SPECTRA Plaza-2 gate

version 6.0

Moscow 2018

Table of Contents

History of changes

Date	Changes
11.04.2018	Changed message type for messages 'OptChangeExpiration', 'FutTransferClientPosition', 'OptTransferClientPosition'. Also, changed type of the field 'amount' in these messages.
30.03.2018	Table 'part_sa' of stream 'FORTS_PART_REPL' now contains a new field 'money_old'.
22.03.2018	Changes applied: • Field 'signs' added into table 'dealer' of stream 'FORTS_FUTINFO_REPL'. • Fields 'strike_step', 'exp_clearings_bf' and 'exp_clearings_cc' added into table 'virtual_futures_params' of stream 'FORTS_INFO_REPL'. • Field 'lot' added into table 'futures_params' of stream 'FORTS_INFO_REPL'. • Fields 'has_options', 'msp_type' and 'currency_id' added into table 'base_contracts_params' of stream 'FORTS_INFO_REPL'. • Tables 'currency_params' and 'common_params' added into stream 'FORTS_INFO_REPL'.
28.02.2018	Table 'part_forecast' deleted from stream 'FORTS_FORECASTIM_REPL'.
26.02.2018	Changes applied: • Fields 'client_code', 'exch_pay', 'exch_pay_scalped', 'clear_pay', 'clear_pay_scalped', 'exch_pay_spot', 'exch_pay_spot_repo', 'sell_fee' and 'buy_fee' deleted from table 'fut_vcb' of stream 'FORTS_FUTINFO_REPL'. • Fields 'client_code', 'exch_pay', 'exch_pay_scalped', 'clear_pay', 'clear_pay_scalped', 'is_spec', 'spec_spread', 'sell_fee' and 'buy_fee' deleted from table 'opt_vcb' of stream 'FORTS_OPTINFO_REPL'.
21.02.2018	Added new error codes: 4148, 4149.
20.02.2018	Changes applied: • Added description of command 'FutChangeBFLimit'. • Fields 'money_blocked' and 'vm_reserve' added into table 'part_sa' of stream 'FORTS_PART_REPL'.
31.01.2018	Changes applied: • Field 'ext_reserve' deleted from table 'money_clearing' of stream 'FORTS_CLR_REPL' . • Field 'coeff' deleted from tables 'fut_sess_contents' and 'fut_instruments' of stream 'FORTS_FUTINFO_REPL'. • Table 'fut_bond_registry' of stream 'FORTS_FUTINFO_REPL': field 'bond_type' type changed to i4. • Tables 'deal' and 'multileg_deal deleted from stream 'FORTS_FUTTRADE_REPL. • Table 'deal' deleted from stream 'FORTS_OPTTRADE_REPL'. • Field 'points_num' deleted from table 'base_contracts_params' of stream 'FORTS_INFO_REPL'. Fields 'spot_price', 'mr1', 'mr2', 'mr3', 'lk1', 'lk2', 'risk_points_n' added into table 'base_contracts_params' of stream 'FORTS_INFO_REPL'. • Fields 'limit' and 'spot_signs' deleted from table 'futures_params' of stream 'FORTS_INFO_REPL'. Fields 'interest_rate_risk_up', 'interest_rate_risk_down', 'time_to_expiration', 'normalized_spot' added into table 'futures_params' of stream 'FORTS_INFO_REPL'. • Fields 'is_net_positive', 'volat_range', 't_squared' and 'max_addrisk' deleted from table 'virtual_futures_params' of stream 'FORTS_INFO_REPL'. Fields 'exp_clearings_sa', 'volatility_risk', 'volatility_risk_mismatch', 'time_to_expiration' added into table 'virtual_futures_params' of stream 'FORTS_INFO_REPL'. • Field 'server_time' added into table 'sys_events' of stream 'FORTS_INFO_REPL'. • Field 'isin_is_spec' deleted from table 'common' of stream 'FORTS_OPTCOMMON_REPL'. • Fields 'pledge_free', 'pledge_blocked', 'coeff_liquidity', 'pledge_old', 'pledge_amount' deleted from table 'part' of stream 'FORTS_PART_REPL'. • Fields 'pledge_amount' and 'liquidity_ratio' deleted from table 'part_sa' of stream 'FORTS_PART_REPL' . Fields 'vm_intercl' and 'fee' added into table 'part_sa' of stream 'FORTS_PART_REPL'. • Added description of stream 'FORTS_FEERATE_REPL - Precise Exchange fee rates'. • Added description of commands 'FutChangeBFParameters', 'FutChangeClientParameters' and 'FutChangeBFClientDefaultParameters'.

Date	Changes
	• Fields 'exp_weight', 'num_clr_2delivery', 'margin_type', 'calendar_spread_margin_type', 'num_clr_2delivery_client_default', 'exp_weight_client_default', 'go_ratio', 'check_limit_on_withdrawal', 'limit_tied_money', 'limits_set', 'no_fut_discount', 'no_fut_discount_client_default' added into table 'diler' of stream 'FORTS_FUTINFO_REPL'. • Field 'calendar_spread_margin_type' added into table 'investr' of stream 'FORTS_FUTINFO_REPL'. • Tables 'dealer' and 'investor' added into stream 'FORTS_FUTINFO_REPL'. • Tables 'dealer' and 'investor' added into stream 'FORTS_INFO_REPL'.
26.12.2017	Changes applied: • Table 'position' of stream 'FORTS_POS_REPL' now contains a new field 'account_type' • Stream 'FORTS_POS_REPL' now contains a new table 'position_sa'.
21.12.2017	Added new error codes (4160 - 4166).
16.11.2017	Description change for parameter 'code_vcb' of method 'FutDelUserOrders'.
25.10.2017	Changes applied: • Table 'delivery_report' removed from stream FORTS_FUTINFO_REPL • Table 'fut_rejected_orders' of stream 'FORTS_FUTINFO_REPL' now contains a new field 'xamount' • Tables 'opt_rejected_orders' and 'opt_exp_orders' of stream 'FORTS_OPTINFO_REPL' now contain a new field 'xamount' • Table 'opt_exp_orders' of stream 'FORTS_OPTINFO_REPL' now contains a new field 'xamount_apply'.
24.10.2017	Changes applied: • Table 'fut_MM_info' of stream 'FORTS_MM_REPL' now contain fields 'xamount_sells', 'xamount_buys', 'xmm_amount' • Table 'opt_MM_info' of stream 'FORTS_MM_REPL' now contain fields 'xamount_sells', 'xamount_buys', 'xmm_amount'.
28.08.2017	Changed message type for messages 'OptChangeExpiration', 'FutTransferClientPosition', 'OptTransferClientPosition'. Also, changed type of the field 'amount' in these messages.
23.06.2017	Deletion of stream RTS_INDEXLOG_REPL.
02.06.2017	Changes applied: • Table 'multileg_dict' of stream 'FORTS_FUTINFO_REPL' now contain field 'leg_order_no'. • Table 'fut_margin_type' of stream 'FORTS_FUTINFO_REPL' now contain fields 'UCP_type', 'prohibit_coeff', 'prohibit_type'.
18.05.2017	Changes applied: • Tables 'fut_pos', 'opt_pos', 'fut_pos_sa' and 'opt_pos_sa' of stream 'FORTS_CLR_REPL' now contain fields 'xpos_beg' and 'xpos_end'. • Table 'pledge_details' of stream 'FORTS_CLR_REPL' now contains fields 'xamount_beg', 'xpay', 'xamount', 'xamount_beg_money', 'xpay_money', 'xamount_money'.
15.05.2017	Changes applied: • Tables 'common' of streams 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL' now contain fields 'xamount_buy', 'xorders_buy_amount', 'xamount_sel'l, 'xorders_sell_amount', 'xamount', 'xcontr_count', 'xpos'. • Tables 'orders' of streams 'FORTS_ORDBOOK_REPL', 'FORTS_FUTORDERBOOK_REPL' and 'FORTS_OPTORDERBOOK_REPL' now contain fields 'xamount', 'xamount_rest', 'xinit_amount'. • Table 'position' of stream 'FORTS_POS_REPL' now contains fields 'xpos', 'xbuys_qty', 'xsells_qty', 'xopen_qty'.
05.05.2017	Changes applied: • Table 'deal' of stream 'FORTS_DEALS_REPL' now contains fields 'xpos' and 'xamount'. • Table 'multileg_deal' of stream 'FORTS_DEALS_REPL' now contains field 'xamount'. • Table 'orders_log' of stream 'FORTS_FUTTRADE_REPL' now contains fields 'xamount' and 'xamount_rest'.

Date	Changes
	• Table 'multileg_orders_log' of stream 'FORTS_FUTTRADE_REPL' now contains fields 'xamount' and 'xamount_rest'. • Table 'deal' of stream 'FORTS_FUTTRADE_REPL' now contains fields 'xpos' and 'xamount'. • Table 'multileg_deal' of stream 'FORTS_FUTTRADE_REPL' now contains field 'xamount'. • Table 'user_deal' of stream 'FORTS_FUTTRADE_REPL' now contains fields 'xpos' and 'xamount'. • Table 'user_multileg_deal' of stream 'FORTS_FUTTRADE_REPL' now contains field 'xamount'. • Table 'orders_log' of stream 'FORTS_OPTTRADE_REPL' now contains fields 'xamount' and 'xamount_rest'. • Table 'deal' of stream 'FORTS_OPTTRADE_REPL' now contains fields 'xpos' and 'xamount'. • Table 'user_deal' of stream 'FORTS_OPTTRADE_REPL' now contains fields 'xpos' and 'xamount'. • Table 'orders_log' of stream 'FORTS_ORDLOG_REPL' now contains fields 'xamount' and 'xamount_rest'. • Table 'multileg_orders_log' of stream 'FORTS_ORDLOG_REPL' now contains fields 'xamount' and 'xamount_rest'.
24.03.2017	Changes applied: • Fields exch_pay, exch_pay_scalped, clear_pay, clear_pay_scalped, sell_fee, buy_fee, exch_pay_spot, exch_pay_spot_repo, client_code of table fut_vcb of stream FORTS_FUTIINFO_REPL contain default values (nulls, empty strings). • Fields exch_pay, exch_pay_scalped, clear_pay, clear_pay_scalped, sell_fee, buy_fee, is_spec, spec_spread, client_code of table opt_vcb of stream FORTS_OPTINFO_REPL contain default values (nulls, empty strings).
28.12.2016	Changes applied: • Added section 'Stream FORTS_FORECASTIM_REPL - Risk forecast after limits extension'. • Field 'exp_weight' deleted from table 'part' of stream 'FORTS_PART_REPL'.
21.12.2016	In accordance with decommission policy, starting from December 5, 2016, P2ClientGate API and Plaza2 libraries v.198 or below are no longer supported. The client software using Plaza2 libraries version 198 and below, or P2ClientGate API will no longer be able to connect to the trading system.
30.08.2016	Changed list of synchroevents in table sys_events of streams FORTS_PART_REPL, FORTS_CLR_REPL, FORTS_INFO_REPL.

18.05.2016	Changes applied:
	• Deleted description of methods for working with Spots:
	  • 'FutChangeBrokerVcb - Changing BF parameters on Underlying';
	  • 'FutChangeClientVcb - Changing client parameters on Underlying';
	  • 'FutChangeMoney - Changing limit for bying spots on BF'.
	• Table 'fut_instruments' of stream 'FORTS_FUTINFO_REPL ' now contains field 'exec_name' (Flag of option maturity).
	• Added description of method 'OptChangeRiskParameters - Risk-parameter management for options'.
	• Field 'num_clr_2delivery' deleted from message 'FutChangeClientMoney - Changing client limits'. If filled in, this field will be ignored in all previous versions of the message.
	• Added description of method 'FutTransferRisk - Risk balancing'.
	• Added return codes: 75, 331, 339, 383, 4127, 4138, 4139, 4150-4155, 9999, 10000, 10001, 10004-10006.
	• Stream 'FORTS_FUTINFO_REPL' now contains tables 'fut_settlement_account' and 'fut_margin_type'.
	• Table 'part_sa' added into stream 'FORTS_PART_REPL'.
	• Tables 'money_clearing_sa', 'fut_pos_sa', 'opt_pos_sa' are added into stream 'FORTS_CLR_REPL'.
	• Tables 'fut_vm_sa' and 'opt_vm_sa' added into stream 'FORTS_VM_REPL'.
	• Table 'part' of stream 'FORTS_PART_REPL' now contains fields 'num_clr_2delivery' and 'exp_weight'.
	• Field 'cal_exp_extra_risk' deleted from table 'part' of stream 'FORTS_PART_REPL'.

Date	Changes
	• Table 'virtual_futures_params' of field 'FORTS_INFO_REPL' now contains fields 'exp_clearings_bf' and 'exp_clearings_cc'. • Fields 'allow_use_extra_exp_risk' and 'calc_extra_exp_risk' deleted from table 'virtual_futures_params' of stream 'FORTS_INFO_REPL'.
14.10.2015	Added description of 'CODHeartbeat' method.
14.10.2015	Table 'fut_sess_contents' now contains 2 new fields: 'pctyield_coeff' and 'pctyield_total'.
12.08.2015	Added new error codes (200 - 208).
23.01.2015	'Trading gate description' now contains section 'Handling abnormal situations'.
22.01.2015	Added section "Cancel on Disconnect".
16.12.2014	Edited list of error codes.
29.09.2014	Added details of table 'prohibition' of stream 'FUTINFO'.
18.08.2014	Added ASTS error codes.
24.07.2014	Tables 'fut_MM_info' and 'opt_MM_info' of stream 'FORTS_MM_REPL' now have contains market-makers obligations accurate to 7-digit client code. Formats of mesages 'FutTransferClientPosition' and 'OptTransferClientPosition' are now equal. Table 'fut_ts_cons' deleted from stream 'FORTS_FUTINFO_REPL'.
17.07.2014	Field 'client_code' deleted from table 'ORDERS' of stream 'FORTS_ORDBOOK_REPL'.
25.04.2014	Stream 'FORTS_MM_REPL' now contains new table 'mm_agreement': table with numbers and types of contracts for the provision of marketmaking services.
15.04.2014	Added new commands: • Transfer futures position between BF • Transfer option position between BF
14.01.2014	Added new fields: • 'fulfil_min' - Minimum percentage of the liabilities for the trading session 'fulfil_partial' - Percentage of partial fulfillment of the liabilities of the trading session 'fulfil_total' - Percentage of fulfillment of liabilities of the trading session 'is_fulfil_min' - Minimum sign of the liabilities for the trading session 'is_fulfil_partial' - Sign of partial fulfillment of the obligations of the trading 'is_fulfil_total' - Sign of fulfillment of obligations of the trading session into tables 'fut_MM_info', 'opt_MM_info' of stream 'FORTS_MM_REPL'.
31.05.2013	New field added: • 'rate_id' - Payment currency identifier into table 'clr_rate' of field 'FORTS_CLR_REPL'.
18.04.2013	Added anonymous stream 'orderbook': • 'FORTS_ORDBOOK_REPL' Added field: • 'ext_reserve' - Extra reserve into table 'money_clearing' of stream 'FORTS_CLR_REPL' Deleted stream 'FORTS_CLMONEY_REPL'.
12.04.2013	New field added: • 'exch_pay' - Exchange fee per 1 contract in Russian rubles. into table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL'.
10.04.2013	New field added: • 'exch_pay' - Exchange fee per 1 contract in Russian rubles.

Date	Changes
	into table 'opt_sess_contents' of stream 'FORTS_OPTINFO_REPL'.
26.03.2013	New field added: • 'rate_id' - Payment currency identifier into tables 'fut_vcb' and 'opt_vcb' of streams 'FORTS_FUTINFO_REPL' and 'FORTS_OPTINFO_REPL' Replication stream added: • 'MOEX_RATES_REPL' - Exchange rates in online mode. Added new table: • 'rates' - Currency exchange rates reference book. into stream 'FORTS_FUTINFO_REPL'.
27.11.2012	Changed description of table 'user_deal'.
01.11.2012	Added descriptions of two events for table 'sys_events'.
30.10.2012	Some changes applied: • Section 'FutChangeMoney - Changing limit for bying spots on BF' now contains extended description of parameter 'limit_spot_buy'. • Sections 'Method FutMoveOrder - Modify order' and 'Method OptMoveOrder - Modify order' now contain extended description of the command 'MoveOrder' logic.
22.10.2012	Some changes applied: • Modified sections: 'Users. How a user is linked to a trading participant', 'SPECTRA Plaza-2 gateway. Components, installation and setup', 'Recommendations for third-party companies on including the Moscow Exchange runtimes into user application when distributing the user software', 'Recovery and late logon'. • Deleted section 'Technical center interface'.
10.02.12	Some changes applied: • Section 'Gate usage specifics' now contains subsection 'Commands'. • Added section 'Pausing trading session for extending limits of trading prices fluctuations'. • Corrected an error in futures price calculation formula. • Updated the Gate installator description.
09.02.2012	New field added: • 'login_from' - Login of a user who added the order into tables: • 'fut_rejected_orders' - Orders rejected during clearing session • 'opt_rejected_orders' - Orders rejected during clearing session of streams: • 'FORTS_FUTINFO_REPL' - Futures: Reference and session information • 'FORTS_OPTINFO_REPL' - Options: Reference and session information
24.01.2012	Table 'orders' of streams: • 'FORTS_FUTORDERBOOK_REPL' - Futures: orderbook snapshot • 'FORTS_OPTORDERBOOK_REPL' - Options: orderbook snapshot now contains fields: • 'init_moment' - Time of the order adding • 'init_amount' - Initial amount in the order
23.01.2012	Event table 'sys_events' added into streams: • 'FORTS_CLMONEY_REPL' - Money in clearing session

Date	Changes
	• 'FORTS_CLR_REPL' - Clearing data
17.01.2012	Field 'exch_pay_spot_repo' containing Exchange fee value on repo added into table 'fut_vcb' of field 'FORTS_FUTINFO_REPL'.
12.01.2012	Added new replication stream: • 'FORTS_ORDLOG_REPL' - the stream transmits anonymized orders events.
02.11.2011	New fields added: • 'comment' - Trader's comment • 'ext_id' - External number into tables: • 'fut_rejected_orders' - Orders rejected during clearing session • 'opt_rejected_orders' - Orders rejected during clearing session
25.11.2011	Added section 'Usage of test examples'.
7.11.2011	Completed sections 'Introduction' and 'Trading gate description'. Added section 'System SPECTRA overview'.
20.10.2011	Fields added: • 'theor_price_limit' - Theoretical option price with limits • 'vm_real' - The accumulated variation margin on futures trades calculated based on the current market quote. Event table 'sys_events' added into streams: • 'FORTS_FUTTRADE_REPL' - Futures: orders and trades • 'FORTS_OPTTRADE_REPL' - Options: orders and trades • 'FORTS_POS_REPL' - Information on positions • 'FORTS_PART_REPL' - information on funds and limits • 'FORTS_FUTINFO_REPL' - Futures: reference and session information • 'FORTS_OPTINFO_REPL' - Options: reference and session information • 'FORTS_INFO_REPL' - Additional reference information
4.10.2011	Added replication streams: • 'FORTS_CLR_REPL' - Various clearing information. • 'FORTS_MM_REPL' - Information on MM's liabilities Changed numbers of trading commands for complete processing time monitoring possibility (including the final link to the client transmission time).
14.09.2011	Corrected errors in default values of some commands. Now all string parameters' values are quoted by default.
15.04.2011	Added fields: • 'status' of table 'diler' of stream 'FORTS_FUTINFO_REPL' - CF and BF accounts information • 'status' of table 'investr' of stream 'FORTS_FUTINFO_REPL' - client accounts information • 'vm_order_reserve' of stream 'FORTS_PART_REPL' - Amount reserved for negative variation margin on orders • 'waprice' of stream 'FORTS_POS_REPL' - weighted average price Changes applied to commands structure: • *NOTE*: Changes applied to the format of the following commands: 'FutAddOrder', 'OptAddOrder' and 'FutAddMultiLegOrder' - now each of the commands contains parameter 'dont_check_money'. Commands' identifiers have also changed. All prevoius identifiers are still valid with commands in previous format.. • Added command 'FutExchangeBFMoney' which allows to transfer funds between the accounts of a BF.
28.03.2011	Table 'multileag_deal' of stream 'FORTS_FUTTRADE_REPL' now contains field 'buyback_amount' - buyback amount for repo trades.
24.03.2011	Added stream 'RTS_INDEXLOG_REPL', which transmits history of RTS indexes changes.

Date	Changes
01.02.2011	For command 'FutChangeClientVcb', parameter 'code_vcb' type has changed from 'c4' to 'c25'. The new command format now has message code 33. The return code for the command has not changed. Added list of return codes.
27.01.2011	An error corrected in description of parameter 'check_limit' of commands 'OptAddOrder' and 'OptMoveOrder'. The correct values are the following: 0 - do not verify, 1 - verify.
24.12.2010	Corrected some errors in command fields names along with default values of some commands: • The new default value of parameter 'ext_id' of command 'FutDelUserOrders' is now 0. • The new default value of parameters 'comment', 'hedge', 'broker_to', 'ext_id', 'trust', 'date_exp' of command 'FutAddMultiLegOrder' is now 0 or empty string, depending on the message type. • The new default value of parameters 'price1' and 'price2' of command 'OptMoveOrder' is now 0. • The new default value of parameter 'no_fut_discount' of command 'FutChangeClientMoney' is now 0. • The new default value of parameter 'limit_spot' of command 'FutChangeBrokerVcb' is now -1. • The return messages for commands 'FutChangeClientMoney', 'FutChangeBFMoney', 'FutChangeClientVcb' and 'OptChangeExpiration' now have their field 'Message' changed to 'message'. .
26.11.2010	Aggregated orderbooks no more contain field 'price2'. Field 'price' now has different meaning depending on the instrument flag 0x1000 (field 'signs' of table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL') presense. If the flag is applied, the field 'price' contains rate value, otherwise it contains swap-price value.
15.10.2010	Added new instrument flags (field 'signs' of table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL'): • 0x800 - flag of an RTS Money instrument • 0x1000 - flag of basic price for multileg instruments (0 - quoted in swap-price, 1 - quoted in rate). Flag of multileg instruments 'multileg_type' (table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL') value is now 2 for RTS Money swaps. Aggregated orderbooks now have a new field 'price2', which contains swap-price value.
14.09.2010	Streams 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL' now contain opening price values and closing price values (fields 'open_price' and 'close_price'). Stream 'RTS_INDEX_REPL' now contains cap value and indexes volume value (fields 'cap' and 'volume').
07.07.2010	Table 'session' of stream 'FORTS_FUTINFO_REPL' now contains info on position transfer interval (fields 'pos_transfer_begin' and 'pos_transfer_end'). Added tables: • 'fut_sess_settl' of stream 'FORTS_FUTINFO_REPL' containing settlement prices values during the last clearing session. • 'opt_sess_settl' of stream 'FORTS_OPTINFO_REPL' containing volatility and option theoretical price values during the clearing session.
15.06.2010	Corrected an error in command 'FutAddMultiLegOrder' description: parameter 'isin_id' is now i4.
	In table 'delivery_report' of stream 'FORTS_FUTINFO_REPL', fields 'oblig_uni' and 'fulfil_uni', type i4, are replaced with fields 'oblig_qty' and 'fulfil_qty', type i8.
31.05.2010	Tables 'fut_sess_contents' and 'fut_instruments' of stream 'FORTS_FUTINFO_REPL' now contain field 'step_price_curr'. Table 'common' of streams 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL' now contains fields with aggregated bid and offer values: 'orders_sell_qty', 'orders_sell_amount', 'orders_buy_qty', 'orders_buy_amount'.
17.05.2010	Added info on instruments parameters: • tables 'base_contracts_params', 'futures_params', 'virtual_futures_params', 'options_params' Added field 'step_price_clr' of table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL', containing info on instrument price tick value during the evening clearing session. Added field 'step_price_interclr' of table 'fut_sess_contents' of stream 'FORTS_FUTINFO_REPL', containing info on instrument price tick value during the intermediate clearing session.
19.04.2010	Changes applied to many fields types, including but not limited to:

Date	Changes
	• aggregated orderbook volume d16.5 -> i8 • order direction i4 -> i1 • flags of instruments (signs) i1 -> i4 Table 'money_clearing' is relocated from stream 'FORTS_FUTINFO_REPL' into stream 'FORTS_CLMONEY_REPL'. Objects renamed: • table 'repo_orders_log' -> 'multileg_orders_log' • table 'repo_deal' -> 'multileg_deal' • command 'FutAddRepo' -> 'FutAddMultiLegOrder' Added: • table 'multileg_dict' – multileg instruments dictionary • fields 'price_dir', 'multileg_type', 'legs_qty', tables 'fut_sess_contents' • fields containing IDs and trade prices are added into tables 'orders_log' of streams 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL' • fields 'fee_sell', 'fee_buy' of table 'deal' of stream 'FORTS_OPTTRADE_REPL' • streams 'FORTS_FUTORDERBOOK_REPL' and 'FORTS_OPTORDERBOOK_REPL', transmitting current order-books data • table 'broker_params' of stream 'FORTS_INFO_REPL' • table 'fut_instruments' of stream 'FORTS_FUTINFO_REPL' • tables 'usd_online' of stream 'FORTS_FUTINFO_REPL' Deleted: • field 'state' of table 'opt_sess_contents'
16.03.2010	Changed description of command 'FutAddRepo': instead of parameter 'swap_price', parameter 'repo_rate' is now used.
24.02.2010	Added: • description of tables 'repo_orders_log', 'repo_deals' • description of orders and repo trades statuses • descriptions of new statuses for orders and trades • description of command 'FutAddRepo' • field 'last_deal_id' of table 'position' of stream 'FORTS_POS_REPL'
18.01.2010	• Added descriptions of commands: 'FutChangeBrokerVcb', 'FutChangeClientProhibit', 'FutChangeMoney', 'OptChangeClientProhibit' • Added field 'limits_set' of table 'part' of stream 'FORTS_PART_REPL' • Corrected some mistakes in commands descriptions
15.01.2010	• Changed ID types of orders and trades (i4 -> i8) • Changed status types of orders and trades (i2 -> i4) • Corrected some mistakes in commands descriptions
25.11.2009	Corrected some mistakes in commands descriptions
03.11.2009	Now it is possible to specify BF codes when sending messages
30.10.2009	Added commands for setting client limits
10.08.2009	Added dictionary on option instruments
15.07.2009	Added description of reference replication streams
17.06.2009	Added descriptions of commands for managing futures and options orders.
27.03.2009	Added description of replication streams 'common'.

