



Node business like show business Future Media, May 2008

VeriSign last week sold Kontiki, Akamai recently won a US\$45m patent infringement case against Limelight and Highwinds raised US\$55m. Adrian Pennington examines the latest developments in the fast-moving world of online video delivery.

Content delivery networks (CDNs) reshape the internet so it can do what it wasn't designed for - to push around vast volumes of data at speed. Without the global network of servers and nodes that cache mirrored versions of content, the web would have ground to a halt long ago. Even with them, there is concern that the sheer amount of data now being shipped online will force the internet's architecture to buckle.

CDNs distribute a whole gamut of content and services, but the sector is so volatile due to the rapacious demand for video galvanising the whole internet community.

"Users once prepared to watch low-quality 30-second clips of skateboarding dogs now want longform, TV-style content blown up to large screens," says Joe Trainor (left), director of offer management at content delivery specialist Level 3 Communications. "That's made video delivery a super-competitive business."

Cisco says IP traffic is running at two million terabytes a month, equivalent to two billion gigabytes, and predicts this will hit 12 exabytes (that's 24 billion gigabytes) a month in just four years. Thirty percent of this demand is for video.

"The way we consume web content is fundamentally changing," says Trainor. "The web was designed for communicating text. Web 2.0 functions included image sharing and web 3.0 is all about interactive video and games. We aren't consuming more web pages, just more data."

First-generation CDNs installed a fibre backbone around the globe, cached content in hundreds of local server farms and used mathematics to intelligently cut the distance, therefore the delay, in routing content to consumers. This methodology is being challenged by new entrants arguing for a radically different approach.

"Traditional CDNs are single-source, which only deliver a particular file from a particular cache," says Phill Robinson (above), CEO of Velocix. "The problem is that the conditions on the net are always changing. What may have been stable at the start of your movie stream may have completely changed a minute or an hour later, fatally undermining performance."

Velocix's answer is multi-source delivery. It intends to serve content from its CDN augmented by portions of the same content stored on users' computers. For clients like Babelgum (below) or HD video service MediaMelon, Velocix dynamically alters the balance of service between the peer network and its CDN to maintain constant bit rate.

This blend of peer-to-peer and CDN offers "rock solid performance," according to Robinson, and since an amount is always delivered over the peer network, for which ISPs pick up the bandwidth cost, the cost to content owners will be cheaper than that of legacy CDNs. Indeed, Velocix has recently gone a step further and launched a free offering for start-ups.

Hybrid P2P is by no means unique to Velocix and is gaining considerable traction. Cisco, the largest internet infrastructure provider, has invested in hybrid service GridNetworks; CDN Internap partnered with P2P platform Pando, which distributes NBC Direct, making NBC the first US major to use P2P; while Highwinds Network, which categorises itself as one of the five leading CDNs, has deals with several P2P clients in the works.

Telecoms giants AT&T and Verizon are part of working group P4P, which includes Pando, LimeWire and BitTorrent. Their goal is to figure out a way to make P2P transfers more efficient for both the CDNs managing them and the ISPs who own the pipes they ride on.

Even Akamai, the CDN behemoth that manages 15% of total web traffic, is bulking up a P2P offering based on the Red Swoosh technology it acquired last year.

"We're ahead of everybody," claims Alex Gibbons (left), the company's director of digital media sales in Europe. "P2P only works when backed by a massive CDN, and we are building a true P2P-plus-CDN environment. Our challenge is getting the Red Swoosh client grid (the number of users storing a piece of content) to be huge, and we are striking a lot of deals to get it accepted by a wider audience."

However, the jury is out on whether the concept is the panacea for the internet's troubles. For Akamai or Highwinds, a hybrid remains one of several delivery solutions in their arsenal. Fellow 'traditional' CDNs, like Limelight and Level 3, have no P2P offering. Verisign last week offloaded its pure P2P network, Kontiki,

to MK Capital for a fraction of the US\$62m it paid for the company in 2006, perhaps realising that it too needs a CDN ally to succeed.

Kontiki powers Channel 4's 4oD service, BSkyB's Sky Player and the BBC iPlayer. FM understands that the latter relationship will be terminated some time this year, however, while at the same time Kontiki is being lined up to power Kangaroo, the on-demand joint venture from BBC Worldwide, ITV and Channel 4.

"If P2Ps can convince customers to use their P2P plug-in - and a lot of customers are reticent to install plug-ins - then all power to them," says Mark Hayes, VP of marketing and business development at Highwinds. "No P2P can deliver 100% of a content owner's business. For us, P2P is just another channel. P2Ps need a CDN more than we need P2P."

It all adds up to a shouting match between infrastructure owners and those who piggy-back them, each contending that P2P or CDNs respectively are exacerbating the internet's inability to handle the quantum leap in data.

In the latter camp lie Velocix, whose chief marketer John Dillon (left) declares: "It's simply not possible to get the benefits of a true hybrid-P2P delivery network by bolting P2P on as an afterthought. P2P technology needs to be built into the network's core on day one, not retrofitted - which is a bit like putting lipstick on a pig."

Robinson elaborates: "CDN vendors only deliver content as far as the edge of the ISP network. ISPs simply can't cope with demand in the last mile to home. It's like FedExing a parcel to New York only to have it dumped at a Manhattan post office."

