

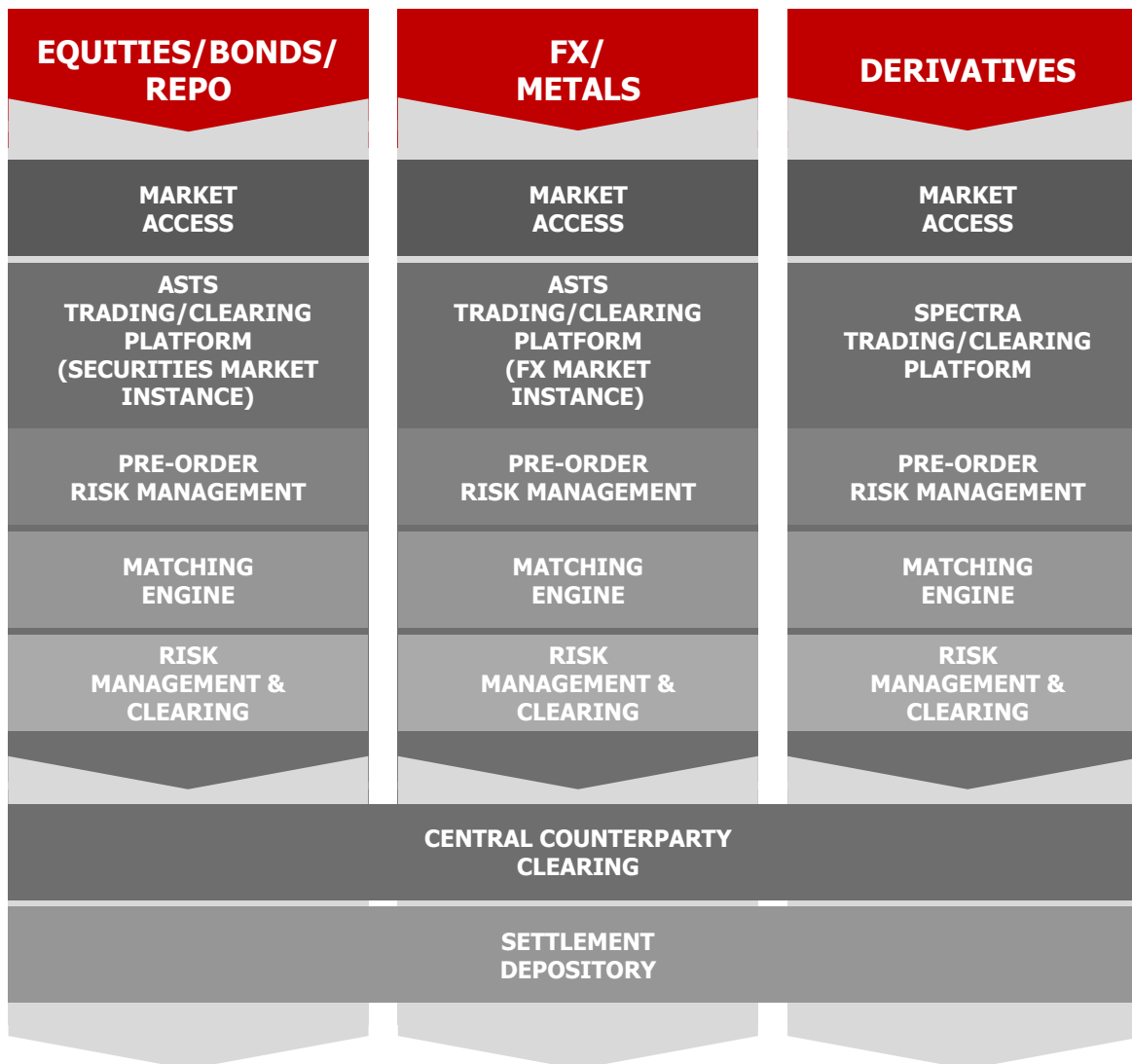


**MOSCOW  
EXCHANGE**

23 October 2013, New York  
Sergey Polyakov  
Chief Information Officer

# **MOSCOW EXCHANGE IT INFRASTRUCTURE**

# MOSCOW EXCHANGE TECHNOLOGY OVERVIEW



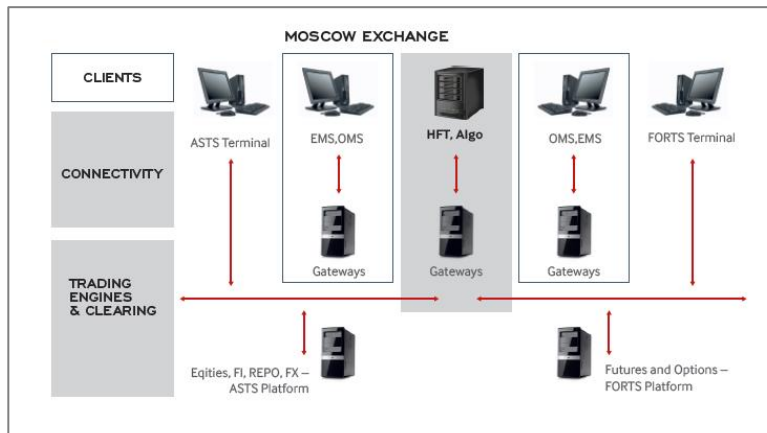
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# INFRASTRUCTURE & CONNECTIVITY FABRIC

**ACCESS THROUGH RUSSIAN DOMESTIC AND GLOBAL NETWORK SERVICE PROVIDERS AND POINT OF PRESENCE IN THE UK**

**UP TO 10GBITS/S EXCHANGE CO-LOCATION WITH VARIABLE FOOTPRINT SIZING OPTIONS**

**CERTIFICATION AND TESTING ENVIRONMENT SERVICES FOR NEW CLIENTS AND VENDORS**



- 300+ certified electronic broker systems and EMS/OMS platform (Fidessa, GL Trade, CQG etc.)
- 10 + telecommunication providers including BT Radianz, SFTI, TMX, Orange and more are coming
- Two data centers in Moscow, redundant connectivity and power infrastructure

## CONNECTIVITY

Market	API & terminals	Network
<b>Securities (powered by ASTS)</b>	ASTS binary API FIX FAST Trade SE terminal	VPN
<b>FX/Metals (powered by ASTS)</b>	ASTS API FIX FAST Trade Currency	1G ConnectMe Domestic Network Service providers
<b>Derivatives (powered by SPECTRA)</b>	SPECTRA API (PLAZAII) FIX FAST FORTS Treminal	BT Radianz, SFTI, TMX, Orange The Exchange Point of Presence in Equinix LD4
<b>Test access to production &amp; preproduction versions</b>	APIs FIX FAST	

## PREMIUM ACCESS - COLOCATION







M1 datacenter	API	Network
<b>44 units per rack, 6 KW, Remote hands</b>	API FIX FAST Multicas	100 Mbits/s 1 Gbits/s 10 Gbits/s

