

Options selects Arista to deliver ultra-low latency access to a diverse range of order execution and broker services for over 200 financial services firms.

## Highlights

### Challenge

Options needed to reduce latency and stop packet loss as part of its managed services offering to over 200 leading financial institutions.

### Solutions

- Arista 7150 Family Switches
- Arista 7280SR Family Switches
- Arista EOS®

### Results

- Moving to Arista helped latency drop from 20ms to below 0.5ms on certain connections
- Consolidated from 15u down to 2u racks delivering significant reductions in power consumption, cooling and rental charges
- Packet Loss stopped with deep-buffer switches placed at strategic points in the network
- Arista EOS improved visibility over performance and utilisation and allows for more strategic capacity planning

As a global leader in financial technology managed services, Options has carved out a reputation as an operator of world class infrastructure today, while supporting business scalability and new technology for tomorrow. Over the last few years, Options has transitioned to Arista Networks to deliver the lowest latency and absolute reliability for its customers that include leading global investment banks, hedge funds, proprietary trading firms, private equity houses and exchanges.

The logo for Options, featuring the word "options" in a bold, dark blue, sans-serif font. The letter "o" is stylized with a vertical line through its center, resembling a power button symbol.

### Project Background

Founded in 1993, Options began life as a hedge fund technology services provider and more than a decade ago the company made a strategic decision to become the first provider to offer cloud services to the financial sector. Today, over 200 firms globally now use the Options platform, including the leading global investment banks, hedge funds, funds of funds, proprietary trading firms, private equity houses and exchanges. Each day, the Options network transfers over 400Tb of data facilitating deals worth billions of dollars.

Options global client presence currently spans over 20 countries worldwide with seven offices covering these regions. The feature-rich platform, built to exacting investment bank standards, is further bolstered by industry-leading transparency around pricing, a 24x7, high touch support model and unrivalled account management and customer engagement.

### Challenge

One of the key services Options offers is a managed colocation and proximity services platform that gives customers access to all the key liquidity centres globally across all asset classes including equities, derivatives, fixed income and FX. The platform provides a managed environment for the delivery of direct market data, order entry, servers and colocation space either as a single managed service or individual component services.

Through relationships with exchanges, clients and partners, Options delivers raw and aggregated market data from all relevant venues globally direct to client applications. This allows its clients to carry out execution of financial deals through ultra-low latency access to a diverse range of order execution and broker services. To deliver these services, Options continually evaluates its technology platforms to source the fastest connections to over 100 exchange, dark pool and ECN venues globally including NYSE, NASDAQ, CME, LSE, Morgan Stanley and Credit Suisse.

In 2013, as Options saw more clients demanding ultra-low latency to support activities such as high frequency trading, it began to look for ways to reduce latency and optimise performance on its incumbent switching platforms.

“With growing traffic volumes, both from organic growth and market data volume increases, we were starting to detect more issues on our network architecture with packets dropping and levels of latency that we felt were unacceptable,” explains Aaron White, Global Head of Networks for Options, “The existing switch series in place was starting to reach end-of-life and so we started to look at replacement switching technologies from a number of vendors.”

### Solution

White and his team began evaluating a number of options and began speaking with several vendors. With the criticality of the network in serving its clients, Options set up a small test-bed to benchmark a number of possible replacement switches. “The Arista team we spoke to was very knowledgeable and from our initial testing it was clear that the Arista 7150 would offer us a significant performance boost while reducing latency,” explains White.

The decision to move to Arista also unlocked a viable roadmap to move from 10G through to 40G and eventually to 100G and beyond, “The decision to go with Arista also gave us an opportunity to reevaluate our architecture and start to take

