

You and your neighbor, Joe, use the Internet. Joe logs-on to the Net (as it is called) to play video games and watch movies. He is on the Net for many of his waking hours. In contrast, you occasionally logon to the Internet to send and receive emails and photos. By virtue of the Internet being a shared resource, Joe is using more of a community pool than you. Video games and movies consume considerably more of the Internet's capacity than email and pictures.

The two of you are paying close to the same amount of money to use the Internet. At first glance, this arrangement is of no consequence. What do you care about Joe's couch potato's habits? With only Joe and you in the neighborhood using the Net across those shared "telephone" lines, you are not aware of this unbalanced sharing of Internet *bandwidth* (the term used to describe Internet's capacity to support users' traffic).

But it is not just Joe in your neighborhood who is, as the Internet geeks say, "hogging bandwidth." Other neighbors, such as Jim, John, and Jane are watching Netflix movies. During times when your neighbors are enjoying "Avatar" and such, you notice it takes longer, much longer, to send and receive your email and photos. Why? Because your neighbors (and millions of other Internet users) are consuming more bandwidth than you.

Yet your neighbors Joe, Jim, John, and Jane are paying-out roughly the same amount of money each month as you do for Internet usage. Is that fair? Their life-styles affect your life-style. Does that make sense? Let's explore this issue in a bit more detail. In so-doing, we will reveal the mysteries surrounding this unrestricted practice. It is called Net neutrality.

The issue of Net neutrality is a prominent topic in the news. The legacy of unrestricted and relatively free use of the Internet is breaking-down. This issue and its resolution will affect every user of the Internet, including companies and individuals. According to the International Telecommunications Union, 81 percent of the United States adult population (called end-users in this article) logs-on to the Internet.

Rulings and legislation on Net neutrality are coming forth from Washington, DC. The FCC and Congress, with the courts refereeing, are debating if companies who transport emails, movies, phone calls, and other images through the Internet can create and enforce rules on how this traffic is delivered. General discussions and findings have been made available for public comment. The FCC anticipates having its final rulings in place by the end of 2014.

In a nutshell, what comes forth from the FCC will affect how companies and individuals use the Internet. The FCC will determine if the consumers of Internet bandwidth will have to pay more for using additional bandwidth. The FCC rulings might also determine if the Internet will be restricted in how it is used, such as giving Joe higher priority for watching "Avatar" than for your sending a photo to a friend. With 81 percent of America's citizens using the Internet, this issue is not a trivial matter.

These potential restrictions raise many questions, some of which run counter to the legacy of the relatively free use of the Net. The issues are complex and bring up scores of legal, technical, social, and political questions. Notwithstanding these complexities, the issues boil down to: *Who will control the Internet?* Here is a summary of the issues, using Joe and you as example guinea pigs:

- Possibly giving *precedence* to Joe's video traffic over your photo traffic: Discriminating between different *types* of traffic.

- Possibly *slowing* the delivery of one party's traffic (your photo), but speeding-up the delivery of traffic from another party (Joe's movie): Discriminating between different *users'* traffic.

Net neutrality means the companies that provide Internet services (an *Internet provider*), such as Comcast, Netflix, Google, Verizon, and AOL, treat *all* traffic on the Internet the same way. There is no discrimination based on traffic from a company or an individual. There is no discrimination on the amount and/or type of traffic sent through the Internet. This means all individuals and organizations have equal access to the Internet's bandwidth.

The allocation of bandwidth is based on the traffic itself. Joe's Netflix movie gets more bandwidth than your email, but you and Joe generally pay the same fee to use the Net's bandwidth. (Exceptions exist, and Internet providers have different rates. I am working with a general model for this article.)

Historically, the Internet has been neutral to these issues. From its inception, the design has been that of a best-effort delivery service for any kind of traffic, regardless of the sender or receiver(s) of the traffic. Some exceptions exist, such as flow-controlling traffic to prevent saturation and network congestion, but this kind of discrimination has been applied to all traffic, regardless of its diversity. In addition, managing traffic has been a simple task, because Internet traffic traditionally consisted of short email messages or file transfers of modest sizes.

Not so today. Long gone is the Internet that once transported only end-user emails and small files to people sitting at semi-teletype workstations. Today, these applications must share the Internet's bandwidth with interactive games, movies and TV shows, photo downloads, and phone conversations. Indeed, traffic diversity and varying requirements for this traffic are a big part of the Net neutrality issue.

The problem with unrestricted use of the Internet's capacity is that your neighbors and you (and millions of others) are sharing a finite resource (the Internet's bandwidth). One reason (and a common occurrence) is that you are sharing a physical channel with your neighbors, such as the telephone line or TV cable running through your neighborhood (as well as servers and other machines). As mentioned at the introduction to this article, your neighbors' hogging of this shared bandwidth is being done at your expense. It this arrangement fair? That is a major aspect of the Net neutrality debate.

The next part in this series will explore this question in more detail.

Net Neutrality: Who will control the Internet?
Part Two: The Big Players

In the previous article about the subject of Net neutrality, the idea was discussed about the possibility of your paying more than your neighbor Joe for using the Internet. We covered the idea that Joe might not be paying less in money. Rather, he might be using more of the Internet's common pool of performance, one shared by all: its capacity, its bandwidth.

