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CO-LOCATION

The need for speed and the race to drive down latency has been one of the most keenly fought contests of 2009. As **Mike West** reports, there is every indication that this trend is set to continue.

High stakes for the highest speed

As milliseconds give way to microseconds and microseconds are replaced by nanoseconds, a key weapon in the back-room war to win traders' business is co-location— moving your server as close as possible to an exchange's matching engine.

In recent years there has been a surge in demand for co-location. In 2008 — and despite the onset of the recession — demand grew by 14%, according to Dan Golding of the analysts 451 Group. Fascinatingly, supply only rose by 6%.

Geography — here read proximity — is the key to speed. Global head of enterprise information at Thomson Reuters Mike Powell compares co-location to the real estate business: "It's similar in that it's all about location, location, location. The winner is the person whose property is closest to the beach!"

The time it takes for your trade to go through a few hundred metres of wires versus kilometres of wires may be minuscule but it is still enough to make a difference to being at the head of a trading queue or at its tail. The primary advantage of co-location is ultra-low latency.

Based on the principle that the closer to the exchange the lower the latency is, typically co-locating at an exchange provides the lowest latency, whereas inner-city hosting is the next best bet and out-of-town data centres are marginally slower. The three tiers equate to a sliding scale of costs and a steep bid-rent curve, co-location being more expensive centrally and prices come down as you move further out.

Conceptual view of Telehouse West's new data centre in London's docklands

According to Interxion's proximity hosting director Lilia Serverina, an exchange-based co-location facility in the heart of London can bring the latency down to 10-15 microseconds, whereas a data centre in the London Docklands will provide latencies in the range of 40-52 microseconds, compared with an out-of-town data centre at Basildon or Slough which might be 250-350 microseconds. (Basildon is around 40 kilometres from central London, Slough is about 30 kilometres.)

However, there are no hard and fast rules and exceptions exist such as Chi-X's decision last year to locate its trading engine at Equinix's LD4 facility in Slough which means co-location can be achieved at an out-of-town data centre.

The cost of co-location has essentially two parameters: the number of racks and the unit cost of power.

Michelle Reid, UK marketing director of Telehouse Europe, said that while the precise amount depends on the bespoke solution provided, a standard rack at an inner city Telehouse data centre with 1kVA-2kVA of power costs around £1,500 ($2,300) a month.

Head of technology at Chi-X Europe Florian Miciu said that managed services where engineers are on-site 24/7 to deal with problems can cost double the amount of a basic power and space package.

Most services are carrier-neutral and include N+1 back-up power, biometric security and fire detection and suppression systems. Estimates from a range of providers suggest on average it will take between a couple of weeks to a couple of days to get set up having made the decision to co-locate or use a

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particular data centre depending on the complexity of the client. Finding the cost of co-location is problematic — suppliers are typically coy at disclosing prices and it is often difficult to compare like with like.

Decision-making is made all the harder in what is sometimes called the "limpet business model" whereby once established at the new location, it is too difficult/too costly to relocate again.

Out-of-town data centres compete with the natural geographical advantage exchanges have by offering a slightly more updated infrastructure, more space and greater power. The major benefits of the data centre model are economies of scale and the specialist services provided by outsourcing.

Third party solutions

Serverina says: "With the financial crisis, what we are seeing is a reluctance to bear the cost of running a data centre on a firm's balance sheet.

"It's increasingly difficult to justify to the board spending £50m to £100m to build and maintain a data centre, which will only use 10% of its capacity at the beginning then gradually fill up over three years or so. This has led to a growth in the demand for data centre services provided by third parties."

BT's head of marketing, financial markets and wholesale banking Chris Pickles says: "Costs have come down enormously in recent years, but now they are more or less static. It's like computers, which for 15 years stayed at more or less the same price, so companies competed fiercely by providing the consumer with more bang for their buck. In other words, for the same price you got higher processing speeds, more RAM, more hard disk space, a better monitor etc.

"Similarly what would get you say a 4Mb connection in 2000 will now stretch to 1GB of bandwidth in 2010. However, there are often hidden costs to watch out for, for example some data centres only allow customers to purchase fibre-optic cables which they supply."

Conventionally, latency matters most to high frequency, high speed and algorithmic traders and hedge funds for which the size of the potential rewards makes it viable to shoulder the high exchange-based costs of co-location.

Pickles distinguishes between ultra-low latency players who require latency to be in the sub-millisecond bracket and low-latency players for whom multi-millisecond latencies will suffice.

In the wake of the financial crisis, what we are seeing is a reluctance to bear the cost of running a data centre on a firm's balance sheet.

The number of traders who can afford a stake in the ultra-low latency game is small. An independent IDC report estimates that only 11% of data centre users can pay for the costs of co-location.

Moreover in the wake of post-Mifid fragmentation in the derivatives market — and when space close to exchanges was already at a premium — the proliferation of exchanges has meant the number of players who can afford to co-locate at multiple execution venues is small.

Pickles says: "In business there's the 80:20 rule, in other words 80% of trade is carried out by 20% of companies. However, with co-location it's more like 80% of trading is done by 20 firms!

"Hedge funds can afford a couple of racks on frequently traded exchanges, but when the market is scattered across a plethora of venues, it's only high speed and high frequency traders that can afford to co-locate."

This economic logic has led to a geographical differentiation as non-mission critical and back-office services are farmed out to inner city and out-of-town data centres where costs are lower, a tendency which that has been amplified recently as space on the exchanges has began to run out.

A battle to capture exchange trading engines has ensued, although there has not been a clear winner yet, nor is there likely to be according to Pickles: "CME in Chicago, NYSE Euronext in Basildon and Deutsche Börse in

How green is my data centre?

