

# The Right Road to HFT



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# With a Little Help From Your Friends

Not so long ago, outsourcing part of your infrastructure was anathema to anyone who was interested in bleeding out latency in order to execute high-frequency trading (HFT) strategies. Right-thinking financial technologists knew that everything related to HFT trading strategies needed to be kept under lock and key along with the location of their co-located servers, the length of the network run to the nearest point-of-present (PoP) and the number of network hops to the datacenter. But HFT evolved and trading firms could no longer reap the profits by executing HFT strategies against a single liquidity pool. Things have become more complex and costly as firms need to interact with more components in a much larger networking ecosystem.

It is enough to make some firms give up on HFT altogether. But in this report, *DWT* looks at how firms can outsource some, or even all, of their infrastructure to third-party firms in order to remain competitive with the HFT firms down the street.

First, we speak with Jeff Wecker, president and CEO of Lime Brokerage, on how buy-side and sell-side firms can leverage Lime's infrastructure and soon-to-be-released services to reduce their trading latency.

Also in this report, *DWT* speaks with Dave Malik, director of solutions architecture in the advanced services team at Cisco; and Dave Bloom, vice president, new markets and strategic ventures at Chi-Tech, about how firms who don't want to rely on an individual brokerage can use existing third-party vendor offerings to meet their latency performance requirements.



**Rob Daly**  
Editor

# Lime Branches Out

The growth in high-frequency trading (HFT) is about to bear fruit for New York-based agency broker Lime Brokerage as HFT firms continue to sprout up across the industry.

Jeff Wecker, president and CEO of Lime Brokerage, attributes the growth to high-frequency traders leaving their existing positions with sell-side proprietary trading desks and multi-strategy trading firms and seeking green opportunities.

“Clearly, there has been a migration taking place in high-frequency trading,” he says. “We have seen a growing number of sole proprietorships

and we have seen people leaving existing high-frequency trading firms and going out on their own as well.”

These new firms, adding to the number of existing clients, seek to deploy their HFT strategies in new markets and in novel ways, leading Lime to expand its offerings to meet the new demands.

Going beyond the popular low-latency offering to the U.S. cash equities market, the broker has made a large commitment to deliver its HFT offerings for the U.S. equities options market, as well as new trading algorithms. Lime plans to reveal more in a series of announcements over the coming weeks, according to Wecker.

“We are being asked and we are complying with those requests for low-latency data and execution services in other asset classes and regions,” says Wecker. “We are offering a

broader array of those offerings to our customers.”

One example of where Lime has seen an uptick in client interest is in improved co-location service. “We already have plans to roll out a co-location framework for all U.S. options exchanges,” says Wecker.

The firm has filed and received a number of patents for provisioning co-location services and executing the

on behalf of our customers,” explains Wecker.

As a result of this business strategy, the firm has shied away from commercially available technology that doesn’t meet Lime’s required levels of quality and performance for data provisioning, executions, order routing and risk aggregation.

“We believe we are open-minded to technology solu-

tion. “It is a variant of that technology that goes well beyond what we offer to the customer today,” says Wecker.

Looking to the future, Wecker sees several new opportunities for Lime and its offerings, including the possibility of breaking out its core offering of data provisioning, executions and order routing as well as risk aggregation into separate offerings. However,

too many clients tend to take the complete package since it provides them with what they need to compete in the market, according to Wecker. Offerings like the one that will address

the proposed SEC rules on “naked” access would involve the execution service as well as Lime’s risk aggregation service, he adds.

According to Wecker, the most difficult challenge facing HFT now and in the months ahead is the public and political misperceptions surrounding it. He attributes much of this to the number of HFT firms that have historically avoided the spotlight. The recent actions of various members of the U.S. Congress and the discussion at the SEC has created a number of public misconceptions of what high-frequency traders do and what service they prove to the marketplace, he says. The greatest challenge for this community is to be able to accurately tell their story so that people understand that they are an essential part of today’s market ecosystem, he adds.



