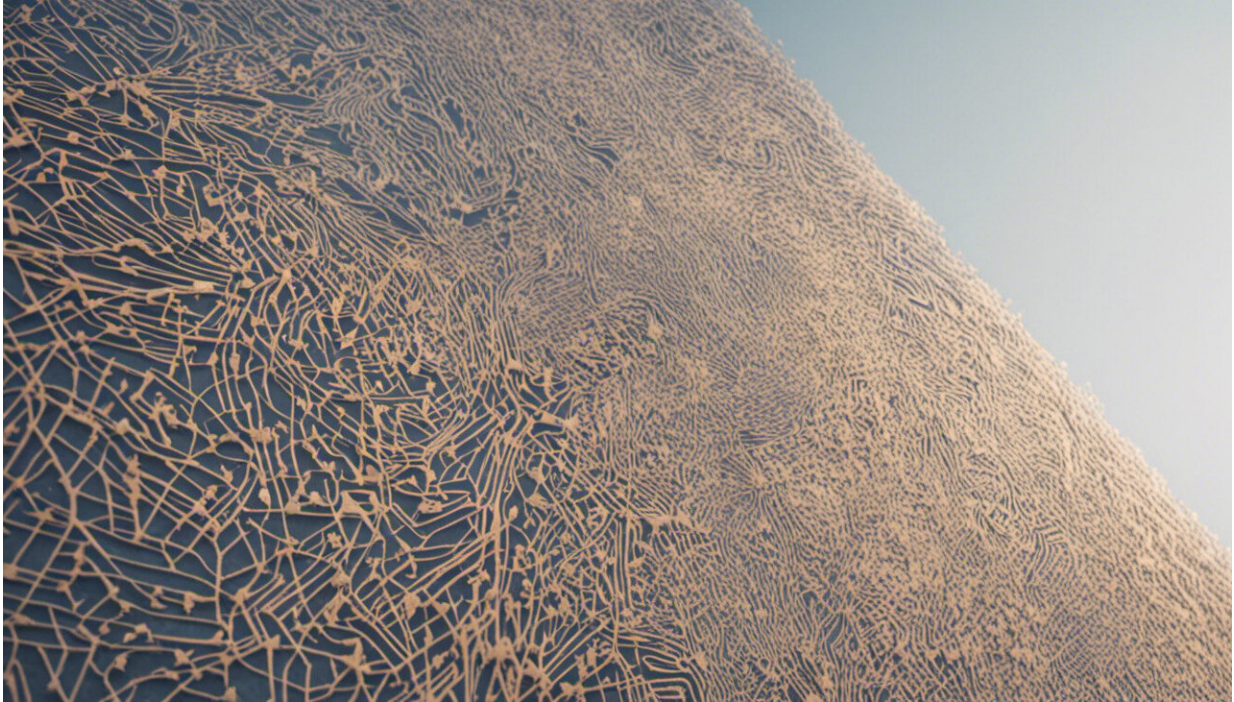


Whose Internet is it, anyway?

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Credit: AI-generated image ([disclaimer](#))

(PhysOrg.com) -- Last week, the new chairman of the Federal Communications Commission, Julius Genachowski, broke with precedent by proposing federal rules that enforce Net neutrality -- the principle that Internet service providers (ISPs) shouldn't play favorites with the traffic traveling over their networks.

Proponents argue that Net neutrality promotes innovation. If software

developers find more efficient ways to use the Internet, the argument goes, they shouldn't fear reprisal from ISPs that sell competing products. Broadband providers that also offer landline phone service shouldn't degrade the quality of Internet telephone calls in order to preserve their market share; the same goes for cable companies and Internet video.

But ISPs argue that they sometimes need to throttle back traffic sent by heavy users. Otherwise, they say, the network will become congested and slow to a crawl; thousands of casual users will pay the price for a few customers sucking up a disproportionate share of bandwidth. If they lose the ability to regulate traffic, the ISPs argue, they'll have to greatly increase network capacity — and their customers will bear the cost.

David Clark, a researcher in the Computer Science and [Artificial Intelligence](#) Laboratory who for most of the 1980s was the Internet's chief architect, has been following the Net neutrality debate for decades and spoke with the News Office about the FCC's proposed rules.

