

INTRODUCTION

The International Securities Exchange Holdings, Inc. (ISE Holdings) is the owner and operator of three electronic options exchanges: ISE, ISE Gemini and ISE Mercury. Through its comprehensive exchange offering, ISE Options delivers a superior trading experience to its member firms through its patented market structure, industry-leading technology, unique functionality for trading complex orders and award-winning customer service.

In addition to its options business, ISE Holdings also operates ISE ETF Ventures, which provides its partners with a broad range of capabilities in index development, index licensing, financing and marketing of exchange-traded products. Total assets under management for ETPs tied to ISE ETF Ventures is approximately \$2.5 billion. ISE Holdings also owns Longitude and licenses its proprietary technology for event-driven applications in a diverse range of industries.

CHALLENGES

In February 2015, ISE learned it must achieve greater geographical diversity for Disaster Recovery (DR) to comply with the Securities and Exchange Commission's (SEC) Regulation Systems Compliance and Integrity (Reg SCI) initiative.



We needed to protect the integrity and privacy of the data moving through our three exchanges. Additionally, we needed to support the high-volume multicast traffic of financial trading applications."

While ISE already had a physical DR site, a catastrophe on the U.S. Eastern seaboard could conceivably render the DR site inoperative. Therefore, ISE management challenged the technology division to achieve geographic diversity while containing the procurement and operational costs of building out a physical infrastructure in a different region.

Although no regulated exchange had done it before, the technology division realized that building DR in the public cloud could bring numerous benefits that extended its existing technical designs. The team also wanted to deliver DR that could be deployed in the public cloud, on-premises infrastructure or both, in order to create an "Anywhere Exchange".

"Before this project, we operated DR with bare-metal, on-premises networks



International Securities Exchange.

HIGHLIGHTS

- Allowed ISE to deliver a Reg SCI-compliant cloud DR solution in under 9 months

CHALLENGES

- Achieving geographic diversity for DR to comply with SEC Reg SCI
- Delivering DR that could be deployed in the public cloud, on-premises infrastructure or both

SOLUTION

- Weave Net molded itself to ISE's underlying infrastructure, providing a non-intrusive solution that did not require changes to its software stack

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using a traditional, native layer-2 network,” said Paul Morgan, lead infrastructure architect at ISE. “With over 100 member firms – including banks and investment firms – we needed to protect the integrity and privacy of the data moving through our three exchanges. Additionally, we needed to support the high-volume multicast traffic of financial trading applications and market data feeds.”

SOLUTION

The technology division evaluated numerous competing technologies and challenged its engineers and architects to present the best available solutions, whether third-party or in-house. The team quickly realized other solutions either required ISE to relinquish control of portions of its AWS infrastructure or could not sustain the massive quantities of data that a financial exchange expects to deliver.



Thanks to the elegance of Weave Net’s design, Weave was barely a footnote in the timeline of ISE’s cloud DR implementation. ISE delivered the new DR solution in under nine months.”

Through its research, the team identified Weaveworks as a potential solution. ISE was impressed with its approach to implement an overlay network that provides layer-2 networking and enables seamless integration into existing application stacks without imposing operational restrictions on deployments.

With Weave Net, multicast applications run normally in the cloud, enabling ISE to process high-volume transactions and accommodate a trading day’s normal volume of transactions with reasonable latency in the event a DR site needs to be activated. Additionally, Weave Net integrates with other cloud-native technologies, such as containers and CoreOS. This would enable ISE to deliver its “Anywhere Exchange” on top of a portable, “invisible” infrastructure.

“After we engaged Weaveworks for a proof-of-concept deployment, we were further impressed by the depth of talent

within their engineering team,” said Morgan. “The Weaveworks team demonstrated a commitment to deliver components that aligned with our vision of ‘invisible’ infrastructure. Additionally, Weaveworks incorporated ISE feedback to improve the performance and scalability of Weave Net.”

Weave enabled ISE to focus on delivering business functionality for disaster recovery. Its application architecture is now consistent across bare metal and cloud solutions, and ISE was not required to change its software stack to accommodate cloud limitations.

“Thanks to the elegance of Weave Net’s design, Weave was barely a footnote in the timeline of ISE’s cloud DR implementation. ISE delivered the new DR solution in under nine months,” said Morgan.

RESULTS

With Weaveworks, ISE delivered a Reg SCI-compliant DR environment within a time budget of nine months and reduced cost by 40% versus the previous on-premise, bare-metal solution.



Without Weaveworks, we could not have delivered a RegSCI-compliant cloud DR solution.”

KEY BENEFITS

- **Allowed ISE to deliver a Reg SCI-compliant cloud DR solution in under 9 months.**
- **Molded itself to ISE’s underlying infrastructure, providing a non-intrusive solution that did not require changes to its software stack.**
- **Enabled ISE to process high-volume transactions and with reasonable latency in the event a DR needs to be activated.**
- **“Without Weaveworks, we could not have delivered a Reg SCI-compliant cloud DR solution,” said Morgan. “We are looking forward to the continued benefits Weave Net will provide, and are thrilled with its seamless integration.”**

ABOUT WEAVERWORKS

Weaveworks is the maker of Weave Net, Weave Scope and Weave Flux, which enable customers to network, visualize and manage microservices and cloud native applications on Docker containers. Weave is open source software and contributions and pull requests are more than welcome via Github. Weaveworks is headquartered in San Francisco. Visit us at www.weave.works.