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Jeff Wecker, president and CEO, Lime Brokerage

recently proposed regulations by the U.S. Securities and Exchange Commission (SEC) regarding pre-order validation by brokers for all their customers.

## Leveling the Field

While many within the industry see investing in the necessary low-latency infrastructure to support HFT as a game only for those with the largest IT budgets, Lime takes a slightly different view.

“We expect that while this is broadly true, we consider ourselves among those firms with deeper pockets due to the years of investment that we have made in our platform,” says Wecker. But Lime sees itself first as a technology and services provider to buy-side and sell-side firms, and an agency broker second.

“We are an engineering firm that operates a broker-dealer as a managed service

tions and equipment from a host of technology providers. When it comes to the execution and data provisioning service, it has historically been homegrown,” says Wecker.

Lime has leveraged its infrastructure investment to create offerings for the buy-side and sell-side communities.

In the coming weeks, the broker expects to announce an expansion of its Virtual Brokerage service, which gives third-party brokers the ability to have their clients directly plug into the Lime trading system. Currently, a few unnamed clients have implemented the new capabilities as part of a soft launch, says Wecker, adding that the new offering will first be available for the U.S. equities market before branching out to other asset classes.

The soon-to-be launched technology is different from what is presently used in pro-

# Lowering the Bar to High-Frequency Trading

Low-latency trading infrastructure is a must for high-frequency trading, but the costs and knowledge required to optimize and maintain it have kept it out of the hands of most firms. *DWT* sits down with Dave Malik, director of solutions architecture in the advanced services team at Cisco; and Dave Bloom, vice president, new markets and strategic ventures at Chi-Tech, to discuss how firms can rely on current third-party offerings to bring HFT within reach.

**DWT:** How can firms overcome the technological barriers to entry into high-frequency trading (HFT)?

**Dave Malik, Cisco:** Firms can overcome some of the technology barriers by taking advantage of services offered by exchanges and financial services providers. Sell-side firms are moving their trading strategies closer to the liquidity venues and using co-location facilities to reduce infrastructure costs and overall latency in the trading cycle. Certain service providers are not only offering empty cages to host a firm's systems but are also offering packages consisting of compute, network, and storage services. A one-stop-shop approach opens the door for firms to enter the HFT race, where more focus can now be applied to the actual business applications. Firms can further offer sponsored access to their clients who can utilize the shared infrastructure.

Validation and tuning of the entire HFT system is a very important step that can be achieved by partnering with companies such as Cisco Systems. Cisco is working with clients to architect low-latency environments comprising Cisco Catalyst and Nexus switching infrastructure, Cisco Unified Computing offerings, messaging solutions, custom applica-



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tions, and a latency-management solution that includes the capability to create a custom dashboard of the trading environment.

**Dave Bloom, Chi-Tech:**

The barriers to entry for firms wishing to engage in HFT are being raised and lowered simultaneously. In terms of the underlying technology, the barriers are being raised precipitously: To squeeze out every last microsecond of latency, firms are making huge capital investments in co-location, networks, market data acquisition and component technologies. Yet the heavy resource demands, time and cost of acquiring space near their primary trading venues, selecting their own fiber strands along specific

routes, lighting that fiber with state-of-the-art optical technology, and designing and implementing complementary switch architectures is beyond the tolerance and practical capability of most firms. Add to that the need to design, build and maintain feed handlers for venues that are constantly in flux—especially those of Europe and Asia—and the costs rise astronomically. Only then can firms invest in developing the proprietary strategies and algorithms that differentiate them from their competitors.

In terms of access to this type of cutting-edge technology, however, the barriers are being lowered. Chi-Tech offers access to a fully optimized network with direct connectivity between

venues built upon its own fiber mesh; a state-of-the-art data acquisition and delivery platform; select co-location close to the matching engines of the major trading venues, and an open architecture for integration of third party services including order submission gateways; sponsored access solutions; smart order routing; complex event processing; and algo containers.

**DWT:** As the regulators attempt to rein in high-frequency traders, do you see the high-frequency trading community growing or shrinking in the future?

