

Economic Policy Vignettes

The Center for Business and Public Policy
November 2007

www.msb.edu/cbpp

Managing the Network? Rethink Prices, not Net Neutrality* by Scott Wallsten

Recently the AP reported that Comcast "actively interferes with attempts by some of its high-speed Internet subscribers to share files online..." Comcast responded, in the same story, by saying that it uses "the latest technologies to manage our network to provide a quality experience for all Comcast subscribers."

While this story immediately degenerated into a fight over net neutrality, economists' ears should have perked up. If network traffic needs to be "managed," then something is probably wrong with prices. Getting prices right--by charging heavy users for the costs they impose on everyone else, for example--would go a long way towards reducing the need to manage the network.

Not surprisingly, Comcast's actions and ambiguous responses set the blogosphere afire with claims that here, finally, was evidence that Internet Service Providers might violate net neutrality principles.

In a sense, they're right.

No ISP, backbone operator, or large content company can really treat traffic as identical bits flowing over a pipe. They have to deal with network congestion, viruses, spam, denial-of-service attacks and other issues. Only a small number of people place such intense demands on the network, but their actions can degrade performance for millions of others. One study, for example, found that about five percent of users generate more than 40 percent of all Internet traffic.¹

Comcast should have been more forthcoming in its response and should be more transparent about its actions. Even so, Comcast isn't the culprit and net neutrality regulations aren't the answer.

Instead, network congestion problems caused by some people's excessive use are a direct and predictable result of the all-you-can-eat pricing that nearly every ISP charges for broadband service.

* This piece was originally release through the Progress and Freedom Foundation and can be found at <http://www.pff.org/issues-pubs/ps/2007/ps3.12networkpricing.html>

We know that this kind of pricing gives people little incentive to pay attention to how much of the service they use. People whose electricity is included in their rent rather than metered, for example, may as well leave the lights on all day and keep their homes frigid in the summer and toasty in the winter. To be sure, some people conserve simply because they care about the environment, but most won't since they don't see any savings from using energy more efficiently.

It is often complicated to determine prices in network industries that have high fixed costs and low marginal costs--like broadband.ⁱⁱ

As long as the cost of sending an extra bit down the pipe is close to nothing, a flat rate for unlimited use is probably efficient. In that case, the operator must cover the fixed cost of the infrastructure, but it might not be worthwhile to monitor usage. If usage costs begin to increase, however, flat rate pricing may become inefficient.

Consider highways. If the road is relatively empty, an additional car imposes few additional costs. But as the road becomes congested, each additional car begins to impose costs on everyone else as traffic moves more and more slowly.

Policymakers have generally tried to deal with congestion by building more roads. A recent study by Clifford Winston of the Brookings Institution found that building more roads is not a cost-effective method of reducing congestion. Congestion pricing, however, in which drivers pay to use roads during periods of high demand reduced congestion at a much lower cost. That is, charging drivers for the costs they impose on others (such as in London's congestion charging zone), is a far more efficient use of resources than is building new roads.ⁱⁱⁱ

We may be moving into a similar situation on the information superhighway. For a time, there was little reason to worry about individuals imposing costs on others; there just weren't enough broadband subscribers or high-bandwidth applications. Even today, the vast majority of people use the Internet in ways that have little effect on anyone else. To put it differently, the roads are plenty big enough to handle most users' traffic easily. Some, however, send caravans of Mack trucks barreling down the highway with no regard for other--sometimes more important--traffic.

And why shouldn't the Mack truck drivers behave that way? They pay the same price as everyone else no matter how they use the network.

One problem with this arrangement is that light users end up subsidizing the heavy users. Grandparents keeping in touch with their grandkids are paying for a network that must satisfy World of Warcraft and file-sharing addicts.

This arrangement isn't just inherently unfair, it can create serious challenges for network operators. ISPs face several choices to keep their networks running smoothly. They can build bigger pipes. And indeed, ISPs are investing heavily in new infrastructure. They can decide how to prioritize packets, or "manage the network," as Comcast says. All ISPs likely have to engage in such activities to some extent. Or they could change their pricing models. So far, no large ISPs have taken this approach.

It's great that ISPs are investing in their networks. Internet traffic is growing, and the infrastructure needs to keep up. But investment should focus on maximizing overall efficiency, not satisfying select (albeit loud) users.

Problems with "managing the network" are practically self-evident. Consumers will rightly demand to know exactly what their ISPs are doing and how those actions affect the Internet. If providers are not transparent about their actions then calls for regulation might grow louder, as we see in the current brouhaha. And since the way networks are managed must change constantly in response to emerging threats, such regulations are likely to be complex and probably not especially effective.

ISPs have a third choice, however. They could price their services differently.

AOL famously moved from metered to flat rate pricing for unlimited (dialup) use in 1996. This arrangement proved to be so popular that no major ISP has offered any other type of plan since. Nevertheless, some industry observers are beginning to ruminate about a return to metering.^{iv}

Returning to some form of metered pricing would be consistent with other network industries, especially utilities. Electricity, for example, is usually metered. Some homes even have 'smart meters' that allow prices to change based on the time of day or based on total demand. Such pricing systems can help smooth out electricity demand and reduce the need to build new power plants.

Piped drinking water is also typically metered. Many water systems use "block tariff" pricing, under which users pay some low amount for the first block of water they use, more for the second block, and so on. If done properly, families who use little water do not pay much, but families who water enormous lawns every day of the summer will face substantial bills.

Broadband use could similarly be metered. One could imagine simple metered pricing, in which users pay by the bit. Alternatively, providers could develop hybrid plans in which metered pricing begins only after some very high level of usage. In that case, heavy users would pay for the costs they impose on the

network rather than being subject to what might otherwise appear to be arbitrary delays in their Internet traffic or threatening letters in their mailboxes.

ISPs know how much bandwidth their users use, even if they do not know what content is flowing over the pipes. Implementing new pricing schemes presumably would not be a technical challenge.

So why do ISPs stick with their current price model?

Perhaps the cost structure of the industry and the nature of demand still mean that flat-rate pricing for unlimited use is the most sensible approach. Maybe ISPs worry that consumers would reject metered pricing and punish any provider that offers it.

But new pricing models might have some additional benefits beyond allowing people to pay only for the bandwidth they use. Low income households, for example, may be more likely to sign up for metered service (perhaps even prepaid), just as they have for prepaid cell phone plans that charge by the minute.

I don't know the right way to price broadband. But as the market and industry changes, providers should take a close look at their pricing schemes. Charging users for the bandwidth they consume and thus for the costs they impose on the network could reduce the need for network management, mitigate calls for regulation, and increase efficiency.

ⁱ <http://arstechnica.com/news.ars/post/20070131-8748.html>

ⁱⁱ A great deal of research has examined pricing under these conditions. Carl Shapiro and Hal Varian discuss this issue in the context of the Internet in their 1998 book, *Information Rules*.

ⁱⁱⁱ Winston, Clifford. 2006. "The Effect of Government Highway Spending on Road Users' Congestion Costs." AEI-Brookings Working Paper 06-11.

^{iv} My colleague Adam Thierer, for example, has been ruminating about metered broadband pricing for some time. See, for example, http://blog.pff.org/archives/2007/09/more_on_meterin.html