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# Deep Value

CASE STUDY

LEVERAGES DIGITAL REALTY  
TO DELIVER ADVANCED  
TRADING ALGORITHMS



DIGITAL REALTY

25  
SPEED LIMIT  
25  
NO TRUCKS



Deep Value is one of only two providers  
of algorithms to the floor of  
The New York Stock Exchange.

Deep Value is one of only two providers of algorithms to the floor of The New York Stock Exchange. The company's world-class technology solution and platform is installed both on-site at client locations as well as at their own data centers. Clients include the New York Stock Exchange, prominent hedge funds and a number of other prestigious financial services powerhouses.

**The Company:**

To achieve leadership in algorithmic trading requires flexible and cutting-edge technologies. Deep Value has implemented its proprietary trading logic on a blend of proprietary software with industry standard open source components. Their container-based system has sophisticated



work scheduling frameworks and is fully distributed and fault-tolerant, ensuring maximum uptime for their clients.

### **The Challenge:**

The rapid growth in recent years of high frequency trading has fundamentally transformed the financial markets requiring participants to embrace technology in order to survive...let alone thrive. As an emerging vendor in a technologically driven business market, Deep Value has to constantly provide innovative solutions to their customers blending the best technology with the best quantitative trading strategies.

In 2010, Deep Value's management team determined that it was necessary to conduct additional analysis of their trading algorithms using historical data. The firm has notable analytical and computational research capabilities running complex market and strategy simulations on hundreds of terabytes of data. To compile these simulations requires splitting the workload across hundreds of machines running in parallel.

"One machine to run our tests was not feasible. For example, if we wanted to run one algorithm against data from a six month period it would take two days running on a single machine," said Paul Haefele, Managing Director of Technology for Deep Value. "But by splitting the workload across hundreds of nodes we can achieve the same results in just 15 minutes."

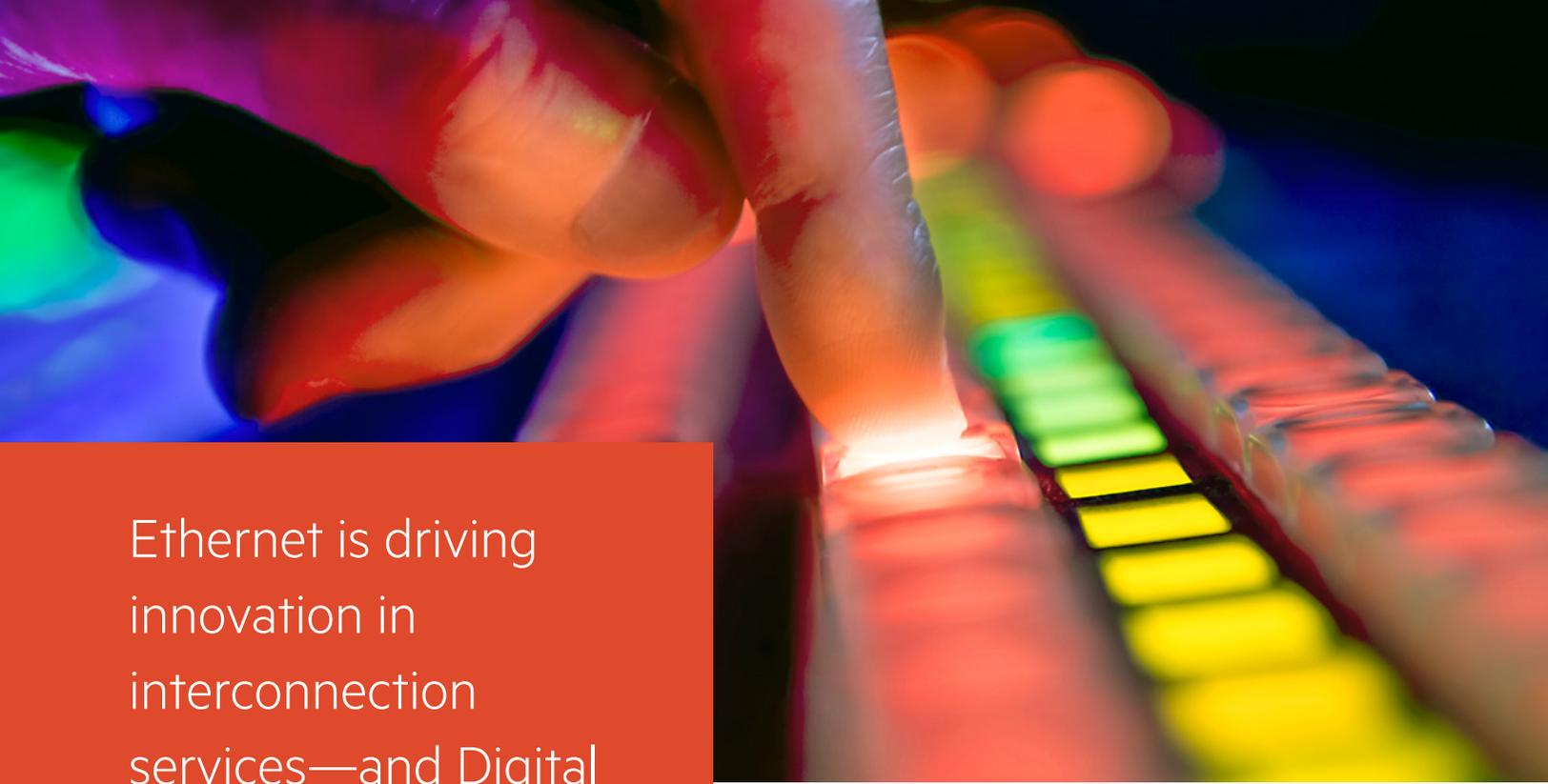
Like many emerging companies which are open to the idea of open-source technologies, Deep Value initially turned to a popular public cloud service to handle the compute workload. But as their compute needs continued to increase, Deep Value's management team found that their monthly service costs for data storage and computing time was becoming unmanageable.

