Videos have Net bursting at the seams
As Web's capacity nears its limits, debate rages over what to do next

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Those amusing YouTube video clips that Internet users send to friends gobble up large chunks of bandwidth and may cause the Net to crash, some elements of the telecom industry warn.

It's an admonition many dismiss as political posturing intended to dissuade lawmakers from restricting the freedom of phone companies to manage Internet traffic as they wish.

But no one disagrees that the Web's capacity is being pushed to its limits.

"We don't see anything catastrophic near term, but over the next few years there's this fundamental wall we're heading towards," said Pieter Poll, chief technology officer at Qwest Communications International Inc., one of the operators of the Internet backbones, which are the big pipes at the network's center.

The problem, Poll said, is that traffic volumes are growing faster than computing power, meaning that engineers can no longer count on newer, faster computers to keep ahead of their capacity demands.

A recent report from Deloitte Consulting raised the possibility that 2007 would see Internet demand exceed capacity. Worldwide, more users every day join the 1 billion people who now use the Internet. Popularity of bandwidth-hungry video makes far greater demands on the network than more basic applications like e-mail, Web browsing or even voice over the Internet.

"For some service providers," the Deloitte report said, "video-chat traffic already exceeds voice volumes, and given that a minute of video requires 10 times the bandwidth as voice, the threat to bandwidth becomes clear."

David Tansley, a London-based Deloitte partner, said that "so many business models assume Internet capacity to be ubiquitous and inexpensive that capacity isn't seen as a limiting factor in applications."

"Yet little thought is given to how infrastructure providers may be [enticed] to keep investing."

While the network was famously overbuilt during enthusiasm of the 1990s Internet bubble, much of that capacity is being used now or soon will be, Tansley said, and network operators are faced with making significant investment to expand capacity further to meet growing demands fueled largely by video applications.

"2007 may be the year of the tipping point where growth in capacity cannot cope with use," Tansley said.

The Deloitte report, along with comments earlier this month by a Google executive at a technology conference in Amsterdam about Web capacity problems, have been cited as...
examples why telecom companies shouldn't face new regulations.

Walter McCormick Jr., chief of US Telecom, the trade group representing dominant phone companies, wrote to lawmakers arguing that the need to manage capacity would be impeded if "network neutrality" legislation passes.

Backed by several consumer groups as well as large Internet enterprises such as Google, network neutrality legislation forbids phone companies from managing the network to favor one Internet user's content over another's.

Network managers need flexibility in order to provide needed capacity as demand grows, McCormick contends.

That logic is tortured at best, said Andrew Odlyzko, director of the University of Minnesota's digital technology center.

"It's posturing for political reasons," said Odlyzko. "The telecom industry opposes network neutrality and uses any pretext to fight it."

Having monitored Internet growth for a decade, Odlyzko said he sees parallels now to earlier plays from telecom executives. Nearly five years ago, when computer users started to hold voice conversations using Internet telephony, industry insiders fretted that bandwidth demands would exceed capacity, he said.

"Local phone companies started fighting Internet calling," he said. "They tried to get regulators to impose access charges on those calls. In a certain sense, what the industry said was plausible because the Internet was small at that time, compared to the voice network.

"If all calling had shifted to the Internet, it would've crashed the network. But that didn't happen. The shift took place more slowly. Today the giants like AT&T and Verizon carry most of their voice traffic as Internet protocol, and it's just a fraction of total traffic."

Telecom executives focus on possible broadband capacity shortfalls because of their heritage, said David Isenberg, an independent industry analyst who once worked for the Bell System.

"They want to manage the Internet as a scarce resource," Isenberg said. "Internet executives want to manage it as an abundant resource. It's a basic philosophical difference."

A major obstacle for telecom managers in planning future capacity needs is that much of the Web's video traffic is generated by individuals who send clips to friends.

This contrasts to the broadcast model, where one source sends the same program to many recipients, said Bill Kleinebecker, a senior consultant with Austin-based Technology Futures Inc.

"People's changing habits drive demand instead of just sending out TV channels," Kleinebecker said. "It's much less predictable."

A growing appetite for high-definition video is certain to keep broadband demand rising, he said, noting that even inexpensive digital cameras available to consumers increasingly have high-definition video capability.

While keeping ahead of bandwidth demand is challenging and expensive, it's not impossible, said John Ryan, a senior vice-president at Level3 Communications, which operates part of the Internet backbone.

"With appropriate continuing investment, the Internet is capable of handling any applications," Ryan said. "What we're starting to see is a distinction between those operators who have the capital to fund expansion and those that don't."

Any service degradation will be spotty and transient, predicted Ryan, who said that underinvestment by some operators may "drive quality traffic to quality networks."

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