



BATS System Performance

World-class, Sustained Low Latency

The BATS system excels during heavy load and has proven itself on the busiest days in the history of the U.S. equities market. This innovative and technology-leading market center provides the following latency numbers based on order latency and order to quote latency. BATS offers 1 Gig and 10 Gig access, and latency data is shown for both interface speeds. The term “latency” for each process is defined below.

Order Acknowledgement Latency

- the time it takes to accept, process, and acknowledge **or fill** a Member order
- the complete round trip from firewall to FIX handler to matching engine and back
- measured from *outside* the BATS firewall
- sustained under heavy load
- measured during the entire day, including open and close

Order Latency	10 Gig Connection		1 Gig Connection	
	BZX Exchange	BYX Exchange	BZX Exchange	BYX Exchange
Average	191 microseconds	163 microseconds	200 microseconds	185 microseconds
80% of orders within	166 microseconds	166 microseconds	173 microseconds	183 microseconds
99% of orders within	906 microseconds	286 microseconds	623 microseconds	323 microseconds
99.9% of orders within	2 milliseconds	606 microseconds	2 milliseconds	1 millisecond

Order to Quote Latency

- the time it takes to accept, process, and deliver a visible Member order via Multicast PITCH
- measured from *outside* the BATS firewall
- sustained under heavy load
- measured during the entire day, including open and close

Multicast PITCH Latency	10 Gig Connection		1 Gig Connection	
	BZX Exchange	BYX Exchange	BZX Exchange	BYX Exchange
Average	198 microseconds	183 microseconds	215 microseconds	211 microseconds
80% of orders within	186 microseconds	186 microseconds	203 microseconds	203 microseconds
99% of orders within	706 microseconds	286 microseconds	723 microseconds	323 microseconds
99.9% of orders within	2 milliseconds	506 microseconds	2 milliseconds	1 millisecond

Technology professionals at BATS constantly engineer the BATS BZX Exchange and BYX Exchange platforms to handle heavier and heavier loads while maintaining what they believe to be the lowest firewall-to-firewall latency numbers in the industry.

Other System Statistics	BZX Exchange		BYX Exchange	
Messages per second	Average: 24,602	Peak: 563,042	Average: 16,013	Peak: 307,328
PITCH events per second	Average: 7,944	Peak: 276,102	Average: 2,399	Peak: 58,990
Max volume to date (millions)	Matched: 2,260	Touched: 2,723	Matched: 216	Touched: 250

BATS offers world-class system performance via FIX (the only ubiquitous financial protocol in the world), which supports all BATS’ features unlike many of BATS’ competitors.

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