Date	Changes
20.03.2009	Initial version of the document

1. Introduction

1. Document purpose

This document is aimed to overview all the details which users may demand to architect and develop software applications for accessing the SPECTRA market using the SPECTRA Plaza-2 gate. The following parts are available in this document:

- The SPECTRA system general overview, including overview of trading instruments, trading participants, trading operations, risk management, limiting of operations, etc.
- Configuration, installation and setup of the SPECTRA Plaza-2 gate software in the form of user manuals on software installation and setup with information on minimum hardware and software requirements. Also, some general references on using the SPECTRA Plaza-2 gate software are added.
- Information on the structure of transmitted data, including description of replication streams and transmitted tables.
- List of commands.
- Help information.

2. Target group

This document is intended for business-analysts, system architects and developers, taking part in architecting and developing software for accessing the SPECTRA market using the SPECTRA Plaza-2 gate.

2. SPECTRA system overview

2.1. Trading participants

Trading participants are:

- Clearing firms
- Brokerage firms
- Clearing firms and brokerage firms' clients

2.1.1. Clearing firms

Clearing firms are firms which incur liabilities for risks and cover risks of their clients and sub-brokers.

Clearing firms are authorized to:

- Perform trades on behalf of themselves and at for their own accounts;
- Perform trades on behalf of themselves and for their clients' accounts;
- Perform settlement directly with National Clearing Centre.
- Service their clients, including brokers;
- Exercise control over their clients and brokers during trading sessions.

Clearing firms are obliged to:

- Become members of Derivatives Market Section;
- Perform commodity futures and option trading trades on exchange on the authority of exchange merchant licence issued by the Central Bank of Russia;
- Pay fees to Insurance fund;
- Provide collaterals for their own trades and for their clients' trades.

2.1.2. Brokerage firms

Unlike clearing firms, brokerage firms do not settle up with exchange directly; instead, they use their clearing firms. Also, brokerage firms are not obliged to obtain licences and pay fees to the Insurance fund.

Brokerage firms are authorized to:

- Perform trades on behalf of themselves;
- Perform trades on behalf of their clients;
- Place orders in the Trading system via the client terminal application
- Exercise control over their clients during trading sessions.

Brokerage firms are obliged to:

- Provide guarantees for their own trades and for their clients' trades.

2.1.3. Clients

Any physical or corporate person can participate in the SPECTRA market as a client on the authority of trading service agreement signed with a brokerage firm or with clearing firm directly.

2.1.4. System code pattern

There is a 7-symbol code pattern (XXYYZZZ) to identify each participant in the system, where

- XX — indicates a clearing firm
- YY — indicates a brokerage firm
- ZZZ — indicates a client

The 00 brokerage firm code indicates state of account of the clearing firm.

Example 1.

Q100 — indicates the Q1 clearing firm

Q1DU — indicates the DU sub-broker of the Q1 clearing firm

The 000 client code indicates state of account of the brokerage firm.

Example 2.

Q1DU000 — indicates state of account of the DU sub-broker of the Q1 clearing firm

2.1.5. Disclosure of data on participants

The list of clearing and brokerage firms is stored in the 'dealer' table of the 'FORTS_FUTINFO_REPL' stream, and the list of clients is stored in the 'investor' table of the 'FORTS_FUTINFO_REPL' stream. Disclosure of data on brokerage firms and clients is limited in accordance with user access rights.

Streams and tables also contain links to 7-symbol clients' codes and 4-symbol brokerage firms' codes.

2.1.6. Users. How a user is linked to a trading participant

A user (login) can be associated with various levels of participants:

- Clearing firm login. Users connected with this login are allowed to view data and perform trading operations on behalf of any brokerage firm or of any client of the clearing firm (please note that performing trading actions is only allowed when the user has sufficient rights!). Users also allowed to set limits for clients and sub-brokers by calling the appropriate operations. A gate software which is used by and in behalf of an clearing firm has to implement 'Technical Center Interface' (for details, see Technical Center Interface).
- Brokerage firm login. Users connected with this login are allowed to view data and perform trading operations on behalf of all broker's clients within the clearing firm, and also set limits for the broker's clients.
- Client login. Users connected with this login are allowed to perform trading operations on behalf of a certain client of a brokerage firm and view data in accordance with the client login rights.

There is a special 4-symbol 'broker_code' field within the scheme of EACH message-command (see Commands description). Every application using the clearing firm account is to fill in this field with a 4-symbol code of a brokerage company registered with SPECTRA when sending any message. Applications which use the client or the brokerage firm account are exempt from this rule.

2.2. Instruments

The SPECTRA instruments are structured hierarchically. Below you will find descriptions of the SPECTRA instruments starting from the root level.

2.2.1. Underlying assets

An underlying asset is an entity related to a certain contract. Therefore, it can be a stock in a stock exchange, a lot of tradable commodity in a commodities exchange or an index/exchange rate/indicator for settling futures. There are certain attributes characterising an underlying asset along with its instruments, which are:

- Trade section name;
- Various commision fees rates and signs of scalping when fees are calculated. If an asset shows a sign of scalping, the comission fee will be only levied on opening trades.
- Delivery type according to the contract (for details, see Delivery of assets and expiration of options):
  - Delivery of the asset itself;
  - Settlement type. The margin between the opening price and the closing price is the single amount of money to be paid after the trade is closed.
- Price step calculation currency. Now it can be one of the following:
  - RUR — when cost of price step is indicated in Russian roubles. The cost of price step is not typically a subject to change during the life of contract;
  - USR — when cost of price step is indicated in Russian roubles. The cost is converted into USD by using a special Moscow Exchange method of conversion (for details, see http://moex.com/n6126). Step price is a subject to change twice a day, i. e. during the main clearing session and during the intermediate clearing session taking place at 2 PM daily.
- Types of trading, where two types are existing: collateralized and non-collateralized. For the collateralized trading, a part of deposit can be pledged by transferring shares and other securities in accordance with the authorized list.

An underlying asset IS IN NO WAY A TRADING INSTRUMENT!

Data concerning underlying assets are contained in the 'fut_vcb' table of the 'FORTS_FUTINFO_REPL' stream.

2.2.2. Futures

Futures contracts are the main trading instruments in the SPECTRA system.

Each futures contract is linked to a certain underlying asset and has its own unique characteristics of the maturity (the date of delivery), lot characteristics, minimum price step and cost of the price step value.

The date of delivery is specified with 3-months interval for every future contract, i.e. mid-March, mid-June, mid-September and mid-December (http://moex.com/a4034?show=se). There can be more than one futures contract for each underlying asset.

Futures contract with various dates of delivery may form a calendar spread. In this case, when risks are calculated, the price correlation is always taken into account. As a result, the total collateral for the spread can be less than sum of collaterals for each futures contract itself.

Futures are quoted in price points. The price in roubles for a contract is calculated as following:

$$\text{PriceRub} = \text{PricePoints} * \frac{\text{step\_price}}{\text{min\_step}}$$

, where:

- PricePoints — indicates price in points;
- step_price — indicates cost of minimum price step
- min_step — indicates minimum price step in points.

Three more fields are required to fill when it comes about future contracts quoted in USR:

- Cost of price step in initial currency, i.e. in USD;
- Cost of price step in Russian roubles, which is fixed upon intermediate clearing session opening;
- Cost of price step in Russian roubles, which is fixed upon the main clearing session opening.

When an instrument has successfully added into the trading system, it is not yet available for trading in the nearest evening trading session; thus, the instrument will be available for trading starting the nearest day trading session (for more info, see Trading and clearing schedule). For information about instruments availability for trading in the evening/day trading session please refer to the value in the field ‘signs’ of table 'fut_sess_contents'.

Futures contract data ara stored in following tables of trade interface:

- 'FORTS_FUTINFO_REPL' stream, 'fut_sess_contents' table. This is the main table, which contains a list of futures contract available on the current trade session;
- 'FORTS_FUTINFO_REPL' stream, 'fut_instruments' table. The table contains limited data amount about all future contracts put into the system, including non-tradable contracts.
- 'FORTS_INFO_REPL' stream, 'futures_params' table. This table contains data about option contracts. According to the data format the table can be loaded by the ClientGo client application for calculating risks.

2.2.3. Options

At present, the SPECTRA system supports American futures options. These options can be divided into two types: 1) so called futures-style margining options type, when variable margin to be paid is based on the settling price, which is calculated twice per trade session; 2) premium options type, when seller receives option premium upon exercising of the option.

Once an option is exercised, its position turns into a futures position which the option was initially linked to.

There are various expiration dates for various options. Unlike futures, there may exist "short" option positions, aimed to be exercised in the middle of the next month. Once the option is exercised, its position turns into a 3-months futures position.

At opening, an amount of strike price values is specified for each option. These strike price values are dispersed near the price value of the futures contract, which the option was initially linked to.

Options data are stored in the following tables:

- 'FORTS_OPTINFO_REPL' stream, 'opt_sess_contents' table. This is the main table, which contains a list of contracts available on the current trade session.
- 'FORTS_INFO_REPL' stream, 'options_params' table. This table contains data about option contracts. According to the data format the table can be loaded by the ClientGo client application.

2.2.4. Multi-leg instruments

The SPECTRA system supports multi-leg trading instruments, i.e. the instruments consisting of more than one components. This allows to use a trading strategy, when a client gets additional positions on two or more instruments when trade is complete. The instruments available now are calendar spreads for futures.

The list of the multi-leg instruments available in the system can be obtained in the 'fut_sess_contents' table of the 'FORTS_FUTINFO_REPL' stream, by looking at the 'multileg_type' field. If a value in the field is not equal 0, than the record describes a compound instrument.

To obtain the list of components of compound instruments you should use the 'multileg_dict' table of the 'FORTS_FUTINFO_REPL' stream, where every multi-leg instrument has two or more entries describing components of such instrument (see pic. 1). The 'multileg_dict' table entries refer back to 'fut_sess_contents', because the components of these instruments present as common trading instruments. We indicate a special coefficient for every single part, which should be multiplied by the amount from initial order to acquire the amount of a compound part of the order. The sign of this coefficient indicates the direction of order of the component — a positive value means that the component will be in the same direction as in the order by a multi-leg instrument, while a negative value means the opposite direction.

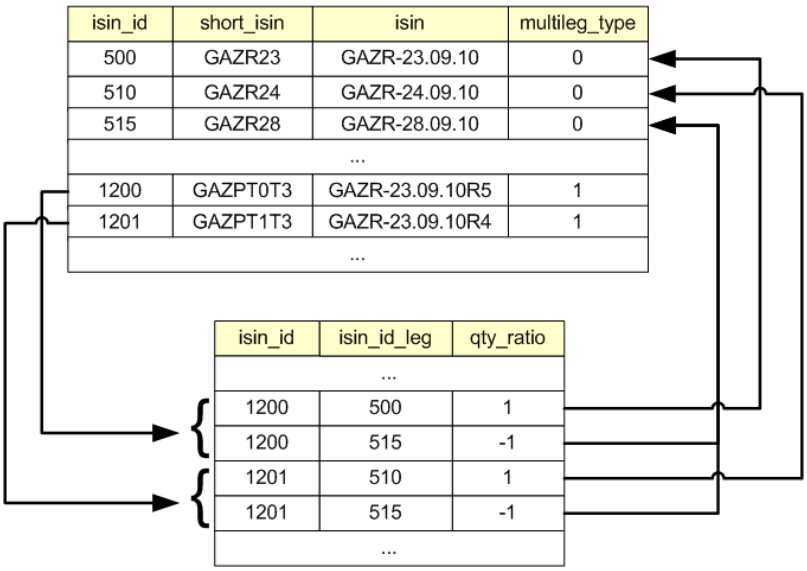

Figure 1. Multileg instruments

2.2.5. Identification of instruments

The SPECTRA system has four fields to identify each instrument:

1. 'isin_id' field, which contains the unique numeral code for each instrument.

2. 'isin' field, which contains the instrument's symbol code.

3. 'short_isin' field, which contains short symbol code for using in order books etc.

4. 'name' field, which contains a long 'humanized' instrument's description.

Example 3. Futures on RTS index value, to exercise in December 2010.

isin_id=

isin = RTS-12.10

short_isin = RIZ0

name = Futures contract on the RTS index value, to exersice on 15, December 2010.

A value in the 'isin_id' field is the primary unique instrument's code, which is used throughout of data structure of the system wherever a corresponded reference exists.

The 'isin' field contains the main symbol futures' code, which is used in order's instructions. The exercise time is unique and guaranteed.

The 'short_isin' field is an alternative symbol contract code. It has been implemented in order to ease access to the SPECTRA system data for news agencies. Unlike 'isin', the 'short_isin' field can change.

2.3. Trading operations

2.3.1. Orders — general information

Order — a command, which is sent into the trading system by a trading participant, aimed to perform an action of buying or selling an instrument at specified price. There are two main types of orders available: negotiated and system.

System orders — a common type of orders available for all users of the system. System orders have to participate in auction along with offsetting orders. If there is an offsetting order available for any system order at a better or equal price, the order itself has to be exercised at the price equal to that of the offsetting order. The unexercised part of the order remains in the system as an order with less amount of instruments.

Orders can be subdivided into three types: quoted, offsetting, and fill-or-kill orders. A quoted order remains in queue after it has been fully or partly exercised. An offsetting orders have to be removed from the system after auction ended, no matter whether it has been exercised fully or partly. At last, the fill-or-kill orders — the offsetting orders which can only be exercised fully.

All orders can be also subdivided into common and multy-day orders, in accordance with their lifetime. Common orders do not have the date of expiration specified; such orders remain in queue until the end of the current trading session. Contrary, the expiration date for multi-day orders is specified, ranged from 1 day up to one year. Such orders are relisted automatically at opening of the next session; additionally each order receives a new ID and a link to the initial order's ID. When relisting, the orders are checked for having sufficient instrument, client and funds. Orders which are out-of-date are automatically removed after the evening session ends.

There are two additional fields added to meet the developers' needs:

- 'comment field' - a 20-symbol string;
- 'ext_id field' - a 4-byte number to store order's ID in the client application.

> **Note**
>
> The SPECTRA system does not check values of the additional fields for being unique.

Orders data are stored in the 'orders_log' tables of the 'FORTS_FUTTRADE_REPL', 'FORTS_OPTTRADE_REPL' and 'FORTS_ORDLOG_REPL' streams. The tables contain orders changing log, where every change is recorded as a separate record in the table. The table 'orders_log' of the streams FORTS_FUTTRADE_REPL and FORTS_OPTTRADE_REPL contains information on the 'own' orders only. The 'own' orders are:

- For a client login - records about all orders, placed on behalf of this client;
- For brokerage firm or clearing firm login - records about all orders placed on behalf of clients of these firms.

Users can view all data on the 'own' orders, including data in service fields and user fields.

Clients are able to be subscribed for receiving the table 'orders_log' of the stream 'FORTS_ORDLOG_REPL; in this case, they will receive complete history of changes for all orders in the trading system in anonymous mode.

Users can do the following:

- Add an order;
- Delete a single order according to its code in the SPECTRA system;
- Move an order (the 'MoveOrder' command). Moving of an order is implemented in two steps: deleting an 'old' order and adding a new one into the system (with a new code, which is sent to user after the order was added). Thus, at least two records (about deleting an order and adding a new one) will be added in the 'orders_log' table. You can move two orders at time by adding parameters ('order_id1', 'order_id2') to the 'MoveOrder' command, which can be useful for market-makers' needs. If you move only one order, then you should specify the 'order_id1' parameter only.
- Delete orders by mask. The following masks can be applied:
  - Direction of operation: buying or selling;
  - Order type: negotiated order or system order;
  - Client's code;
  - Underlying asset's code;
  - Order's ID in the client system ('ext_id');
  - Instrument's code.

2.3.2. Negotiated orders

An order addressed to a certain client are called negotiated order. Unlike system orders, negotiated orders have some limitations for users in managing orders and selecting counterparts, namely the following:

- Negotiated orders may be added only by a BF’s login, with the Brokerage Firm as the only allowed counterparty.
- For specifying a counterpart, the counterpart's RTS code is used in orders in 'broker_to' field. The brokerage firms which do not have the RTS code act as counterparts for negotiated orders.
- Instead of moving, negotiated orders can only be deleted and listed anew manually.
- Negotiated orders can only be exercised when price of one order exactly matches that of the counterpart order. Negotiated orders can also be exercised partly.

2.3.3. Trades

In the SPECTRA trading system, trades are settles if an instrument price in one order meets the instrument price in an opposite order, i.e. selling or buying one for the same instrument. The price of order settled first is the price of the trade. There are two types of trades: negotiated and system. Many trade's attributes are equivalent of that of the orders. Trades cannot be edited or deleted from the system.

Data on own trades are stored in the user_deal and user_multileg_deal tables of the 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL' streams. The data on all trades in the system are distributed among all users via table deal of the stream 'FORTS_DEALS_REPL' in accordance with the following rules: a user gets access only to his/her own part of the trade (buyer's or seller's). If a user acts on behalf of a brokerage firm or a clearing firm, and both buyer and seller are the clients of the same firm, the user gets access to the data concerning both parts of the trade.

Along with records regarding common trades, some additional records are stored in the deal table. These records cannot be classified as trades legally, but still they show some operations in the system, which influence the participant's status. These trades are called 'technical

trades'. You can tell trading trades from the technical ones by values in the fields status_sell and status_buy of the tables user_deal and user_multileg_deal of the streams 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL', or by the flag nosystem in the table deal of the stream 'FORTS_DEALS_REPL' (for details see Trade types, created upon exercising and expiration of futures and options).

2.3.4. Specifics of trading multileg instruments

The SPECTRA system supports multileg trading instruments, i.e. the instruments consisting of more than one components. This allows to use a trading strategy, when a client gets additional positions on two or more instruments when trade is complete. The instruments available now are calendar spreads for futures.

The main specifics of trading multileg instruments:

- Prices in OrderBook can be ranked in two directions: straight or reverse.
- When listing the multileg order, a client is obliged to buy or sell two or more components. Therefore, calculation of collateral for such positions should be made in the appropriate way.
- Multileg orders cannot be moved or deleted by mass cancel.

2.4. Delivery of assets and expiration of options

2.4.1. Deliveries on futures

There are three types of futures exist in terms of deliveries:

- Non-deliverable futures upon expiration, difference between the contract price and the current price of the asset are delivered. The delivery is performed as technical closing of the position, and is marked with a special sign in the 'status_sell' and 'status_buy' fields (for details see Trade types, created upon exercising and expiration of futures and options).
- Commodity futures: upon expiration, the assets and money are delivered. The delivery is performed as technical closing of the position, and is marked with a special sign in the 'status_sell' and 'status_buy' fields.
- Stock futures: upon settlement, the position for futures turns into a position on the T+ market (Moscow Exchange Main Market). The settlement is processed as a technical position closing trade on derivatives market (the trade is marked with special flag in the 'status_sell' and 'status_buy' fields) and position opening trade on T+ market (added into the ASTS system of derivatives market). For more information see the section below.

2.4.1.1. Settlement of futures contracts of derivatives market for stock market (T+2 mode)

All deliverable futures contracts are settled via the automatic matching procedure for T+2 trades in the 'FB MMVB' Main market section (ASTS trading and clearing system).

In the SPECTRA clearing system, each Brokerage firm in order to make settlement is obtained with the firm code along with the trading-and-clearing account (TCA), both registered in the Trading and clearing system of the securities market. These two entities are used to perform the T+2 trades in order to fulfill obligations for the futures contracts. The client's account of the positions account register may have a separate TCA and client's code registered in the ASTS Securities Market.

The T+2 trades are matched on the ASTS Securities Market in a separate trading mode (SPEQ), with the settlement code Y2. The trades are matched between the National Clearing Centre and Securities Market Participants, with no additional confirmation by the Securities Market Participants.

If a T+2 trade cannot be matched due to absence of trade details (or wrong Firm and TCA details), then the Participant must provide a real TCA bound to the appropriate Brokerage Firm not later than 3 PM Moscow time. After 3 PM Moscow time, all positions for futures contracts which cannot be matched into trades are compulsorily closed by the Clearing Centre. Also, the whole amount of collateral is taken as a fee.

After the settlement for securities has been fulfilled on the securities marked (in case of sufficient collateral amount), the futures position in SPECTRA system closes, and the collateral for this position releases. If the collateral amount is insufficient for the T+2 market position, then the futures position and its collateral remain blocked in the SPECTRA system until the margin request is executed on the T+2 market.

After the futures for securities are settled, the technical trades for closing futures positions appear in the trades table, marked with the 'Futures settlement trade' value in the 'status_sell' and 'status_buy' fields. The technical trades for closing futures positions will also appear in the derivatives market reports 'f04.csv' and 'fut_deal.csv'.

For more information see http://moex.com/s1262. [http://moex.com/s1262]

2.4.2. Option exercise

At present, the SPECTRA system supports American futures options. When exercising, the option position turns into a futures position with the price equal to strike of the exercising option contract. The exercise is processed during clearing session, and, technically, consists of closing of the option position and opening a futures position. Both of the positions are marked with a special flag in the fields 'status_sell' and 'status_buy' (for details see Trade types, created upon exercising and expiration of futures and options.

There are two types of exercise available:

- Prescheduled exercise, processed according to a participant's order. A buyer is allowed, at any time, put the corresponding order into the system (for details see Method OptChangeExpiration - Add order for expiration of options). The orders are accepted during the whole trading session, while exercised only twice a day: during the intraday clearing session and the evening clearing sessions.

- Automatic exercise, on the option expiration date. On the expiration date, each in the money option exercises automatically.

For on the money option contracts (the call and put ones with their strike prices strictly equal to the appropriate futures settlement prices), automatic exercise is processed for the half of the open option position with the specified strike price. If the open position value is uneven, then rounding up (where 0.5=1) is applied for options call and rounding down is applied for options put (0.5=0) to calculate the settlement position value.

You can turn off the automatic exercise feature by adding a negative amount of option contracts into the 'Option contract exercise' request ('OptChangeExpiration', field 'amount'). The amount of option contracts specified will not exercise automatically.

2.4.2.1. Option risk calculation before expiration

Current initial margin calculation algorithm can cause sudden collateral increase for clients. For more flexible management, new parameters allowing the broker to set IM calculation algorithm for clients, will be added into the trading system.

Expiration scenario parameters:

- **exp_clearings_bf** - this parameter is set by NCC globally which defines quantity of clearing sessions before expiration for series of options. During those clearing sessions IM calculated on expiration model"s basis will be blocked for Broker. Starting from (exp_clearings_bf/2) days before the expiration date volatility model will be used. This is applied only during evening or intermediate clearing session. Can differ for different underlying assets.
- **exp_clearings_sa** - number of clearing sessions before expiration with expiration scenario applied for Settlement Account. The setting is applied and changed by NCC for the whole market during the intraday and evening clearing sessions.
- **exp_weight** - weight of risk profile in accordance with expiration scenario.
  - **exp_weight (client)**: The setting may be applied by a Brokerage Firm by sending a non-trading transaction OptChangeRiskParameters for each client, will be applied during the nearest clearing session.
  - **exp_weight (broker)**: The setting may be applied by a Clearing Firm via the EDM system, by sending command 'FutChangeBFParameters'. The setting 'exp_weight (broker)' will be used to calculate collateral value for a Brokerage Firm with the nett margining mode enabled.
  - **exp_weight_client_default**: The setting may be applied by a Clearing Firm via the EDM system by sending command 'FutChangeBFClientDefaultParameters'. The setting 'exp_weight_client_default' will be applied for all BF's clients with non-specified setting ‘exp_weight (client)’, as the default setting.

  If the Broker does not set weights of risk-profile, for all his clients NCC default parameters will be applied.
- **exp_clearings_cc** - this parameter is set by NCC per all clearing participants and defines quantity of clearing sessions during which risk profile weight exp_weight might be applied for clients. Can be applied only after evening or intermediate clearing session.
- **num_clr_2delivery (broker)** - the setting may be applied by a Brokerage Firm via sending a non-trading gateway transaction 'FutChangeBFParameters'. The value stands for the number of clearing sessions before expiration, with risk profile weight applied to calculate collateral value for BF with the nett margining mode enabled. This setting overrides the NCC-applied setting ‘exp_clearings_bf’ if value ‘num_clr_2delivery (broker)’ is less than that of ‘exp_clearings_bf’.
- **num_clr_2delivery_client_default** - the setting may be applied by a Clearing Firm via the EDM system by sending command 'FutChangeBFClientDefaultParameters'. The setting is applied for all BF’s clients with non-specified setting ‘num_clr_2delivery’, as the default setting.

2.4.3. Trade types, created upon exercising and expiration of futures and options

Flags applied to orders and trades:

Flag name	Bit mask	Description
Market orders		
eAuctionStatus	0x1	Day order.
eOppositeStatus	0x2	Offsetting order (IOC).
eFOKStatus	0x80000	Fill-or-Kill order.
Clearing trades		
eNonQuoteStatus	0x4	Off-book order, including negotiated orders, multi-leg orders, and IQS trades.
eExecStatus	0x20	Option exercise trade.
eExpirationStatus	0x80	Instrument, futures, or option expiration.
eDUFlowStatus	0x800	Technical trade of position transfer between trust managing BFs of Clearing Firms.
eOptionLapse	0x800000	Option expiration trade
eClearingTrade	0x2000000	Off-book clearing trade. Applied to all clearing trades.

Flag name	Bit mask	Description
eFuturesExecution	0x40000000	Futures exercise trade.
eChangeCollateral	0x400000000	Collateral instrument trade.
eIqsOrder	0x800000000	Indicative order/trade (IQS)
Negotiated orders/trades		
eTransferClientPosition	0x8	Position transfer between BFs.
eAddressStatus	0x4000000	Negotiated order/trade.
eTransferSource	0x200000000	Donor BF side in position transfer between BFs.
Multi-leg orders/trades		
eREPOBackStatus	0x4000	Far leg transaction.
eStrategy	0x8000000	Multi-leg order/trade. Applied to all multi-leg transactions.
Other		
eDontCheckMoney	0x10	Do not verify collateral for client accounts.
eDontCheckLimits	0x200	Do not verify limits for options.
eLastRecStatus	0x1000	End Of Transaction bit.
eOppositeOrderTailDeleteDueToCrossTrade	0x20000000	Order cancellation due to a cross-trade.
eCODBulkDeleteOperationStatus	0x100000000	Order cancellation due to COD.
eFineOperationStatus	0x1000000000	Applied on order cancellation due to an IQS fee.

The data in the Plaza-2 gateways and orders are synchronized for providing convenience work of the back-offices. The 'signs' field is used in the f04_XXYY.dbf, f04clXXYYZZZ.dbf, o04_XXYY.dbf, o04clXXYYZZZ.dbf reports. This field is based on the bitmask of Plaza-2.