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A key element of providing high-performance algorithmic trading strategies for their clients is sophisticated back-testing and simulation. “We routinely run tick-by-tick computations on 300 machine clusters generating event-by-event data. Digital Realty made it easy for us by offering a single-vendor solution encompassing two data centers as well as interconnectivity between the two.

Paul Haefele Managing Director of Technology  
Deep Value

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Ethernet is driving innovation in interconnection services—and Digital Realty interconnection facilities are at the forefront.

### **The Solution:**

Deep Value’s search for a hosting solution first began back in 2008. During that time, Deep Value took up space in Digital Realty’s facility at NYC2 (111 8th Ave) in New York City for low-latency connectivity to the financial exchanges.

For the last several years, Deep Value has leveraged Digital Realty’s NYC2 (111 8th Ave) facility because of its high-performance connectivity to the financial exchanges, broad selection of telecommunication carriers, and proximity to Deep Value’s clients.

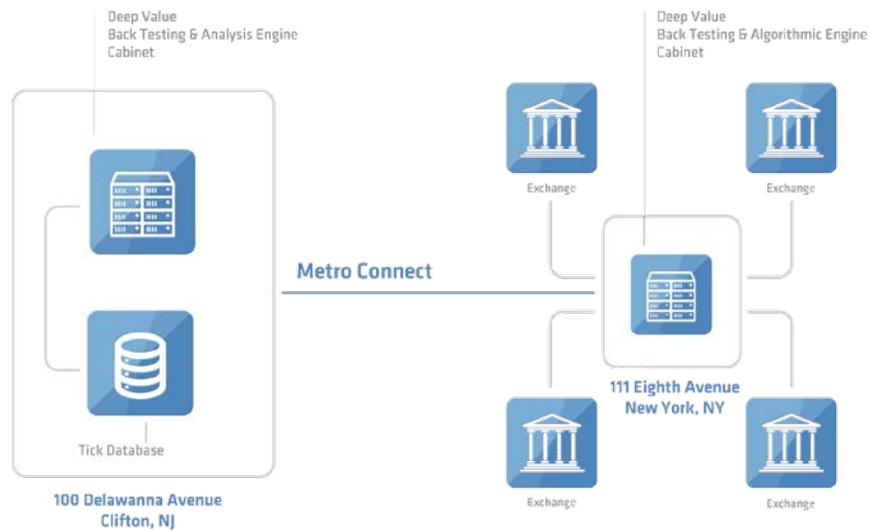
Due to its proximity to the financial markets in New York City, NYC2 (111 8th Ave) is a

central hub for many of the world’s leading carriers and physical connection points for top global financial, telecommunication and internet companies. The facility provides low-latency access to financial exchanges, market data vendors, as well as Cloud and software-as-a-service (SaaS) providers.

Within the NYC2 facility, Digital Realty operates the “Meet Me Room” which is the heart of the facility providing the critical interconnectivity between the telecommunication carriers and the services hosted there.

High-performance, cost-effective access to the financial ecosystem is vital for the continued success of Deep Value, and NYC2 (111 8th Ave) offered the financial ecosystem for their business to thrive. As Deep Value continued to run increasingly advanced computations, their costs for public cloud services continued to expand leading the management team to explore a private cloud to handle their growth.

In 2012, Deep Value expanded their partnership with Digital Realty and began utilizing Digital Realty’s data center at NJR2 (100 Delawanna Ave) in



Clifton. The Digital Realty Clifton facility offered high-density power configurations enabling Deep Value to cost effectively host their less latency sensitive applications. Deep Value coupled that need for connectivity by hosting their less latency sensitive technology in Digital Realty's NJR2 (100 Delawanna Ave) facility.

NJR2 (100 Delawanna Ave) in Clifton is one of the most robust colocation centers in the New York City metro area with a full 2N power configuration and ample telecommunication alternatives. Located just 11 miles outside of Manhattan, the data center offered an ideal location for Deep Value to host its computationally intensive analytics engines while the latency sensitive services remained at NYC2 (111 8th Ave). Haefele explains, "There has been a seismic shift in the financial world over the last few years. In this era, we need battle tested technology. Deep Value is positioned on the front line to help ensure we get liquidity in the marketplace for our clients."

To connect Deep Value's systems in 111 8th with their new engines in Clifton, Deep Value leveraged Digital

Realty's Metro Connectivity services connecting Digital Realty's facilities together with a "virtual" cross-connect. Metro Connect<sup>SM</sup> is in the center of Digital Realty's interconnection suite of products along with intra Facility Connectivity, National Connectivity and Global Internet Connectivity. As a "network neutral" provider, Digital Realty does not own or operate its own network, allowing it to act as an unbiased intermediary to facilitate the exchange of communications network traffic. Ethernet is driving innovation in interconnection services – and Digital Realty interconnection facilities are at the forefront.

"Over the last few years, Deep Value has welcomed Digital Realty providing us with more control of hardware and storage at lower price points. As we determined that Digital Realty was able to offer us a better ROI by helping us establish a private cloud within their Clifton facility, it made sense from a business perspective, to expand our relationship," said Haefele.



## About Digital Realty

Digital Realty Trust, Inc. supports the data center and colocation strategies of more than 1,000 firms across its secure, network-rich portfolio of data centers located throughout North America, Europe, Asia and Australia. Digital Realty's clients include domestic and international companies of all sizes, ranging from financial services, cloud and information technology services, to manufacturing, energy, gaming, life sciences and consumer products.

[www.digitalrealty.com](http://www.digitalrealty.com)

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