**Bloom:** There is no doubt that regulation will change the way HFT is conducted in the future as perceived structural weaknesses in the market are addressed, so in my view, say "goodbye" to naked access and "hello" to more stringent risk controls over market participants. But the need for ever-faster, more efficient markets will push HFT inexorably forward for many years to come.

**Malik:** The HFT market is definitely growing, despite the regulators attempting to gain more control. It has not been embraced heavily in global markets as compared to the U.S. markets. However, these other regions are planning to enter the arena in an aggressive

manner to develop strategies for various asset classes to access diverse liquidity pools. Firms are actively developing self-regulated controls that would avoid acute or catastrophic events, which would necessitate further regulatory intervention.

**DWT:** What do you see as the greatest hurdle for firms wishing to improve the performance of their high-frequency trading infrastructure? How can it be addressed?

**Malik:** Measuring and optimizing end-to-end latency in the trading cycle appear to be the greatest challenges in terms of improving performance in an HFT environment. Thorough application-level testing with real workload on a given infrastructure must be conducted instead of testing and optimizing a single element in the system by itself in a lab environment. Understanding the multiple transactional flows for a given event will provide further insight into which elements in the data path are contributing to latency or degradation in performance. Optimizing the switching infrastructure, host stack and adapter, interconnects, messaging and trading application logic are some of the key areas that firms constantly focused on improving. In addition, the testing efforts need to include the mapping of how business behavior interacts with complex market ecologies. Cisco is investing in real-world testing scenarios and tuning, to shorten the time-to-market for our customers. Our offering in

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**“The barriers are being raised precipitously: To squeeze out every last microsecond of latency, firms are making huge capital investments in co-location, networks, market data acquisition and component technologies.”**

this space is the Algo Speed solution and more information on it can be found at [www.cisco.com/go/hft](http://www.cisco.com/go/hft).

**Bloom:** As the quest for “zero latency” continues, trading firms have been forced to divert more of their valuable resources toward building and maintaining competitive infrastructure and away from devising, implementing and tuning the trading strategies that give them the best competitive advantage. Only a handful of the most highly capitalized firms can continue to do so; the others will need to leverage the infrastructure of providers such as Chi-Tech, so that they can refocus their resources toward their core businesses.

**DWT:** Can any portion of a high-frequency trading infrastructure be outsourced? If so, which portions?

**Bloom:** Some firms that trade using the infrastructure of their respective brokers have, in essence,

outsourced their entire HFT stack including their trading strategies. It is interesting for them to note that their brokers are choosing to outsource and white-label many of the underlying HFT component services, including co-location, connectivity and market data acquisition, to specialized vendors. Brokers are moving to this model because they want to leverage the investment of firms that specialize in these services rather than maintain the expense of going it alone.

Similarly, some buy-side firms are seeking independence from their brokers as a means to mitigate risk. For these firms, Chi-Tech’s MarketPrizm provides a means for them to access state-of-the-art HFT components in an independent way, allowing them to engage multiple brokers over time as their needs change.

**Malik:** The server, compute, storage, and interconnect infrastructure can be outsourced to a service provider. Co-location facilities

are extremely popular because they allow firms to reduce their latency budget by placing their trading systems close to the exchange’s matching engines. Infrastructure-as-a-service (IaaS) allows the trading firm to worry only about their applications for trading strategies and pay for the infrastructure based on an established contract. Most firms have outsourced connectivity to the local points-of-presence (PoPs) and different trading venues. A firm may have equities cash trading strategies running in a New Jersey co-location datacenter that need to use futures index analytics residing in a Chicago datacenter in order to execute a proprietary algorithm.

Focusing on the strategies and not the infrastructure management allows trading firms to gain more value for their business. Latency arbitrage is a key focus area for the HFT market. Co-location and proximity services are enabling access to fragmented liquidity across the globe and managed service offerings have become a very profitable business. The predictability of cost also makes outsourcing a very attractive option for member firms.

