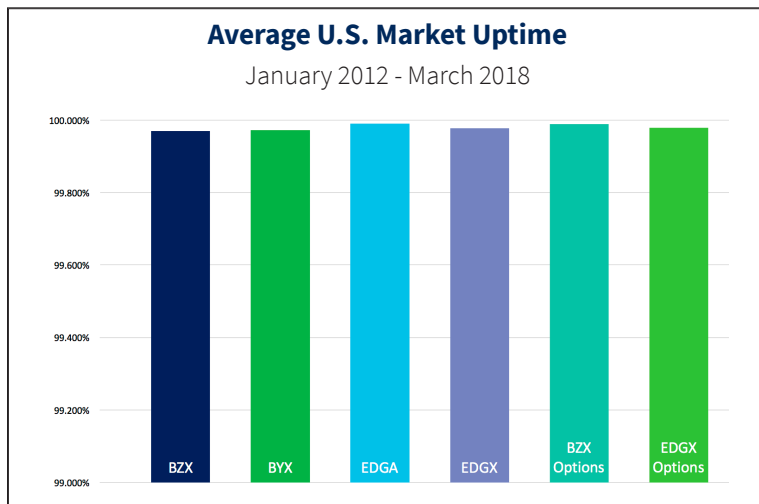


Overview

Cboe takes pride in the reliability and availability of its systems. The Cboe exchanges running on Bats technology have an uptime history of more than 99.9%.* Yet, Cboe continues to spend extensive time and resources toward planning and preparing for system failures, including those that might affect the primary auctions of securities listed on the Cboe BZX U.S. Equities Exchange. Redundancies and resiliencies are built into every part of the system, including software, hardware, storage, database and network components. Below are highlights of our Business Continuity Plan (BCP) and Disaster Recovery (DR) plan.