Trade types, created upon execution and expiration of futures and options are listed in the table below:

Operation type	Position closing trade	Position opening trade	Date and time of trades availability in reports and in the gateway
Exercise of deliverable futures	• id in reports is 0, id in gateways is nonzero. • Trade price is rounded to minimal step price. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eExecStatus, eFuturesExecution, eClearingTrade.	No.	On the execution day, in the morning.
Exercise of cash-settled futures	• id in reports is 0, id in gateways is nonzero. • Trade price is rounded to the minimal price step. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eExecStatus, eFuturesExecution, eClearingTrade.	No.	On the execution day, in the evening.
Exercise of option	• id in gateways is nonzero. id in reports is 0 (trade at the evening clearing session), nonzero id (trade at the intermediate clearing session). • Trade price is 0.	• id in gateways is nonzero. id in reports is 0. • Trade price is rounded to 5 places. • This trade is a trade legally.	• At the intermediate clearing session • At the evening clearing session Depending on time of applying the option (the next clearing session after applying).

Operation type	Position closing trade	Position opening trade	Date and time of trades availability in reports and in the gateway
	• Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eExpirationStatus, eClearingTrade.	• Signs in gateways and reports (bitmask): eNonQuoteStatus, eExpirationStatus, eClearingTrade.	
Expiration of option	• id in gateways is nonzero. id in reports is 0. • Trade price is 0. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eExecStatus, eClearingTrade, eOptionLapse.	No.	On the futures execution day, in the evening.
Segregated Brokerage Firm position transfer	• id in gateways is nonzero. id in reports is 0. • Trade price is 0. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eTransferClientPosition, eClearingTrade.	• id in gateways is nonzero. id in reports is 0. • Trade price is 0. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eTransferClientPosition, eTransferSource, eClearingTrade.	During the evening clearing session.

Trades are shown as following:

Operation type	Operations info
Stock futures trade based on a negotiated order	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus.
Stock futures trade based on a system order	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask):bits value is 0.
Stock futures option trade based on a negotiated order	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus.
Stock futures option trade based on a system order	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask):bits value is 0.
Position transfer trade	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places.

Operation type	Operations info
	• This trade is not a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eTransferClientPosition, eTransferSource.
Technical trade based on the negotiated multi-leg order (near leg)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eStrategy.
Technical trade based on the negotiated multi-leg order (far leg)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eStrategy, eREPOBackStatus.
Technical trade based on the system multi-leg order (near leg)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eStrategy.
Technical trade based on the system multi-leg order (far leg)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eStrategy, eREPOBackStatus.
Equity futures trade based on indicative trade in IQS	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eIqsOrder.
Option on equity futures trade based on indicative trade in IQS	• id in gateways and reports is unique and nonzero. • Trade price is rounded to the minimal price step. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eIqsOrder.
Technical trade for the near leg of a multi-leg order based on indicative trade in IQS	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eStrategy, eIqsOrder.
Technical trade for the far leg of a multi-leg order based on indicative trade in IQS	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): eNonQuoteStatus, eAddressStatus, eStrategy, eREPOBackStatus, eIqsOrder.

2.5. Trading and clearing schedule

2.5.1. Trading schedule. Trading sessions.

In the SPECTRA system, the trading session is subdivided into two parts (not related to the astronomical day!), which are:

- Evening trading session — takes place from 7PM till 11.50 PM (Moscow time)
- Main trading session — takes place from 10 AM till 6.45 PM (Moscow time).

During a trading session, the same trading instruments are traded and the same parameters are used to calculate the collateral to pledge. There are very important operations taking place in the SPECTRA system between the two sessions: clearing, contracts expirations, reports generating and forwarding and many others.

There is also a technical possibility available to set up one more trading session in the morning (not used for now).

2.5.2. Intermediate clearing session

There is a gap in the main trade session (2 PM - 2.03 PM, Moscow time), during which the intermediate clearing session takes place. It is used to fix new prices for instruments and transfer variable margins to participants.

The following values are changed during the intermediate clearing:

- The settling prices of the instruments traded in the evening session and in the first half of the main session. The new and the previous prices are displayed in the special fields of the 'fut_sess_contents' and 'opt_sess_contents' tables of the 'FORTS_FUTINFO_REPL' and 'FORTS_OPTINFO_REPL' streams, respectively.
- Clients' amounts of funds after the variating margins were calculated and transferred. The transferred variating margins values are displayed in the appropriate field of the part table of the 'FORTS_PART_REPL' stream.

The following values are not changed during the intermediate clearing:

- Trading instruments limitation values.
- The trading instruments list. Deleting of expired instruments and adding of new ones is taking place during the main clearing session.

2.5.3. Main clearing session

The main clearing session is taking place in the end of the trading session, from 6.45 PM till 7 PM (Moscow time). The following operations are performed:

- Calculation and fixation of settling prices in accordance with the trading session results.
- Calculation and transferring of variating margins between participants.
- Deletion of expired instruments and adding new ones.
- Renewing information on clients, brokerage and clearing firms by deleting obsolete data and loading newly calculated data.

After the main clearing session has finished, the corresponding reports are generated and sent out.

2.5.4. How different entities act on assigning a new trading session

2.5.4.1. Reference data and session data

When a new trading session is assigned, the data in the tables linked to the session number are loaded anew. For the tables that are not linked to the session number, new records are added in accordance with the new data available in the trading session; the records which do not correspond the actual trading session data will be deleted. The reference data are sent out within the tables of the 'FORTS_FUTINFO_REPL' and 'FORTS_OPTINFO_REPL' streams. As a result, the new record with a new session number is added into the 'session' table.

2.5.4.2. Funds and positions

When a trade session changes, the data on funds, limitations and clients positions are updated as following: only the records which have been modified are subject to change (including the 'FORTS_PART_REPL', 'FORTS_POS_REPL' and 'FORTS_INFO_REPL' streams).

2.5.4.3. Orders and trades

The main trading data (the 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL' streams) i.e. the orders and trades which were made until 7:00 PM of the currrent trading session are available in the system till 12:00 PM on the current day.

Upon changing the trading session, the multi-day orders are relisted automatically except those which are expired. The relisting is made by deleting an old order and adding a new one with a new number, with no data added into the 'orders_log' table. Therefore, the client system should act as following: after finding a new trading session number in the 'session' table, the client system should 'forget' all the orders stored in memory by the moment and 'listen' to the replication stream for new orders with the new trading session number.

2.5.4.4. Instruments

When switching the trading sessions, the system deletes expired trading instruments and adds new ones, which cannot be traded during the evening trading session (7:00 PM till 11:50 PM); however, these new instruments appear in the system and are transmitted in the replication stream. They are also marked with a special sign in the 'fut_sess_contents' and 'opt_sess_contents' tables.

2.5.4.5. Replication streams

The replication streams can be closed and then reopen again by the trading system servers, yet some streams may transmit notification about changing the life number of a scheme.

For now, the following streams can be reopen without changing life numbers:

- 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL' — general market data.
- 'FORTS_VOLAT_REPL' — the current volatility values.
- 'FORTS_VM_REPL' — the current variating margin value

The following streams are not subjects to reopen:

- 'FORTS_FUTINFO_REPL' and 'FORTS_OPTINFO_REPL' — reference data
- 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL' — trading data
- 'FORTS_FUTORDERBOOK_REPL' and 'FORTS_OPTORDERBOOK_REPL' — snapshots of order books
- Streams with aggregated order books.
- 'FORTS_PART_REPL', 'FORTS_POS_REPL', 'FORTS_INFO_REPL'
- 'RTS_INDEX_REPL' — exchange indices
- 'FORTS_MISCINFO_REPL' and 'FORTS_CLR_REPL'.

2.5.4.6. Event-sensitive scheme for data synchronizing

If a developed system demands the possibility of synchronizing the consistent states of data, then the event-sensitive scheme should be used, which is available starting from the 3.8.2 version of SPECTRA. The following events are used to start synchronization:

- All data for a new trading session are loaded and calculated (~18:49-18:50, Moscow time zone)
- Intraday clearing session has started (14:00, Moscow time zone)
- Funds have been recalculated after intraday clearing session (~14:01:30, Moscow time zone)
- All clearing procedures has finished for intraday clearing session (~14:02, Moscow time zone)
- Main clearing session has started (~18:45, Moscow time zone)
- All data after the main clearing session are recalculated (~18:49, Moscow time zone)
- Limits have been extended (during the trading session)

The new 'sys_events' table is added to the replication streams in order to inform outer systems about the events occurred:

Field	Type	Description
replID	i8	Replication subsystem service field
replRev	i8	Replication subsystem service field
replAct	i8	Replication subsystem service field
event_id	i8	Unique event ID
sess_id	i4	Trading session ID
event_type	i4	Event type
message	c64	Text description

The table is added into the following replication streams:

- 'FORTS_FUTTRADE_REPL'
- 'FORTS_OPTTRADE_REPL'
- 'FORTS_INFO_REPL'
- 'FORTS_PART_REPL'

- 'FORTS_POS_REPL'
- 'FORTS_FUTINFO_REPL'
- 'FORTS_OPTINFO_REPL'
- 'FORTS_ORDLOG_REPL'
- 'FORTS_CLR_REPL'

The rules of the synchronization are the following: when a global event occurs in the system, and when all the data regarding this event are generated by all the subsystems, the new record is added to the 'sys_event' table containing the same 'event_id' value, with the 'event_type' value corresponding to the following event occurred:

- 1 (session_data_ready) - all data from the clearing system have been loaded into the trading system; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream
- 2 (intraday_clearing_finished) - all clearing procedures have been finished in the intraday clearing session; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream
- 3 (clearing_data_ready) - data are ready after the main clearing session; this type of event is transmitted only in the 'FORTS_CLR_REPL' stream
- 4 (intraday_clearing_started) - intraday clearing session has started; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream
- 5 (clearing_started) - main clearing session has started; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream
- 6 (extension_of_limits_finished) - limits have been extended; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream
- 8 (broker_recalc_finished) - Funds have been recalculated after intraday clearing session; this type of event is transmitted in all streams containing sys_events, except the 'FORTS_CLR_REPL' stream

An outer system may subscribe to receive the event table via all the available replication streams; when the data are ready, a notification will be sent to the outer system. The 'sys_event' table records, relating to the same event, will have the same 'event_id' field value in every replication stream. There are additional data available in the 'sess_id' and 'message' fields: the number of the current or upcoming trading session and a text message, respectively. Please also note that:

- The identity of service fields values (the 'replID' and 'replRev' fields) cannot be guaranteed for the same event in the different replication streams. You should view the 'event_id' value instead.
- The notification for the 'sys_event' table arrives AFTER all other data. It means that working in on-line mode, the system receives the newest data available, for example, instruments or the multi-day orders rolled over from the previous session, before adding records into the 'sys_events' table.

2.5.4.7. Game and test mode trading schedule

Except for the real SPECTRA trading system, there are also game and test systems available.

X-points — a point on the arrow of time, upon reaching which the negotiated trades are allowed only when both seller and buyer are clients of the same brokerage firm. This period of time is necessary for brokers to close all the positions, where deliveries are physically impossible.

Game system trading schedule:

- Evening trading session: 4:00 PM - 10:00 PM.
- Morning trading session: 06:00 AM - 08:55 AM.
- Main trading session: 09:00 AM - 1:00 PM.
- Intraday clearing session: 1:00 PM - 1:03 PM.
- Main trading session: 1:03 PM - 3:45 PM.
- Clearing session: 3:45 PM - 4:00 PM.

Test system trading schedule (for developers):

- Evening trading session: 3:30 PM - 11:50 PM.
- Morning trading session: 07:00 AM - 07:15 AM.
- Main trading session: 07:15 AM - 2:45 AM.
- Intraday clearing session: 12:00 PM - 12:05 PM.

- X-points: 1:00 PM, 1:15 PM.
- Delivery: 1:30 PM - 2:00 PM.

2.6. Risk management and limitation of trading operations

2.6.1. Collaterals

The Risk Management System implemented into SPECTRA allows to dramatically reduce risks of non-fullfilment of obligations by permanent evaluation of market risks for every participant's position. The core of the system is the initial margin (hereinafter also referred to as IM) calculation algorithm, applied to open positions and orders recognized on clearing and trading participants' position accounts.

One of the key features of the SPECTRA Risk Management System is the calculating initial margin on orders and positions per one trading transaction in online mode. Therefore, it is almost impossible for non-pledged orders and trades to appear in the system, because the initial margin is always verified before any relating order appears in the system.

Another important feature of the SPECTRA Risk Management System is the three-level calculating scheme, in accordance to which the position accounts are subdivided into three groups:

Settlement Account - the upper-level account of a clearing participant (i.e. Clearing Firm). The Settlement Account is an independent account for recognizing collateral assets margined by a trading participant (and/or their clients), orders added for all lower-level accounts (sub-accounts) belonging to the Settlement Account, trades performed basing on these orders, and resultant positions. Therefore, a position for an instrument recognized under the Settlement Account is equal to the net amount of all positions for the given instrument which are recognized under the sub-accounts.

The amount of initial margin for a Settlement Account is calculated independently of the other settlement account. All settings of SPECTRA Risk Management System are specified by the Central Counterparty (clearing firm).

During a clearing session, the system calculates the clearing participant's obligations and requirements (variation margin, commission fees, etc.). Also, the system calculates collateral sufficiency to meet initial margin requirements.

Settlement accounts are subdivided into three sections:

- own - trades are covered with clearing participant's assets;
- client - trades are covered with direct clients and clearing participant's 2nd-level clients' assets;
- Asset management - trades are covered with assets managed by a clearing participant.

For each clearing participant (Clearing Firm), there are at least two Settlement Accounts assigned: own and client.

Each Settlement Account will be identified by trading system SPECTRA in accordance with its unique 5-digit code.

Brokerage Firm - a sub-account of a Settlement account, which can be set up upon application by the clearing participant (Clearing Firm). Each Brokerage Firm belongs to a single Settlement Account, where the Settlement Account is subject to change upon the clearing participant application applied to the clearing entity. To make a Settlement Account available in SPECTRA , there should be at least one Brokerage Firm bound to it.

The clearing system of SPECTRA recognizes the initial margin deposited by a client, and/or their clients to client section of the Brokerage Firm. Detailed information on initial margin values are available in reports.

By default, initial margin value is calculated in half nett mode (margin_type =3 in command FutChangeBFParameters) in accordance with risk values for positions recognised at client sections of Brokerage Firm. Nett mode is also available for Brokerage Firm for initial margin calculation (margin_type =4 in command FutChangeBFParameters); using this mode, the initial margin value of a Brokerage Firm will be calculated according to nett sum of all positions for the given instrument at all sections of the Brokerage Firm, and total amount of orders added for sections of the Brokerage Firm.

All margining settings of a Brokerage Firm can be changed by a clearing participant (Clearing Firm) using the command FutChangeBFParameters.

Separate Brokerage Firm (**SBF**) - a separated sub-account of a Settlement account, similar to common Brokerage Firms, purposed for recognizing collateral assets deposited by a client, and/or their clients, and not recognized at any section of common Brokerage Firms.

Detailed information on initial margin values are available in reports.

Also, each SBF contains a special account called liquidation account, which is purposed to recognize positions based upon trades performed by Clearing Centre in order to handle obligations unperformed by a clearing participant (for example, an unperformed Margin Call requirement for the Settlement Account). None of clearing participants (a Clearing Firm) is able to add orders with the liquidation account specified; excluding the orders aimed to lower the amount of an opened position for the given account. Also, clearing participants (Clearing Firms) are able to transfer positions from the liquidation account to other Brokerage Firms' accounts (command FutTransferClientPosition).

Client Account - a sub-account of Brokerage Firm. The low-level account, which can be opened upon the application by client, and specified as the 'client code' in order adding transaction. This is the primary account to recognize orders added by participant and/or client, trades performed upon these orders, and open positions; the initial margin value will be calculated using these orders and positions. One can change Client Account margining settings via commands FutChangeClientMoney, FutChangeClientParameters, FutChangeBFClientDefaultParameters.

The clearing system of SPECTRA recognizes the initial margin deposited by a client, and/or their clients to a Client Account. Detailed information on initial margin values are available in reports.

2.6.1.1. Margining of calendar spreads

Margining of calendar spreads on futures (multi-leg orders), and opposite direction positions with different exercise dates for the same underlying asset (intermonth spread) may proceed in two modes:

- half nett - IM value will be calculated based upon the larger IM of the instruments in the spread;
- nett - IM value will be calculated based upon price variable rate value of the instruments in the spread.

For a Settlement Account, the solely available margining mode is the nett mode.

For a Brokerage Firm, it is possible to change calendar spread margining mode only if IM value for the Brokerage Firm proceeds in the nett mode. To change the calendar spread margining mode, please use setting 'calendar_spread_margin_type' of command FutChangeBFParameters.

To change the calendar spread margining mode for a Client Account, please use setting 'calendar_spread_margin_type' of command FutChangeClientParameters.

2.6.2. Trading limits

Trading limits are aimed to restrict a participant, and/or their clients, from adding orders and open positions for position accounts.

Trading limit for a Settlement Account can be calculated based upon total imputed value of IM recognized for the given Settlement Account, i.e. total value of IM recognized for all sub-accounts of the given Settlement Account. Collateral assets may consists of Russian Rubles, foreign exchanges, and securities.

Trading limit for a Settlement Account can be changed by depositing, withdrawal, or transferring collaterals, based upon requests applied to the clearing entity, or clearing depositary (as well as to other settlement entities, once there have been any collateral deposited) by participant via the appropriate electronic document management systems. Another way to change trading limit is to transfer collateral (Russian Rubles) from one sub-account of Settlement Accounts (Brokerage Firm/Separated Brokerage Firm) to another using command FutExchangeBFMoney.

Trading limits are used to reserve negative variating margins, withdraw fees and premiums, accrue premiums and reserve collaterals.

By default, trading limit for a Settlement Account (similar to that of Settlement Accounts) will be calculated based upon total imputed value of IM recognized for sub-accounts of a Brokerage Firm. Collateral assets may consists of Russian Rubles, foreign exchanges, and securities. To change trading limit of a Brokerage Firm, please use command FutExchangeBFMoney.

For a Brokerage Firm, it is possible to switch trading limit calculation mode, in order to calculate the trading limit independently of value of IM recognized for the Brokerage Firm's sub-accounts. To switch to that mode, please use command FutChangeBFLimit. Also, trading limit will be changed in accordance with the profit/loss value resulted from the evening clearing session (variation margin and fees).

To change trading limit mode, please use setting 'limit_tied_to_money' of command FutChangeBFParameters.

Trading limit for Client Account does not depend on IM value recognized for the given account, To manage trading limits for Client Accounts, please use command FutChangeClientMoney, with the following possibilities:

- Set up/change/delete trading limits (separately for money and pledges);
- Enhancement/lessening of requirements to client's IM via applying a special ratio, which is used to multiply the client's IM value upon adding orders. All assets sufficiency verification will be then made in accordance with that ratio;
- The client's trading results will be automatically applied for limits in the next trading session.

As a rule, one is able to add an order only if there are sufficient limits to cover the required IM for all three levels (CLient Account, Brokerage Firm, Settlement Account). It is possible to switch off the limit sufficiency verification for Brokerage Firm and Client Account using commands FutChangeBFParameters and FutChangeClientMoney, appropriately.

Please note that it is not possible to switch off the limit sufficiency verification for a Settlement Account.

2.6.2.1. Unified Collateral Pool

If a Settlement Account belongs to Unified Collateral Pool (UCP), then, instead of collateral assets, clearing system of SPECTRA recognizes asset profiles transferred to its sub-accounts (Brokerage Firms, SBF) from clearing systems of Securities Market and FX Market. The asset profiles are transferred based upon the clearing participant's requests applied to the clearing entity via the appropriate electronic document management system. Please note that it is impossible to transfer IM to a Brokerage Firm of a Settlement Account belonging to UCP. Please also note, that it is impossible to transfer profiles between Brokerage Firms of different Settlement Accounts belonging to the Unified Collateral Pool.

An asset profile is recognized in SPECTRA trading system as imputed value of the asset according to its profile sign (+/-, to change the trading limit accordingly), and as position for a separate instrument (excluding Russian Ruble related profile), at the same time. The position for a separate instrument will be added either onto the Brokerage Firm's client account (if the profile transferred onto the same client account), or onto a Separate Brokerage Firm (with the client code '000'; if the profile transferred with no client account specified for this

transfer transaction). There is a dedicated instrument (name suffixed with '_CLT') in SPECTRA for every asset eligible for profile transfer, the one is restricted to add orders and perform trades for. The only method to change a position opened for that dedicated instrument is to transfer the appropriate profile to/from SPECTRA clearing system. The IM calculation at participant's accounts/sub-accounts for the dedicated instrument position is similar to that of a futures position for the same underlying asset, i.e. the position will be margined exactly the same way.

All other specifics of managing the IM value and trading limits for sub-accounts of Unified Collateral Pool are similar to that of the standard Settlement Accounts.

2.6.3. Limitations on trading operations and opening positions for clients

The SPECTRA system allows to set up the additional limits on client trading operations, i.e. prohibitions, when it is possible to prohibit opening positions and placing orders for a certain client (or for all clients), a certain instrument (or for all instruments) or a certain underlying asset (or for all underlying assets). The following methods are used: FutChangeClientProhibit method — Changing client limits for futures and OptChangeClientProhibit method — Changing client limits for options.

2.6.4. Risk balancing between the Derivatives Market and FX Market

In order to reduce the amount of funds a trading/clearing participant is obliged to hold on both Derivatives Market and FX Market for covering their open positions/obligations, the trading system SPECTRA provides availability to balance risks between two markets, i.e. to transfer a part of risk from a position accounting register of the Derivatives Market to one of the FX market.

This can be made using two technical instruments (though they are not instruments juristically) in the trading system SPECTRA: EURRUB_RSK and USDRUB_RSK; each of the instruments contains 0x20000 in its field ‘signs’. On the FX Market, the appropriate instruments have been added for the board RSKC.

In the SPECTRA Clearing system, each Brokerage Firm (BF) has its own Settlement account, registered in the TCS of the FX Market.

Thus, when a participant/Brokerage Firm is going to split the single amount between two markets, they are required to apply a Risk balancing request (method FutTransferRisk, via the SPECTRA gateway Plaza-2), containing name of a risk management instrument, amount of risk, position accounting register of the Request originator (Brokerage Firm) ID and risk transfer direction specified.

After the order has added, the negotiated order with the National Clearing Centre as the counterparty appears in the system. Then, the order passes the standard risk management procedures. After the order has been verified for collateral sufficiency, it matches into trade, and the single limit recalculates. The trade is accounted at the current central rate, and no collateral accrues.

A risk transfer technical trade appears in the SPECTRA trading system. The trade is visible in the gateway interfaces in the table 'deals' with the flag 'nosystem=1', and is added into reports with ‘type=16’.

As a result of the trade, a permanent position appears. It can be closed by performing an opposite trade for the same instrument.

2.6.5. Position (obligation) transfer

The SPECTRA system provides possibility to transfer a positions from one Brokerage Firm client to another client of the same Brokerage Firm.

To transfer a position from one clearing register to another, a clearing participant should add a new transaction into the Trading system.

Verification procedures on position transfer are the same as that of adding an order. Additionally, it is verified that volume of the position to be transferred does not exceed that of the donor account. Also, the VAT/personal data (including separated brokerage firms accounts) must be equal for both accounts.

Technically, the position transfer is a trade, performed between a donor account and a recipient account. Juridically, it is not a trade (for details see Trade types, created upon exercising and expiration of futures and options). Position transfer is visible both in the gateway and in the reports (f04/o04).

2.6.6. Pausing trading session for extending limits of trading prices fluctuations

Technically, the following actions take place in the SPECTRA system when pausing trading:

- When the condition is set to pause trading for a certain underlying asset, then the trading pauses for this asset.
- The trading administrators calculate the new extended limits of prices fluctuations.
- The amount of collateral is recalculated for every position, which includes the underlying asset (if the limits extend, then the amount grows)
- After the collateral is recalculated, the trading still pauses, allowing participants to delete orders.
- The trading resumes in the standard mode.

The corresponding notifications are sent on every action listed above (see the 'sys_message' table of the 'FORTS_FUTINFO_REPL' stream):

- Warning about the upcoming trading pausing for a certain instrument if the prices remain unchanged.
- Notification about pausing the trading.

- Notification about successful recalculation of collateral (orders can now be deleted).
- Notification about resuming the trading.

2.6.7. Risk parameters forecast information for trading participants

The Trading System provides risk parameters forecast information to the trading participants (via service ForecastIM). The service recalculates the Initial Margin value at a specified time interval, forecasting a new most probable value which would occur after the limits were extended. Then, the new data will be transmitted to the trading participants.

This will be done in the following steps:

- At the time interval of 1 minute, the market condition is being analyzed for instruments due to which the limit extension procedure may, or will be performed (once an instrument's price value stays close to a specified limit for more than X minutes).
- Once such instruments are detected, the Initial Margin will be recalculated for client portfolios. The new risk parameters will be applied for the instruments, according to the new limit values set after extension.
- The recalculated funds are transmitted within the table part_sa_forecast of the replication stream FORTS_FORECASTIM_REPL.
- Once the limit extension risk is over due to the market condition change, or when the limits have been already extended before, the service halts recalculation and transmitting of the Initial Margin value. All the previously received data will be declared as non-valid (all forecasted data in the appropriate table will be cleared at receiving command CLEARDELETED with the maximum possible revision value).

If the limits have been already extended twice for the same instrument during a single trading session, there will be no more risk parameters forecasted and forecast information transmitted for this given instrument during this trading session.

There will be no limits extensions made during evening trading sessions. Therefore, risk parameters will not be forecasted during evening trading sessions as well.

3. Trading gate description

3.1. SPECTRA Plaza-2 gateway. Components, installation and setup.

3.1.1. Components and architecture

The SPECTRA Plaza-2 gate consists of the following software components:

- The 'P2MQRouter' module. This module provides the following services:
  - Establishing TCP-connections to the Exchange servers.

    Normally, the SPECTRA Plaza-2 gate uses four TCP-connections to the Exchange servers: one outgoing default connection and three outgoing direct connections. This structure is used as the standard to establish connection directly to the Exchange server farm, but connection via a Brokerage Firm server server may require a different structure; in this case, clients should apply to the server's owners for more details about connection.
  - Receiving/sending P2-messages.
  - Encrypting data sent by participants and decrypting data received from the Exchange.
  - Authentication of participants in the Exchange network.
- 'cgate' - the gateway library.

  The library is the official software interface, provided to trading participants along with their clients as well as to software developers. The interface provides availability to create and send messages into the trading system and receive trading data from the trading system (data replication). There are x32 and x64 versions available for Windows systems, as well as a version for Linux OS.
- Plaza-2 system libraries.
- Software development kit, including additional utilities, command files, documentation and test examples.

