

Streaming video could strain Internet's capacity

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With a click on your Xbox, your Wii, your Roku or a fast-growing class of gadgets that stream Internet video, you've instantly brought Johnny Depp into your living room.

Netflix last week set a new pricing schedule that nudges consumers toward computers and away from mailboxes. So by tapping into the company's "play now" feature to watch "Alice in Wonderland," you swerve into a high-consumption [data traffic](#) lane.

For now that's no problem. The Net can handle the less than 2 percent of people online at peak hours who pump [Netflix](#) video to their TVs. That's even with Netflix traffic making up more than 17 percent of the data gushing around the Web.

Now imagine what might happen come Christmas, when the flood of electronics is unwrapped and plugged in, and perhaps 20 percent of us stream video off the Internet.

Few experts see the backbone of the Internet reaching gridlock anytime soon. Rather, they liken it to a lightly traveled interstate highway system where more lanes could be opened without much expense.

The trouble is the last mile of the Internet - the cable or telephone line to your house built for far narrower lanes of traffic.

Today it might be easy enough to watch a high-definition streaming

movie. But those local lanes could quickly become overwhelmed once all your neighbors sit down for marathons of "The Office" over the Internet.

More traffic may have just been routed that way. As Netflix increased its mail subscription rates, it introduced a cheaper online-only deal for \$8 a month.

A reaction came quickly. Level 3 Communications, the company that distributes Netflix Corp. videos, on Tuesday complained to the Federal Communications Commission that [Comcast](#) raised its fees to carry Netflix videos on its network.

"If you see a whole lot of people in that last mile trying to stream video, you could imagine them going, 'Whoa! Crap!' " said Dan Andresen, a Kansas State University computer scientist. "When that happens, things are going to have to change."

For now, Netflix users won't see higher fees because of Comcast's action. But the larger problem remains.

It could mean your Internet service provider might need to cap your consumption. They might raise rates to pay for improvements on that last mile. Or you could be introduced to a baffling choice of services depending on whether you want the Internet for e-mail and shopping, for online gaming, or to bring Hollywood movies to your living room.

That poses tough questions for commerce and public policy, for whether the future of home entertainment will remain the stuff of cable and satellite packages or be gleaned from the anarchic Internet.

Already, 24 hours of video is uploaded every minute to YouTube, and that service alone takes up 8 percent of prime time Internet traffic. (Like conventional TV, consumers spend most of their time watching Internet

video after they come home from work and before they hit the sack.)

"It's revolutionizing what's happening online," said El Amri Reda, president of Fox Web Creations in Kansas City.

His small firm creates and spruces up websites. And ever more of his work involves pushing streaming video. Sometimes it's a video host greeting a visitor to a corporate website. Other times it's the constant streaming of video advertisements to flat screens in hotel lobbies and medical waiting rooms.

While not long ago it was a whiz-bang novelty, Reda said, "video is everything now."

DVD players increasingly come crammed with electronics that can snatch programming from the Internet - from Netflix, Hulu, YouTube, iTunes and upstarts such as Ivi and Filmon.com - and deliver the content to your home screens.

Boxee, AppleTV and GoogleTV sell stand-alone gadgets to funnel Internet video or package their electronics and software directly into new televisions. Slingbox users have long recorded TV programming in their homes and then passed it to themselves over the Internet as they traveled.

A report by Internet network management firm Sandvine estimates that as much as 43 percent of peak Internet traffic is eaten up by real time entertainment, mostly streaming video. As that grows rapidly, it imperils the ability to pipe entertainment to neighborhoods.

Today, Internet service providers deliberately overbook their capacity. It's as if they have sold 500 seats on a plane that fits 75 passengers, but have been lucky because only about 25 ever show.

The beauty in Internet usage now is that most customers, content to send e-mail or look at news websites, don't come close to using the capacity.

"Home users are actually getting quite a deal, but the prices are built around an assumption that you don't run your network flat out," said Dan Wallach, a Rice University computer scientist. "If everybody used their full allotment of bandwidth, the Internet backbone would probably be fine, but the gear closer to the users would fall over and die."

For years, the biggest bandwidth hogs have been people using BitTorrent and other file-sharing programs to swap mostly pirated music, movies and TV shows. BitTorrent makes up almost 14 percent of all Internet traffic during peak usage hours.

Now, though, the streaming of video has surpassed that.

Experts note that all Internet traffic isn't the same. Some requires a large amount of bandwidth to move huge files such as movies someone might store on their computer - but such file transfers don't have to move that fast because the end user isn't watching them live.

Other traffic, like online game playing, hogs less bandwidth. But if your connection isn't speedy enough, your "Call of Duty" avatar could move so slowly he ends up in a digital pool of blood.

[Video](#) streaming brings a moving image to your screen in real time. But it's buffered - the data arrives to your home a little before it arrives on your screen. That uses bandwidth slightly differently from file downloads or online games.

So imagine different pricing of Internet service for gamers, for users of the popular online phone system Skype, for Netflix and Hulu fanatics.

"The story here isn't that the sky is falling, it's: Here we go again," said Tom Donnelly, co-founder of Sandvine, a consultant to Internet providers.

The industry is constantly shifting with changing uses of the Internet, and the variety of ways people use it, he said. As people look to use more bandwidth for different purposes, the controversial issue of "network neutrality" takes on new urgency.

"A neutral network is not necessarily a fair network," Donnelly said. "What you're going to have is a high level of inefficiency. Networks need to be managed. These are not self-regulating environments."

The [Federal Communications Commission](#) recently put off its December meeting by about one week, when agency Chairman Julius Genachowski is likely to tackle the issue of whether the government has the power to regulate broadband providers. The Obama administration has said it wants that power so it can prevent Internet service companies from giving special priority to different content.

For instance, a cable company might want to give Netflix top priority in delivering signals to homes in return for a fee from the video-streaming company. Critics say that could stifle competition.

So they argue for net neutrality, which would essentially keep the status quo where all traffic moves with the same priority. Critics of that position, though, say it could allow Netflix users to hog bandwidth while paying the same rates as their non-Netflix neighbors.

Others say the solution is fatter data pipes to our homes - a plus for consumers if it doesn't raise rates too much to pay for the upgrades.

Those Internet service providers, or ISPs, especially given that their

cable TV packages look less enticing as the Internet offers more competition, will want to capture more of the money that content providers such as Hulu, Netflix and even Google are pocketing.

"They want a piece of that action," said Wallach, the Rice computer scientist. "And they own the wires going into people's houses."

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