# ASTS PLATFORM

## SECURITIES MARKET

**SECURITIES MARKET OF THE MOSCOW EXCHANGE IS THE LARGEST EQUITIES AND BONDS MARKET IN THE EASTERN AND CENTRAL EUROPE**

### TECHNOLOGY

<b>ASTS (NASDAQ OMX)</b>	C ++ Linux 1 instance with hot backup Throughput - 22 000 per sec. Latency - 450 µs (99% within 1000 µs)	
	<b>Peak</b>	<b>Test</b>
<b>Transactions/d Orders/day Trades/day Peak tr/day MD bandwidth</b>	20 mln 17 mln 1.1 mln Over 75 mln 20 MB/sec	100 mln 70 mln 3 mln Over 100 mln 20 MB/sec
	<b>API &amp; Screens</b>	<b>Network</b>
<b>Connectivity</b>	API FIX 4.4 FAST Multicast GUI Terminal	ConnectMe NSP, Extranet , POP in Equinix LD4
<b>Market data</b>	     	

### MARKET INFO

<b>T+2 Trading schedule (Moscow time)</b>	09:45 10:00 Main trading mode T+ (pre-trading period) 10:00 18:40 Main trading mode T+ 17:00 18:40 Odd-Lot Mode 09:30 16:00 Negotiated Trades with the Central Counterparty 09:30 19:00 Negotiated Trades with the Central Counterparty
<b>Order types</b>	<ul style="list-style-type: none"> <li>• Limit order</li> <li>• Market order</li> <li>• Post-trading period order</li> <li>• Off order book negotiated deal order</li> <li>• Off order book orders</li> <li>• Block order</li> <li>• etc...</li> </ul>
<b>Deployment facts</b>	<ul style="list-style-type: none"> <li>• T+2 mode launched</li> <li>• REPO with CCP</li> <li>• UDP Multicast MarketData</li> <li>• Trading system latency improvement</li> </ul>
<b>Trading modality</b>	<ul style="list-style-type: none"> <li>• Order-Driven Market</li> <li>• Quote-Driven Market</li> <li>• Two-way auctions</li> <li>• Unilateral auction</li> <li>• DMA</li> <li>• REPO</li> <li>• Discrete auctions</li> <li>• Clearing</li> <li>• Pre-trade risk management</li> </ul>