**DWT:** Which services do firms need in order to cater to high-frequency traders?

**Malik:** Services such as latency monitoring; direct feed distribution; complex-event processing integration; co-location of scale-out compute, networking and storage infrastructures; and long-haul optical interconnects between different trading venues are just a few offerings for high-

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# Lowering the Bar to High-Frequency Trading

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frequency traders available from service providers and niche firms. Providing consulting services focused on how to build the most optimal co-location designs is just one area where Cisco is working with financial institutions embracing HFT. Tuning strategies and algorithms is giving rise to another breed of very specialized services being offered to niche players, which member firms can take advantage of, depending on their investment goals. Utilizing outsourced services allows the firms to invest minimal capital and accelerate time to market to reap significant rewards.

**Bloom:** Firms must provide everything from base connectivity to containers that host the client's algorithms. But no single firm can provide the full breadth of services on their own; they must be prepared to interoperate with solutions offered by any number of other providers. Understanding this reality, we are taking this view seriously, working with a number of third-party independent software vendors (ISVs) to incorporate our MarketPrizm market data application programming interfaces (APIs) into their applications. By doing so, ISVs can optimize their solutions to interoperate on the MarketPrizm network.

However, traditional services like co-location, connectivity and market data provision will not be enough to address the needs of HFT traders in the near future. As the HFT landscape becomes ever more competitive, traders will need to know much more about the ecosystem they trade within. To provide this information, Chi-Tech is partnering with a leader in the latency metrics space to provide new, state-of-the-art services. These include "temporal" data feeds that describe the current latencies being experienced along each network path and the current cycle times of the matching engines of the relevant mar-

kets. By combining this data with low-latency market data, traders will have the means to develop more sophisticated strategies that can better target liquidity and improve fill rates.

**DWT: Which area of the market will be the next to see the introduction of high-frequency trading?**

**Malik:** We will see further growth in the commodities, futures, and foreign exchange (FX) areas. Currently, the equities market is predominantly active in HFT but, with increasing interest from global participants, diversification will open up doors to new strategies.

## High-Frequency Trading in the News

### MLJS DEBUTS DMA

In conjunction with network and managed IT provider KVH and low-latency market data provider Activ Financial, Merrill Lynch Japan Securities (MLJS) recently debuted its third-party co-located direct market access (DMA) platform. The new service allows users to host their systems in a single datacenter and access multiple exchanges via brokers that hold membership in those exchanges. According to firm officials, the new DMA offering's latency is on par with other co-located offerings currently available in the Japanese market.

### QUANT EXPANDS DMA

In order to offer direct market access (DMA) from local and cross-border clients, India-based Quant Broking has joined trading platform and market data provider Fidessa's global network of buy-side and sell-side firms. Through the new arrangement, the brokerage will be able to receive CARE orders as well as DMA order flow via the connection.

### BLOOMBERG TRADEBOOK ADDS OPTIONS ALGO

Trading system and market data provider Bloomberg has expanded its available trading algorithm offering on Bloomberg Tradebook with the introduction of algorithms for electronic options, according to vendor officials. The new offering includes



algorithms based on volatility, delta and the bid-ask spread. Among them are the PegTo Volatility, or vega, algorithm, which allows traders to select a price of volatility to buy or sell while the PegTo Delta routes orders and adjust an order's limit to float with a specified delta to the underlying

security, say officials. In other Bloomberg news, users of Bloomberg's Execution Management System (EMSX) now can access the Ballista Alternative Trading System (ATS) for block options, which is operated by Ballista Securities. Users of EMSX now can access the ATS immediately via the function EMSX <GO> on the Bloomberg Professional service.

### ABOVENET RAMPS UP NETWORK

High-bandwidth connectivity provider AboveNet has deployed the 2RS module for its CN 4200 FlexSelect Advanced Services platform from network equipment provider Ciena as part of its recently introduced agility guarantee program, which provides ultra-low-latency service level agreements (SLAs). The CN 4200 aims to cut delay in optical connections by up to 20 percent, enabling AboveNet to provide high-bandwidth connectivity for latency-sensitive applications such as algorithmic or futures trading, voice over IP (VoIP) and video.