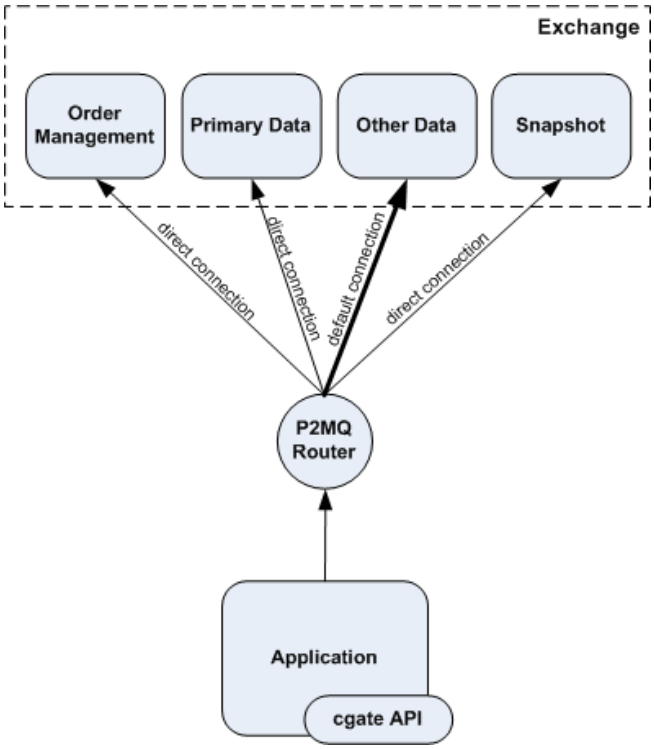

Figure 2. Gateway architecture

3.1.2. Hardware and software requirements

3.1.2.1. Hardware requirements

Hardware requirements may vary depending on usage of the Plaza-2 gate.

The minimum system requirements for individual login without disk saving option are as follows:

- CPU: Core 2 duo 1 Ghz or better
- Memory: 2 GB or more for x32 systems, 4 GB or more for x64 systems.

The minimum system requirements for brokerage firm login without disk saving option are as follows:

- CPU: Intel Xeon E5 2 cores or better
- Memory: 16 GB or more
- Separate SAS controller. Minimum 2 hard drives in RAID1. Two partitions, 30 GB each.

The minimum system requirements for brokerage firm login with disk saving option are as follows:

- CPU: Intel Xeon E5 2 cores or better
- Memory: 16 GB or more
- Separate SAS controller powered with the write-back cache policy. Minimum 4 hard disks in RAID10. Two partitions, 30 GB each.

3.1.2.2. Software requirements

The following operation systems are supported by the gateway software:

- Microsoft Windows 2003/XP
- Microsoft Windows 7
- Microsoft Windows Server 2008 R2 and older
- Linux RedHat 6.0 (CentOS 6.0) and older
- Ubuntu 14.04 LTS / Debian and older

3.1.3. Installation for Windows

Download the latest gateway software version from ftp://ftp.moex.com/pub/ClientsAPI/Spectra/CGate/. The installation file's name is 'setup_SpectraCGate_x86_vx.x.x .exe' ('setup_SpectraCGate_x64_vx.x.x .exe'), where x.x.x is the software version number, for example 5.3.1.

Run 'setup_SpectraCGate_x86_vx.x.x.exe' ('setup_SpectraCGate_x64_vx.x.x.exe'). The installation wizard will guide you through the installation process:

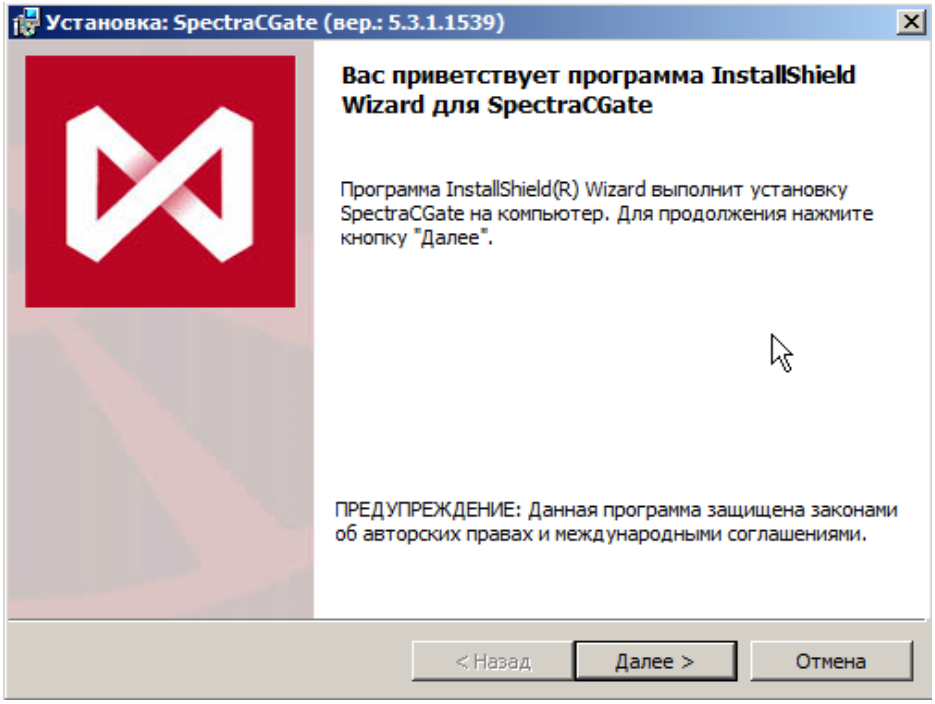

Figure 3. Installation start

Click the 'Далее' button to continue with installation:

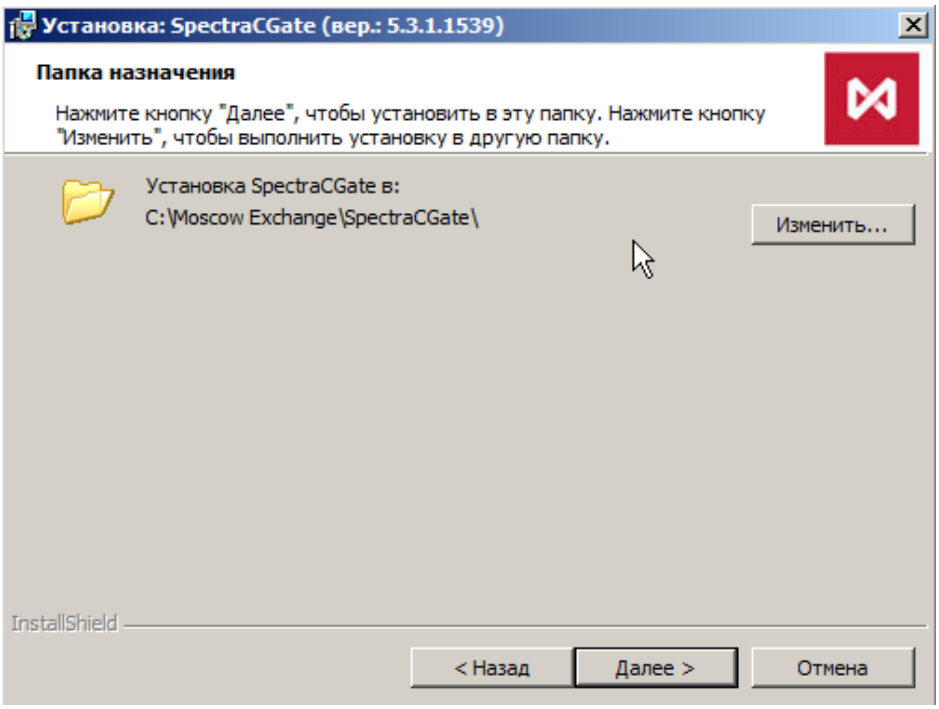

Figure 4. Destination folder

The default destination folder is C:\Moscow Exchange\SpectraCGate\. To confirm installation using the default folder and continue to the next step, click the 'Далее' button.

To change the destination folder, click the 'Изменить...' button. A new window appears in the screen; in this window, select a new destination folder using the "Поиск в папке" button; to move one level up in the folder tree use the button. Also, you can create a new destination folder using the button, or select an already existing one by manually typing the path in the "Имя папки" entry box in the lower part of the window. Click 'OK' to apply the changes you have made and close the current window. In the "Папка назначения" window, press the "Далее" button to continue to the next step.

Important

Please be known that you will only be able to change the destination folder upon the initial installation, or when you are re-installing the software anew. In all other cases, you will not be able to change the destination folder (the 'Изменить...' button will be disabled).

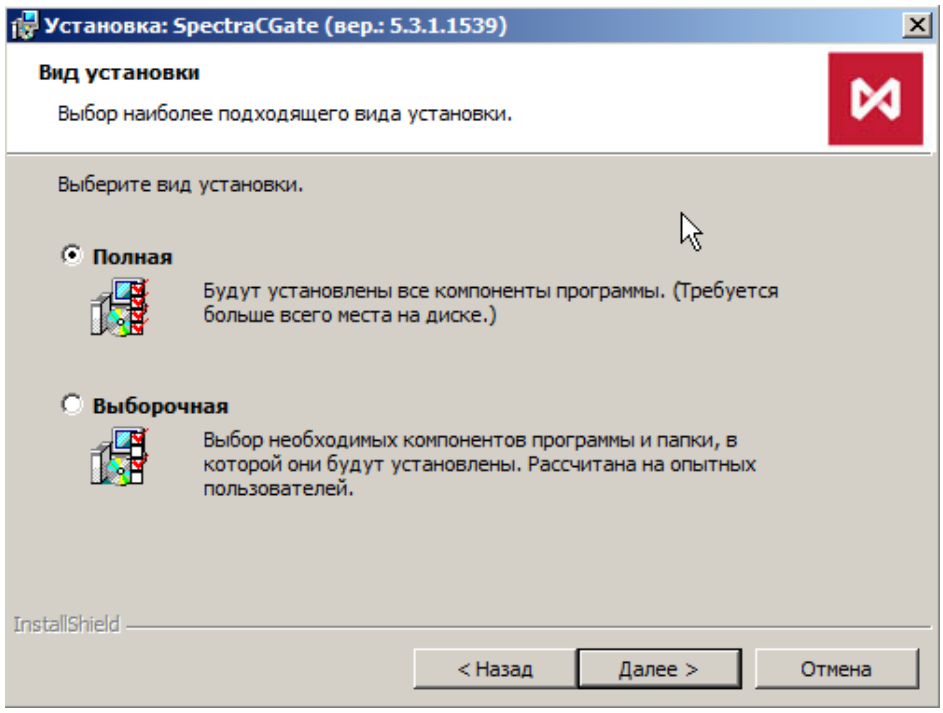

Figure 5. Select components to install

Select the installation mode you want to use, full or custom. The full install mode will install all the gateway components including module P2MQRouter, library cgate, additional utilities and the software development kit. The custom install mode allows you to manually select software components to install.

Click the 'Далее' button to continue with installation:

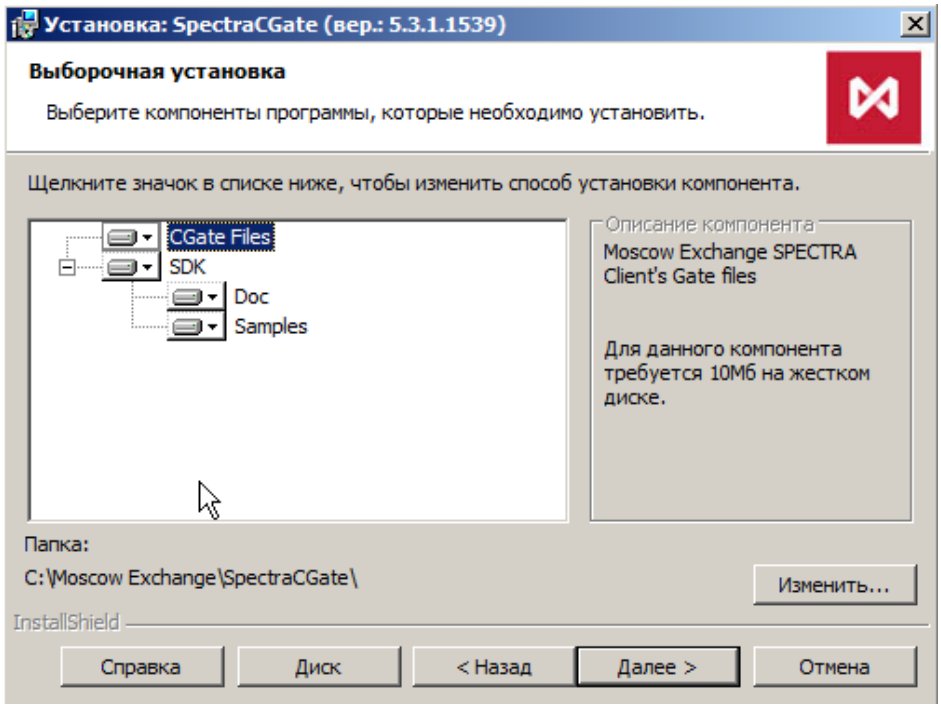

Figure 6. Custom install

Select the software components you need to install and the destination folder. The destination folder should be selected in accordance with the administrative recommendations.

Click the 'Далее' button to continue with installation:

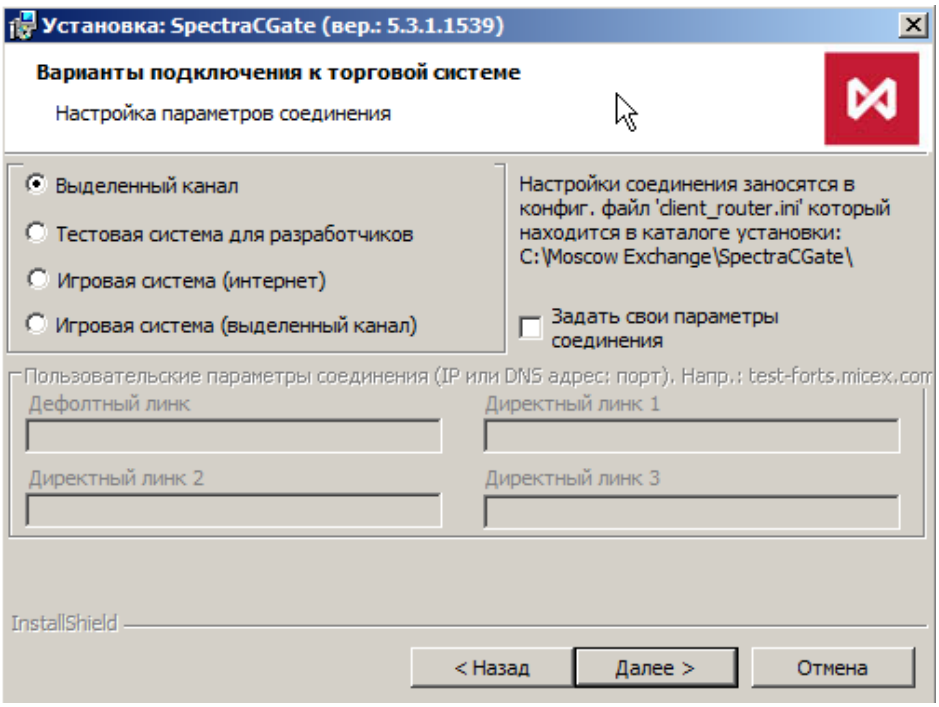

Figure 7. Select an address to connect

For selecting the proper connection type (Production server, UAT Server, Mock trading server, etc.), you should contact your brokerage firm and/or the Exchange technical support service.

Click the 'Далее' button to continue with installation:

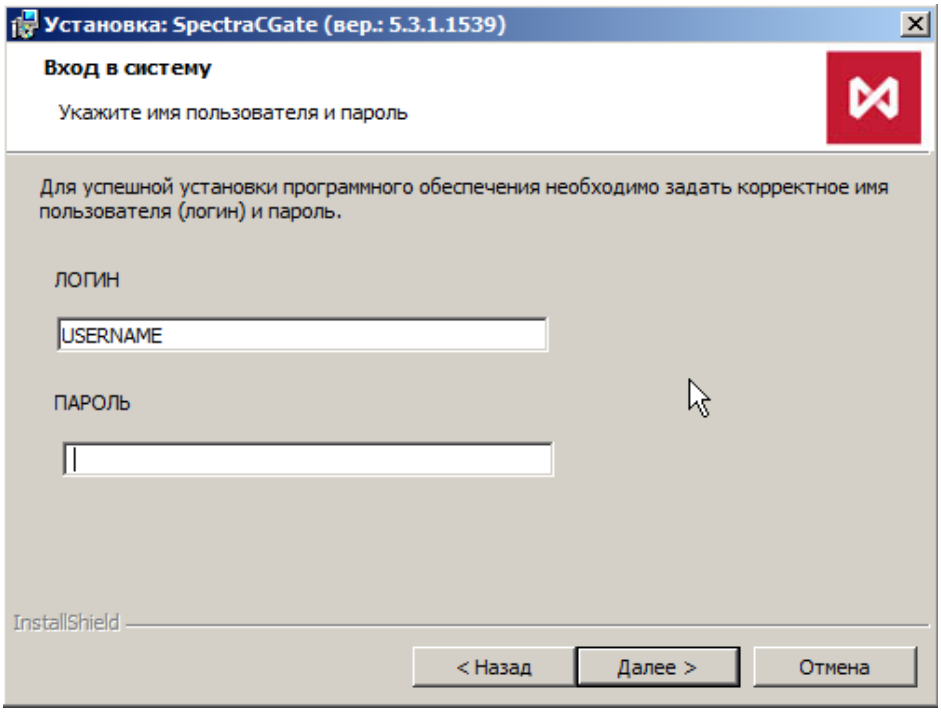

Figure 8. Enter username and password

Enter a username and a password to get access to the SPECTRA trading system. After the installation complete, the username and the password will be added to the ini-file of the 'P2MQRoutel' module for automatic authentication in the Exchange network on next login. Please note that usernames and passwords differ for each connection type (real, testing and gaming).

Click the 'далее' button to continue with the installation:

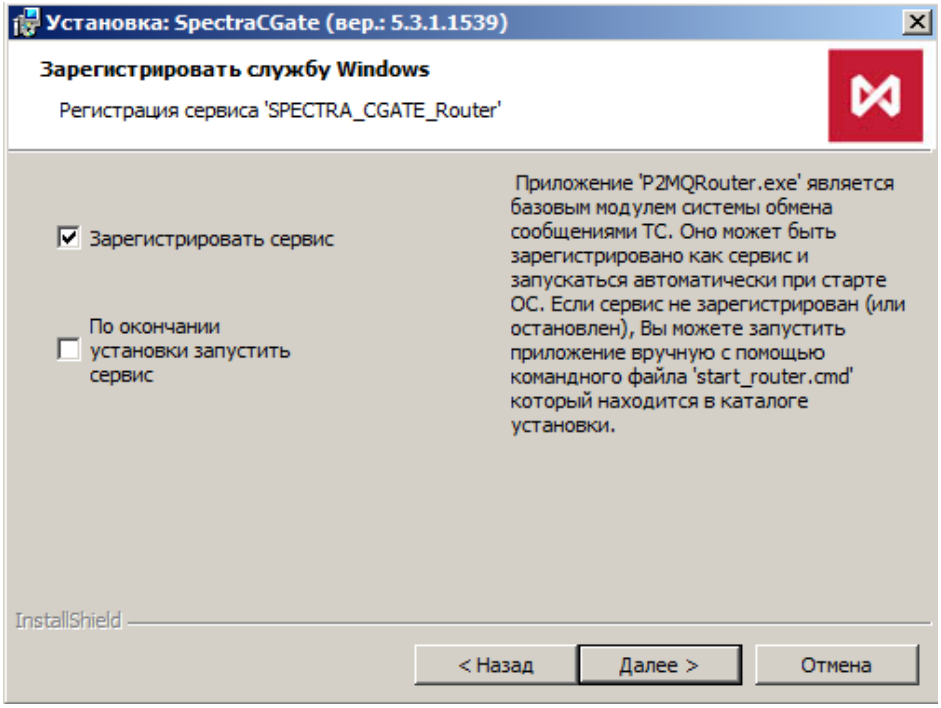

Figure 9. Registering router as OS service

If you need to install the Router as Windows service, check the appropriate checkbox and click the 'Далее' button to continue with the installation.

If you do not register the P2MQRouter as an OS service, you can do it later manually using the command file 'install_router.cmd (uninstall_router.cmd)'. The file is a part of distribution kit.

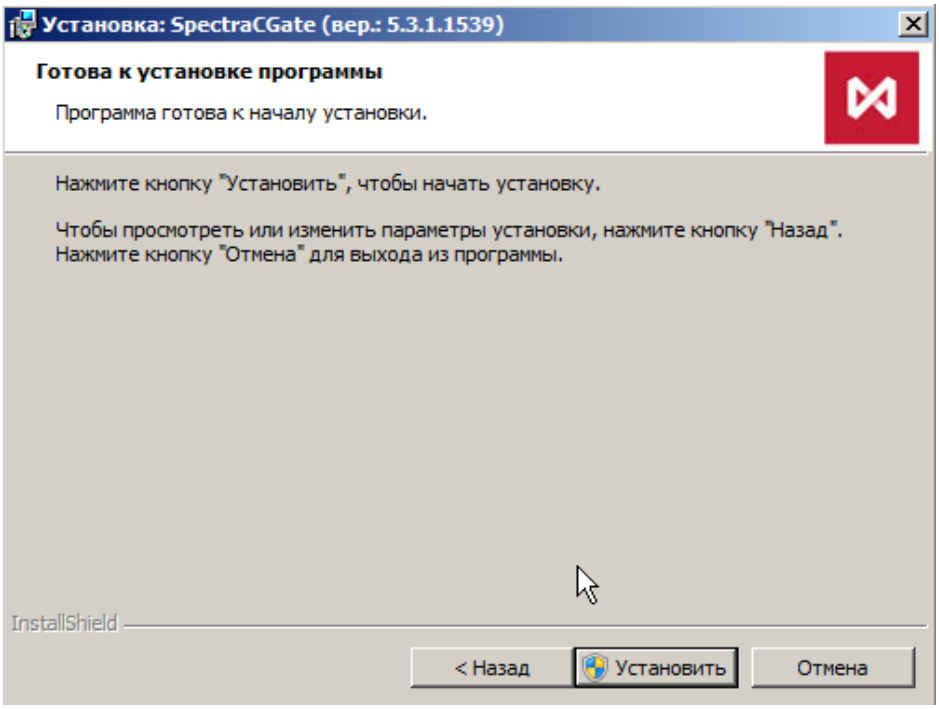

Figure 10. Starting installation

Click 'Установитьl' to begin installation.

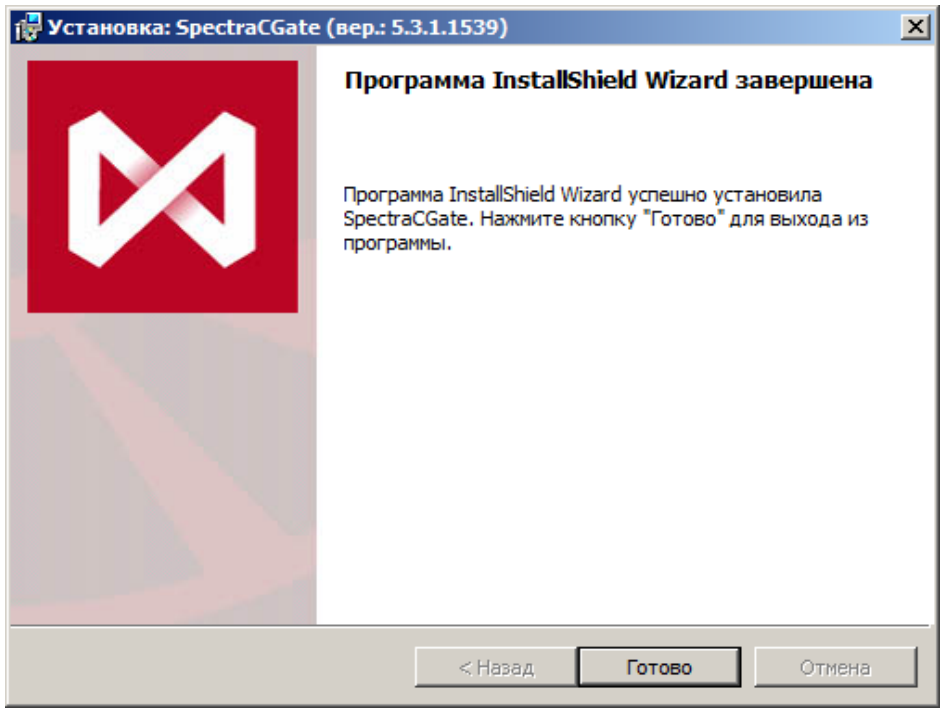

Figure 11. Finishing installation

Click 'Готово' to finish the installation.

3.1.4. Installation for Linux

The distribution kit for Linux OS consists of installation script ('install.sh') and archive file 'tar.gz' (for example, 'cgate-1.3.9.8.x86_64.tar.gz'); the archive file contains loadable modules 'cgate' and 'cgate_java', files 'include', documentation files and test examples. The distribution kit can be downloaded at ftp://ftp.moex.com/pub/ClientsAPI/Spectra/CGate/.

Installation order:

1. Execute the command:

```
chmod 755 ./install.sh
```

2. Execute the command:

```
./install.sh ./cgate-1.3.9.8.x86_64.tar.gz
```

Note

If you executed command './install.sh ./cgate-1.3.9.8.x86_64.tar.gz' and got message 'Access denied' in reply, execute 'chmod 755 ./install.sh' to add the necessary permissions for the file's attributes.

3. When you receive 'Please, enter cgate install path', specify the full path to the folder to decompress the cgate software.
4. When you receive 'Please, enter P2 login', specify the user's login.
5. When you receive 'Please, enter P2 password', specify the user's password.
6. The next installation steps may vary depending on the Linux OS software version installed:

- Debian 6:
  - Install 'ant'
  - Install 'openjdk-6-jdk' (java examples compilation)
  - Install g++ (C++ examples compilation).
- CentOS 6:
  - Install 'gcc'
  - Install 'gcc-c++' (C++ examples compilation)

- Install 'ant' (java examples compilation).

3.1.5. Developer guidelines

3.1.5.1. Usage of test examples

In order to verify the installation accuracy you can compile and run the test examples included into the distribution kit.

The examples can be found either in folder Moscow Exchange\SpectraCGate\SDK\samples for Windows OS, or /usr/share/doc/cgate-examples for Linux OS. To compile examples, you should run the special scripts, which may vary depending on the operation system and programming language used. For Linux OS, it is recommended to copy the examples into your login directory to compile them.

Description of examples:

1. Example 'aggrspy'

   'aggrspy' is an example which is used to build aggregated orderbook for to buy and sell a fixed instrument for the stream 'FORTS_FUTAGGR50_REPL'. Press 'Enter' to display the orderbook snapshot.

