

*P2P-Optimized Architecture Could Buy Time for Capacity Expansion*

# Comcast/BitTorrent Deal May Benefit All ISPs

By FRED DAWSON

The clash between Web video content suppliers and ISPs over surging bandwidth costs looked a little less worrisome as March came to a close, thanks to agreement on a collaborative effort between Comcast and BitTorrent to explore ways to mitigate conflict in the peer-to-peer realm.

The agreement between the top cable MSO and a leading supplier of P2P modes of distribution puts them on course to work with other ISPs, technology companies and the Internet Engineering Task Force to explore development of what was termed a “new distribution architecture” to enable a non-discriminatory, P2P-friendly approach to ensuring efficient delivery of rich media content.

“In the spirit of openness and fostering innovative solutions, BitTorrent will take the first step in enhancing our client applications to optimize them for a new broadband network architecture,” said BitTorrent co-founder and president Ashwin Navin. “Furthermore, we will publish these optimizations in open forums and standard bodies for all application developers to benefit from.”

The agreement, which elicited generally favorable responses from FCC chairman Kevin Martin and the other commissioners, clearly addresses the uproar in Washington over the legality of Comcast’s efforts to throttle congestion-inducing P2P traffic (see March issue, p. 10). But its larger significance might be to lead the way out of confrontation between content providers and ISPs over the infrastructure costs the latter are incurring as a result of the sudden surge in video traffic.

Comcast CTO Tony Werner acknowledged the time has come to join forces with rather than fight the P2P phenomenon. “This new architecture would enable many new and emerging applications and will be based upon an open, non-discriminatory framework that



*Tony Werner, CTO,  
Comcast Cable*

could interface with or support multiple technologies,” Werner said. “We believe that P2P technology has matured as an enabler for legal content distribution, so we need to have an architecture that can support it with techniques that work over all networks.”

Earlier in the month, at the TV of Tomorrow Conference in San Francisco, BitTorrent’s Navin moderated a panel discussion among players in Web video distribution where the looming clash between ISPs and content owners over bandwidth costs was a key point of debate. Citing a recent meeting with representatives from both sides in London, Jeff Richards, vice president of digital content services at CDN supplier VeriSign, commented, “This is a very contentious topic in Europe. In our [London] meeting ISPs were saying, ‘We’re under-provisioned to push the content you’re sending over our network, and we’re not positioned to double our capital spending.’”

On the content side, Richards added, some of the providers were saying, “It’s not my problem.”

Richards noted that in the U.S. three of four TV broadcasters have launched TV over the Internet and that 75 percent of those who have are using VeriSign’s platform with P2P, streaming and progressive download strategies. “There’s no resolution of where revenues are going to come from to cover the costs” of video-driven capacity expansion, he said.

While a move to standardize P2P interfaces doesn’t solve this problem directly, it does create a “non-discriminatory framework,” as Werner put it, where ISPs would be on safer ground when it comes to implementing controls over network-clogging surges in video traffic. “Reasonable and non-discriminatory” management of network resources is presently accepted as a legal right of ISPs in the U.S., although what that means remains to be determined in an ongoing FCC proceeding.

The need for some kind of standardized approach to using P2P as a mechanism for distributing high-quality video was stressed by Barrett Lyon, CEO of CDN supplier BitGravity, during the discussion in San Francisco. Noting his company could easily partner with a P2P supplier to add that mode of distribution to its portfolio, Lyon said he wasn’t ready to do that because “P2P on the Internet is not a successful model. It needs to be interpreted differently in protocols than it is today.”

Lyon’s point was the proliferation of many proprietary techniques developed by P2P suppliers leads to “different P2P platforms doing different things,” often causing disruptions to applications at the individual computer level and preventing any uniform approach to smoothing out congestion from the network side. “This puts ISPs in an adversarial position with P2P suppliers,” he said.

“Imagine if P2P protocols were integrated with the network protocol stack,” Lyon added. “P2P makes a lot of sense, but not with the protocols used today. As a CDN, we’re being paid to deliver content reliably to everyone. That’s the problem when it comes to using P2P.”

Ironically, as bad as P2P might be, streaming is worse with regard to the impact on network capacity, Richards noted. “Barrett’s point of having people come together and work this out is a good one,” Richards said. “Large ISPs are saying P2P looks like a better model

than too many users watching streamed video.”

But according to Cisco System’s latest projections, streaming is likely to become an ever more prominent contributor to the traffic load. Cisco’s Global IP Traffic Forecast issued in January predicts that while P2P traffic, measured at 63 percent of all consumer Internet traffic in 2006, will quadruple to over 5 exabytes (quintillion bytes) per month globally by 2011, its traffic share will drop to 43 percent. Streaming and downloads of video will jump from nine percent of consumer traffic in 2006 to 30 percent, or about 3 exabytes per month, by 2011, the report says, noting that overall consumer Internet traffic will grow at a compound annual growth rate of 42 percent, hitting 12 exabytes per month in 2011.