He says the problem is that the economics of the internet are broken. "ISPs are seeing flat-to-declining revenue per user, a declining growth in subscribers and yet an unprecedented increase in traffic. They can't afford to stay in business. Instead, they are forced to shape traffic, like turning a tap down to a trickle, which is why users everywhere right now are experiencing poor quality video."

Highwinds' Hayes accepts that ISPs are forced to throttle traffic but disagrees that this is the fault of CDNs. "P2P relies on users consenting to push content back to the network, forcing ISPs to use bandwidth they haven't budgeted for, so naturally they take action to restrict it."

Akamai's Gibbons is more forthright: "All Velocix does is sell boxes to ISPs, so saying the problem lies in the last mile is convenient for them. If we had quality of service issues then Velocix would have a lot more of our customers. The truth is that the problem, of latency in particular, lies in the middle mile between host and end-user, which is like sucking golf balls through a straw."

"The problem isn't in metronet areas but in the delivery of HD video over the middle mile," agrees Level 3's Trainor. "It's an issue that can perhaps be solved by lighting up more fibre capacity."

Internet conditions do fluctuate, says Gibbons, "but there isn't anyone who has the level of insight that we do because we're partners with more networks and ISPs, and have more points of presence than anyone else. We've built our entire business on being able to constantly update traffic and accurately map users to places where they are served most effectively."

Content owners like Hulu (left) and Apple iTunes contract with Akamai not just because it has the largest server network, Gibbons claims, but because it offers proven business rules for asset management, control, monetisation and reporting.

"P2P on its own is better than the internet but no one has so far created a sustainable business with return-on-investment case study customers using HD video," he says. "Once you can take an asset and deliver it to users, how do you make money with it? Every conversation I have about CDN technology with clients always ends up as one about economics."

Velocix says it will revenue share with ISPs to counter their bandwidth costs. Akamai says it saves ISPs money "by respecting their business" and optimising performance at point of delivery.

"There's a big market out there and it's a nascent one," says Robinson. "Right now, we're seeing fragmentation and commoditisation, which will consolidate as the market matures."

Level 3, which owns considerable quantities of physical fibre, has invested in CDN businesses Savvis, Servecast and Move Media, becoming a competitor to the likes of Highwinds, which leases capacity from it.

"2008 is a big year for us," says Trainor. "This is a brand new business for Level 3 but we believe there's going to be a big push for HD video. Since we own the fibre in the ground we own the capacity and scale to support higher capacities, when everyone else has to buy it off other people."

As competition intensifies, the number two CDN player, Limelight Networks, is feeling the heat. When it got too close to Akamai for comfort, Akamai slapped it with a patent infringement lawsuit, which Limelight lost. Forced to pay US\$45m, it is now having to fend off a similar case from Level 3, after reportedly losing the custom of MySpace - to Akamai. Speculation is rife that Akamai may swallow Limelight in a takeover.

Indeed, the CDN battle could be won and lost on the strength of intellectual property. Akamai's patent number 6,108,703 describes the use of distributed servers that point a user to the fastest source of content based on network conditions. Since most CDNs use similar methods, the ruling, in March, could give Akamai a virtual monopoly on that approach to content distribution.

"We're not yet big enough to attract their (Akamai's) attention, but we've taken great strides to put a fence around our IP," observes Hayes. "Rationalisation is inevitable. There are 40 companies claiming to be CDNs but only a handful actually own a substantial network with multiple points of presence and a private backbone to accelerate delivery through peering relationships. Those will be the ones that win out."

Despite losing its court battle with Akamai, Limelight insists it will endure. "Limelight Networks was founded with the philosophy that a strong relationship with each of our customers was the key to building a great business and we continue to do so. Our commitment to customers and partners is stronger than ever," a spokesman told FM in a written statement.

"We do not believe we infringe the patents at issue in these matters and will continue to defend ourselves vigorously. We have no plans to discontinue operations. We are financially sound, with approximately US\$197m of cash and marketable securities on our balance sheet as of the end of 2007, and no material debt.

"Further, we are actively exploring alternatives that would enable us to continue to provide the same level of service that we always have and eliminate any issue of infringement, if such is determined with finality by the courts. Additionally, there are many aspects of our business that were either not accused of infringing or we believe are clearly outside the scope of what was litigated."

The newest entrant into the CDN space claims it cuts through all these arguments. Digital Fountain, whose encoding technology is widely used to stream video over mobile, is introducing DF Splash, aimed exclusively at HD delivery, with Fox-owned Speed TV as a launch customer.

According to Scott Monson, general manager of business development, Digital Fountain dispenses with both P2P networking and mass deployment of server farms by delivering H.264 video from only a handful of super-regional hosting centres over unmanaged public internet. It says it can do this while maintaining instant streaming and no buffering because of unique software that corrects up to 99% of packet loss, thereby ensuring glitch-free video.

"The CDN market is oversubscribed and highly commoditised, with CDNs trying to compete on price by buying bandwidth and under-cutting everyone else," says Monson. "That's precisely why we're launching into this market, because we

have technology that no-one else has. We fully understand the internet's limitations - we embrace them."