International points of presence

PRODUCTION CONNECTIVITY

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DOCUMENT SERIES

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NAVIGATION

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OVERVIEW

International Points of Presence (POP) is one of the options to get a network connectivity to the Moscow Exchange services outside the Russian Federation. The authorized Network Service Providers (NSP) organize connectivity through the special aggregated channels. The service includes:

- Two cross-connects to NSP equipment in the chosen location (not included into the service charge and billed separately);
- NSP carrier channels;
- Two cross-connects between the NSP and MOEX at both DSP (primary) and M1 (secondary) data centers.

This scheme provides automatic traffic switching to a backup data center without an additional configuration in case of a failure. BGP (Border gateway protocol) protocol is used for network route advertisements and the PIM SSM (source specific multicast) for the multicast delivery. The NSP provides fault tolerant network channels.

Detailed information can be found in the section Technical diagram and the full list of available MOEX POP locations at https://www.moex.com/s655.

TECHNICAL DIAGRAM
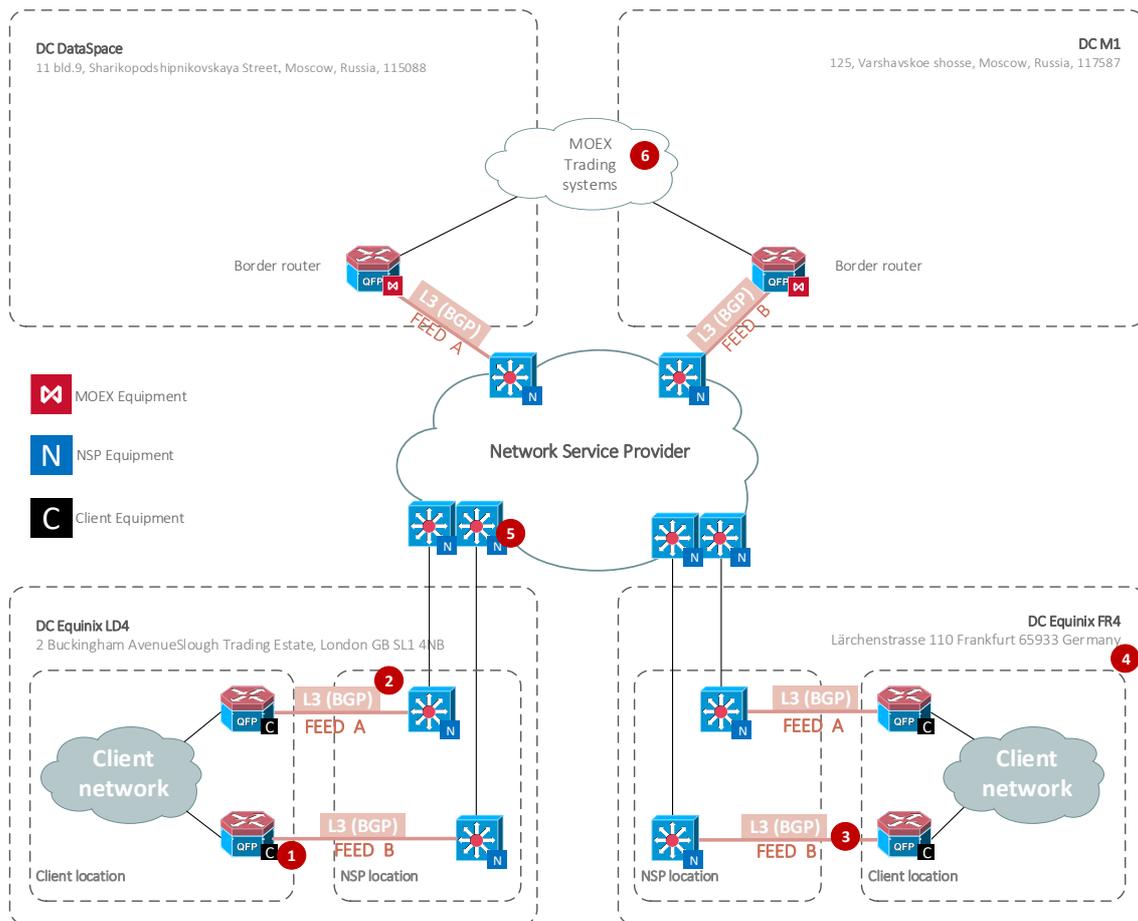
1 **Redundancy.** Second Client router can provide additional redundancy and this option is recommended but not required. In the scheme with one router two cross-connects would be terminated on one router, thus the equipment has to have at least three available ports.

2 **Network Protocols.** There are two options for the multicast subscriptions:

- Static IGMP Joins configured by the NSP on Client ports. It suits when there is no technical possibility for the SSM. However, Client will receive data from all the multicast groups in spite of whether they are needed or not,
- PIM configured in SSM mode. If your setup meets the requirements, it is the best way to receive multicast feeds.

Client chooses IP subnets from the options below and advertise them to MOEX via BGP:

- Private IP range assigned by MOEX with a prefix from 24 to 32.
- Dedicated Public IP range provided by Client.

3 **Cross-connects.** MOEX is ready to accept cooper and fiber optic links. Most common option is 1 Gb/s fiber optics connection either single-mode (1000BASE-LX/LH standard) or multi-mode (1000BASE-SX standard).

4 **Global Points of Presence.** Full set of available MOEX POP locations can be found at https://www.moex.com/s655.