   Execute:

   ```
   aggrspy ISIN_ID depth outfile [r]
   ```

   Input arguments:

   - 'isin_id' - instrument's ID;
   - 'depth' - depth of orderbook (up to 50);
   - 'outfile' - orderbook file for printing;
   - 'r' - reverse the sorting order (for instrument with reversed sorting order).

2. Example 'repl'

   'repl' is an example which is used for receiving replication data and printing all incoming messages into a log-file. When disconnected, the replica transfer process starts anew from the beginning. No input parameters required.

3. Example 'repl_resume'

   'repl_resume' is an example very similar to 'repl'. When disconnected, it allows to resume replica transfer process starting from the last message 'TN_COMMIT'. No input parameters required.

4. Example 'send'

   'send' is used to add order into the SPECTRA and write incoming replies into the trading system log. No input parameters required.

5. Example 'orderbook'

   'orderbook' is an example which is used to build aggregated orderbook for to buy and sell a fixed instrument for the online stream 'FORTS_ORDLOG_REPL' along with the snapshot stream 'FORTS_FUTORDERBOOK_REPL'. It is recommended to use it for developing 'late join', and also for minimizing inactivity time when archival data is being downloaded. Press 'Enter' to display the orderbook snapshot.

   Execute:

   ```
   orderbook ISIN_ID depth outfile [r]
   ```

   Input arguments:

   - 'isin_id' - instrument's ID;
   - 'depth' - depth of orderbook (up to 50);
   - 'outfile' - orderbook file for printing;
   - 'r' - reverse the sorting order (for instrument with reversed sorting order).

6. Example 'p2sys'

   'p2sys' is an example, which is used for authorising the Router from cgate side. The following actions are executed cyclically:

   - Send erroneous login/pwd pair, get the 'logon failed' in reply;
   - Send the correct login/pwd pair;
   - Receive an 'authorisation successful' message, send 'logout' request;

- Go back to the beginning.

7. Example 'send_mt'

   'send_mt' is an example of multi-thread order adding. (Please note, that only C++11compilers are supported!). Thread 1 is used for adding orders, while thread 2 is used for processing 'reply' messages received.

Before executing the examples, please make sure that 'P2MQRouter' has started and connected to the Plaza-2 network (with touter massages analyzed), the INI files are accessible for the example file, as well as the Plaza-2 libraries (it may be necessary to add 'Moscow Exchange\SpectraCGate\bin' folder into the PATH environment variable or specify Moscow Exchange\SpectraCGate\bin for your development environment).

> **Note**
>
> The examples above are not intended to be used with data other than test data! It is strictly prohibited to use these examples for working with the real logins!

3.1.5.2. Distributed configurations

The 'cgate' application and the 'P2MQRouter' module can be distributed to different computers. To distribute the modules in the brokerage firm network, you should do the following: a) install the 'Router 'module to the computer connected to the Exchange network; b) install 'cgate' to the client computer with the client application installed; c) specify the following settings:

- On the client side:
  - Specify the 'Host 'and 'Port' settings in accordance with that of your corporate network router.
  - Specify the Password settings (the local AppName application password for the router, which must be applied every time the application connects router from outside of the same computer). Please note that the local connection password is not the same as the Plaza-2 authentication password!
- On the router side:
  - Add the '<AppName>=<local password>' string into the 'router.ini' file, [AS:Local] section, where 'AppName' (the application name) and 'Password' (the local password) should match the parameters transmitted by the client application.

3.1.5.3. Recommendations for third-party companies on including the Moscow Exchange runtimes into user application when distributing the user software

Users should copy the file set from the installation folder (Moscow Exchange\SpectraCGate\bin), as well as data and messages schemes (Moscow Exchange\SpectraCGate\SDK\scheme) into the folder containing user application. All these software parts should be distributed together.

It is not allowed to use different versions of 'P2MQRouter' and 'cgate' due to incompatibility. Before installing user application, please make sure that the 'P2MQRouter' version matches the one used in developing.

3.2. Market data structure

This section describes the structure of information sent by Plaza-2 gateway.

All transmitted data is divided into the following logical groups:

- Reference information
- Trade information
- Recovery information
- Funds and limits information
- Clearing information
- Rates and indices information
- Auxiliary data streams

3.2.1. Reference information

The reference information includes the following data:

- Trading session status and schedule

  Trading session time information and all its components: intermediate clearing, evening clearing, evening session time are available in 'session' table of the FORTS_FUTINFO_REPL stream. You can find trading session status in the same table, that helps to track current session status.

- Instruments and underlying assets dictionary, properties

  Futures Instruments assigned to the trading session are available in the 'fut_sess_contents' table of the 'FORTS_FUTINFO_REPL' stream. Compound istruments are also listed in the table. Options instruments are sent in the 'opt_sess_content' table of the 'FORTS_OPTINFO_REPL' stream. Dictionary of the futures' underlying assets is represented by the 'fut_vcb' table of the 'FORTS_FUTINFO_REPL' stream.

  These directories can be updated during the trading session, for example, as a result of the suspension of trading on any instrument or during the price limit enlargement procedure

- Companies and clients references

  Are sent in the 'diler' and 'investr' tables from the 'FORTS_FUTINFO_REPL' stream. Personal clients' information is available in these references.

- Bond references

  Bonds are desribed by a set of tables from the 'FORTS_FUTINFO_REPL' stream: bond's settings references 'fut_bond_registry', bond's instruments references 'fut_bond_isin', ACI (Accrued Coupon Income) for coupon payment dates 'fut_bond_nkd', nominal payout value for a bond 'fut_bond_nominal'.

- Parametric volatility curve parameters

  Are sent in the 'volat_coeff' table of the 'FORTS_MISCINFO_REPL' stream.

To carry out operations on all of the SPECTRA trading system markets user's system should receive at least the following reference information on-line:

- Sessions' schedule (session)
- Instruments dictionary (fut_sess_contents, opt_sess_contents)

3.2.2. Trade information

Trade information includes:

- Aggregate orderbooks

  Are generated on the basis of user system requests by adding up the volume for each instrument, the price level and the direction of an order. Updated online and comes to be the main way to get information by current prices and volumes. User can select the desired depth of an orderbook from 5, 20 or 50 of quotations in each direction; this choice is made when configuring a login and can not be changed during the trading session.

  Orderbooks are sent by multiple Plaza-2 replication streams:

  - For futures and multileg instruments streams are 'FORTS_FUTAGGR5_REPL', 'FORTS_FUTAGGR20_REPL' and 'FORTS_FUTAGGR50_REPL'
  - For options streams are 'FORTS_OPTAGGR5_REPL', 'FORTS_OPTAGGR20_REPL' and 'FORTS_OPTAGGR50_REPL'

- Market activity

  The best bid/ask price,opening price, closing price, current settlement prices, etc are sent as a part of market activity information. This information is sent in the streams 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL' for futures and options, respectivily.

- User's orders log (and full orders log in the trade system)

  The entire history of user's operarions with orders is sent in user's orders log. User's orders logs are available in 'orders_log' table of the 'FORTS_FUTTRADE_REPL' stream for futures; the 'orders_log' table of the 'FORTS_OPTTRADE_REPL' stream for options; the 'multileg_orders_log' table of the 'FORTS_FUTTRADE_REPL' stream for and multileg instruments.

  In case the user configures his login with option to receive "full orders log", he will receive the complete log of all operations with orders on market (including own operations with orders) in anonymous mode. The log will be available in the table 'orders_log' of the stream FORTS_ORDLOG_REPL.

- User's deals log

  It contains a list of user's committed deals in the current session. User's deals log are available in the 'user_deal' table of the 'FORTS_FUTTRADE_REPL' stream for futures and the 'user_deal' table of the 'FORTS_OPTTRADE_REPL' stream for options; the table 'user_multileg_deal' of the 'FORTS_FUTTRADE_REPL' stream contains logs for multileg instruments deals.

- All trade system deals log

  It contains a list of all committed deals from all users in the current session. Information of somebody else's deals is presented in anonymous mode. User's deals logs are available in the 'deal' table of the 'FORTS_DEALS_REPL' stream for futures and options; the table 'multileg_deal' contains logs for multileg instruments deals.

3.2.3. Recovery information

To ensure fast recovery of trade information receiving after losing connection with SPECTRA, and same with late start scenario connecting to exchange, Plaza-2 gateway receives periodic snapshots from recent orderbooks in a non-aggregated form. This helps to receive the recent status of personal orders (in case when the 'full orders log' option is set - all orders in the trade system) at the current time.

Snapshots of active orders are sent with 1 minute interval in 'FORTS_FUTORDERBOOK_REPL' for futures and 'FORTS_OPTORDERBOOK_REPL' for options.

3.2.4. Funds and limits information

Includes the following:

Position information

- Positions information

  Is sent in form of time snaps in the 'FORTS_POS_REPL' stream and last deal ID, included in position calculation by each position value, is available.

- User's funds and limits information

  Is sent in form of time snaps in the 'FORTS_PART_REPL' stream. Money amount (both money and pledge), money amount at the beginning of the trade session, also current and reserved funds - all of them are available for each value of the client's account.

3.2.5. Clearing information

Clearing information, sent by Plaza-2 gateway, includes the following data:

- Clearing settlement prices

  Are formed by the time of evening clearing and available in the 'fut_sess_settl' table of the 'FORTS_FUTINFO_REPL' stream. The table with settlement prices also includes the instruments whose validity period has ended allowing this table to be used to receive right prices when delivery comes.

- Intermediate clearing's variation margin

  Intermediate clearing's variation margin is available in the 'fut_intercl_info' table of the 'FORTS_FUTINFO_REPL' stream for futures and 'opt_intercl_info' of the 'FORTS_OPTINFO_REPL' stream for options.

- Registries, containing orders rejected during the clearing session.

  Contain the orders, which were not replaced during the clearing session due to lack of funds. The futures registry is transmitted in the 'fut_rejected' table of the 'FORTS_FUTINFO_REPL' stream.

- Rejected during clearing orders' registries

  Include information on the amount of funds in the accounts, account activity, fees, total initial and variation margin by the time of clearing. Are sent in the 'FORTS_CLR_REPL' stream.

- Option execution orders

3.2.6. Indices and rates information

The following information is sent as a part of this group:

- Current values of RTS indices

  Includes current values of RTS index, as well as all Exchange indices values. The values in this table are updated with 15 seconds intervals. The composition of the index information includes of USD rate value, which is used in index calculation. The data is sent in the 'RTS_INDEX_REPL' stream.

- Currencies rates values

  Contain rates of currencies used in the trading system for processing contracts, calculated in a currency other than rubles. The currencies values are available in the 'curr_online' table of the 'MOEX_RATES_REPL' stream.

3.2.7. Auxiliary information streams

That group includes the streams providing the following additional functions:

- Current values of variation margin

  are sent in the 'FORTS_VM_REPL' in the context of client's positions.

- Current volatility values and theoretical prices for options

  Are sent in the 'FORTS_VOLAT_REPL' stream.

3.3. Gate usage specifics

3.3.1. Service replication fields

Each replicated table contains three fields of the fixed type i8 in the top, which are used for replication purpose:

- **replID** — the unique record ID. When a new record appears in the table, the record is assigned with a unique ID. Even though a table may already have a primary ID-key, the one and only ID for replication purpose is the ID contained in the field 'replID'.
- **replRev** — when there is a change made in the table such as record insert, record edit or record deletion, this record will be assigned with a new value in the field 'replRev' (maximum previous 'replRev' value + 1).
- **replAct** — flag of a deleted record. If 'replAct' contains a value other than 0, then the record has been deleted. If 'replAct' contains 0, then the record is active.

3.3.2. Commands

To send a command, you should create a publisher with parameters 'NAME = FORTS_SRV', 'category = FORTS_MSG'. If you need to receive replies to the messages sent, you should specify the flag 'CG_PUB_NEEDREPLY ' within the message sending function and create a type 'p2mqreply' listener.

In case of the message delivery and handling errors, the client receives either sending message function error or the 'system error' message in return.

Field	Type	Description
code	i4	Return code
message	c255	Message body

Please note that the 'system error' message can be received in reply to any business-logic command.

3.3.3. Flood control

The control system of clients' application flood control is functioning in the SPECTRA trade system. It restricts client's application to send more transactions per time unit (for single login on SPECTRA) than it is stated in the connection agreement. At present moment you can acquire login on SPECTRA with 30, 60, 90, etc. trading transactions per second. Trade operations are all transactions associated with order managing. Amount of non-trade (all the rest) operations for any type of login is limited in 1000 transactions per second.

If you exceed the limit of messages, the control system does not transmit a message into the trade system core, and sends the user a reply message with the notification of denial of service. It is P2_Type = 99 and has the following structure:

Field	Type	Description
queue_size	i4	Number of messages for a single user
penalty_remain	i4	Time in milliseconds after which the next message from this user will be successfully received.
message	c128	Error text message

Please pay attention to the two details:

1. The number of messages for the elapsed second is estimated while receiving *every single* message. Thus, if a user constantly sends requests with the frequency greater than it is allowed, then his messages will not be processed at all.

2. A reject message with 99 type can be sent in a reply to any user's message.

3.3.4. Latency monitoring by the client side

Trading system SPECTRA provides a possibility to automatically monitor data distribution latencies by marking a period of time between sending a message and receiving a reply message or a replication record; the time difference between two marks allows to calculate the latency. The data collected are available for further analysis by the SPECTRA centralized monitoring system. Please note that you should install the Plaza2 software and use the new messages scheme versions compatible with SPECTRA 3.8.2 and later; otherwise, there will be no possibility of usage the latency monitoring feature. The string below (can be found in the message description) points to the new message schemes:

```
LocalTimeField=<field
```

```
name>
```

Please also note that using the new message schemes with old Plaza2 binary modules will cause problems, and is strictly not recommended!

3.3.5. Cancel On Disconnect

The Trading System SPECTRA provides a client connection control feature ('Cancel On Disconnect' or 'COD'). This option allows to automatically cancel some client's orders (anonymous orders without specified expiration time) on disconnect.

To enable/disable the 'COD' option, a trading participant should apply the appropriate request to the Client Center. The 'COD' option will be enabled for the ID (p2login) belonging to the trading participant.

When an ID connects to the trading system having the 'Cancel On Disconnect' option enabled, the trading system starts to monitor its connection activity in the 'COD' mode.

The connection activity monitoring algorithm is as following:

- If the 'COD' mode is enabled for the client, the system monitors the client's activity on transaction layer. Each and every client's command or message registered by the Trading System is considered as activity, no matter whether it was complete or not.
- If the client does not send a single message, or does not reconnect to the Trading System after loosing connection within the time period specified (now is 20 seconds), all they active orders are automatically cancelled.

The order cancellation conditions are as following:

- A client has not sent any transaction within the specified time limit.
- Client application has lost connection to the Router. Orders will be cancelled after reaching the specified time limit.
- Router has lost connection to the Access Server. Active orders will be cancelled after reaching the specified time limit.
- Access Server has lost connection to the Trading System or become unable to operate properly due to an error. All active orders of all clients connected to this Access Server will be cancelled after reaching the specified time limit.
- There may occur an issue when FIX server or an API clients access server connected to the Trading System via gateway becomes unable to operate properly: it loses connections to a client but does not inform the Trading System about it. The Trading System cannot handle such issues; if occurs, the issue should be resolved on the client side.

All orders added by clients with COD-mode enabled are cancelled when the evening trading session ends and when the Trading System has been restored after a failure.

The orders cancelled via the 'Cancel On Disconnect' option are marked with a special status (field 'xstatus') in the table.

If clients need to simulate their transaction activity, they should sent command ‘CODHeartbeat (P2_Type=10000) into the Trading System at least once per at least once per 10 seconds. The command structure is as following:

Field	Type	Details
seq_number	i4	Heartbeat-message number (not used in the current version).

The command is not included into transaction fee.

The connection control service does not send replies to the Heartbeat messages, so that clients should set 0 (no reply expected) when calling the message sending function: (cg_pub_post(pub, msgptr, 0). Any attempt to call the function 'cg_pub_post' with 'CG_PUB_NEEDREPLY' on sending a Heartbeat message will result the error 'CG_MSG_P2MQ_TIMEOUT'.

3.4. Handling abnormal situations

3.4.1. Recovery on loss of connection with Exchange servers

In the standard configuration of Plaza 2 gate, there are four TCP-connections to the Exchange servers:

- Connection for sending requests and commands
- Connection for receiving the main market data such as aggregated order-books streams and the streams 'FORTS_ORDLOG_REPL', 'FORTS_DEALS_REPL', 'FORTS_FUTTRADE_REPL', 'FORTS_OPTTRADE_REPL', 'FORTS_FUTCOMMON_REPL' and 'FORTS_OPTCOMMON_REPL'.
- Connection for receiving auxiliary and reference streams
- Connection for receiving snapshots (at the first connection or when recovering after loss of connection)

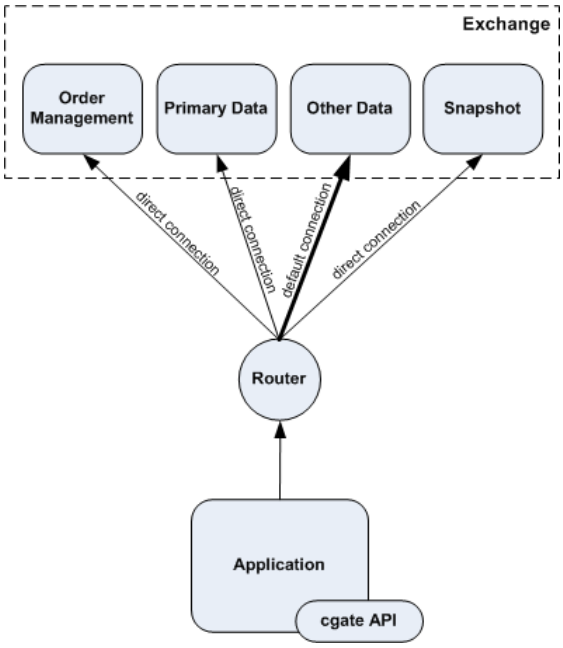

Figure 12. Connection scheme

In order to obtain stability, the trading system uses load balancing method to connect clients to the least loaded server at the moment.

3.4.1.1. Connection loss detection

P2MQRouter software handles all TCP-connections, with settings specified in the INI file where connection 'Other Data' is specified as the default outcoming connection and the other connections are specified as outcoming direct connections. This structure is used as the standard to establish connection directly to the Exchange server farm, but connection via a Brokerage Firm server server may require a different structure; in this case, clients should apply to the server's owners for more details about connection.

The P2MQRouter software also handles connection recovery in case of loss of connection. After disconnecting, P2MQRouter starts attempting to reestablish the connection periodically in accordance with the specified time value, while the client software is not able to interfere with the process. P2MQRouter status then changes from 'ROUTER_CONNECTED' to 'ROUTER_RECONNECTING' by receiving the appropriate notifications from object 'connection', and this is a way for client to check whether connection is still active or not.

3.4.1.2. Clients with different versions

The way an application acts is depending on the application program interface it uses.

CGate, versions up to 1.3.9 inclusive

When you use any version of CGate up to 1.3.9 inclusive, the library acts in the following way: when the loss of connection occurs, every object (publisher and listener) linked to a local connection with the router will change their states to 'ERROR' automatically. After that, you should release all objects in the 'ERROR' state and then try to reopen them anew periodically, for example, once in a few seconds.

CGate, version 1.3.10

CGate version 1.3.10 is implemented with significantly reworked connection loss handling algorithm.

When the loss of connection to the incoming request processing gateway occurs, it is detected directly on the moment of receiving the TCP-connection error. All the 'publisher' objects concerned go to the error state.

When the loss of connection for receiving the main market data occurs, it is detected within 15 seconds for 'collocation' (streams '_FASTREPL') and within 30 seconds for the main server farm (streams '_REPL'). All the 'listener' objects concerned go to the error state.

All object in error state should be released. After that, it is necessary to try to reopen them anew periodically, for example, once in a few seconds.

3.4.1.3. Recovery algorithm

In general, the connection recovery algorithm is as follows:

- After start-up, try to open connection to P2MQRouter periodically;
- When the router is reconnected to the Plaza 2 network, the object 'connection' will go to the ACTIVE state;
- Open the necessary streams. To make it faster, it is recommended to receive data starting from the last update. When opening a stream, you should use the 'repl state' value received on closing the stream; also, you can directly specify revision numbers for tables and scheme life number by using that of the last received data.

- Recover the list of active orders (see below)
- Register 'publisher' for orders and commands.

The table below contains the recommended methods for recovering data depending on the stream:

Stream (table) name	Information type	Recovery method
FORTS_FUTTRADE_REPL • orders_log FORTS_OPTTRADE_REPL • orders_log	Own orders activity log (futures and options)	List of active orders: • use stream 'FORTS_FUTORDERBOOK_REPL' ('FORTS_OPTORDERBOOK_REPL') to receive snapshot, then open stream 'FORTS_FUTTRADE_REPL' ('FORTS_OPTTRADE_REPL') using the revision number specified in snapshot Orders activity log: • open 'FORTS_FUTTRADE_REPL' ('FORTS_OPTTRADE_REPL') starting from the last received revision number
FORTS_FUTTRADE_REPL • multileg_orders_log	Own orders activity log (multileg orders)	Orders activity log: • open 'FORTS_FUTTRADE_REPL' starting from the last received revision number
FORTS_ORDLOG_REPL • orders_log	Complete anonymous orders activity log (futures and options)	List of active orders: • use stream 'FORTS_ORDRBOOK_REPL' to receive snapshot, then open stream 'FORTS_ORDLOG_REPL' using the revision number specified in the snapshot Orders activity log: • open 'FORTS_ORDLOG_REPL' starting from the last received revision number
FORTS_ ORDLOG _REPL • multileg_orders_log	Complete anonymous orders activity log (multileg orders)	Orders activity log: • open 'FORTS_ORDLOG_REPL' starting from the last received revision number
FORTS_DEALS_REPL • deal • multileg_deal FORTS_FUTTRADE_REPL • user_deal • multileg_deal FORTS_OPTTRADE_REPL • user_deal	Orders log (futures, options, multileg instruments)	Reopen the appropriate stream using the last received revision number or 'repl state' value received on closing the stream.
FORTS_FUTCOMMON_REPL FORTS_OPTCOMMON_REPL	General market information (futures and options)	Reopen the appropriate stream anew
FORTS_FUTAGGR##_REPL FORTS_OPTAGGR##_REPL	Order books for futures and options. (### - depth of order book)	Reopen the appropriate stream anew
FORTS_FUTINFO_REPL FORTS_OPTINFO_REPL	Reference and session information	Quick method: • Reopen the appropriate stream using the last received revision number or 'repl state' value received on closing the stream. Allowable method: • Reopen the appropriate stream anew
FORTS_PART_REPL	Information on limits	Reopen the stream anew
FORTS_POS_REPL	Information on positions	Reopen the stream anew

Stream (table) name	Information type	Recovery method
FORTS_VM_REPL	Information on variation margin	Reopen the stream anew
FORTS_VOLAT_REPL	Information on volatility and theoretical prices on options	Reopen the stream anew
RTS_INDEX_REPL	Exchange indices values	Reopen the stream anew

Note

Data recovery algorithm for streams 'collocation' with suffix '_FASTREPL' is the same as for the common streams with the same names.

Upon recovery, it is very important to receive the lists of the client's current orders:

1. List of orders which are active during the recovery procedure period
2. Orders activity log during the connection loss period.

For the first case, you should receive the order-book snapshot ('FORTS_FUTORDERBOOK_REPL/FORTS_OPTORDERBOOK_REPL'). The orders missed in the snapshot have been either already matched or cancelled during the connection loss period.

For the second case, you should receive your own orders activity log (the table 'orders_log' of the streams 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL', also, the table 'multileg_orders_log' of the stream 'FORTS_FUTTRADE_REPL') covering the connection loss period. To do this, you should open the appropriate stream using revision number of the last record actually received before the loss of connection occurred. Every order activity happened during the connection loss period will be recorded in these tables. Changing the stream state to 'ONLINE' indicates that all orders activity data have been successfully received.

Note

The recovering procedure described above can be also used for the late start connection.

3.4.1.4. General recommendations

In general case, to minimize possibility of loss of connection, the Exchange recommends to do the following:

- establish alternative connections
- obtain two client's IDs for the gateway, with the same user rights in order to have possibility to receive the same data by running two client applications simultaneously. Therefore, in case of any failure, you will be able to switch between two applications.

Alternatively, it is recommended to enable a feature in your application allowing to switch to another connection (a P2MQRouter connected to the Exchange servers using an alternative connection) in case of any failure.

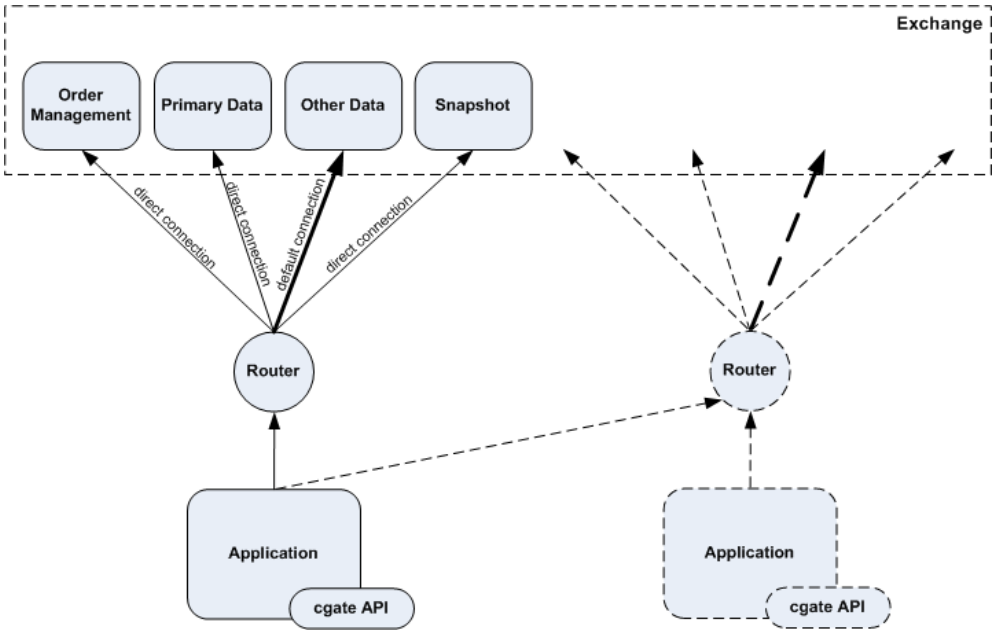

Figure 13. Channel duplication scheme

3.4.2. Recovery in case of the Exchange infrastructure failure

By the Exchange infrastructure failure we mean failures on the Exchange side caused by the Trading System kernel errors, or by errors in market data generating services. Then, as a rule, the services halt and restart.