Q: In what respect do ISPs have a legitimate concern?

The Internet is not, in terms of cost for byte, terribly expensive, but neither is it free. You can find some numbers reported informally in the press, and I think the numbers are somewhat reasonable, that for a residential ISP to deliver another gigabyte of information to you, the cost in terms of the investment they make in facilities allocated to that gigabyte is about ten cents. So if I watch Internet television eight hours a day every day of the month, I'm probably generating several dollars in cost. It's not several hundred dollars in cost; it's several dollars in cost. But that's probably the ISP's profit margin.

Q: So what can the ISP do?

A while back Comcast announced that they were putting a monthly cap on their Internet users over the cable system. The cap they announced was 250 gigabytes a month. And nobody blinked, because that's maybe 50 or 100 times what the average Internet user was doing.

What if I said to you, okay, for \$40 a month, which is what most people pay today, I'm going to do something much more restrictive than what Comcast did: you can transfer 100 gigabytes? For \$50 a month, we'll take the cap off, and you can transfer as much as you want. For an additional \$10, would the high-end guys be willing to do that? A lot of people today pay a little extra to get a higher peak rate; many people subscribe to a premium version of Internet service. I think most people would say, if the high-end people are paying an extra \$10 a month, that's not burdensome..

People's fear in this space is that if we take one step away from the current pricing model of all-you-can-eat flat pricing, that the world will end. All of a sudden we'll be paying by the byte, which I think everyone understands will be a real inhibitor of experimentation on the market.

Q: But why is a usage cap any better than paying by the byte?

I was talking to somebody in a school district, and they said, look, we couldn't possibly afford a per-byte charge because some kid could come and get a program running on the computer and leave it running over the weekend and blow our entire year's budget.

I really think that's the point. The user at home wants to be protected from amazing overage charges. His computer goes into a loop, or it has a virus, and the computer has five days where it does nothing but splash data out full time, and you get a bill at the end of the month for \$5,000.

That's what terrifies everybody. But in the wireless space, many of the broadband services are fixed price with a usage cap, and the market deals with that much better than with a per-byte charge. Because nobody knows with an Internet application how many bytes it sends. Will this cost me a penny or a dime or a dollar? But they can average over a month. They look at the bill: I sent three gigabytes last month. The cap was five. Okay! They can deal with that.

The only question is, when usage caps come in, will they be done in a reasonable way, or will lack of competitive discipline allow ISPs to try things that are really pretty abusive?

Q: But given that many cable providers and phone companies are basically local monopolies, is there enough competition to provide that pressure?

As a rule of thumb, it's nice to see four or five competitors in a market. And we only have two wireline [phone and cable] in most markets. So you might say that two isn't really enough. On the other hand, when I watch Comcast and Verizon, in our serving area here, slugging it out on television with their ads, boy there's a lot of competition going on there. Just observing what I've seen on television, they believe that they're in a very competitive situation. Comcast just sent me a note that said, "We've upgraded your service." Why'd they do that? Because they're subjected to the pressures of competition.

Q: One of Chairman Genachowski's comments that's gotten a lot of attention is that Net neutrality rules will apply to wireless services as well. What do you see happening there?

Spectrum is more scarce than, say, the capacity on the fiber to your house. When you get into a heavily used cell where a number of people are trying to do bit-rate-intensive things, there are going to be real issues in managing that scarcity and allocating it. I quoted you a number of what it cost to do a gigabyte: that number applies to an Internet service provider that's large, that's got scale, and that's probably operating in a metropolitan or suburban area. People don't want to show you their exact business models, but I've seen situations that look like that number for a rural wireless provider was more like a dollar a gigabyte.

I think the thing we're going to debate in the wireless space is whether or not there are classes of behaviors that seem to be associated with classes of applications. Should those behaviors be limited? Whether the wireless guys will say, "Look, you just can't watch as much video as you want." And they can do that in two ways. One of them is, they can say you have a monthly cap of three gigabytes. Go crazy! You want to watch video, you can blow out your monthly quota in about two days. And then you're going to be cranky. Or they could say, we're going to block certain video applications. I'm in favor of a usage cap over application-specific discrimination. Because the usage cap really does reflect to some extent what the ISP's cost structure is. Give the consumer choice.

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