

## PRODUCT DESCRIPTION

# Data Fabric™ on Intel Xeon 5500 Multi-Core Processors

## Next Generation Messaging on Next Generation CPU

### FAST FACTS

#### What is it?

Data Fabric, a high-throughput application messaging platform, powered by Intel Xeon 5500 series processors.

#### Who is it for?

Customers looking to improve the performance of mission critical financial services applications.

#### What does it provide?

High performance real-time data distribution and the foundation for a new generation of business applications.

*"NYSE Technologies' Data Fabric is taking advantage of the superior performance available from Intel Xeon 5500 processors," says Sunil Kulkarn, Sr. SW Engineering Manager – Software & Services Group at Intel. "This is an impressive example of how Xeon processors significantly improve the performance of mission critical financial services application."*



Demands on market data infrastructures within investment firms have increased in number and intensity; market data volumes have grown exponentially and processing systems are being forced to deal with the deluge of immediate, relevant information that serves as input into today's trading decisions. Constant change in the competitive landscape is the new norm and technological innovation is gaining momentum.

### Customer Challenges

An improved solution is needed – one that requires a smaller hardware footprint, enables flexible deployment scenarios, features minimal time to market for critical applications, while at the same time demonstrating superior latency and throughput profiles. Clients need help from a trusted supplier to seamlessly handle this complexity and allow them to focus on their core job - defining and executing trading and investment strategies.

#### • Growing Volumes of Data

Clients today face the challenge of handling ever increasing volumes of real-time data. From high-frequency trading to cloud computing, NYSE Technologies Data Fabric on Intel Xeon 5500 series processors is unparalleled for real-time data distribution.

#### • Low Latency

In market data quote platforms and financial trading systems, micro-bursting of data (i.e. large quantities of simultaneous updates from many sources within a few microseconds) happen regularly, forcing standard IP based middleware to buffer messages. This causes significant latency spikes and leads to message outliers. Micro-bursts of data updates can highlight bottlenecks across various parts of the trading system, especially in the I/O stack and the middleware. The Data Fabric™ platform achieves breakthrough performance with low CPU overhead because it eliminates the need for CPU time to be spent on I/O. This enables business applications to do even more critical work, faster and with less data center real estate. With NYSE Technologies Data Fabric running on Intel Xeon 5500 processors, data center spend goes further than previously possible.

### Solution Benefits

NYSE Technologies' Data Fabric™ is the market leading platform for low-latency, high-throughput application messaging. By fundamentally changing the approach to middleware, the Data Fabric platform simultaneously benefits from, and maximizes the power of multi-core CPUs with fast memory access, like the Intel® Xeon® 5500 processors Series.

#### • A New Approach

By taking advantage of Xeon's powerful I/O Hub, Data Fabric enables applications to leverage the CPU's multiple cores, without needing complex multi-threading code changes. With both Local Direct Memory Access (LDMA) and Remote Direct Memory Access (RDMA) capabilities, it efficiently scales applications beyond a single machine, with many application instances and heavy data access requirements.

#### • Breakthrough Performance

NYSE Technologies' Data Fabric™ platform, using industry standard hardware, offers 10x times the throughput with 1/10th the latency of traditional, low-latency IP-based middleware. This breakthrough performance is achieved by leveraging the hardware acceleration afforded by the latest generation of servers with Intel Xeon processors and common network adapters that bypass the OS and IP stack – two bottlenecks that traditionally plague IP based middleware offerings. NYSE Technologies have found that one of the most important determinants of performance on any given hardware platform, is the memory access times by the Central Processing Unit. Intel Xeon 5500 series processors, with the I/O Hub and dedicated RAM channels, offer significantly improved performance over previous generation CPUs.

## Data Fabric™ on Intel Xeon 5500 Multi-Core

### Shared Memory – No Retransmissions

Data Fabric™ incorporates the revolutionary approach of a publish-and-subscribe, topic-based, application messaging platform that leverages Shared Memory Access. This unique design eliminates retransmission requests, and multicast storms which occur on IP platforms when there are network issues, or when a subscriber is unable to process updates at the same rate as the publisher. By leveraging RDMA hardware acceleration to handle message delivery, Data Fabric also provides protection for the publisher from misbehaving subscribers.

### Flexibility and Choice

NYSE Technologies Data Fabric platform supports four message transportation types: LDMA; RDMA over 10Gigabit Ethernet; RDMA over InfiniBand; and direct TCP sockets. By employing the Data Fabric Daemon, clients can ‘bridge’ all of these transport types and filter traffic flowing between them, both locally and over a WAN. This flexibility allows Architects and Administrators to choose the ideal interconnect solution without requiring any code changes, and ensures the best performance possible regardless of the deployment choice.

Each transport method addresses a different performance goal:

- LDMA – trading venue co-location and other high latency sensitive applications
- RDMA – latency sensitive applications requiring processing across multiple servers
- TCP – efficient enterprise fan-out to servers and desktops where only traditional Ethernet is available

### Business Use Case

US Options trading generates greater market data volumes than any other market in the world, with quote to trade ratios in excess of 6,000:1 and message rate micro-bursts exceeding 1.1 million messages per second on the OPRA (Options Price Reporting Authority) feed alone. Currently systems can manage only small portions of OPRA, requiring complex data segmentation efforts and huge amounts of ‘wasted’ processing power to handle filtering rather than valuable business logic. OPRA hit a 1,110,642 message per second maximum peak in July 2009, forcing participants under acute pressure to ensure their systems can withstand these volumes now and in the future; NYSE Technologies Data Fabric on Intel Xeon 5500 Processors delivers on that need.

### Key Features of Data Fabric™

- Breakthrough application performance:
  - Over 8+ million 200 byte messages per second, with nanosecond latency between two applications running on a single, 8 core Xeon 5500 server using Data Fabric’s Local Direct Memory transport
  - Over 1.6 million 200 byte messages per second, with single-digit microsecond latency between two applications on two 8-core Xeon 5500 servers, using Data Fabric’s Remote Direct Memory transport
- Flexible deployment options: LDMA, RDMA 10GigE, RDMA IB, TCP
- Simplified application design and development: One API for all transports
- Predictable business application performance: ‘Flat’ latency curve
- Greater data center efficiency: Reduced CPU utilization

### About NYSE Technologies

NYSE Technologies provides leading edge software, market data and high performance connectivity for electronic trading, delivering innovative tools and access to worldwide markets and liquidity, from complete exchange platforms to single trading positions.

### About Intel

Intel pushes the boundaries of innovation so our work can make people’s lives more exciting, fulfilling, and manageable. And our work never stops. We never stop looking for the next leap ahead—in technology, education, culture, manufacturing, and social responsibility. And we never stop striving to deliver solutions with greater benefits for everyone.

### Find Out More

Contact our Trading Solutions team now for further information.

Email: [NYSE-Technologies-Sales@nyx.com](mailto:NYSE-Technologies-Sales@nyx.com) or Visit: [www.nyse.com/technologies](http://www.nyse.com/technologies)

*“NYSE Technologies’ Data Fabric, the high performance messaging backbone to NYSE Technologies’ trading and exchange solutions, saw dramatic improvements in performance, by leveraging the new Intel Xeon processor 5500 series,” said Conor Allen (Head of Core Engineering and R&D at NYSE Technologies). “Combining Data Fabric and Intel’s Xeon Processor 5500 provides 25% reduction in latency and 2x throughput when compared to Xeon’s predecessor, Harpertown. This compelling hardware/software combination provides the performance headroom needed to keep pace with growing market data volumes.”*