Another factor in the future development of co-location and data centre services will be pressures to reduce their energy consumption and carbon footprint.

When it opens in April the new £80m Telehouse West data centre in London Docklands will recycle 9MW of heat to provide nearby houses and businesses with hot water.

This is the equivalent to 3,000 kettles boiling continuously. The nine-storey, 19,000m? data centre is designed to reduce energy consumption. Alternating hot and cold rows of racks lowers energy density, thereby decreasing the cooling requirement and energy consumption. The roof of the building is also fitted with photovoltaic cells.

Other companies like Unite Technologies provide data centres with software to analyse energy consumption and increase their Power Usage Effectiveness (PUE).

Telehouse technical services director Bob Harris said: "The green data centre is no longer an oxymoron. Under the Carbon Reduction Commitment (CRC) all businesses using more than 6,000 MW of energy will be required to offset the surplus by purchasing carbon credits at a cost of £12 per ton of CO2.

"Whoever can find a way to optimise data centre energy efficiency first will make a mint."

Harris: "The green data centre is no longer an oxymoron"

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Pickles: "Costs are now more or less static"

Powell: "The winner is the person whose property is closest to the beach!"

Frankfurt have all been relatively successful in consolidating their corners of the market, but unless you force all of the exchanges back on to a single venue then it's virtually impossible to have a single victor."

Proximity hosting

This vacuum has to a certain extent been filled temporarily by innovative proximity hosting solutions which, in the absence of true co-location, seek to find an optimal way to connect the major exchanges by piggy-backing on a strategically located data centre situated roughly in the middle, then fine-tuning order-routing to shave-off latency.

The result is savings in the milliseconds, not microseconds, but that is good enough for many traders. An example of proximity hosting is Thomson Reuters' partnership with Savvis to provide a low latency feed across six data centres in Chicago, New York, London, Frankfurt, Tokyo and Singapore.

In addition, in the battle to entice trading engines away from the exchanges to create the ultimate virtual trading community, different players have settled into different niches. Pickles believes Interxion has been more successful with respect to derivatives, while BT and Equinix specialise more in providing co-location for equities trading.

In Europe the main players in the data centre game are BT, Colt, Equinix, Global Switch, Interxion, Savvis, Telecity Group, Telehouse and Verizon.

It is difficult to compile data on market share and no two data centres are the same, but according to figures seen by *FOW* at the latest count Interxion has 26 data centres in Europe, which puts it slightly ahead of Equinix which has 24, although director of business development and financial services at Equinix Robin Manicom claimed that Equinix is bigger in terms of the total number of network interconnections.

But if the big players compete fiercely in Europe and the US, so far most of the rest of the world has proved more off-limits due to political and legal issues.

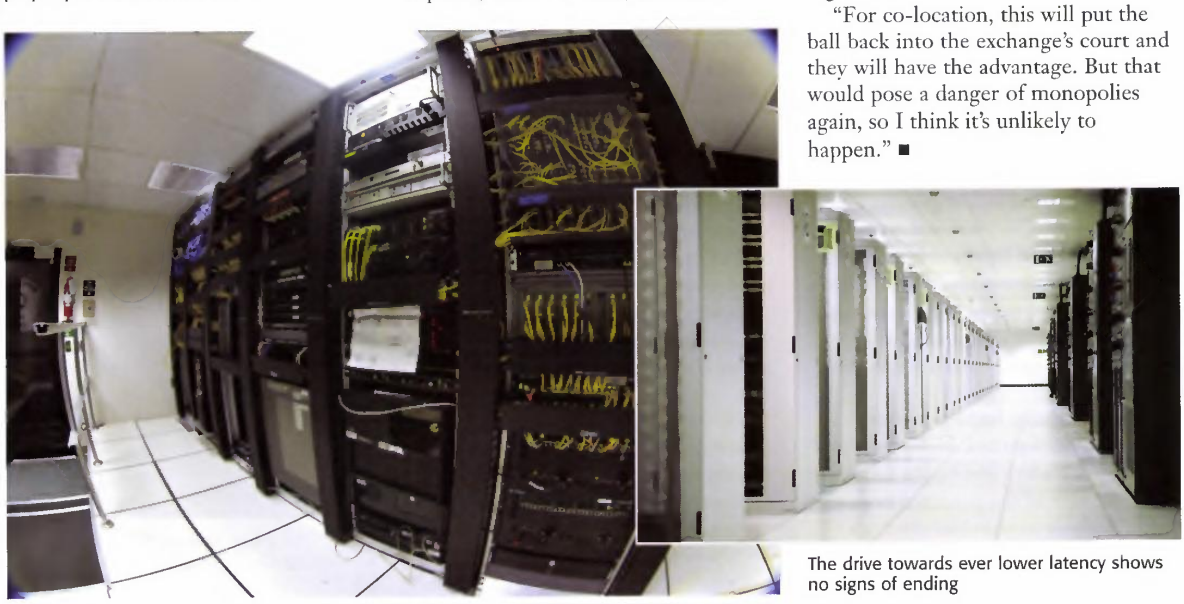
Lower latency

The drive towards ever lower latency shows no sign of ending. Serverina says: "The trend has unmistakably been from milliseconds, down to microseconds and it's only a matter of time before we see nanoseconds.

"The demand for latency-sensitive solutions will continue to grow, even for asset fund and pension fund managers, who might not think in microseconds, but milliseconds still matter to them."

For Pickles a key factor will be regulation: "If the US get its way, and they probably won't, they will try to force all trading on to a single exchange to increase transparency and make execution venues easier to regulate.

"For co-location, this will put the ball back into the exchange's court and they will have the advantage. But that would pose a danger of monopolies again, so I think it's unlikely to happen." ■



The drive towards ever lower latency shows no signs of ending