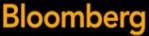




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# ASTS PLATFORM

## FX MARKET

**THE FX MARKET OF THE MOSCOW EXCHANGE IS THE OLDEST DOMESTIC REGULATED VENUE FOR FOREIGN CURRENCY TRADING. THE MARKET'S ELECTRONIC TRADING SYSTEM OFFERS TRANSACTIONS IN A WIDE RANGE OF FX INSTRUMENTS IN THE U.S. DOLLAR, EURO, CHINESE YUAN, UKRAINIAN HRYVNYIA, KAZAKHSTAN TENGE, BELARUSIAN RUBLE, DUAL-CURRENCY BASKET AND FX SWAPS**

### TECHNOLOGY

<b>ASTS (NASDAQ OMX)</b>	C ++ Linux 1 instance with hot backup Throughput - 15 000 per sec. Latency - 450 µs (99% within 1000 µs)	
	<b>Peak</b>	<b>Test</b>
<b>Transactions/d Orders/day Trades/day Peak tr/day MD bandwidth</b>	30 mln 18 mln 1 mln Over 75 mln 4-12 MB/sec	100 mln 70 mln 3 mln Over 100 mln 20 MB/sec
	<b>API &amp; Screens</b>	<b>Network</b>
<b>Connectivity</b>	API FIX 4.4 FAST Multicast GUI Terminal	ConnectMe NSP, Extranet , POP in Equinix LD4
<b>Market data</b>	    	

### MARKET INFO

<b>Trading schedule (Moscow time)</b>	<ul style="list-style-type: none"> <li>• 10:00 to 15:00 EURRUB_TOD and EURUSD_TOD</li> <li>• 10:00 to 17:15 USDRUB_TOD</li> <li>• Trading in USDRUB_TOD to execute swap trades USD_TODTOM. Off order book trading in USDRUB_TOD. from 10:00 to 17:30</li> </ul>
<b>Order types</b>	<ul style="list-style-type: none"> <li>• Limit Order</li> <li>• Market Order</li> <li>• Immediate-or-Cancel</li> <li>• Place in Queue</li> <li>• Fill-or-Kill</li> <li>• Iceberg Order</li> </ul>
<b>Deployment facts</b>	<ul style="list-style-type: none"> <li>• UDP Multicast MarketData</li> <li>• Two Level market access for clients</li> <li>• Non-banking participants access</li> <li>• Trading system latency improvement</li> </ul>
<b>Trading modality</b>	<ul style="list-style-type: none"> <li>• Order-Driven Market</li> <li>• Quote-Driven Market</li> <li>• Two-way auctions</li> <li>• Unilateral auction</li> <li>• DMA</li> <li>• Clearing</li> <li>• Pre-trade risk management</li> </ul>



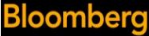



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# SPECTRA PLATFORM

## DERIVATIVES MARKET

**FORTS, THE FUTURES AND OPTIONS MARKET OF THE MOSCOW EXCHANGE, IS A LEADING TRADING VENUE FOR DERIVATIVES IN RUSSIA AND EASTERN EUROPE. FORTS COMBINES THE ADVANCED INFRASTRUCTURE, RELIABILITY AND GUARANTEES OF THE MOSCOW EXCHANGE AS WELL AS STATE-OF-THE-ART TECHNOLOGIES FOR FUTURES AND OPTIONS TRADING WITH MORE THAN TEN YEARS OF THE STABLE AND SUCCESSFUL MARKET DEVELOPMENT**

### TECHNOLOGY

<b>SPECTRA (inhouse)</b>	C ++ Linux 1 instance with hot backup Throughput - 30 000 orders per sec. Latency - 500 µs (99% within 1000 µs)	
	<b>Peak</b>	<b>Test</b>
<b>Transactions/d Orders/d Trades/day Peak tr/day MD bandwidth</b>	20 mln 10 mln 40 000 Over 75 mln 10 MB/sec	100 mln 70 mln 5 mln Over 100 mln 20 MB/sec
	<b>API &amp; Screens</b>	<b>Network</b>
<b>Connectivity</b>	API (PlazaII) FIX 4.4 FAST Multicast GUI Terminal	ConnectMe NSP, Extranet , POP in Equinix LD4
<b>Market data</b>	   	