Such growth, of course, will leave ISPs no choice but to expand bandwidth, no matter what congestion-control techniques are applied. But at least a more rational approach to network management in the interim will help avoid the kinds of uncontrollable surges that have been putting everyone on pins and needles at a time when neither content owners nor ISPs have figured out how to generate sufficient revenues to cover the costs of all this video.

Presently, Richards noted, YouTube is registering annual revenues close to \$100 million, but the real costs of bandwidth might be twice that amount. “Off-loading the costs of delivering video puts huge strains on ISPs,” he said.

Advertising might eventually rescue everyone from this conundrum, but it’s not there yet.

“Advertising isn’t making money [profits for video providers],” said Tony Yi, vice president of business development at Narrowstep, a supplier of Web publishing and CDN services for providers of high-value video. “We need tools for our professional broadcasters to make money, because they can’t make it on advertising today.”

Obviously, video providers and ISPs alike must come up with business models that will help defray the costs of the traffic explosion now underway. From the ISP side one big opportunity yet to be exploited by most is the monetization potential of their portals with respect to both advertising revenues and revenues to be derived from creating an attractive location for video providers.

ISPs can do deals with content owners that guarantee quality and distribution to three screens, noted Joe Franzetta, executive vice president and general manager for the broadband TV unit at Tandberg Television, now a part of Ericsson. “We have a lot of discussions with ISPs,” Franzetta said. “The smart ones understand there’s real opportunity here to develop services that users want and to aggregate eyeballs for content suppliers.”

#### More Attractive To Broadcasters

Such deal making is likely to become more attractive to TV broadcasters and other video providers as ISPs move to support delivery of Web content to the TV. But there’s a catch, insofar as, in Cisco’s evaluation, that will only serve to drive the traffic volume higher. Cisco predicts that by 2011 Internet video traffic destined for the TV will increase by a factor of 12 over current rates, accounting for 10 percent of all Internet video traffic by that time.

And that, says Cisco is just the beginning. In what the company calls a second wave of video traffic growth in the 2010-2015 timeframe Internet-to-TV video traffic will surge dra-

matically, though the company doesn't say by how much.

Comcast is at the leading edge when it comes to preparations for not only accommodating capacity increases, but creating revenue streams to support them. Its aggressive expansion of portal-based business models tied to aggregation of content and the shift of video-on-demand TV content into the broadband pipeline are closely linked to its commitment to introduce 100 megabit-per-second or higher broadband service via the DOCSIS 3.0 wideband platform (see February issue, p. 1).

Reiterating its plans to reach "up to" 20 percent of its customer base with wideband technology by year's end, Comcast also said it was expanding upstream capacity. "We plan to more than double the upstream capacity of our residential Internet service in several key markets by year end 2008," said John Schanz, executive vice president of national engineering and technical operations at Comcast Cable. "We plan to take advantage of multi-carrier technology to further increase upstream capacity for all of our broadband customers in advance of the full DOCSIS 3.0 roll out."

As for the traffic management techniques to be used going forward as the P2P architectural discussion advances, Comcast said it would migrate to a method that is "protocol agnostic" by the end of the year, which is to say, by that time, when it comes to controlling congestion, it won't single out particular suppliers as it had been doing with BitTorrent and another P2P provider, Vuse. "This means that we will have to rapidly reconfigure our network management systems, but the outcome will be a traffic management technique that is more appropriate for today's emerging Internet trends," Werner said.

"We have been discussing this migration and its effects with leaders in the Internet community for the last several months," he added, "and we will refine, adjust, and publish the technique based upon feedback and initial trial results."

BitTorrent sounded an understanding note with respect to the procedure Comcast has been using to target P2P streams, which, according to industry insiders, is based on deep-packet inspection technology supplied by Sandvine. "While we think there were other management techniques that could have been deployed, we understand why Comcast and other ISPs adopted the approach that they did initially," said BitTorrent CTO Eric Klinker.

Kevin Martin, however, was less accommodating. While welcoming the deal and Comcast's commitment to move away from the targeted approach to avoiding congestion, he voiced concern "that Comcast has not made clear when they will stop this discriminatory practice."

Martin added: "It appears this practice will continue throughout the country until the end of the year and in some markets, even longer. While it may take time to implement its preferred new traffic management technique, it is not at all obvious why Comcast couldn't stop its current practice of arbitrarily blocking its broadband customers from using certain applications."

But regardless of whatever regulatory battles lie ahead, there may be greater hope now than ever that ISPs and content providers will be able to pursue a more rational course as

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they try to cope with the costs of making the Web video proposition a winning one for all concerned. Without such a course, the burden of surging traffic loads could prove too much for the market to handle. ■