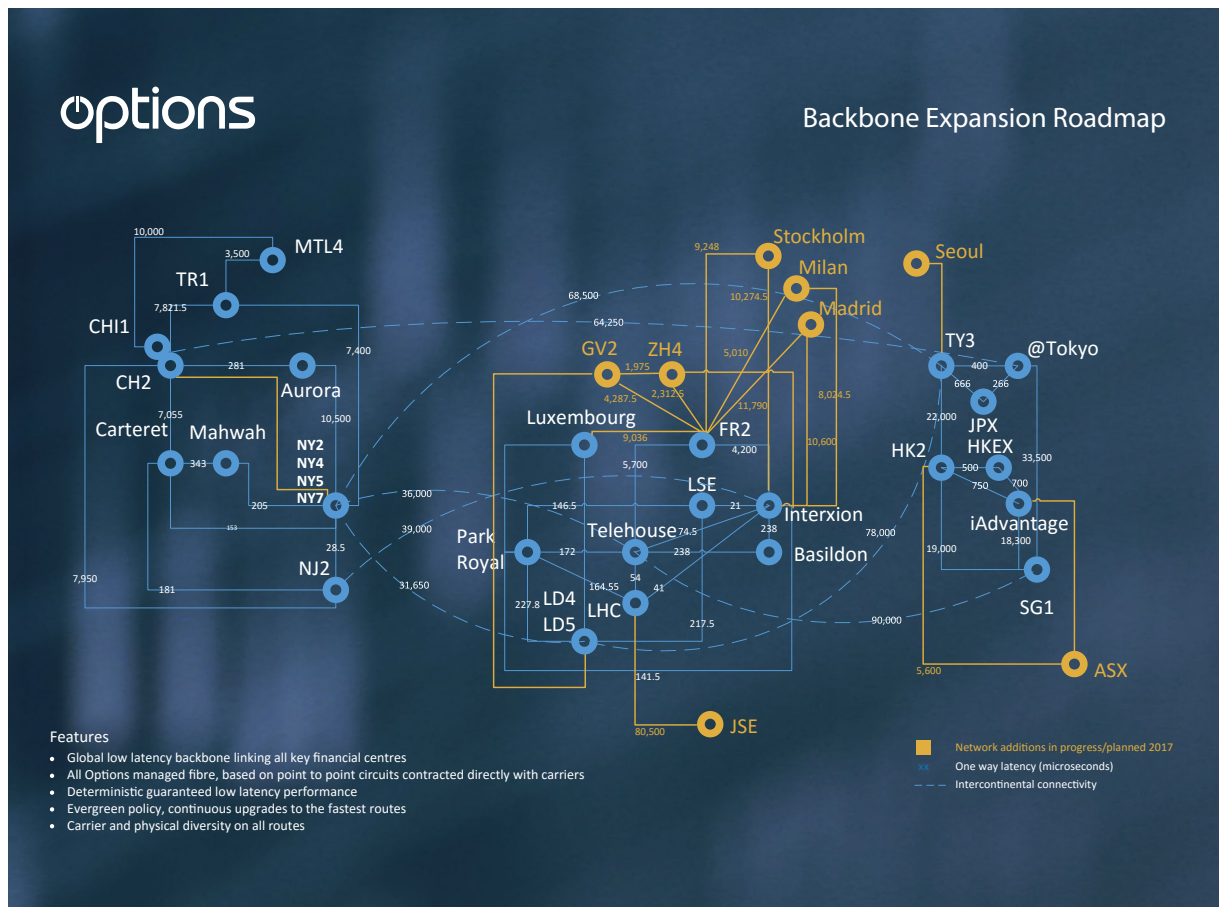
advantage of extensibility features within the platform such as buffer monitoring, that offer us more visibility over traffic flow, and to take proactive capacity planning measures to avoid any future issues.”

All of the deployed Arista switches share the same Extensible Operating System (EOS) which, along with a consistent management interface, offers resiliency and programmability via a unique multi-process state sharing architecture. This separates state information and packet forwarding from protocol processing and application logic.

### Conclusion

Options initially rolled out the new Arista switches at key co-location datacentres serving customers connecting to the London and New York markets. With Arista in place, the improvement in network performance was profound. As White explains, “We saw significant latency improvements going from between 12-16ms on the old switches to dropping below 0.5ms on the new Arista switches. Our roundtrip latency on certain routes, with multiple switch hops in the path, went from around 90ms to below 10ms. In fact, across the board, we saw major improvements in all the key network metrics we value.”

Alongside the performance boost, the higher density of the Arista switches allowed Options to use less rack space. In certain sites, Options consolidated from 15u down to 2u delivering significant reductions in power consumption, cooling and rack rental charges.



With the initial test sites up and running, Options spent the next 24 months on a carefully considered upgrade program, replacing the bulk of its legacy switches at 15 data centres with Arista 7000 series switches.

“The upgrade allows us to offer the fastest path routes utilising Arista ultra-low latency switching technology to provide sub microsecond delivery in the data centre,” says White, “Not only are our customers benefiting from the lowest possible latency but we also have gained more visibility over our network layer and enough headroom to grow our service offering in line with demand. Additionally, the support model provided by Arista has an extremely rapid response rate for bug fixes compared to our previous provider, while also providing other automation and scripting benefits.”

The success of the project has prompted Options to look at ways to further strengthen its operational capabilities.

In 2015, Options deployed the Arista 7280R series platform to cope with the high throughput and burst traffic demands of its Managed Applications solution. Offering deep buffer architecture to deal with the most demanding of traffic patterns, the 7280R provides up to 48 ports of wire speed 100GbE in a 1 or 2RU system allowing Options to scale as needed.

Furthermore, White and his team are already utilising the Arista Networks’ Latency Analyzer (LANZ) to gain near real-time visibility into congestion conditions as experienced by the network itself. With LANZ, the IT team can gain granular notification of impending congestion events detected at the network layer directly to the application layer. This enables close integration with applications and administrative workflows. In addition, Options is now piloting the use of Arista CloudVision, a network-wide approach to workload orchestration, workflow automation and real-time telemetry.

“Our customers demand that we provide them with the best possible service and our investment in innovative new technology that helps us to detect issues before they arise, along with tools for more effective capacity, are just some of the ways we differentiate ourselves in this evolving financial services technology market,” White concludes.

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