We explored the unpleasant fact that Joe might be stealing your rightful part of this bandwidth. In so doing, Joe might rob you of your ability to send a photo to someone within a reasonable tine. He might also deny you the bandwidth you need to logon to Netflix to see a movie. He is a pain in the, forgive the French, bandwidth ass. But why should he care? He is paying about the same to use the Internet bandwidth as you are.

With the first article in mind, let's move to other aspects of this vital issue. Vital, in that 81 percent of America's population will be affected by what is decided in DC about Net neutrality.

Much of the confusion about this issue has come about because the media, Congress (and even the FCC) have not clearly and consistently identified the different companies who have billions of dollars riding on the FCC rulings, the big players in the Internet game. The names and functions of these institutions are summarized below to clarify their roles in supporting you and me…and Joe.

For the remainder of this article, keep in mind these companies have different skin in the game than an individual citizen. Some of them are adamant in wanting to do away with Net neutrality. They want to charge Joe, you, and me for the amount of bandwidth use. Ironically, some of these organizations are fearful that they will also be charged for bandwidth use by other providers. Let's delve into a bit more detail. In so doing, we will address the fundamental issues of Net neutrality.

- The channel provider: Controls the physical media (Such as the local telephone company that owns the telephone wires running through neighborhoods).
- The content provider: Provides the information that is placed on the physical media (Such as Netflix and Facebook).
- The service provider (the Internet Service Provider, ISP): Provides the Internet user with the ability to log-on to the Internet to exchange content. AOL comes to mind, but like many ISPs, AOL is getting into the content business, which leads to one of the key components in the Net neutrality debate.

And here is where it gets dicey:

- The multi-function provider: Provides a combination of the three basic services. An example is Comcast.

The problem facing the FCC and the providers listed above deals with the fact that only so many companies can be a physical channel provider. For example, it makes no sense to lay multiple telephone lines in a neighborhood. Consequently, content providers, such as Netflix,

Google, and Facebook are dependent on the companies that own the physical links. Of course, so are individual users.

To amplify the "dicey" nature of this issue---dicey for end-users, content providers and traditional ISPs---traditional channel providers, such as Frontier Communications and Comcast, have evolved to become multi-function providers. Consequently, if a channel provider who owns the wires, cables, and cellular phone channels of the Internet also becomes a multi-function provider, the "pure" content providers who do not own physical channels might not be sleeping well at night. After all, the multi-function competitors also own the wires the content providers must use.

Who is to say that a multi-function provider, such as Comcast, might favor its distribution of movies over that of another movie distributor, such as Netflix? After all, Netflix is forced to use a multi-function provider's channels, as it owns no wires or cables. Netflix might have its video traffic throttled by Comcast, so that Comcast's video would be of higher quality. Mind you, I am not accusing Comcast of this dastardly deed. I am presenting an abstract but apt scenario of one Net neutrality issue.

Given this environment, the company that controls the Internet physical channels has a different opinion about Net neutrality than a company that does not own this media, but uses it.

If Net neutrality is eliminated, end-users will be dependent on the Internet providers described in this article. In one fashion or another, the Internet providers, especially the channel providers, who favor charging for bandwidth usage state that competition will keep prices down and performance high.

In the meantime, Uncle Sam is allowing these companies to merge and consolidate, which in my view, is eliminating the very competition they claim that will exist in the future. It is disturbing that the fees charged by cable TV companies to subscribers have outpaced the Consumer Price Index so much that the CPI looks like the tortoise and the CATV fees look like the hare. Metaphors aside, according to the Organization for Economic Co-operation and Development, the United States ranks 30th out of 33 developed countries in relation to the price and quality of 45 megabit-per-second (Mbps) service.[1]

Nothing in life is simple, including the Net neutrality debate. Let's return to the bandwidth hogging neighbor. Do you really want to encourage Joe's couch potato habits? Should he not pay his own way? Is he robbing you of your rightful share of the bandwidth? Don't you become a bit irritated when you try to download a picture and it is slow as rush hour traffic because of his 24-hour habit of watching "24"?

That is one side of the issue. It deals with the little players in the marketplace, Joe and Uyless---the ultimate end-users. The other side of the deals with the big players in the marketplace, the Internet providers discussed in this section of this report. Their continued merging and consolidation is *not* driving down or even keeping down the fees charged to end-users.

In its simplest terms, and using topical jargon, should certain parties be granted fast lanes on the Internet highway? Can others be placed in slow lanes and still receive adequate service to meet their needs? Should the users of the fast lanes pay more than the slow lane users?

Although it is too soon to make a judgment on what the FCC will do, it appears these questions will be answered in the affirmative. If so, the next question goes to the crux of the Net neutrality debate: Who will control the traffic on these lanes and their associated pricings?

[1] Haley Sweetland Edwards, *Time*, August 4, 2014, 39.

It is a dog fight in relation to the future of the Internet. The rulings of the FCC, Congress, and the courts will be vital to all Internet users. The Internet providers described in this article are lobbying the FCC based on their interests and those of their stock holders. They are not lobbying the FCC based on their interests in the individual citizen. We should be paying attention. Let's us hope that the FCC is.

As these issues are argued during the next few months, it is certain the Internet channel, content, and service providers are going to follow that great human tradition: "What's mine is mine, and what's yours is up for grabs."