3.4.2.1. Data cleanup by streams

In case of any routine maintenance, normal or abnormal service restarts on the Exchange side, or after reestablishing connection to a client, the publishing services send out notifications about obsolete data cleanup before sending the current snapshot to clients.

There are two types of data cleanup notifications:

- CG_MSG_P2REPL_CLEARDELETED - by every table, with use of revision number. The notification gives client the order to cleanup all records with the 'replRev' value smaller than the one in notification. In order to optimise data transfer, the notification may have a revision number value as 'MAX(int64) – 1'. This means that client should cleanup all data from the specified table, as the entire table will be transferred anew.
- CG_MSG_P2REPL_LIFENUM - for the entire replication stream, using the new stream life number. This notification means, that data have been significantly changed since the last connection. Client should cleanup all data in all tables. All data will be transferred anew.

3.4.2.2. Possible data change in case of abnormal work of publishing services

In normal work mode, including routine works at non-trading time, when opening or reopening any replication stream except those related to history of orders and trades ('FORTS_FUTTRADE_REPL', 'FORTS_OPTTRADE_REPL', 'FORTS_ORDLOG_REPL' and 'FORTS_DEALS_REPL'), a client may receive both 'CG_MSG_P2REPL_CLEARDELETED' or 'CG_MSG_P2REPL_LIFENUM' notification types, and should process them correctly.

In normal work mode, for the streams related to history of orders and trades (see above), the notification CG_MSG_P2REPL_LIFENUM' is sent only in case of system version change, after the testing-mode trades, in order to make clients cleanup the user data. The notification 'CG_MSG_P2REPL_CLEARDELETED' has the 'replRev' value for the first available order or trade at the moment.

A 'CG_MSG_P2REPL_LIFENUM' with a new stream life number during a trading session indicates a severe failure in the Trading System, so the system is to resend data on orders and trades which could be already delivered to clients.

Additionally, there are some other information channels (the Exchange web site, etc.), where information about possible data issues (whether the data already delivered to clients were affected by the last data correction or not) will be posted. This includes information about possible system rollback to the state it was before the failure, along with the last number of order and trade available to client after the system restart.

4. Replication scheme FORTS_PUBLIC

4.1. Stream FORTS_FUTTRADE_REPL - Futures: orders and trades

This stream contains tables from the log of changes to your orders and trades.

4.1.1. Data scheme

Tables:

- orders_log - Log of operations with orders
- multileg_orders_log - Log of operations with multileg orders
- heartbeat - Server times table
- sys_events - table of events
- user_deal - User trades
- user_multileg_deal - User's multileg orders trades

4.1.1.1. Table orders_log: Log of operations with orders

Table 1. Fields of table orders_log

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
id_deal	i8	Deal ID for this operation
xstatus	i8	Extended order's status
status	i4	Order's status
price	d16.5	Price
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
dir	i1	Direction
action	i1	Operation with the order
deal_price	d16.5	Price of the deal
client_code	c7	Client code
login_from	c20	Login of the user who has entered the order
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order
trust	i1	Attribute of an order from an asset management company
ext_id	i4	External ID number. It is added to orders, trades
broker_to	c7	FORTS code of the company to whom the direct order is addressed
broker_to_rts	c7	RTS code of the company to whom the direct order is addressed
broker_from_rts	c7	RTS code of the company who has entered the order
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order

Field	Type	Description
local_stamp	t	User's local time

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

  0 Order cancelled

  1 Order added

  2 Order is exercised in the trade

- Field id_ord1 contains the initial order ID number, i.e. the ID number which was assigned to order before the order has once been relisted
- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.1.1.2. Table multileg_orders_log: Log of operations with multileg orders

Table 2. Fields of table multileg_orders_log

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
isin_id	i4	Multileg instrument ID
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
id_deal	i8	Deal ID for this operation
xstatus	i8	Extended order's status
status	i4	Order's status
price	d16.5	Price
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
dir	i1	Direction
action	i1	Operation with the order
deal_price	d16.5	First leg price of a filled trade
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
client_code	c7	Client code
login_from	c20	Login of the user who has entered the order
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order
trust	i1	Attribute of an order from an asset management company
ext_id	i4	External ID number. It is added to orders, trades
broker_to	c7	FORTS code of the company to whom the direct order is addressed
broker_to_rts	c7	RTS code of the company to whom the direct order is addressed
broker_from_rts	c7	RTS code of the company who has entered the order
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
local_stamp	t	User's local time

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes action with order

  0 Order cancelled

  1 Order added

  2 Order exercised in a trade

- Field rate_price contains 0 for the instruments traded in swap-price.
- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.
- If field price of table 'multileg_orders_log' contains 0, then price value of each leg of a multileg order is equal to that of instrument price at the previous evening clearing session.

4.1.1.3. Table heartbeat: Server times table

Records in this table are added periodically by the trading system's core. It can be used for synchronization purposes (e.g. to check whether all the trades were received at specified moment of time). The table is insert-only, no modifications or deletions occur during trading session.

Table 3. Fields of table heartbeat

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
server_time	t	Server date and time

4.1.1.4. Table sys_events: table of events

Table 4. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

event_type = 8
message = "broker_recalc_finished"
Funds have been recalculated after intraday clearing session

4.1.1.5. Table user_deal: User trades

Table 5. Fields of table user_deal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
id_deal	i8	Deal ID number
id_deal_multileg	i8	Deal ID number for multileg deals
id_repo	i8	ID number of the other leg of a repo trade
pos	i4	Number of positions in the instrument in the market after the trade
xpos	i8	Number of positions in the instrument in the market after the trade (8-byte version)
amount	i4	Volume, number of units of the instrument
xamount	i8	Volume, number of units of the instrument (8-byte version)
id_ord_buy	i8	ID number of the buyer's order
id_ord_sell	i8	ID number of the seller's order
price	d16.5	Price
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
nosystem	i1	Sign of non-system deal
xstatus_buy	i8	Status of the trade from the buyer's side
xstatus_sell	i8	Status of the trade from the seller's side
status_buy	i4	Status of the trade from the buyer's side
status_sell	i4	Status of the trade from the seller's side
ext_id_buy	i4	External ID number from the buyer's order
ext_id_sell	i4	External ID number from the seller's order
code_buy	c7	Buyer's code
code_sell	c7	Seller's code
comment_buy	c20	Comment from the buyer's order
comment_sell	c20	Comment from the seller's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order
trust_sell	i1	Sign of an asset management company's order from the seller's order
hedge_buy	i1	Sign of a hedging deal from the buyers's side
hedge_sell	i1	Sign of a hedging deal from the seller's side
fee_buy	d26.2	Fee of the buyer's deal
fee_sell	d26.2	Fee of the seller's deal
login_buy	c20	Login of the buyer user
login_sell	c20	Login of the seller user
code_rts_buy	c7	RTS code of the buyer company
code_rts_sell	c7	RTS code of the seller company

Notes:

- Fields code_sell, comment_sell, ext_id_sell, trust_sell, hedge_sell, login_sell, code_rts_sell, fee_sell, code_buy, comment_buy, ext_id_buy, trust_buy, hedge_buy, login_buy, code_rts_buy, fee_buy, are filled with info only for "own" deals.
- Fields status_sell and status_buy are bit masks (for details see Trade types, created upon exercising and expiration of futures and options)

- For technical trades that are results of trades with multileg instruments filed nosystem always equals 1, regardless the fact whether the trade is regular or negotiated one. To define whether the initial trade is regular the sign of the field nosystem should correspond to the record in the table multileg_deal.
- The field id_repo contains the ID of the opposite REPO deal part. It contains ID of the second part for the first part, and ID of the first part for the second one.
- Field id_deal_multileg contains code of the trade with multileg intrument, if this record is about technical trade. the field equals 0 if the trade is with an ordinary instrument.
- For all other (not client-related) trades, fields ‘status_buy’ and ‘status_sell’ may contain flags ‘eNonQuoteStatus’, ‘eClearingTrade’, ‘eAddressStatus’, ‘eStrategy’.
- In exercise trades, field id_ord_buy contains the order ID (option call). In exercise trades, field id_ord_sell contains the order ID (option put).
- In fields xstatus_sell and xstatus_buy, the first 32 bits are equal to that of fields status_sell and status_buy, respectively. The other bits are reserved for order status extra details.

4.1.1.6. Table user_multileg_deal: User’s multileg orders trades

Table 6. Fields of table user_multileg_deal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Multileg instrument ID
isin_id_rd	i4	Repo direct instrument ID
isin_id_rb	i4	Repo back instrument ID
isin_id_repo	i4	Repo instrument ID
duration	i4	Repo duration
id_deal	i8	Deal ID number
id_deal_rd	i8	ID of the first part of repo in deals table
id_deal_rb	i8	ID of the second part of repo in deals table
id_ord_buy	i8	ID number of the buyer's order
id_ord_sell	i8	ID number of the seller's order
amount	i4	Volume, number of units of the instrument
xamount	i8	Volume, number of units of the instrument (8-byte version)
price	d16.5	Price of the first part of multileg trade
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
buyback_amount	d16.2	Price of the second part of multileg trade
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
nosystem	i1	Sign of non-system deal
xstatus_buy	i8	Extended status of the trade from the buyer's side
xstatus_sell	i8	Extended status of the trade from the seller's side
status_buy	i4	Status of the trade from the buyer's side
status_sell	i4	Status of the trade from the seller's side
ext_id_buy	i4	External ID number from the buyer's order
ext_id_sell	i4	External ID number from the seller's order
code_buy	c7	Buyer's code
code_sell	c7	Seller's code
comment_buy	c20	Comment from the buyer's order
comment_sell	c20	Comment from the seller's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order

Field	Type	Description
trust_sell	i1	Sign of an asset management company's order from the seller's order
hedge_buy	i1	Sign of a hedging deal from the buyers's side
hedge_sell	i1	Sign of a hedging deal from the seller's side
login_buy	c20	Login of the buyer user
login_sell	c20	Login of the seller user
code_rts_buy	c7	RTS code of the buyer company
code_rts_sell	c7	RTS code of the seller company

Notes:

- Fields code_sell, comment_sell, ext_id_sell, trust_sell, hedge_sell, code_rts_sell, fee_sell, code_buy, comment_buy, ext_id_buy, trust_buy, hedge_buy, code_rts_buy, fee_buy, are filled with info only for "own" deals.
- Field rate_price contains 0 for the instruments traded in swap-price.
- In fields xstatus_sell and xstatus_buy, the first 32 bits are equal to that of fields status_sell and status_buy, respectively. The other bits are reserved for order status extra details.

4.2. Stream FORTS_OPTTRADE_REPL - Options: orders and trades

4.2.1. Data scheme

Tables:

- orders_log - Log of operations with orders
- heartbeat - Server times table
- sys_events - table of events
- user_deal - User trades

4.2.1.1. Table orders_log: Log of operations with orders

Table 7. Fields of table orders_log

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
id_deal	i8	Deal ID number
xstatus	i8	Extended order's status
status	i4	Order's status
price	d16.5	Price
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
dir	i1	Direction
action	i1	Operation with the order
deal_price	d16.5	Price of the deal
client_code	c7	Client code
login_from	c20	Login of the user who has entered the order

Field	Type	Description
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order
trust	i1	Attribute of an order from an asset management company
ext_id	i4	External ID number. It is added to orders, trades
broker_to	c7	FORTS code of the company to whom the direct order is addressed
broker_to_rts	c7	RTS code of the company to whom the direct order is addressed
broker_from_rts	c7	RTS code of the company who has entered the order
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
local_stamp	t	User's local time

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

  0 Order cancelled

  1 Order added

  2 Order is exercised in the trade
- Field id_ord1 contains the initial order ID number, i.e. the ID number which was assigned to order before the order has once been relisted
- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.2.1.2. Table heartbeat: Server times table

Records in this table are added periodically by the trading system's core. It can be used for synchronization purposes (e.g. to check whether all the trades were received at specified moment of time). The table is insert-only, no modifications or deletions occur during trading session.

Table 8. Fields of table heartbeat

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
server_time	t	Server date and time

4.2.1.3. Table sys_events: table of events

Table 9. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2

message = "intraday_clearing_finished"
All clearing procedures have been finished in the intraday clearing session

event_type = 4
message = "intraday_clearing_started"
Intraday clearing session has started

event_type = 5
message = "clearing_started"
Main clearing session has started

event_type = 6
message = "extension_of_limits_finished"
Limits have been extended

event_type = 8
message = "broker_recalc_finished"
Funds have been recalculated after intraday clearing session

4.2.1.4. Table user_deal: User trades

Table 10. Fields of table user_deal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
id_deal	i8	Deal ID number
id_deal_multileg	i8	Deal ID number for multileg deals
pos	i4	Number of positions in the instrument in the market after the trade
xpos	i8	Number of positions in the instrument in the market after the trade (8-byte version)
amount	i4	Volume, number of units of the instrument
xamount	i8	Volume, number of units of the instrument (8-byte version)
id_ord_buy	i8	ID number of the buyer's order
id_ord_sell	i8	ID number of the seller's order
price	d16.5	Price
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
nosystem	i1	Sign of non-system deal
xstatus_buy	i8	Status of the trade from the buyer's side
xstatus_sell	i8	Status of the trade from the seller's side
status_buy	i4	Status of the trade from the buyer's side
status_sell	i4	Status of the trade from the seller's side
ext_id_buy	i4	External ID number from the buyer's order
ext_id_sell	i4	External ID number from the seller's order
code_buy	c7	Buyer's code
code_sell	c7	Seller's code
comment_buy	c20	Comment from the buyer's order
comment_sell	c20	Comment from the seller's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order
trust_sell	i1	Sign of an asset management company's order from the seller's order
hedge_buy	i1	Sign of a hedging deal from the buyers's side
hedge_sell	i1	Sign of a hedging deal from the seller's side
fee_buy	d26.2	Fee of the buyer's deal
fee_sell	d26.2	Fee of the seller's deal

Field	Type	Description
login_buy	c20	Login of the buyer user
login_sell	c20	Login of the seller user
code_rts_buy	c7	RTS code of the buyer company
code_rts_sell	c7	RTS code of the seller company

Notes:

- Fields code_sell, comment_sell, ext_id_sell, trust_sell, hedge_sell, login_sell, code_rts_sell, fee_sell, code_buy, comment_buy, ext_id_buy, trust_buy, hedge_buy, login_buy, code_rts_buy, fee_buy, are filled with info only for "own" deals.
- Fields status_sell and status_buy are bit masks (for details see Trade types, created upon exercising and expiration of futures and options)
- In option contracts exercise trades field id_ord_sell contains ID of the exersice order.
- In fields xstatus_sell and xstatus_buy, the first 32 bits are equal to that of fields status_sell and status_buy, respectively. The other bits are reserved for order status extra details.

4.3. Stream FORTS_ORDLOG_REPL – anonymous orders

4.3.1. Data scheme

Tables:

- orders_log - Log of operations with orders
- multileg_orders_log - Log of operations with multileg orders
- heartbeat - Server times table
- sys_events - table of events

4.3.1.1. Table orders_log: Log of operations with orders

Table 11. Fields of table orders_log

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
id_deal	i8	Deal ID for this operation
xstatus	i8	Extended order's status
status	i4	Order's status
price	d16.5	Price
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
dir	i1	Direction
action	i1	Operation with the order
deal_price	d16.5	Price of the deal

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

  0 Order cancelled

1 Order added

2 Order is exercised in the trade

- Field id_ord1 contains the initial order ID number, i.e. the ID number which was assigned to order before the order has once been relisted
- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.3.1.2. Table multileg_orders_log: Log of operations with multileg orders

Table 12. Fields of table multileg_orders_log

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
id_deal	i8	Deal ID for this operation
xstatus	i8	Extended order's status
status	i4	Order's status
price	d16.5	Price
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
dir	i1	Direction
action	i1	Operation with the order
deal_price	d16.5	First leg price of a filled trade
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes action with order

  0 Order cancelled

  1 Order added

  2 Order exercised in a trade

- Field rate_price contains 0 for the instruments traded in swap-price.
- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.
- If field price of table 'multileg_orders_log' contains 0, then price value of each leg of a multileg order is equal to that of instrument price at the previous evening clearing session.

4.3.1.3. Table heartbeat: Server times table

Records in this table are added periodically by the trading system's core. It can be used for synchronization purposes (e.g. to check whether all the trades were received at specified moment of time). The table is insert-only, no modifications or deletions occur during trading session.

Table 13. Fields of table heartbeat

Field	Type	Description
replID	i8	Service field of the replication subsystem

Field	Type	Description
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
server_time	t	Server date and time

4.3.1.4. Table sys_events: table of events

Table 14. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.4. Stream FORTS_DEALS_REPL – anonymous trades

4.4.1. Data scheme

Tables:

- deal - Trades
- multileg_deal - Multileg trades
- heartbeat - Server times table
- sys_events - table of events

4.4.1.1. Table deal: Trades

Table 15. Fields of table deal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
id_deal	i8	Deal ID number
pos	i4	Number of positions in the instrument in the market after the trade
xpos	i8	Number of positions in the instrument in the market after the trade (8-byte version)
amount	i4	Volume, number of units of the instrument
xamount	i8	Volume, number of units of the instrument (8-byte version)
id_ord_buy	i8	ID number of the buyer's order
id_ord_sell	i8	ID number of the seller's order
price	d16.5	Price
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
nosystem	i1	Sign of non-system deal

Notes:

- In exercise trades, field id_ord_sell contains the order ID (option trade). In exercise trades, field id_ord_buy contains the order ID (futures trade for option call). In exercise trades, field id_ord_sell contains the order ID (futures trade for option put).

4.4.1.2. Table multileg_deal: Multileg trades

Table 16. Fields of table multileg_deal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Multileg instrument ID
id_deal	i8	Deal ID number
id_ord_buy	i8	ID number of the buyer's order
id_ord_sell	i8	ID number of the seller's order
amount	i4	Volume, number of units of the instrument
xamount	i8	Volume, number of units of the instrument (8-byte version)
price	d16.5	Price of the first part of multileg trade
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
buyback_amount	d16.2	Price of the second part of multileg trade
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
nosystem	i1	Sign of non-system deal

4.4.1.3. Table heartbeat: Server times table

Records in this table are added periodically by the trading system's core. It can be used for synchronization purposes (e.g. to check whether all the trades were received at specified moment of time). The table is insert-only, no modifications or deletions occur during trading session.

Table 17. Fields of table heartbeat

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
server_time	t	Server date and time

4.4.1.4. Table sys_events: table of events

Table 18. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.5. Stream FORTS_FEE_REPL - exchange fees

4.5.1. Data scheme

Tables:

- adjusted_fee - exchange fees
- sys_events - table of events

4.5.1.1. Table adjusted_fee: exchange fees

Table 19. Fields of table adjusted_fee

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_deal	i8	Deal ID number
moment	t	Time when the deal was made
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
code_buy	c7	Buyer's code
code_sell	c7	Seller's code
initial_fee_buy	d26.2	Initial fee of the buyer's deal
initial_fee_sell	d26.2	Initial fee of the seller's deal

Field	Type	Description
adjusted_fee_buy	d26.2	Adjusted fee of the buyer's deal
adjusted_fee_sell	d26.2	Adjusted fee of the seller's deal
id_repo	i8	ID number of the other leg of a repo trade
id_deal_multileg	i8	Deal ID number for multileg deals

4.5.1.2. Table sys_events: table of events

Table 20. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.6. Stream FORTS_FEERATE_REPL - Precise Exchange fee rates

Attention! Up to version 6.0 inclusive, the stream contains no data.

4.6.1. Data scheme

Tables:

- futures_rate - fee rates on futures and multi-leg instruments
- option_rate - fee rates on option contracts
- sys_events - table of events

4.6.1.1. Table futures_rate: fee rates on futures and multi-leg instruments

Table 21. Fields of table futures_rate

Field	Type	Description
replID	i8	Service field of the replication subsystem

Field	Type	Description
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Session number
exchange_fee_negdeal	d26.2	Exchange fee rate for a single contract of negotiated trade
exchange_fee	d26.2	Exchange fee rate for a single contract of anonymous trade
clearing_fee_negdeal	d26.2	Clearing fee rate for a single contract of negotiated trade
clearing_fee	d26.2	Clearing fee rate for a single contract of anonymous trade

4.6.1.2. Table option_rate: fee rates on option contracts

Table 22. Fields of table option_rate

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Session number
exchange_fee_negdeal	d26.2	Exchange fee rate for a single contract of negotiated trade
exchange_fee	d26.2	Exchange fee rate for a single contract of anonymous trade
clearing_fee_negdeal	d26.2	Clearing fee rate for a single contract of negotiated trade
clearing_fee	d26.2	Clearing fee rate for a single contract of anonymous trade

4.6.1.3. Table sys_events: table of events

Table 23. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

event_type = 8
message = "broker_recalc_finished"
Funds have been recalculated after intraday clearing session

4.7. Stream FORTS_FUTORDERBOOK_REPL - Futures: order book snapshot

4.7.1. Data scheme

Tables:

- orders - Current futures orderbook
- info - Orderbook snapshots information

4.7.1.1. Table orders: Current futures orderbook

Table 24. Fields of table orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
client_code	c7	Client code
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
xstatus	i8	Extended order's status
status	i4	Order's status
action	i1	Operation with the order
isin_id	i4	Instrument unique ID
dir	i1	Direction
price	d16.5	Price
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order
trust	i1	Attribute of an order from an asset management company
ext_id	i4	External ID number. It is added to orders, trades
login_from	c20	Login of the user who has entered the order
broker_to	c7	FORTS code of the company to whom the direct order is addressed
broker_to_rts	c7	RTS code of the company to whom the direct order is addressed
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
broker_from_rts	c7	RTS code of the company who has entered the order
init_moment	t	Time of the order placement
init_amount	i4	Initial amount in the order
xinit_amount	i8	Initial amount in the order (8-byte version)

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

1 Order added

2 Order is exercised in the trade

- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.7.1.2. Table info: Orderbook snapshots information

Table 25. Fields of table info

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
infoID	i8	Unique key
logRev	i8	Revision for futures upon snapshot generation
lifeNum	i4	In stream life number
moment	t	Snapshot time

4.8. Stream FORTS_OPTORDERBOOK_REPL - Options: order book snapshot

4.8.1. Data scheme

Tables:

- orders - Current options orderbook
- info - Orderbook snapshots information

4.8.1.1. Table orders: Current options orderbook

Table 26. Fields of table orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
client_code	c7	Client code
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
xstatus	i8	Extended order's status
status	i4	Order's status
action	i1	Operation with the order
isin_id	i4	Instrument unique ID
dir	i1	Direction
price	d16.5	Price
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order
trust	i1	Attribute of an order from an asset management company
ext_id	i4	External ID number. It is added to orders, trades
login_from	c20	Login of the user who has entered the order
broker_to	c7	FORTS code of the company to whom the direct order is addressed

Field	Type	Description
broker_to_rts	c7	RTS code of the company to whom the direct order is addressed
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
broker_from_rts	c7	RTS code of the company who has entered the order
init_moment	t	Time of the order placement
init_amount	i4	Initial amount in the order
xinit_amount	i8	Initial amount in the order (8-byte version)

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

  1 Order added

  2 Order is exercised in the trade

- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.8.1.2. Table info: Orderbook snapshots information

Table 27. Fields of table info

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
infoID	i8	Unique key
logRev	i8	Revision for futures upon snapshot generation
lifeNum	i4	In stream life number
moment	t	Snapshot time

4.9. Stream FORTS_ORDBOOK_REPL - Depersonalized order book snapshot

4.9.1. Data scheme

Tables:

- orders - Current orderbook
- info - Orderbook snapshots information

4.9.1.1. Table orders: Current orderbook

Table 28. Fields of table orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id_ord	i8	Order ID number
sess_id	i4	Trading session ID
moment	t	Order update time
moment_ns	u8	Order update time, nanoseconds since Unix epoch, UTC
xstatus	i8	Extended order's status
status	i4	Order's status
action	i1	Operation with the order
isin_id	i4	Instrument unique ID

Field	Type	Description
dir	i1	Direction
price	d16.5	Price
amount	i4	Number of lots in the operation
xamount	i8	Number of lots in the operation (8-byte version)
amount_rest	i4	Remaining number in the order
xamount_rest	i8	Remaining number in the order (8-byte version)
init_moment	t	Time of the order placement
init_amount	i4	Initial amount in the order
xinit_amount	i8	Initial amount in the order (8-byte version)

Notes:

- Field status is a bit mask. For the complete list of all possible values of field 'status' please refer to section Trade types, created upon exercising and expiration of futures and options.
- Field action describes an action with the order

  1 Order added

  2 Order is exercised in the trade

- In field xstatus the first 32 bits are equal to that of field status, the other bits are reserved for order status extra details.

4.9.1.2. Table info: Orderbook snapshots information

Table 29. Fields of table info

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
infoID	i8	Unique key
logRev	i8	Revision at moment of snapshot's creation
lifeNum	i4	In stream life number
moment	t	Snapshot time

4.10. Stream FORTS_FUTCOMMON_REPL - Futures: common information

4.10.1. Data scheme

Tables:

- common - Market fundamentals

4.10.1.1. Table common: Market fundamentals

The table contains

Table 30. Fields of table common

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
best_buy	d16.5	Best offer
amount_buy	i4	Size of the best offer
xamount_buy	i8	Size of the best offer (8-byte version)
orders_buy_qty	i4	Number of bid orders

Field	Type	Description
orders_buy_amount	i4	Total number of contracts in bid
xorders_buy_amount	i8	Total number of contracts in bid (8-byte version)
best_sell	d16.5	Best bid
amount_sell	i4	Size of the best bid
xamount_sell	i8	Size of the best bid (8-byte version)
orders_sell_qty	i4	Number of offer orders
orders_sell_amount	i4	Total number of contracts in offer
xorders_sell_amount	i8	Total number of contracts in offer (8-byte version)
open_price	d16.5	Opening price
close_price	d16.5	Closing price
price	d16.5	Price of the last trade
trend	d16.5	Price trend (difference between the prices of the last two trades)
amount	i4	Size of the last trade
xamount	i8	Size of the last trade (8-byte version)
deal_time	t	Date and time of the last trade
deal_time_ns	u8	Date and time of the last trade, nanoseconds since Unix epoch, UTC
min_price	d16.5	The low
max_price	d16.5	The high
avr_price	d16.5	Average weighted price
contr_count	i4	Total number of contracts in the trades
xcontr_count	i8	Total number of contracts in the trades (8-byte version)
capital	d26.2	Total volume of trades in Russian rubles
deal_count	i4	Number of trades
old_kotir	d16.5	Settlement price of the previous session
pos	i4	Current open interest
xpos	i8	Current open interest (8-byte version)
mod_time	t	Date and time of changing the entry in the table
mod_time_ns	u8	Date and time of changing the entry in the table, nanoseconds since Unix epoch, UTC
cur_kotir	d16.5	Current quote
cur_kotir_real	d16.5	Market quote
local_time	t	Time stamp for monitoring purposes

Notes:

- Field open_price contains the price of the first transaction in the current session, and if not, then 0.
- Field close_price contains a price value of the last trade in the appropriate trading session. Before the trading session closes, the field contains 0. After the session closes (7 PM till 10 AM), the field close_price contains a price value of the last trade, or 0, if there were no trades during the last trading session.

