
Information technologies

The Exchange is a company with advanced IT infrastructure across trading, clearing and risk management. The Group has a major focus on upgrading its technological infrastructure and providing reliable, high-quality services.

The Exchange's trading and settlement services are on par with those of leading international trading venues, and are based on state-of-the-art IT platforms.

INFRASTRUCTURE

The Group's computing capacities are located in two advanced data centres (DCs) — DataSpace, the main centre, which holds Tier III certification; and M1, the backup centre. Failsafe technologies at the network and hardware levels allow for maximum seamless system switching both inside the two data centres and between the main and backup locations. The same approach is applied to backing up clients' connections: interfaces with communication service providers are switched between data centres automatically, with no manual intervention required.

MOEX uses the most advanced server and network hardware from leading international manufacturers across its platforms, including ultra low latency network loops and optimised computing capacities for on-line computation in trading systems.

TECHNOLOGICAL ACCESS TO TRADING

The Exchange offers a complete range of trading solutions. Options for optimizing performance include remote connections via authorized operator networks, global financial networks, dedicated channels, the Internet, and international points of presence (PoP) in major financial centers such as London, Chicago, New York and Frankfurt, as well as in Asia and the Middle East (Singapore, Hong Kong, Shanghai, Dubai, Mumbai). In 2019, MOEX added new options for Russian and international market participants to connect to the Exchange's trading and clearing systems using business-to-business channels and technological infrastructure provided by leading international providers of technical access services.

Access to trading on the Group's markets and distribution of exchange data utilize standardized FAST and FIX protocols, including TWIME and Plaza II protocols developed by the Exchange.

A colocation zone located at the main DataSpace DC ensures the highest levels of reliability, accessibility and security for connecting clients who are interested in high-frequency trading on the Exchange's markets. About 40 professional market participants use colocation services. In 2019, as part of the expansion of colocation services, several new services were commissioned, including exact time and traffic mirroring services.

RELIABILITY MANAGEMENT AND INFORMATION SECURITY

The Exchange maintains a strong focus on the reliability of its trading and computing infrastructure, which achieved 99.99% uptime during 2019.

99.99%

reliability of trading and computing infrastructure

Uninterrupted functioning and fault tolerance are maintained using “hot” and “cold” backup technologies which support fast recovery of trading and clearing systems. In 2019, the Exchange supplemented these instruments with a distributed cluster of database management systems for one of its exchange platforms, which will lead to significantly shorter recovery times in case of emergency.

The Exchange’s technical policy for its IT infrastructure is designed to maintain hardware reliability. Server equipment for critical trading and clearing operations is replaced every four years, while network equipment is replaced every five years.

The Exchange regularly conducts information security audits, including intrusion and anti-phishing tests, and continues to improve its applied security systems.

To enhance continuity of its core businesses in 2019, the Exchange created a mobile backup office that supports continuous trading management even in case of emergency.

DEVELOPMENT OF THE TRADING AND CLEARING SYSTEMS

The Exchange’s main markets are based on two trading and clearing systems: ASTS (Equity & Bonds and Money Markets, as well as FX and Precious Metals Market) and SPECTRA (Derivatives Market). These systems have a modular architecture which simultaneously supports a high level of performance of exchange infrastructure. The performance indicators of the Exchange’s trading systems are comparable to those of major global platforms, and can process a combined 200 thousand transactions per second.

In 2019, trading and clearing systems successfully underwent a major transformation. A system version with hardware-independent trading and clearing cores was introduced on the Equity Market. Within the FX Market, a separating (partitioning) system for clearing cores was implemented. The Derivatives Market system was divided into hardware-independent trading and clearing cores with the possibility of clearing partitioning. SPECTRA migrated to the Linux operating system, which offers additional sustainability and performance. Both platforms also migrated to a new version of the high-speed LLM bus.

ELECTRONIC PLATFORM DEVELOPMENT

In 2019, the Exchange continued the creation of the Marketplace platform. This was developed using a microservice architecture with Java/JS for development, Kubernetes for containers management, Apache Kafka for message queue management, Camunda BPM for business processes management, free PostgreSQL

database management system, and other elements from the latest technological stack.

A separate platform was developed for corporate clients, offering simple and convenient access to the Exchange's FX and Money Markets.

APPLYING COMPUTERIZED LEARNING

In 2019, computerized learning technologies were introduced to analyze cases when users contacted technical support. Messages are now handled classified, categorized and assigned to an incident group automatically.

NEW IT STRATEGY

A new IT strategy was adopted as part of the Exchange's overall strategy in 2019. The strategy focuses on developing the architecture of main applications using loose coupling of modules, restructuring of application and infrastructure management to support 24/5 and 24/7 operation,

development of a multi-vendor system for main equipment types, switching IT team management to a "product/platform" model, and embedding a culture of IT interaction based on "community/contribution" principles.