

6WIND: The Gold Standard for Software-Defined Networks



High Frequency Trading



- ▶ Sophisticated trading strategies need high-performance networking platforms
- ▶ Standard server blades are too slow
- ▶ FPGA- and ASIC-based solutions are too inflexible
- ▶ 6WIND delivers sub-10 μ s latency in a pure software solution on standard, low-cost hardware platforms
- ▶ Optimized for industry-leading multicore processor platforms

Timing is everything and in the world of High Frequency Trading (HFT), being able to react in mere seconds is not even close to being fast enough. For HFT networking equipment, latencies in the millisecond range were adequate until recently, but today's competitive environment demands response times of microseconds and a fully-programmable solution.

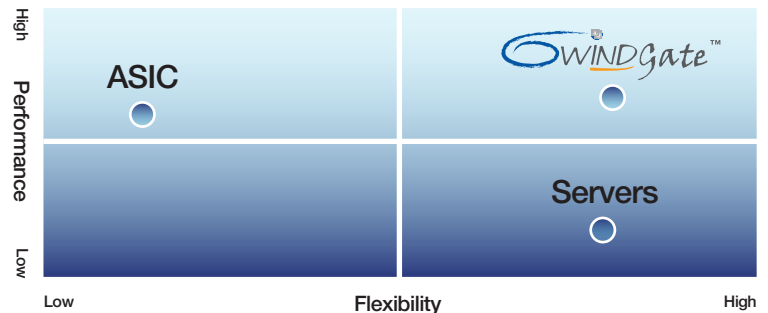
The HFT market involves the use of sophisticated tools, running on high performance computing and networking systems, for trading securities such as stocks and options. These systems collect and process vast quantities of data, in order to identify and capture trading opportunities that may open up for as little as a fraction of a second. With high-frequency trades executing in microseconds, minimizing the delay between market data analysis and trade submission increases the effectiveness of trading algorithms. This maximizes the probability that a trade generated using that data can, and will, be executed.

For networking equipment used in HFT, low-latency connections are critical in providing a competitive edge for processing these high-speed streams of information. In addition to low latency, though, these systems require:

- ▶ Processing of complex networking protocols to extract financial application information.
- ▶ Advanced high-speed routing systems.
- ▶ Zero-downtime reliability during trading periods. The financial implications of losing trades because of equipment outages are enormous.
- ▶ High-performance security protocols to protect of network traffic against a wide variety of threats.
- ▶ Programmability and flexibility, so systems can be updated in line with improved algorithms or new standards.

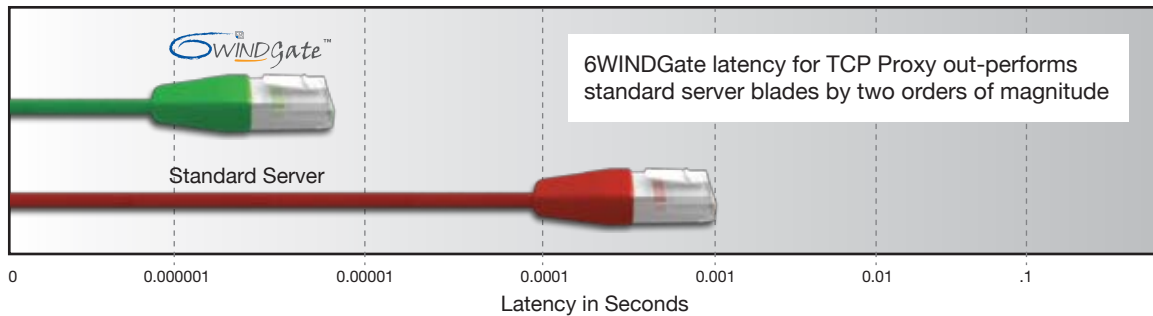
In the past, HFT networking functions were performed on off-the-shelf servers running standard Operating Systems such as Linux, achieving response times in the millisecond range. For environments where the highest speed is required, these systems have been superseded by custom solutions based on dedicated, high-performance hardware.

FPGAs represent one option for achieving ultra-low latency within custom hardware. By designing an FPGA to perform a specific, pre-defined set of networking functions, engineers can obtain microsecond latencies while retaining the option to cost-reduce the system via an ASIC-based implementation at some time in the future.



The FPGA approach, however lacks the programmability and flexibility that is required in markets such as HFT where algorithms are constantly evolving and standards (not least for regulatory compliance) change frequently. A far superior solution is possible when a high-performance multicore processor is used along with the 6WINDGate™ HFT Edition software.

6WINDGate™ HFT Edition



Innovative Software Architecture

The 6WINDGate HFT Edition software solution is ideal for use in HFT networking equipment. By performing the most frequently used networking functions (such as TCP Proxy) on dedicated processor cores that do not also run the complete OS, 6WINDGate avoids the performance penalties imposed by OS latencies and overheads. In addition, 6WINDGate implements a controlled distribution of packets between cores to ensure the optimum use of computing resources. This innovative fast path architecture improves the latency of HFT networking functions by more than an order of magnitude, when compared to OS-based implementations.



Portable Solution

The 6WINDGate software is available for a wide range of industry-leading multicore processors and has been optimized to fully exploit the performance-oriented features designed into those devices, such as on-chip accelerators for security functions. This provides system architects with the flexibility to select whichever processor is best suited for a specific HFT networking product, with the confidence that the use of 6WINDGate will enable them to extract the best possible networking performance from that platform.

Easy Integration

While maximizing the performance of critical networking functions, 6WINDGate also provides full compatibility with standard application-level Linux APIs. Proprietary HFT application software already developed for other platforms can be deployed to run on 6WINDGate without the need for time-consuming rewrites or re-validation. This minimizes the schedule risk for developing a new HFT platform and allows system designers to focus on their unique, value-added capabilities rather than low-level platform-specific optimizations.

Comprehensive Protocol Suite

In addition to a full set of protocols for implementing low-latency HFT connections, such as TCP Proxy (termination and retransmission), IP Forwarding and firewall functions, 6WINDGate includes a wide range of security protocols and support for high-performance routing.

Ready for Tomorrow's HFT Challenges

The high-performance 6WINDGate HFT Edition software has been proven to provide designers of HFT networking equipment with a unique system-level solution for today's performance challenges. At the same time, as a pure software solution rather than a custom hardware implementation, 6WINDGate ensures the flexibility, programmability and scalability to adapt to tomorrow's challenges in this fast-paced, competitive market.



HIGH AVAILABILITY

6WINDGate provides full support for High Availability (HA) frameworks, in order to ensure zero-downtime reliability through industry-standard failover modes.

VIRTUALIZATION

6WINDGate integrates seamlessly with hypervisors and virtualized environments, supporting industry-standard configurations for virtualized packet processing.

TECHNICAL SUPPORT

6WIND delivers comprehensive, global services and support. Our expert team is available for custom software design and optimization.

For more information on any of our products, services or partners please visit www.6wind.com or call +1 (650) 968-8768.

©6WIND 2012. References to company names, products or other such items may be trademarks of their respective owners.

Specifications subject to change without notice.

V020612