4.11. Stream FORTS_OPTCOMMON_REPL - Options: common information

4.11.1. Data scheme

Tables:

- common - Market fundamentals

4.11.1.1. Table common: Market fundamentals

The table contains

Table 31. Fields of table common

Field	Type	Description
replID	i8	Service field of the replication subsystem

Field	Type	Description
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
best_buy	d16.5	Best offer
amount_buy	i4	Size of the best offer
xamount_buy	i8	Size of the best offer (8-byte version)
orders_buy_qty	i4	Number of bid orders
orders_buy_amount	i4	Total number of contracts in bid
xorders_buy_amount	i8	Total number of contracts in bid (8-byte version)
best_sell	d16.5	Best bid
amount_sell	i4	Size of the best bid
xamount_sell	i8	Size of the best bid (8-byte version)
orders_sell_qty	i4	Number of offer orders
orders_sell_amount	i4	Total number of contracts in offer
xorders_sell_amount	i8	Total number of contracts in offer (8-byte version)
open_price	d16.5	Opening price
close_price	d16.5	Closing price
price	d16.5	Price of the last trade
trend	d16.5	Price trend (difference between the prices of the last two trades)
amount	i4	Size of the last trade
xamount	i8	Size of the last trade (8-byte version)
deal_time	t	Date and time of the last trade
deal_time_ns	u8	Date and time of the last trade, nanoseconds since Unix epoch, UTC
min_price	d16.5	The low
max_price	d16.5	The high
avr_price	d16.5	Average weighted price
contr_count	i4	Total number of contracts in the trades
xcontr_count	i8	Total number of contracts in the trades (8-byte version)
capital	d26.2	Total volume of trades in Russian rubles
deal_count	i4	Number of trades
old_kotir	d16.5	Settlement price of the previous session
pos	i4	Current open interest
xpos	i8	Current open interest (8-byte version)
mod_time	t	Date and time of changing the entry in the table
mod_time_ns	u8	Date and time of changing the entry in the table, nanoseconds since Unix epoch, UTC
local_time	t	Time stamp for monitoring purposes

Notes:

- Field open_price contains the price of the first transaction in the current session, and if not, then 0.
- Field close_price contains a price value of the last trade in the appropriate trading session. Before the trading session closes, the field contains 0. After the session closes (7 PM till 10 AM), the field close_price contains a price value of the last trade, or 0, if there were no trades during the last trading session.

4.12. Aggregated orderbook streams

There are several streams of aggregated quotes defined with different depths.

Futures:

- FORTS_FUTAGGR50_REPL – 50 quotes depth

- FORTS_FUTAGGR20_REPL – 20 quotes depth
- FORTS_FUTAGGR5_REPL – 5 quotes depth

For options:

- FORTS_OPTAGGR50_REPL – 50 quotes depth
- FORTS_OPTAGGR20_REPL – 20 quotes depth
- FORTS_OPTAGGR5_REPL – 5 quotes depth

> **Note**
> The ability to receive particular stream depends on user account rights.

4.12.1. Data scheme

Tables:

- orders_aggr - Netted orders

4.12.1.1. Table orders_aggr: Netted orders

The table contains list of aggregate quotes. Each aggregate quote is a result of summing up volumes of active quotes on the same instrument, price and direction.

Table 32. Fields of table orders_aggr

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
price	d16.5	Price level
volume	i8	Volume
moment	t	Moment of the last quote update
moment_ns	u8	Time when the deal was made, nanoseconds since Unix epoch, UTC
dir	i1	Direction

Note:

- Records in the table can be completely updated, i.e. not only quote's volume can be updated but also the instrument, price, direction. When this event occurs it is considered that previous quote left the order-book and the new one appeared.
- There can be records with zero volume in the table (volume = 0). These records should be ignored. Nulling of existing quotes may take place – this means that quote left the order-book or zero quote was filled in by any values – this means that quote with new values was placed in the order-book.

4.13. Stream FORTS_POS_REPL - information on positions

4.13.1. Data scheme

Tables:

- position - Client and BRokerage Firm positions
- position_sa - Settlement Account positions
- sys_events - table of events

4.13.1.1. Table position: Client positions

The table contains information on clients and BF positions.

Table 33. Fields of table position

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
isin_id	i4	Instrument's unique ID
pos	i4	Current position
xpos	i8	Current position (8-byte version)
buys_qty	i4	Number of contracts bought during the session
xbuys_qty	i8	Number of contracts bought during the session (8-byte version)
sells_qty	i4	Number of contracts sold during the session
xsells_qty	i8	Number of contracts sold during the session (8-byte version)
open_qty	i4	Number of positions at the start of the session
xopen_qty	i8	Number of positions at the start of the session (8-byte version)
waprice	d16.5	Volume-weighted average price
net_volume_rur	d26.2	Nett volume per trading session, in Rubles. Positive value indicates credited funds, negative value indicates debited funds
last_deal_id	i8	ID of the last deal
account_type	i1	• 1 - BF's account • 2 - client's account

4.13.1.2. Table position_sa: Settlement Account positions

The table contains information on Settlement Account positions.

Table 34. Fields of table position_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c12	Settlement Account code
isin_id	i4	Instrument's unique ID
pos	i4	Current position
xpos	i8	Current position (8-byte version)
buys_qty	i4	Number of contracts bought during the session
xbuys_qty	i8	Number of contracts bought during the session (8-byte version)
sells_qty	i4	Number of contracts sold during the session
xsells_qty	i8	Number of contracts sold during the session (8-byte version)
open_qty	i4	Number of positions at the start of the session
xopen_qty	i8	Number of positions at the start of the session (8-byte version)
waprice	d16.5	Volume-weighted average price
net_volume_rur	d26.2	Nett volume per trading session, in Rubles. Positive value indicates credited funds, negative value indicates debited funds
last_deal_id	i8	ID of the last deal

4.13.1.3. Table sys_events: table of events

Table 35. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event

Field	Type	Description
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.14. Stream FORTS_PART_REPL - information on fund, limits and risk parameters for clients

4.14.1. Data scheme

Tables:

- part - Client’s funds, limits and risk parameters
- part_sa - Funds and limits
- sys_events - table of events

4.14.1.1. Table part: Client’s funds, limits and risk parameters

The table contains information on clients limits.

Table 36. Fields of table part

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
money_free	d26.2	Available cash amount
money_blocked	d26.2	Blocked cash amount
vm_reserve	d26.2	Variation margin value on closed positions within cleared funds amount. '+' or '-' signs indicate direction when '+' indicates virtual margin deducted from client's cleared funds and '-' indicates virtual margin added to client's cleared funds.
fee	d26.2	Debited fee
balance_money	d26.2	Money transfers balance for current trading session
coeff_go	d16.5	Client’s collateral ratio
limits_set	i1	Flag of set limits. 0 for no limits
money_old	d26.2	Total amount of funds at the end of the previous session
money_amount	d26.2	Total cash amount

Field	Type	Description
money_pledge_amount	d26.2	Sum of estimated value of collateral
vm_intercl	d26.2	Variation margin debited or credited during the intraday clearing
is_auto_update_limit	i1	Flag of automatic adjustment of the limit by the amount of income during downloading after clearing: 0-no, 1-adjust.
no_fut_discount	i1	Flag of ban to provide discounts for futures: 1-ban, 0-no.
num_clr_2delivery	i4	Number of clearing sessions (including intraday clearing sessions) to turn on automatic exercise scenario of risk calculation for the non-quarterly series of options with the closest expiration date for this account

4.14.1.2. Table part_sa: Funds and limits

Table 37. Fields of table part_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
settlement_account	c12	Settlement Account
money_old	d26.2	Total cash amount at the end of previous session
money_amount	d26.2	Total cash amount
money_free	d26.2	Available cash amount
money_blocked	d26.2	Blocked cash amount
money_pledge_amount	d26.2	Sum of estimated value of collateral
vm_reserve	d26.2	Reserved variation margin
vm_intercl	d26.2	Variation margin withdrawn or deposited during the intraday clearing session
fee	d26.2	Total fee to withdraw for a single trading session

4.14.1.3. Table sys_events: table of events

Table 38. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_type	i4	Type of the event
event_id	i8	Unique ID of the event
sess_id	i4	Session number
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.15. Stream FORTS_FUTINFO_REPL - Futures: reference and session information

4.15.1. Data scheme

Tables:

- rates - Currency rates dictionary
- fut_sess_contents - Traded instruments dictionary
- fut_vcb - Traded assets dictionary
- fut_instruments - Instruments dictionary
- fut_bond_registry - Guide on parameters of bonds
- diler - Companies dictionary
- sys_messages - Trading system messages
- prohibition - Prohibitions
- multileg_dict - Multileg instruments dictionary
- fut_rejected_orders - register of orders rejected during the clearing
- fut_intercl_info - Information of the variation margin calculated based on the results of the intraday clearing
- fut_bond_nkd - Accrued interest as of the coupon payment date
- fut_bond_nominal - Payment of bonds' face value
- fut_bond_isin - Guide on bond instruments
- usd_online - USD rate online
- investr - Clients dictionary
- fut_sess_settl - Clearing results: settlement prices
- fut_margin_type - Type of margining
- fut_settlement_account - Settlement Account
- sys_events - table of events
- dealer - Companies directory
- investor - Clients directory
- session - Information about a trading session

4.15.1.1. Table rates: Currency rates dictionary

Table 39. Fields of table rates

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
rate_id	i4	Payment currency identifier
curr_base	c15	Base currency code
curr_coupled	c15	Linked currency code
radius	d16.5	Price indicator change radius (in percent)

4.15.1.2. Table fut_sess_contents: Traded instruments dictionary

The table contains dictionary of instruments which are traded in specified trading session.

Table 40. Fields of table fut_sess_contents

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem

Field	Type	Description
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
short_isin	c25	Description of the instrument
isin	c25	Symbol code of the instrument
name	c75	Instrument name
inst_term	i4	Shift from RTS standard instruments
code_vcb	c25	Base contract code
is_limited	i1	Flag of limits established for trading
limit_up	d16.5	Upper price limit
limit_down	d16.5	Lower price limit
old_kotir	d16.5	Adjusted settlement price of the previous session
buy_deposit	d16.2	Collateral of the buyer
sell_deposit	d16.2	Collateral of the seller
roundto	i4	Number of decimal places after the decimal point for the price
min_step	d16.5	Minimum price increment
lot_volume	i4	Lot, i.e. number of units of the underlying asset in the instrument
step_price	d16.5	Value of the minimum price incrememnt
d_pg	t	Expiration date
is_spread	i1	Flag of the futures contract's being part of an intermonth spread 1 – spread; 0 – no spread.
d_exp	t	Instrument's settlement date
is_percent	i1	Flag of futures contract. 1 – interest rate futures, 0 – common futures, 2 - weather and electricity futures, 3 - Eurobonds futures, 4 - futures on repo rate
percent_rate	d6.2	Variation margin rate for interest rate futures
last_cl_quote	d16.5	Quote after the last clearing session
signs	i4	Flags field
is_trade_evening	i1	Flag of being traded during the evening trading session
ticker	i4	Unique ID number of the primary RTS standard instruments
state	i4	State of trading in the instrument
price_dir	i1	Direction of price sorting for the instrument
multileg_type	i4	Type of multileg instrument
legs_qty	i4	Number of instruments for multileg instrument
step_price_clr	d16.5	Value of the minumum increment for the clearing session
step_price_interclr	d16.5	Value of the minumum increment for the intraday clearing session
step_price_curr	d16.5	Value of the minimum increment in USD
d_start	t	Instrument's start trade date
exch_pay	d16.5	Exchange fee
pctyield_coeff	d16.5	Coef. for yield calculation on percent rates futures
pctyield_total	d16.5	Sum of rates for yield calculation on percent rates futures

Notes:

- Trading session state has priority over instrument state. That is, if a session is in "suspended" or "finished" state, then all instruments can't be traded regardless their states.
- Field state can take the following values:

  0 Session for this instrument is scheduled. One can cancel orders for this instrument

  1 Session for this instrument is running. One can both add and cancel orders for this instrument

  2 Trading in all instruments has been suspended. One can cancel orders for each instrument.

  3 Session for this instrument has been closed compulsorily. Orders can be neither added nor cancelled

4 Session for this instrument has been completed because the time is up. Orders can be neither added nor cancelled

5 Trading in this instrument has been suspended. One can cancel orders for this instrument

- Field signs is a bit mask and defines the following values:

  0x01 The instrument is traded in the evening session

  0x02 Futures-style (1) or equity-style (0)

  0x10 Sign of anonymous trading

  0x20 Sign of non-anonymous trading

  0x40 Sign of trading in the main session

  0x100 Sign of multileg-instrument

  0x1000 Sign of primary price for multileg instruments:

  - 0 for swap price
  - 1 for rate price

- Field price_dir can take the following values:

  0 Standard order of price graduation

  1 Reverse order of price graduation

- Field multileg_type can take the following values:

  0 Ordinary instrument, not the multileg one

  1 The instrument that is traded in the REPO mode

  2 The instrument is RTS Money swap

  3 The instrument is calendar futures spread

- Field is_trade_evening is bit mask:

  0 Instrument is not traded

  1 Instrument is traded in the evening trading session

  2 Instrument is traded in the main trading session

- Field roundto. For this field, the number of decimal places in its value may differ for expiration technical trades. The number of decimal places for expiration price value is determined according to contract specification.

- Field exch_pay is to be removed starting the second release version after 6.0. The commission value should be obtained from FORTS_FEERATE_REP.

4.15.1.3. Table fut_vcb: Traded assets dictionary

The table contains directory of base contracts for instruments.

Table 41. Fields of table fut_vcb

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
code_vcb	c25	Base contract code
name	c75	Name
exec_type	c1	Settlement type
curr	c3	Payment currency
trade_scheme	c1	Trading mode
section	c50	Market section. 'Securities', 'Commodities', 'Money'
rate_id	i4	Rate ID

Field	Type	Description
SECCODE	c12	Code 'SECCODE' of table 'SECURITIES' of ASTS. Default value is NULL.
is_foreign	i1	Foreign instrument

Notes:

- Field exec_type can take the following values:

  A Alternative

  D Settlement

  I Index

  T Settlement via T+ mode, ASTS

- Field trade_scheme can take the following values:

  F With 100% collateral

  G With pledge

4.15.1.4. Table fut_instruments: Instruments dictionary

Table 42. Fields of table fut_instruments

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
short_isin	c25	Description of the instrument
isin	c25	Symbol code of the instrument
name	c75	Instrument name
inst_term	i4	Shift from RTS standard instruments
code_vcb	c25	Base contract code
is_limited	i1	Flag of limits established for trading
old_kotir	d16.5	Adjusted settlement price of the previous session
roundto	i4	Number of decimal places after the decimal point for the price
min_step	d16.5	Minimum price increment
lot_volume	i4	Lot, i.e. number of units of the underlying asset in the instrument
step_price	d16.5	Value of the minimum price incrememnt
d_pg	t	Expiration date
is_spread	i1	Flag of the futures contract's being part of an intermonth spread 1 – spread; 0 – no spread.
d_exp	t	Instrument's settlement date
is_percent	i1	Flag of futures contract. 1 – interest rate futures, 0 – common futures, 2 - weather and electricity futures, 3 - Eurobonds futures, 4 - futures on repo rate
percent_rate	d6.2	Variation margin rate for interest rate futures
last_cl_quote	d16.5	Quote after the last clearing session
signs	i4	Flags field
volat_min	d20.15	Volatility lower edge
volat_max	d20.15	Volatility upper edge
price_dir	i1	Direction of price sorting for the instrument
multileg_type	i4	Type of multileg instrument
legs_qty	i4	Number of instruments for multileg instrument
step_price_clr	d16.5	Value of the minumum increment for the clearing session
step_price_interclr	d16.5	Value of the minumum increment for the intraday clearing session

Field	Type	Description
step_price_curr	d16.5	Value of the minimum increment in USD
d_start	t	Instrument's start trade date
is_limit_opt	i1	Flag of calculation of the limits on options on this future
limit_up_opt	d5.2	For options in the money: the upper limit of deviation from the central strike volatility
limit_down_opt	d5.2	For options in the money: the lower limit of deviation from the central strike volatility
adm_lim	d16.5	For options in the money: limit of the theoretical price deviation set by the administrator
adm_lim_offmoney	d16.5	For options out of the money: limit of the theoretical price deviation
apply_adm_limit	i1	For options in the money: 1 - apply administrative limits, 0 - apply volatility deviation limits
pctyield_coeff	d16.5	Coef. for yield calculation on percent rates futures
pctyield_total	d16.5	Sum of rates for yield calculation on percent rates futures
exec_name	c1	Flag of dated option. D-daily, W-weekly, M-monthly

Notes:

- Field roundto. For this field, the number of decimal places in its value may differ for expiration technical trades. The number of decimal places for expiration price value is determined according to contract specification.

4.15.1.5. Table fut_bond_registry: Guide on parameters of bonds

Table 43. Fields of table fut_bond_registry

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
bond_id	i4	ID of the bond
small_name	c25	Trading code for corporate bonds trading on RTS
short_isin	c25	Bonds issue
name	c75	Bond’s name
date_redempt	t	Bond’s maturity date
nominal	d16.5	Bond’s face value
bond_type	i4	Type: share/bond
year_base	i2	Day-count basis

Notes:

- Field bond_type is a bit mask and defines the following values:

  0 not set

  0x1 Share

  0x2 Bond (not amortized, actual formula)

  0x4 Amortized bond

  0x8 Bond, virtual American formula

  0x10 Bond, virtual European formula

4.15.1.6. Table diler: Companies dictionary

Table 44. Fields of table diler

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
name	c200	Company name
rts_code	c50	RTS code of the company
status	i4	Sign of segregated account
transfer_code	c7	Account code for position transfer
exp_weight	d3.2	Expiration scenario weight for BF, in total collateral. Applied during the evening clearing session.
num_clr_2delivery	i4	Number of clearing sessions before expiration to start BF expiration scenarios calculation. Applied during the evening clearing session.
margin_type	i1	Margin type, according to BF's sections, applied during the evening clearing session: • 3 - half nett • 4 - nett
calendar_spread_margin_type	i1	Margin type for calendar spreads, for BF portfolio, applied during the evening clearing session: • 3 - half nett • 4 - nett
num_clr_2delivery_client_default	i4	Number of clearing sessions before expiration to start clients' expiration scenarios calculation (default value). Applied during the evening clearing session.
exp_weight_client_default	d3.2	Expiration scenario weight for client sections, in total collateral (default value). Applied during the evening clearing session.
go_ratio	d16.5	Total collateral ratio value, for BF. Applied during the evening clearing session.
check_limit_on_withdrawal	i1	Verify collateral sufficiency, for BF, upon funds depositing/withdrawal, applied during the evening clearing session: • 1 - Verify • 0 - Do not verify
limit_tied_money	i1	BF trading limit accordance with the BF's total funds amount (all sections): • 1 - maintain accordance • 0 - virtual (independent) limit. The value may change according to the profit/loss values only, resulting from the evening clearing session. Applied during the evening clearing session.
limits_set	i1	Verify collateral sufficiency, for BF, upon adding orders: • 1 - Verify • 0 - Do not verify
no_fut_discount	i1	Discount on futures for BF portfolio, applied during the evening clearing session: • 1 - Discount prohibited • 0 - Discount allowed
no_fut_discount_client_default	i1	Discount on futures for BF's clients, default value: • 1 - DIscount prohibited • 0 - DIscount allowed Applied during the evening clearing session.

Notes:

- Status field is a bit mask:
  - 0x01 - control section

- 0x02 - separate register
- 0x04 - BF is control

4.15.1.7. Table sys_messages: Trading system messages

Table 45. Fields of table sys_messages

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
msg_id	i4	Unique message ID
moment	t	Message date and time
lang_code	c8	Message language
urgency	i1	Urgency
status	i1	Message status
text	c255	Short text
message_body	c4000	Full text

4.15.1.8. Table prohibition: Prohibitions

Table 46. Fields of table prohibition

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
prohib_id	i4	Number of prohibition
client_code	c7	Client code
initiator	i4	Prohibition originator
section	c50	Section
code_vcb	c25	Base contract code
isin_id	i4	Instrument unique ID
priority	i4	Priority of prohibition
group_mask	i8	Bitmask of groups for which there is a prohibition
type	i4	Type of prohibition
is_legacy	i4	Prohibition originator type

Notes:

- Field Initiator - Initiator of the prohibition:

  0 BF;

  1 CF Chief trader;

  2 CC Administrator;

  3 TS Administrator.

- Field Type - Prohibition type

  0 No prohibitions (when cancelling a previous prohibition with lower priority, otherwise simply delete the line);

  1 prohibited to open positions;

  2 prohibited to perform all trading operations;

  3 prohibited to open sell positions;

  0x08 BF prohibition to add orders for exercising.

  0x10 Only Chief Trader is allowed to add orders for exercising.

- Field ProhibitionGroupMask - Instrument type bitmask:

0x1	T+0
0x2	T+1
0x4	T+2
...	...
0x8000000	T+27
0x10000000	T-1
0x20000000	spots
0x40000000	futures
0x80000000	options

- Field Priority - From high to low

Client code, instrument	9
Client code, UA	8
Client code, all UAs	7
BF code, instrument	6
BF code, UA	5
BF code, all UAs	4
CF code, instrument	3
CF code, UA	2
CF code, all UAs	1

- Field SectionID - Name:

  1 Securities

  2 Commodities

  3 FX

  4 MOSENEX

  5 SPBEX

  6 SPBEX_OAO

  7 NAMEX

- Field is_legacy - Prohibition originator type:

  0 indicates the prohibition set by the Trading Administrator/Clearing Administrator; these prohibitions cannot be changed by traders.

  1 indicates the prohibition set by a trader; these prohibitions can be changed by traders.

4.15.1.9. Table multileg_dict: Multileg instruments dictionary

Table 47. Fields of table multileg_dict

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Multileg instrument ID
isin_id_leg	i4	ID of the instrument which is a component of specified multileg instrument
qty_ratio	i4	Quantity ratio
leg_order_no	i1	Leg order in a multileg instrument. The default value is 0.

Notes:

- The meaning of the filed qty_ratio is specifying the number and direction of the multileg instrument: If the value equals qty_ratio > 0 then this instrument is a multileg instrument with the same direction with which is the multileg order, if qty_ratio < 0 – with opposite. Absolute value of qty_ratio specifies the coefficient by which the number of multileg instruments in the order should be multiplied in order to get the number of instruments isin_id_leg.

4.15.1.10. Table fut_rejected_orders: register of orders rejected during the clearing

Table 48. Fields of table fut_rejected_orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
order_id	i8	Order ID number
sess_id	i4	Trading session ID
moment	t	Order update time
isin_id	i4	Instrument unique ID
client_code	c7	Client code
dir	i1	Direction
amount	i4	Volume, in units of the instrument
xamount	i8	Volume, in units of the instrument (8-byte version)
price	d16.5	Price
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
moment_reject	t	Time when the order was rejected
ret_code	i4	Return code of the re-entering procedure
ret_message	c255	Text of the message containing the reason for rejection of the order when it is re-entered
comment	c20	Trader's comment
login_from	c20	Login of the user who has entered the order
ext_id	i4	External ID number. It is added to orders, trades

4.15.1.11. Table fut_intercl_info: Information of the variation margin calculated based on the results of the intra-day clearing

Table 49. Fields of table fut_intercl_info

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
client_code	c7	Client code
vm_intercl	d16.2	Variation margin debited or credited during the intraday clearing

4.15.1.12. Table fut_bond_nkd: Accrued interest as of the coupon payment date

Table 50. Fields of table fut_bond_nkd

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
bond_id	i4	ID of the bond
date	t	Coupon payment date
nkd	d16.7	Accrued interest as of the coupon payment date

Field	Type	Description
is_cupon	i1	Flags: 0 - accrued interest as of the bond futures contract settlement date, 1 - coupon, 2 - accrued interest as of the bond settlement date

4.15.1.13. Table fut_bond_nominal: Payment of bonds' face value

Table 51. Fields of table fut_bond_nominal

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
bond_id	i4	ID of the bond
date	t	Coupon payment date
nominal	d16.5	payment of bonds' face value
face_value	d16.5	Payment of bonds' rest face value
coupon_nominal	d8.5	Coupon value in % of face value
is_nominal	i1	Type of record in the table

Notes:

- Field is_nominal may contain the following values:

  0 Residual face value as of the bond futures contract settlement date

  1 Residual face value as of the coupon payment date

  2 Residual face value as of the bond settlement date

4.15.1.14. Table fut_bond_isin: Guide on bond instruments

Table 52. Fields of table fut_bond_isin

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
bond_id	i4	ID of the bond
coeff_conversion	d5.4	Conversion ratio

4.15.1.15. Table usd_online: USD rate online

Table 53. Fields of table usd_online

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
id	i8	Rate ID
rate	d16.4	USD rate
moment	t	Time of the rate

Notes:

- At current moment filed id can take value = 1 (rub to usd)

4.15.1.16. Table investr: Clients dictionary

Table 54. Fields of table investr

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
name	c200	Client name
status	i4	Client's flags
calendar_spread_margin_type	i1	Margin type of calendar spreads, for client (applied during the evening clearing session): • Half nett • Nett

Notes:

- Status field is a bit mask:
  - 0x1 - Trust Management
  - 0x2 - Separated
  - 0x4 - Brokerage Firm (Trust Management type)
  - 0x80 - Private entity
  - 0x100 - Legal entity
  - 0x200 - Non-resident
  - 0x2000 - Individual investment account
  - 0x8000 - Stateless person
  - 0x20000 - Own
  - 0x40000 - Client
  - 0x80000 - Special BF
  - 0x10000000 - Additional own account

4.15.1.17. Table fut_sess_settl: Clearing results: settlement prices

The table contains settlement instruments prices of the last clearing.

Table 55. Fields of table fut_sess_settl

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
date_clr	t	Clearing date
isin	c25	Symbol code of the instrument
isin_id	i4	Instrument unique ID
settl_price	d16.5	Settlement price

4.15.1.18. Table fut_margin_type: Type of margining

Table 56. Fields of table fut_margin_type

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
code	c12	Settlement Account or Brokerage Firm Code
type	i1	Type of Code. Settlement Account - 0, Brokerage Firm - 1.
margin_type	i1	Type of margining. 2 - Gross, 3 - Half nett, 4 - Nett.

