

NASDAQ EXPANDS AND ENHANCES TRADE OPERATIONS WITH SECURE CISCO NETWORK

NASDAQ is migrating its trading operations from a costly private network toward a secure public and private network design that gives its trading partners more flexibility, reduces costs, and enhances network performance and security.

ABSTRACT

The NASDAQ Stock Market depends on its network to bring millions of investors together with the world's leading enterprises.

- To help streamline processes and minimize expenses, NASDAQ sought a networking solution that would make it easier for trading partners to connect to its network.
- To improve the performance and efficiency of its own internal network, NASDAQ is implementing a new virtual private network (VPN) architecture that features Cisco 7609 routers to connect and consolidate operations for its data centers.
- By migrating toward a more flexible public network infrastructure, NASDAQ can save millions of dollars in annual communications expenses.

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Phil Marie, Senior Vice President of Network and Web Operations, NASDAQ

BACKGROUND

Since its debut in 1971 as the world's first electronic stock market, The NASDAQ Stock Market has used technology to bring millions of investors together with the world's leading enterprises. NASDAQ lists approximately 3600 innovative companies. Its competitive market structure, combined with an extensive portfolio of products and services, attracts large, rapidly growing companies. NASDAQ trades more shares per day than any other U.S. equities market, and more companies now list on NASDAQ than all other major U.S. stock markets. NASDAQ is also well regulated, employing sophisticated surveillance systems and regulatory specialists to protect investors and provide a fair and competitive trading environment.

CHALLENGE

Technology has long been a cornerstone of NASDAQ's operations. Trades are executed through a sophisticated computer and telecommunications network - a system which transmits timely, critical investment information to more than 1.3 million users in 83 countries. As the organization grew, however, the network infrastructure became increasingly complex and expensive.

"We've been using a fully managed network from a global Internet service provider," explains Phil Marie, senior vice president of Network and Web Operations, NASDAQ. "Between our corporate networks and all the trading networks for the NASDAQ stock market, we were running about 15 separate networks, and the costs were mounting."

As part of its ongoing effort to streamline processes and minimize expenses, NASDAQ sought a networking solution that would make it easier for trading partners to connect to its network and subscribe to content and services, while reducing the costs and complexity of its communications infrastructure.

“Our approach to our network has changed,” explains Marie. “Our company is moving more toward an open environment with more trading partners. So we’ve decided to migrate to secure public network connectivity instead of continuing to build out a private network.”

SOLUTION

NASDAQ began its network upgrade by taking steps to improve the performance and efficiency of its own internal network. The organization is implementing a new VPN architecture that features Cisco® 7609 routers to connect and consolidate operations for its data centers in Rockville, Maryland, and Trumbull, Connecticut.

To efficiently distribute traffic over the VPN, NASDAQ uses Multiprotocol Label Switching (MPLS), a packet-forwarding technology that uses labels to make efficient data forwarding decisions. Cisco 7609 routers provide built-in support for the MPLS VPN, as well as the high level of performance needed to support one of the world’s most important securities organizations, delivering 30 Mbps forwarding rates and up to 256 Gbps total throughput.

After completing the upgrades to its data center networks, NASDAQ began making significant changes to the network that supports its trading partners, migrating from a private network to a more flexible environment that can support multiple connectivity options.

“The new environment will be a mixture of different models,” says Marie. “We can still own some of the partner networks and run them, either via a managed service or Internet service provider. We could also enable customers to connect to us via a financial extranet service.”

To support this new network scenario NASDAQ will implement an autonomous system structure on its internal network. Each autonomous system will feature a Cisco Catalyst® 6509 switch with a router blade, connected to a pod of servers that supports a specific trading application. The Cisco switches will provide an interface to NASDAQ’s extranet providers, as well as connectivity to its backbone network.

“Using our new Cisco architecture offers several important advantages, including better consolidation of bandwidth, segregation of function, and giving partners the ability to work with multiple telecom providers to get the best rate,” says Marie.

Maintaining the confidentiality of sensitive financial data is key to the integrity of a world-class trading organization. To safeguard its securities organization, NASDAQ protects its core network with Cisco PIX® Security Appliances, and will install intrusion detection system (IDS) and Cisco PIX® firewall blades on the Cisco Catalyst 6509 switches.

“The network will connect to multiple venues, so firewalls and IDS will be especially important to our network environment,” explains Marie. “The autonomous system structure will also provide an increased level of security by adding segmentation and segregation.”

RESULTS

NASDAQ’s new network model will deliver a number of benefits to the organization and its partners. By migrating toward a more flexible public network infrastructure, NASDAQ can reduce the costs associated with running a nationwide private network, saving millions of dollars in annual communications expenses.

NASDAQ's trading partners benefit from the new architecture as well. "With our Cisco network solution, we'll be able to enjoy a wider coverage of different partners and customers than we had before," says Marie. "Some of our partners can connect to extranets, and others can connect via the Internet. Implementing a public network lets us expand our market, and gives partners a choice of telecom providers, so they can push their costs lower."

NEXT STEPS

Having upgraded its data centers to a Cisco infrastructure, NASDAQ will deploy its new network architecture rapidly over the coming months. The organization is also extending its network with new multiservice applications, such as voice over IP (VoIP) connectivity, telework initiatives, videoconferencing, and unified messaging using a Cisco IP Communications solution.

"The maintenance associated with voice over IP is a lot less, which translates to a lower cost of ownership," he explains. "The network device moves, adds, and changes are easier, because you just pick up a phone and plug it in. And our Cisco IP Communications solution gives us the ability to provide wireless IP telephony for executives and other mobile employees."

NASDAQ is also implementing support for Financial Information eXchange (FIX) Protocol, on its Cisco network. FIX is a language that defines specific kinds of electronic messages for communicating securities transactions between two parties.

"Over the next three to four years, FIX support is a key IT strategy for us," says Marie. "Providing FIX connectivity to different traders gives us an easy-to-implement, open standard for communicating financial information."

Because NASDAQ's Cisco network infrastructure was designed for maximum scalability and flexibility, the organization can confidently accommodate new applications and trading partners in the years ahead.

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