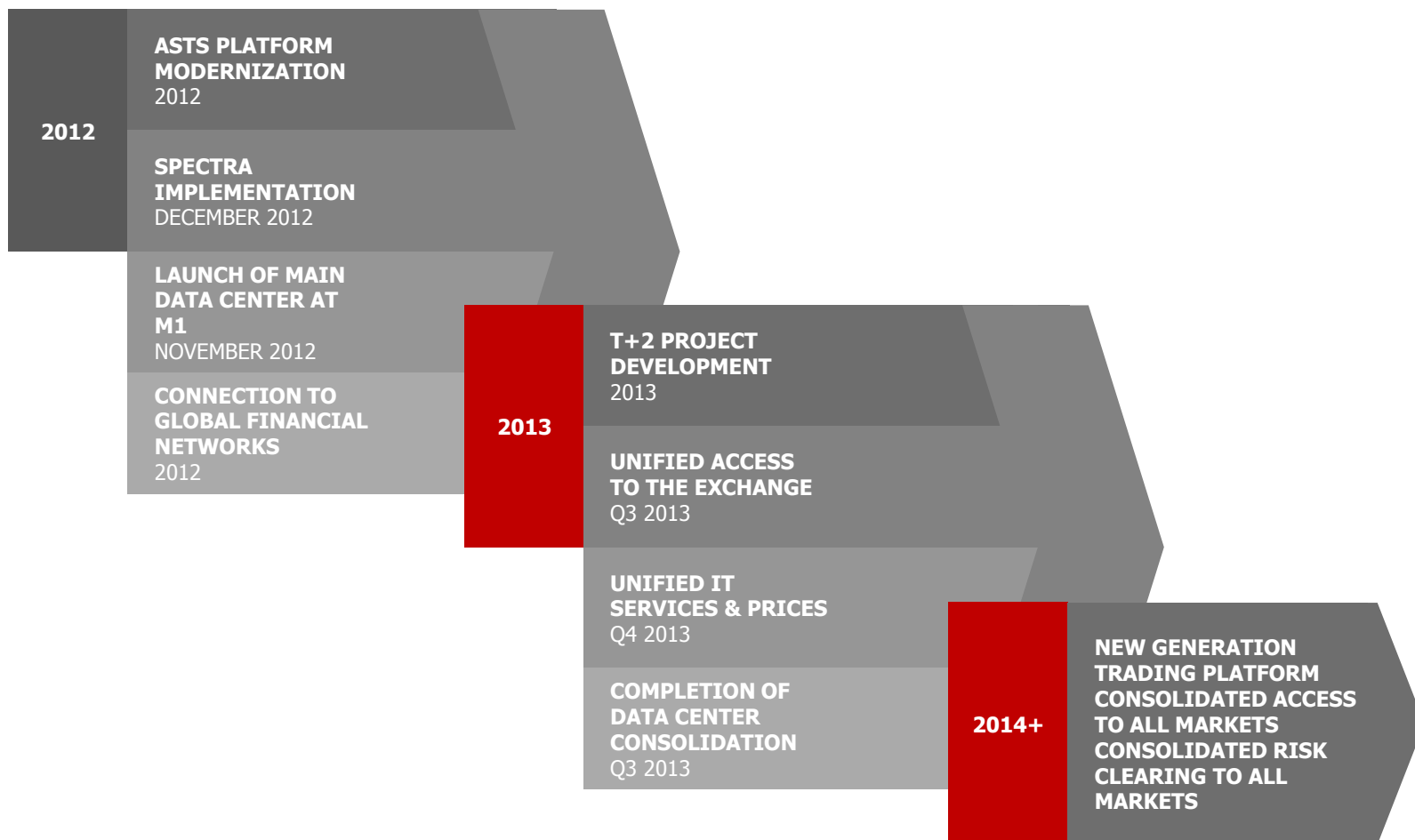
### MARKET INFO

<b>Trading schedule (Moscow time)</b>	10:00 - 14:00 Opening of the main trading session 14:00 - 14:03 Intraday clearing session 14:03 - 18:45 Closing of the main trading session 18:45 - 19:00 Evening clearing session 19:00 - 23:50 Evening trading session
<b>Order types</b>	<ul style="list-style-type: none"> <li>• Limit Order</li> <li>• Market Order</li> <li>• Market Order full size only</li> </ul>
<b>Deployment facts</b>	<ul style="list-style-type: none"> <li>• New generation trading system (FORTS -&gt; SPECTRA)</li> <li>• C++ client API (cgate)</li> <li>• New CSV reporting system</li> <li>• Migration to new data center + HW upgrade</li> <li>• New low latency feed at Nov 13</li> </ul>
<b>Trading modality</b>	<ul style="list-style-type: none"> <li>• Order-driven market</li> <li>• Quote-driven market</li> <li>• Discrete auctions</li> <li>• Clearing</li> <li>• Pre-trade risk management</li> <li>• DMA</li> </ul>



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# MOSCOW EXCHANGE IT EVOLUTION PLAN



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