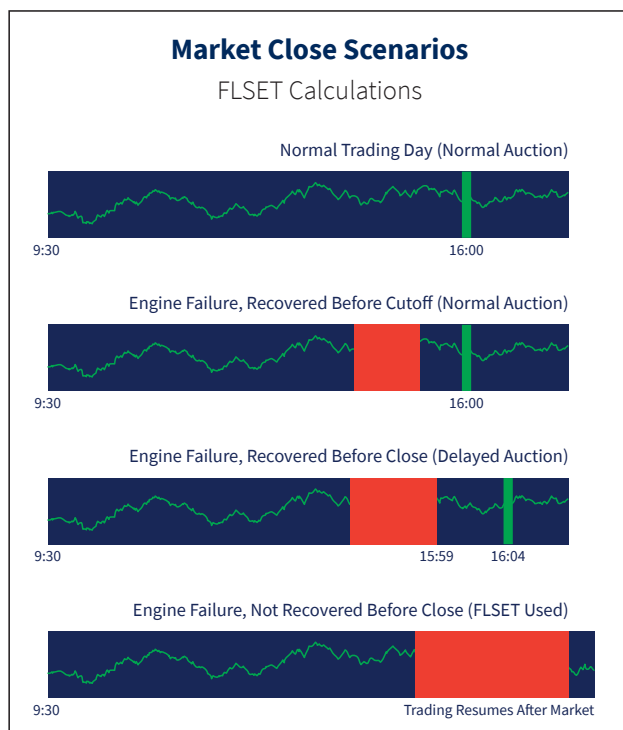
Matching Engine Resiliency

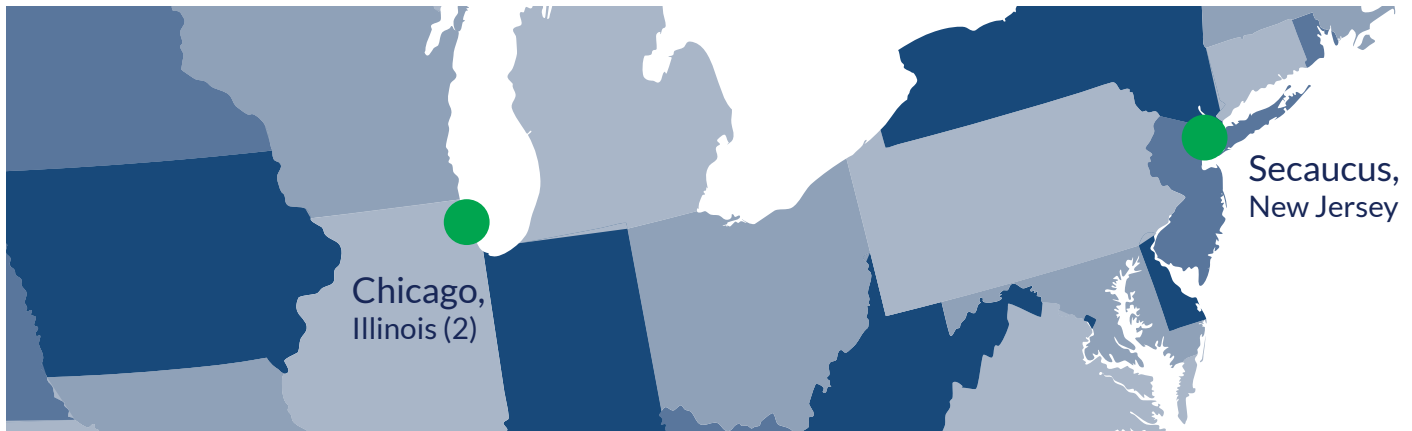
Cboe’s Bats technology includes rigorously engineered matching engine resiliency to ensure markets operate in a fair and orderly manner, especially for **Cboe-listed securities**. Cboe-listed products trade on dedicated matching engines, and each matching engine has a primary and secondary instance. If the primary instance fails (software or hardware), the secondary instance automatically takes over continuous trading in approximately 45 seconds. This matching engine failover process has handled numerous failovers globally in production and has worked as designed to prevent undue disruption to trading.

Cboe also offers “cancel on disconnect” to customers. This automatically cancels customers’ orders on that session if they disconnect. However, our system gives customers the option to persist auction orders through a session disconnect to ensure they participate in the auction even if their session is down. This provides customers maximum flexibility to ensure they are participating in all continuous trading and auction periods they desire, especially in Cboe-listed securities.

Matching engine resiliency also applies during auction periods. Cboe has a detailed auction resiliency matrix that automatically drives matching engine recovery during critical auction periods. Cboe will make every effort to failover to the secondary matching engine during these critical periods to conduct the auction.

- If the recovery from a matching engine failure is successful before a scheduled auction closing cutoff, the auction will occur on the secondary matching engine at the normally scheduled time.
- If the failover completes after the closing cutoff time but before the close, the closing auction will be postponed to allow for a normal five-minute period after the cutoff to ensure the closing auction is fair and orderly.
- If recovery cannot be completed until after the close, no auction will be conducted but an Official Closing Price will be reported to the consolidated tape for each Cboe-listed security. The Cboe Official Closing Price will be the price of the Final Last Sale Eligible Trade (FLSET). It will be represented by a sale of condition of “M” (Market Center Official Close).





Data Center Redundancy

Cboe maintains multiple data centers (primary and secondary) in different parts of the country for geographic diversity. Cboe tests its secondary exchange platforms with its customers and other exchanges annually and is able to quickly initiate trading out of its backup data centers in the event of an outage at the primary data center.

In fact, Cboe switched the trading of one of its exchanges (BYX Exchange) to its secondary data center intraday on September 26, 2013, without issue. To our knowledge, Cboe is the first and only exchange operator to have successfully switched to a DR data center intraday on an actual trading day.

With close to 80% of Cboe's daily market volume connected to our DR sites, our customers can expect a viable, tested failover site with a critical mass of liquidity from market participants.

Business Continuity

To ensure business continuity of operations in the United States, Cboe operations personnel report to a business continuity office space to operate the U.S. markets one day each month.

On an annual basis, the Cboe facility operating exchanges on Bats technology is taken completely offline for an entire trading day, with Cboe associates located at that facility reporting to the business continuity office to ensure readiness.

For more information regarding business continuity, read the [Cboe Business Continuity Disclosure](#).

Communications

Cboe strives to keep customers well informed during failure scenarios and will seek to provide updates as frequent as every 30 minutes after an initial System Status notice has been distributed through event resolution. Event updates may be viewed via the Exchange Notices/System Status section for each asset class on markets.cboe.com, or by subscribing to the System Status email distribution list through the [Cboe Trade Desk](#).

U.S. Equities System Status

U.S. Options System Status

U.S. Futures System Status

❖ Cboe appreciates your continued business. Please call the Cboe Trade Desk or your Director of Sales with any questions regarding the Cboe BCP/DR Plan.

**All Cboe markets run on Bats technology with the exception of the Cboe FX markets, and the Cboe Options Exchange. The Cboe Options Exchange is migrating to Bats technology on October 7, 2019, pending regulatory approval. Learn more [here](#).*