5 **Routing.** There are two independent routers placed on NSP side for fault tolerance. Network 91.203.252.0/22 is announced over both cross-connects with the same metric, and more

specific subnets for the multicast are announced separately (91.203.253.224/28 over the primary x-connect and 91.203.255.224/28 over the secondary).

6   **MOEX services** are in 91.203.252.0/22 IP range.

SUPPORTED HARDWARE

There are no restrictions from MOEX on the equipment choice used for connection at global points of presence.

NETWORK CONNECTION REQUIREMENTS

Depending on the number of services and the set of multicasts streams subscriptions (FAST UDP multicast technology), the recommended bandwidth is calculated as the sum of the values:

- 4 Mbit/s per terminal
- 15-50 Mbit/s for each FeedA and FeedB stream at the Securities Market
- 15-50 Mbit/s for each FeedA and FeedB stream at the FX Market
- 6-15 Mbit/s for each FeedA and FeedB stream at the Derivatives Market

For more details, please refer to the [Load Test Report](https://fs.moex.com/f/11254/load-test-report-30-03-2019.pdf) (https://fs.moex.com/f/11254/load-test-report-30-03-2019.pdf).

ADDRESSING PLAN

Type	Network address	Prefix	Network mask
Private range for the Client`s source range	10.137.X.0	/24	255.255.255.0
Private range for the transit network	10.195.25.0	/30	255.255.255.252
Client`s public range	Any public network with any prefix provided by the client for both source and transit networks (please notice that this range have to be allocated to the Client)		

Source IP addresses are listed in FIX IDs forms for MOEX Trading system access and can be transferred to a broker (Trading member). Transit subnets are assigned by MOEX for both cross-connects from private range (unless Client uses subnets from a public range).

Moscow Exchange service addresses are provided upon request to [the technical support service](#).

EQUIPMENT SETUP

For the route advertisement Moscow Exchange uses the BGP (Border Gateway Protocol), therefore it should be configured in chosen platform's syntax. Once the POP order is processed, client will receive technical details with IP addressing and AS number (if client's public IP range and public AS number are not going to be used for the transit network).

There are two options for the multicast subscriptions:

- Static IGMP Joins configured by NSP on Client ports. It suits when there is no technical possibility for the SSM. However, Client will receive data from all the multicast groups in spite of whether they are needed or not.
- PIM configured in SSM mode. If your setup meets the requirements, it is the best way to receive multicast feeds.

There are no restrictions from MOEX on Client's infrastructure and network architecture thus all other settings in the Client's area of responsibility.

HOW TO GET STARTED

To get started, client must perform the following steps:

- Consult a manager from the technology service sales team by phone on +7 (495) 363-3232, ext. 5656 or email at itsales@moex.com to make sure that the chosen solution best suits client needs, find out what paperwork is required and which next steps should be taken.
- Fill in the order form (https://fs.moex.com/files/18472/).
- Arrange cross-connects to POP equipment in the chosen location. Note, that this cross-connects are not included into the service charge and charged separately.
- **(Optional)** Connect to the UAT environment to compare the solutions, review the algorithms and check software.
- **(Optional)** Pass the Software certification procedure in order to connect to MOEX's trading systems (required, if non-standard trading software is used).
- Switch to the production mode.

HOW TO GET TECHNICAL SUPPORT

In case of any issues with the service please immediately contact Avelacom and MOEX technical support using the following contact details:

- E support@avelacom.ru and connect@moex.com (please ensure both emails are specified in your email)
- P +7(499)947-0959
- **Subject**: Client ID: XXX *(ID Provided by Avelacom after the service installation)*

For best support we highly recommend you to provide the following details in your original email:

- Connection type: PROD
- Primary and secondary Cross-connect IDs
- Brief problem description
- Problem start time
- User test result

In case of any other issues, please contact us at:
- E help@moex.com
- P +7(495) 733-9508

AUTHORIZED NETWORK SERVICE PROVIDERS

AVELACOM

"Avelacom Business" LTD

P: +7 (495) 777-03-01,
sales@avelacom.com

FREQUENTLY ASKED QUESTIONS

Is the IP address space of the Moscow Exchange registered?

Yes, the Moscow Exchange addresses are from the registered range 91.203.252.0/22.

Do you provide same pair or separate pairs of cross connects for multicast and unicast data?

We offer two separate ports for each client. Each connection can carry one multicast feed (only one, not both) and have full access to FIX servers.

Which multicast mode is used, sparse or dense mode?

Multicast data is delivered with the "source specific multicasting" (sparse mode, no RP's needed).

With FAST Feed A presented on the primary cross connect and Feed B on the secondary only, does it mean the connection has no failover?

Even though neither FeedA nor FeedB failover to another cross-connect, Feed A and Feed B provide the same data feed. Such configuration guarantees market data delivery and network communication between the client and MOEX.

Are multicast sources and RPs located in the same address space as the unicast targets?

Our registered scope is separated between multicast sources and unicast services. We do not use RPs and use "source specific multicasting" instead.

Where are your servers located?

Our servers are located in Moscow:

"DataSpace" Data Center: 11 bld.9, Sharikopodshipnikovskaya Street, Moscow, Russia, 115088

"M1" Data Center: 125, Varshavskoe shosse, Moscow, Russia, 117587.

Who supplies cross connect subnets and are they from the registered range?

We assign subnets from the private range (/30 subnets). Alternatively, you can use any subnet from your own public range.

Is any DNS resolving required?

No, DNS resolving is not required.

Are the unicast data flows load balanced?

Yes, the unicast flows are load balanced.

Is there any QoS or a traffic shaping implemented on our links?

No