

A View from the Edge

Howard Greenfield suggests that CDNs are like the tireless pioneers who first ascended the world's highest peaks. That must make Akamai's Tom Leighton Chief Sherpa.

In the last issue of *IP Television* we discussed how yesterday's 'dumb pipes' are giving way to intelligent cloud services and driving a new online video brokerage.

One calling of today's Content Delivery Networks (CDNs) is to bridge network hub and router hops to provide a seamless Internet media experience. Like sherpas - the tireless pioneers that first muscled up Everest and K2 - CDNs are today's super-porters of new media.

The only difference is that instead of going sky-high, CDNs increasingly take their cargo *wide*. That is, to support services like Netflix and iTunes, they must bring high-definition and high bit-rate streams to the edge of today's tangled networks to carry programming to mass audiences.

They are becoming centre stage because storing and pushing bits across digital networks is a major growth business. With 28% compounded annual growth through 2015, the video CDN market alone is expected to exceed \$1 billion in 2013.

Making this happen requires scalable, reliable pipes when it comes to events such as the World Cup and the Royal Wedding that can generate up to 2Tbps of content. Akamai believes that as devices, premium content, and consumer behaviour shift to online, we'll see a thousand-fold spike in the years ahead.

"Most CDNs out there today work on the principle of having a large number of servers and a very *small* number of data centers," says Akamai chief scientist and co-founder Tom Leighton (above, right). "Then they load balance across the data centers in their attempt to deliver the video. This can work well if you're not at a very large scale and the user is close to the data center."

Mobility is another content catalyst. YouTube, which receives 35 hours of UGC content uploads each minute, serves over 200m mobile device views every day. And, as Google's \$12.5 billion bid for Motorola Mobility in August showed, mobile is the platform of the decade. By 2014, over two-thirds of all mobile traffic will be driven by video, with over 15 billion connected devices reachable worldwide by 2015.

And though for years making money from broadband video distribution has been elusive - the holy grail according to Google's Eric Schmidt - the cash flow is finally kicking in. "Now that there is real money in mobile," writes *Streaming Media* blogger Dan Rayburn, "bad performance is a more painful problem that hits revenue numbers and corporate profitability."

Many organisations have created their own network. Yahoo!'s can handle up to 500 thousand simultaneous streams. "We wanted a 50 millisecond latency from every data center in every streaming path," says Arjun Saxena, Yahoo!'s lead video platform product manager. But building your own delivery system comes with its own issues.



"Complexity comes with scale," says Saxena. For instance, invasion by pirates has dogged their efforts, as anonymous content uploaders to the Video.yahoo.com UGC site have exploited services and bandwidth to stream unlicensed content. "That was hitting us quite a bit - five to ten per cent of

our traffic - so we didn't know if we'd continue, or if we should block them."

It goes with the territory according to Leighton - which is why they maintain 90,000 servers in over 1,800 locations and 70 countries. But by managing content from thousands of strategic edge locations (instead of a centralised data center) Akamai claims they achieve increased throughput, sustainable bit rates, as well as lower packet loss and rebuffering—all resulting in a higher quality media experience.

Another reward is economy of scale. "A lot of effort goes into reducing the cost of video delivery because the industry as a whole is under pressure," says Leighton, who believes that the path to greater revenues for content providers will be created by greater network efficiency.

One of those content providers, Apple renewed its contract with Akamai in January to deliver all its iTunes media. It has also been reported that Akamai is behind Apple's new iCloud data and media storage services.

Leighton sees several trends pushing CDN's to the edge. Changing interactive video consumption habits at home and on the move, and the proliferation of devices are creating both challenges and opportunities. "There is potential for a great increase in video traffic over IP because more video is being watched online. And as quality increases, more bits per minute of movie-viewing are sent."

Traditional networks have not been equipped for prime time delivery. Leighton believes Akamai is best positioned to address this. "A lot of effort goes into reducing the cost of video delivery because the industry as a whole is under pressure. *There's not been enough monetisation of the video!* So, by decreasing the cost of distribution, we help the content owner quite a bit," he concludes.



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