MOEX Trading and Clearing Systems Load Testing plan for 26 September 2015

Infrastructure

Markets

During the load testing all MOEX Trading Systems will be tested, with the following maximum number of orders per market are to be reached:

- Equities market (ASTS system) – 75 000 000

- FX market (ASTS system) – 75 000 000

- Derivatives market (Spectra system) – 120 000 000

The aim of this testing is to provide participants with an opportunity to check their infrastructure and software at peak transaction frequency and with increased number of orders.

Total load testing run time – 5.5 hours. Target numbers of orders for every market 1.5-2 times exceed the maximum numbers achieved in real trading.

It is planned that transaction frequency during the tests will exceed the real market frequencies by 3-4 times on one second intervals, but at the same time the frequency will be below the maximum system performance capacity.

The maximum performance capacity of trading and clearing engines and all the subsystems will be measured during the short interval at the end of the tests to avoid the distortion of measurements caused by transaction queues.

All the gateways that satisfy minimum system requirements will be switched on before the testing starts. As the load during the tests increases all the gateways not capable to process that load level will be noted and switched off.

In order to create realistic environment it is recommended to all participants to connect all the external systems that are used during the normal trading to the ASTS system and all the intermediate servers and client gates to the Spectra system.

Services

The following services and subsystems will be up and running during the tests:

- Index Servers

- Web services

- FIX UDP multicast marketdata (FAST)

- FIX transactional servers

Requirements to the infrastructure of participants

Gateway

- CPU: Intel Xeon with minimum 4 cores, 2.7 GHz, 2.9 GHz and higher recommended.

- RAM – 32 Gb DDR3 1600 or faster

- Free disk space – 32 Gb

Intermediate server

- CPU: Intel Xeon with minimum 2 cores

- RAM – 24 Gb

- Free disk space for test logs – 20 Gb

Network

In order to reach the maximum planned intensity of transactions every local Gateway or FAST udp multicast marketdata service should be connected by channels with the following bandwidth per every channel:

- Equities market – 8 Mbit/s

- FX market – 8 Mbit/s

- Derivatives market –10 Mbit/s

- FIX udp multicast for Equities market (feed A) – 30 Mbit/s

- FIX udp multicast for FX market (feed A) – 30 Mbit/s

- FIX udp multicast for Derivatives market (feed A) – 5 Mbit/s

Note: only those clients who use leased lines with bandwidth higher then sum of requirement for every copy of services, given above, should expect their Gateways to run normally at the expected peak frequencies.

Clients with smaller bandwidth will witness the slippage of Gateways or FAST packets lost once 100% of the channel bandwidth becomes occupied by the replication traffic.

To avoid any reconfigurations during the tests it is recommended that all the owners of local Gateways contact the Exchange telecom team in advance in order to split gateway connections between connection channels.

Load Testing Scenario (tentative)

Participants may run their own scenarios but it is strongly recommended to adhere to the following principles in avoidance to create artificial deterioration of Trading System capacity:

- To comply with the real trading statistics withdraw 99% of orders or more by order number.

- Try not to conclude too many trades. Otherwise tests may stop when the maximum trade number is reached while the maximum order number is not.

- We strongly recommend to participants to analyze market parameters for instruments during load testing for minimizing quantity of transactions that would be rejected due to non-market price range.

MOEX team are allowed to block accounts in case if malicious activity, interfering with load testing is detected.

Load Testing Schedule

Start time (tentative) – 12:00 MSK, end of test – 17:30 MSK

Figures for peak frequencies is approximate.

Event	Duration, minute	Time of the beginning of an event	FX Market, transaction /sec	Equities Market, transaction /sec	Derivatives Market, transaction /sec	FX Market, orders	Equities Market, orders	Derivatives Market, orders
Start	30	0	0	0	0	0	0	0
Opening auction	10	30	0	200	0	0	120000	0
3*3000	20	40	3 000	3 000	3 000	2 400 000	2520000	2400000
3*6000	5	60	6 000	6 000	6 000	3 600 000	3720000	3600000
3*10000	5	65	10 000	10 000	10 000	5 600 000	5720000	5600000
3*12000	5	70	12 000	12 000	12 000	8 000 000	8120000	8000000
3*16000	5	75	16 000	16 000	16 000	11 200 000	11320000	11200000
3*2000	5	80	2 000	2 000	2 000	11 600 000	11720000	11600000
3*6000	20	85	6 000	6 000	6 000	16 400 000	16520000	16400000
Intermediate Clearing of Derivatives Market	25	105	6 000	6 000	0	22 400 000	22520000	16400000
Crash Test of Derivatives Market	90	130	6 000	6 000	0	44 000 000	44120000	16400000
3*16000	10	210	16 000	16 000	16 000	50 400 000	50520000	22800000
3*6000	20	225	6 000	6 000	6 000	55 200 000	55320000	27600000
Maximum	30	240	16 000	16 000	80 000	74 400 000	74520000	123600000
Stop loading	0	300	0	0	0	74 400 000	74520000	123600000
Evening Clearing on Derivatives Market (optional), switching on the reserve trade engine of FX Market	30	300						
Stop		330						