Field	Type	Description
UCP_type	i1	Type of Unified Collateral Pool: • 1 - Unified Collateral Pool (standard) • 0 - not Unified Collateral Pool
prohibit_coeff	d16.2	Debt coefficient value for Settlement Account. If NULL, then no debt coefficient will be applied, all applied automatic prohibitions will be cancelled.
prohibit_type	i4	Type of automatic prohibition for Settlement Account: • 1 - prohibited to open positions • 2 - prohibited to add orders.
settlement_account_type	i1	Settlement Account Type. 0 - own SA, 1 - client SA, 2 - SA (Trust Management type).

4.15.1.19. Table fut_settlement_account: Settlement Account

Table 57. Fields of table fut_settlement_account

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
code	c7	Brokerage Firm Code or Client Code
type	i1	Brokerage Firm - 1, Client - 2
settlement_account	c12	Settlement Account

4.15.1.20. Table sys_events: table of events

Table 58. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"

Funds have been recalculated after intraday clearing session

4.15.1.21. Table dealer: Companies directory

Table 59. Fields of table dealer

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
name	c200	Company name
rts_code	c50	RTS code of the company
signs	i4	Lock mode. 4 - locked by the Trading System Administrator. 8 - locked by Clearing Firm's Chief Trader.
status	i4	Sign of segregated account
transfer_code	c7	Account code for position transfer
exp_weight	d3.2	Expiration scenario weight for BF, in total collateral. Applied during the evening clearing session.
num_clr_2delivery	i4	Number of clearing sessions before expiration to start BF expiration scenarios calculation. Applied during the evening clearing session.
margin_type	i1	Margin type, according to BF's sections, applied during the evening clearing session: • 3 - half nett • 4 - nett
calendar_spread_margin_type	i1	Margin type for calendar spreads, for BF portfolio, applied during the evening clearing session: • 3 - half nett • 4 - nett
num_clr_2delivery_client_default	i4	Number of clearing sessions before expiration to start clients expiration scenarios calculation (default value). Applied during the evening clearing session.
exp_weight_client_default	d3.2	Expiration scenario weight for clients, in total collateral (default value). Applied during the evening clearing session.
go_ratio	d16.5	Total collateral ratio value, for BF. Applied during the evening clearing session.
check_limit_on_withdrawal	i1	Verify collateral sufficiency, for BF, upon funds depositing/withdrawal, applied during the evening clearing session: • 1 - Verify • 0 - Do not verify
limit_tied_money	i1	BF trading limit accordance with the BF's total funds amount (all sections): • 1 - maintain accordance • 0 - virtual (independent) limit. The value may change according to the profit/loss values only, resulting from the evening clearing session. Applied during the evening clearing session.
limits_set	i1	Verify collateral sufficiency, for BF, upon adding orders: • 1 - Verify • 0 - Do not verify
no_fut_discount	i1	Discount on futures for BF portfolio, applied during the evening clearing session: • 1 - Discount prohibited • 0 - Discount allowed
no_fut_discount_client_default	i1	Discount on futures for BF's clients, default value:

Field	Type	Description
		• 1 - DIscount prohibited • 0 - DIscount allowed Applied during the evening clearing session.

Notes:

- Status field is a bit mask:
  - 0x01 - control section
  - 0x02 - separate register
  - 0x04 - BF is control

4.15.1.22. Table investor: Clients directory

Table 60. Fields of table investor

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
name	c200	Client name
status	i4	Client's flags
calendar_spread_margin_type	i1	Margin type for client calendar spread, applied during the evening clearing session: • 3 - half nett • 4 - nett

Notes:

- Status field is a bit mask:
  - 0x1 - Trust Management
  - 0x2 - Separated
  - 0x4 - Brokerage Firm (Trust Management type)
  - 0x80 - Private entity
  - 0x100 - Legal entity
  - 0x200 - Non-resident
  - 0x2000 - Individual investment account
  - 0x8000 - Stateless person
  - 0x20000 - Own
  - 0x40000 - Client
  - 0x80000 - Special BF
  - 0x10000000 - Additional own account

4.15.1.23. Table session: Information about a trading session

The table contains trading sessions timetable.

Table 61. Fields of table session

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
begin	t	Opening time
end	t	Closing time
state	i4	Session status
opt_sess_id	i4	ID number of the relevant session for options
inter_cl_begin	t	Time when the intraday clearing begins
inter_cl_end	t	Time when the intraday clearing is over
inter_cl_state	i4	Status of the intraday clearing
eve_on	i1	Flag of holding an additional evening session
eve_begin	t	Time when the additional evening session starts
eve_end	t	Time when the additional evening session is over
mon_on	i1	Flag of holding an additional morning session
mon_begin	t	Time when the additional morning session starts
mon_end	t	Time when the additional morning session is over
pos_transfer_begin	t	Time when the special period for position transfer starts
pos_transfer_end	t	Time when the special period for position transfer finishes

Notes:

- Fields pos_transfer_begin and pos_transfer_end specify the period of trading session during which special mode of concluding trades with instruments that are delivered during this current trading day is in power. During this special mode all orders with this certain instrument are prohibited excluding negotiated trades within one Clearing member.
- Field state can take the following values:

  0 Session is scheduled. Orders can't be placed but can be cancelled.

  1 Session is running. Orders can be both placed and cancelled.

  2 Trading with all instruments is suspended. Orders can't be placed but can be cancelled.

  3 Session is closed compulsorily. Orders can be neither placed nor cancelled.

  4 Session is completed because the time is up. Orders can be neither added nor cancelled.
- Field inter_cl_state is a bit mask:

  0x0 It is not defined. Orders can be both placed and cancelled.

  0x01 It is scheduled today. Orders can be placed and cancelled.

  0x02 It is cancelled. Orders can be placed and cancelled.

  0x04 Current, i.e.it is running, nothing can be done. Orders can't be placed and cancelled.

  0x08 Current, i.e. it is running (due to time schedule), but actually it is over and intraday clearing data is already available. Orders can't be placed but can be cancelled.

  0x10 It is successfully over (due to time schedule as well). Orders can be placed and cancelled.

4.16. Stream FORTS_OPTINFO_REPL - Options: reference and session information

4.16.1. Data scheme

Tables:

- opt_sess_contents - Traded instruments dictionary
- opt_vcb - Traded assets dictionary
- opt_rejected_orders - register of orders rejected during the clearing
- opt_intercl_info - Information of the variation margin calculated based on the results of the intraday clearing

- opt_exp_orders - Register of orders for expiration of option
- opt_sess_settl - Clearing results: volatility and theoretical prices
- sys_events - table of events

4.16.1.1. Table opt_sess_contents: Traded instruments dictionary

The table contains dictionary of instruments which are traded in specified trading session.

Table 62. Fields of table opt_sess_contents

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
isin	c25	Symbol code of the instrument
short_isin	c25	Description of the instrument
name	c75	Instrument name
code_vcb	c25	Base contract code
fut_isin_id	i4	ID of the futures instrument
is_limited	i1	Flag of limits established for trading
limit_up	d16.5	Upper limit on premium
limit_down	d16.5	Lower limit on premium
old_kotir	d16.5	Quote (theoretical price of the option) of the previous session
bgo_c	d16.2	Basic size of the collateral to be posted on one open position of the option writer (Russian rubles)
bgo_nc	d16.2	Basic size of collateral to be posted on one unsecured position of the option writer (Russian rubles)
europe	i1	Option’s kind. 0 – American option, 1 – European option
put	i1	Option’s type. 0 - Call option, 1 - Put option
strike	d16.5	Strike price
roundto	i4	Number of decimal places after the decimal point for the price
min_step	d16.5	Premium’s minimum increment
lot_volume	i4	Lot, i.e. number of units of the underlying asset in the instrument
step_price	d16.5	Value of the minimum premium's increment
d_pg	t	Expiration date
d_exec_beg	t	Day when the instrument’s expiration begins
d_exec_end	t	Day when the instrument’s expiration is over
signs	i4	Flags field
last_cl_quote	d16.5	Settlement Price (theoretical price of the option) after the last clearing session
bgo_buy	d16.2	Basic size of Collateral requested in order to buy a futures-style option
base_isin_id	i4	ID of the base futures instrument
d_start	t	Instrument's start trade date
exch_pay	d16.2	Exchange fee per 1 contract in Russian rubles

Notes:

- Field signs is a bit mask and defines the following values:

  0x01 The instrument is traded in the evening session

  0x02 Futures-style (1) or equity-style (0)

  0x10 Sign of anonymous trading

  0x20 Sign of non-anonymous trading

0x40 Sign of trading in the main session

- Field exch_pay is to be removed starting the second release version after 6.0. The commission value should be obtained from FORTS_FEERATE_REP.

4.16.1.2. Table opt_vcb: Traded assets dictionary

The table contains dictionary of base contracts for instruments.

Table 63. Fields of table opt_vcb

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
code_vcb	c25	Base contract code
name	c75	Name
exec_type	c1	Settlement type
curr	c3	Payment currency
trade_scheme	c1	Trading mode
coeff_out	d7.3	Approximation ratio for options priced beyond limits
min_vol	i4	Minimum volume of quotes from the specialist
rate_id	i4	Rate ID

4.16.1.3. Table opt_rejected_orders: register of orders rejected during the clearing

Table 64. Fields of table opt_rejected_orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
order_id	i8	Order ID number
sess_id	i4	Trading session ID
moment	t	Order update time
isin_id	i4	Instrument unique ID
client_code	c7	Client code
dir	i1	Direction
amount	i4	Volume, in units of the instrument
xamount	i8	Volume, in units of the instrument (8-byte version)
price	d16.5	Price
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
moment_reject	t	Time when the order was rejected
ret_code	i4	Return code of the re-entering procedure
ret_message	c255	Text of the message containing the reason for rejection of the order when it is re-entered
comment	c20	Trader's comment
login_from	c20	Login of the user who has entered the order
ext_id	i4	External ID number. It is added to orders, trades

4.16.1.4. Table opt_intercl_info: Information of the variation margin calculated based on the results of the intra-day clearing

Table 65. Fields of table opt_intercl_info

Field	Type	Description
replID	i8	Service field of the replication subsystem

Field	Type	Description
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
client_code	c7	Client code
vm_intercl	d16.2	Variation margin debited or credited during the intraday clearing

4.16.1.5. Table opt_exp_orders: Register of orders for expiration of option

Table 66. Fields of table opt_exp_orders

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
exporder_id	i8	Unique ID number of the order for expiration
client_code	c7	Client code
isin_id	i4	Instrument unique ID
amount	i4	Number of expiring positions
xamount	i8	Number of expiring positions (8-byte version)
sess_id	i4	Trading session ID
date	t	Date and time
amount_apply	i4	Number of positions detailed in orders as of intraday clearing
xamount_apply	i8	Number of positions detailed in orders as of intraday clearing (8-byte version)

4.16.1.6. Table opt_sess_settl: Clearing results: volatility and theoretical prices

The table contains volatility and theoretical prices of the last clearing.

Table 67. Fields of table opt_sess_settl

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
date_clr	t	Clearing date
isin	c25	Symbol code of the instrument
isin_id	i4	Instrument ID number
volat	d16.5	Option’s volatility
theor_price	d16.5	Option’s theoretical price

4.16.1.7. Table sys_events: table of events

Table 68. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 2
  message = "intraday_clearing_finished"
  All clearing procedures have been finished in the intraday clearing session

  event_type = 4
  message = "intraday_clearing_started"
  Intraday clearing session has started

  event_type = 5
  message = "clearing_started"
  Main clearing session has started

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

  event_type = 8
  message = "broker_recalc_finished"
  Funds have been recalculated after intraday clearing session

4.17. Stream FORTS_MISCINFO_REPL - miscellaneous information

4.17.1. Data scheme

Tables:

- volat_coeff - Parametric volatility curve's parameters

4.17.1.1. Table volat_coeff: Parametric volatility curve's parameters

Table 69. Fields of table volat_coeff

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
a	d16.10	Coefficient A of the parametric volatility curve
b	d16.10	Coefficient B of the parametric volatility curve
c	d16.10	Coefficient C of the parametric volatility curve
d	d16.10	Coefficient D of the parametric volatility curve
e	d16.10	Coefficient E of the parametric volatility curve
s	d16.10	Coefficient S of the parametric volatility curve

4.18. Stream FORTS_MM_REPL - information on MM's obligations

4.18.1. Data scheme

Tables:

- fut_MM_info - MM's obligations in futures
- opt_MM_info - MM's obligations in options
- cs_mm_rule - Instruments for recalculating the central strike price.
- mm_agreement_filter - Table numbers and types of contracts for the provision of market-making services

4.18.1.1. Table fut_MM_info: MM's obligations in futures

Table 70. Fields of table fut_MM_info

Field	Type	Description
replID	i8	Service field of the replication subsystem

Field	Type	Description
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
spread	d16.5	Spread in points
price_edge_sell	d16.5	Price of the worst sell order included in the spread
amount_sells	i4	Number of contracts in the sell order included in the spread
xamount_sells	i8	Number of contracts in the sell order included in the spread (8-byte version)
price_edge_buy	d16.5	Price of the worst buy order included in the spread
amount_buys	i4	Number of contracts in the buy order included in the spread
xamount_buys	i8	Number of contracts in the buy order included in the spread (8-byte version)
mm_spread	d16.5	Agreed spread
mm_amount	i4	Number in accordance with the agreement
xmm_amount	i8	Number in accordance with the agreement (8-byte version)
spread_sign	i1	Sign: 1-spread is not maintained, 0-spread is maintained
amount_sign	i1	Sign: 1- number is not maintained, 0- number is maintained
percent_time	d6.2	% of fulfilled obligations
period_start	t	Start of the period of MM rules coming into force
period_end	t	End of the period of MM rules coming into force
client_code	c7	Client code
active_sign	i4	Sign: 1-note is deleted (stopped being active), 0-is active
fulfil_min	d6.2	Minimum percentage of the liabilities for the trading session
fulfil_partial	d6.2	Percentage of partial fulfillment of the obligations of the trading session
fulfil_total	d6.2	Percentage of fulfillment of obligations of the trading session
is_fulfil_min	i1	Minimum sign of the liabilities for the trading session
is_fulfil_partial	i1	Sign of partial fulfillment of the obligations of the trading
is_fulfil_total	i1	Sign of fulfillment of obligations of the trading session
agmt_id	i4	Identifier of the MM agreement
is_rf	i1	Sign of clearing member market-maker requirement
id_group	i4	ID of market-maker group of instrument

Notes: The 'fut_MM_info' table of the 'FORTS_MM_REPL' stream contains market-makers obligations accurate to 7-digit client code.

4.18.1.2. Table opt_MM_info: MM's obligations in options

Table 71. Fields of table opt_MM_info

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
spread	d16.5	Spread in points
price_edge_sell	d16.5	Price of the worst sell order included in the spread
amount_sells	i4	Number of contracts in the sell order included in the spread
xamount_sells	i8	Number of contracts in the sell order included in the spread (8-byte version)
price_edge_buy	d16.5	Price of the worst buy order included in the spread
amount_buys	i4	Number of contracts in the buy order included in the spread
xamount_buys	i8	Number of contracts in the buy order included in the spread (8-byte version)
mm_spread	d16.5	Agreed spread

Field	Type	Description
mm_amount	i4	Number in accordance with the agreement
xmm_amount	i8	Number in accordance with the agreement (8-byte version)
spread_sign	i1	Sign: 1-spread is not maintained, 0-spread is maintained
amount_sign	i1	Sign: 1- number is not maintained, 0- number is maintained
percent_time	d6.2	% of fulfilled obligations
period_start	t	Start of the period of MM rules coming into force
period_end	t	End of the period of MM rules coming into force
client_code	c7	Client code
cstrike_offset	d16.5	Central Strike offset
active_sign	i4	Sign: 1-note is deleted (stopped being active), 0-is active
fulfil_min	d6.2	Minimum percentage of the liabilities for the trading session
fulfil_partial	d6.2	Percentage of partial fulfillment of the obligations of the trading session
fulfil_total	d6.2	Percentage of fulfillment of obligations of the trading session
is_fulfil_min	i1	Minimum sign of the liabilities for the trading session
is_fulfil_partial	i1	Sign of partial fulfillment of the obligations of the trading
is_fulfil_total	i1	Sign of fulfillment of obligations of the trading session
agmt_id	i4	Identifier of the MM agreement
is_rf	i1	Sign of clearing member market-maker requirement
id_group	i4	ID of market-maker group of instrument

Notes: The 'opt_MM_info' table of the 'FORTS_MM_REPL' stream contains market-makers obligations accurate to 7-digit client code.

4.18.1.3. Table cs_mm_rule: Instruments for recalculating the central strike price.

Table 72. Fields of table cs_mm_rule

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
client_code	c4	Client code
isin_id	i4	Instrument unique ID

4.18.1.4. Table mm_agreement_filter: Table numbers and types of contracts for the provision of market-making services

Table 73. Fields of table mm_agreement_filter

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
agmt_id	i4	Identifier of the agreement
is_fut	i1	Type of obligation
agreement	c50	Number of the agreement
client_code	c7	Client code

4.19. Stream FORTS_CLR_REPL - clearing information

4.19.1. Data scheme

Tables:

- money_clearing - Status of clients' cash accounts after clearing
- clr_rate - Currency and Index rates

- fut_pos - Open interest in futures as a result of evening clearing session
- opt_pos - Open interest in options as a result of evening clearing session.
- fut_sess_settl - Futures settlement prices
- opt_sess_settl - options' settlement price
- pledge_details - Pledgs details table
- money_clearing_sa - Status of clients’ cash accounts after clearing
- fut_pos_sa - Open interest in futures as a result of evening clearing session
- opt_pos_sa - Open interest in options as a result of evening clearing session.
- sys_events - table of events

4.19.1.1. Table money_clearing: Status of clients’ cash accounts after clearing

Table 74. Fields of table money_clearing

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
share	i1	Account type
amount_beg	d16.2	At the start of the day
vm	d16.2	Variation margin including variation margin on futures-style options
premium	d16.2	Premium on options
pay	d16.2	Account operations
fee_fut	d16.2	Exchange fee on futures
fee_opt	d16.2	Exchange fee on options
go	d16.2	Total collateral on futures and options
amount_end	d21.2	At the end of the day
free	d22.2	Available funds

4.19.1.2. Table clr_rate: Currency and Index rates

Table 75. Fields of table clr_rate

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
rate	d16.5	Index value
moment	t	Date and time value was fixed
signs	i1	Sign, that corresponds to the current value
sess_id	i4	Trading session ID
rate_id	i4	Rate ID

4.19.1.3. Table fut_pos: Open interest in futures as a result of evening clearing session

Table 76. Fields of table fut_pos

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID

Field	Type	Description
isin	c25	Symbol code of the instrument
client_code	c7	Client code
account	i1	Account type (0 - CF; 1 - BF; 2 - client)
pos_beg	i4	Position on trading session start
xpos_beg	i8	Position on trading session start (8-byte version)
pos_end	i4	Position on trading session end
xpos_end	i8	Position on trading session end (8-byte version)
vm	d16.2	Total variation margin at clearing time
fee	d16.2	Total fee
accum_go	d16.2	Accumulated Collateral Deposit
fee_ex	d16.2	Exchange fee
vat_ex	d16.2	VAT included in exchange fee
fee_cc	d16.2	Clearing fee
vat_cc	d16.2	VAT included in clearing fee

4.19.1.4. Table opt_pos: Open interest in options as a result of evening clearing session.

Table 77. Fields of table opt_pos

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
isin	c25	Symbol code of the instrument
client_code	c7	Client code
account	i1	Account type (0 - CF; 1 - BF; 2 - client)
pos_beg	i4	Position on trading session start
xpos_beg	i8	Position on trading session start (8-byte version)
pos_end	i4	Position on trading session end
xpos_end	i8	Position on trading session end (8-byte version)
vm	d16.2	Total VM after the main clearing session per client/firm and instrument. Equals to the sum of VAR_MARG_P and VAR_MARG_D fields.
fee	d16.2	Total fee of the client/firm and instrument. Coincide with the SBOR field of reports
fee_ex	d16.2	Exchange fee
vat_ex	d16.2	VAT included in exchange fee
fee_cc	d16.2	Clearing fee
vat_cc	d16.2	VAT included in clearing fee

4.19.1.5. Table fut_sess_settl: Futures settlement prices

Table 78. Fields of table fut_sess_settl

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
date_clr	t	Clearing date
isin	c25	Symbol code of the instrument
isin_id	i4	Instrument unique ID

Field	Type	Description
settl_price	d16.5	Settlement price

4.19.1.6. Table opt_sess_settl: options' settlement price

Table 79. Fields of table opt_sess_settl

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
sess_id	i4	Trading session ID
date_clr	t	Clearing date
isin	c25	Symbol code of the instrument
isin_id	i4	Instrument ID number
volat	d16.5	Option’s volatility
theor_price	d16.5	Option’s theoretical price

4.19.1.7. Table pledge_details: Pledgs details table

Table 80. Fields of table pledge_details

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
pledge_name	c10	Foreign currency/security code
amount_beg	d10.0	Foreign currencies/securities amount at session opening
xamount_beg	d26.2	Foreign currencies/securities amount at session opening
pay	d10.0	Amount of foreign currencies/securities deposited or withdrawn, in units
xpay	d26.2	Amount of foreign currencies/securities deposited or withdrawn, in units
amount	d10.0	Current amount of foreign currencies/securities
xamount	d26.2	Current amount of foreign currencies/securities
rate	d16.5	Assessed value of foreign currency/security unit (in Russian roubles)
amount_beg_money	d16.2	Foreign currency/securities amount at session opening (in Russian rubles)
xamount_beg_money	d26.2	Foreign currency/securities amount at session opening (in Russian rubles)
pay_money	d16.2	Amount of foreign currencies/securities deposited or withdrawn, in units (in Russian roubles)
xpay_money	d26.2	Amount of foreign currencies/securities deposited or withdrawn, in units (in Russian roubles)
amount_money	d16.2	Current amount of foreign currencies/securities (in Russian rubles)
xamount_money	d26.2	Current amount of foreign currencies/securities (in Russian rubles)
com_ensure	i1	Collateral type

Notes:

- Field 'amount_money' - Current amount of foreign currencies/securities (in Russian rubles) (calculated as 'amount' * 'rate')
- Field 'amount_beg_money' - Foreign currencies/securities amount at session opening (in Russian rubles) (in Russian roubles) (calculated as 'amount_beg' * 'rate')
- Field 'pay_money' - Amount of foreign currencies/securities deposited or withdrawn, in units (in Russian roubles) (calculated as 'pay' * 'rate')
- Field 'com_ensure' - Collateral type:

  0 partial collateral;

  1 full collateral.

4.19.1.8. Table money_clearing_sa: Status of clients' cash accounts after clearing

Table 81. Fields of table money_clearing_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
settlement_account	c12	Settlement Account
share	i1	Account type. 0 - roubles, 1 - pledge.
amount_beg	d26.2	At the start of the day
vm	d26.2	Variation margin
premium	d26.2	Premium on options
pay	d26.2	Account operations
fee_fut	d26.2	Exchange fee on futures
fee_opt	d26.2	Exchange fee on options
go	d26.2	Total collateral on futures and options
amount_end	d26.2	At the end of the day
free	d26.2	Available funds

4.19.1.9. Table fut_pos_sa: Open interest in futures as a result of evening clearing session

Table 82. Fields of table fut_pos_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
isin	c25	Symbol code of the instrument
settlement_account	c12	Settlement Account
pos_beg	i4	Position on trading session start
xpos_beg	i8	Position on trading session start (8-byte version)
pos_end	i4	Position on trading session end
xpos_end	i8	Position on trading session end (8-byte version)
vm	d26.2	Total variation margin at clearing time
fee	d26.2	Total fee
fee_ex	d26.2	Exchange fee
vat_ex	d26.2	VAT included in exchange fee
fee_cc	d26.2	Clearing fee
vat_cc	d26.2	VAT included in clearing fee

4.19.1.10. Table opt_pos_sa: Open interest in options as a result of evening clearing session.

Table 83. Fields of table opt_pos_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
isin	c25	Symbol code of the instrument
settlement_account	c12	Settlement Account

Field	Type	Description
pos_beg	i4	Position on trading session start
xpos_beg	i8	Position on trading session start (8-byte version)
pos_end	i4	Position on trading session end
xpos_end	i8	Position on trading session end (8-byte version)
vm	d26.2	Total VM after the main clearing session per client/firm and instrument. Equals to the sum of VAR_MARG_P and VAR_MARG_D fields.
fee	d26.2	Total fee of the client/firm and instrument. Coincide with the SBOR field of reports
fee_ex	d26.2	Exchange fee
vat_ex	d26.2	VAT included in exchange fee
fee_cc	d26.2	Clearing fee
vat_cc	d26.2	VAT included in clearing fee

4.19.1.11. Table sys_events: table of events

Table 84. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_id	i8	Unique ID of the event
sess_id	i4	Session number
event_type	i4	Type of the event
message	c64	Description of the event

Notes:

- Possible types of events:

  event_type = 3
  message = "clearing_data_ready"
  Data are ready after main clearing session

  event_type = 9
  message = "clearing_data_correct"
  Data are verified and corrected after main clearing session, updated data are being sent

4.20. Stream RTS_INDEX_REPL - online indices

4.20.1. Data scheme

Tables:

- rts_index - Indices

4.20.1.1. Table rts_index: Indices

The table contains data about Stock Exchange Indices values.

Table 85. Fields of table rts_index

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
name	c25	Index ID
moment	t	Time of the last update
value	d18.4	Index value
prev_close_value	d18.4	Close value

Field	Type	Description
open_value	d18.4	Open value
max_value	d18.4	Max value
min_value	d18.4	Min value
usd_rate	d10.4	USD rate for indices which include both RUB and USD contract prices
cap	d18.4	Index capitalization
volume	d18.4	Volume of trades that compose index value

4.21. Stream FORTS_VM_REPL - online variational margin stream

4.21.1. Data scheme

Tables:

- fut_vm - Variation margin for futures
- opt_vm - Variation margin for options
- fut_vm_sa - Variation margin for futures
- opt_vm_sa - Variation margin for options

4.21.1.1. Table fut_vm: Variation margin for futures

Table 86. Fields of table fut_vm

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
client_code	c7	Client code
vm	d16.5	The accumulated variation margin on futures trades calculated according to the current quote
vm_real	d16.5	The accumulated variation margin on futures trades calculated based on the current market quote

4.21.1.2. Table opt_vm: Variation margin for options

Table 87. Fields of table opt_vm

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
client_code	c7	Client code
vm	d16.5	The accumulated variation margin on futures-style options trades calculated based on the current option quote
vm_real	d16.5	The accumulated variation margin on futures-style options trades calculated based on the current option quote

4.21.1.3. Table fut_vm_sa: Variation margin for futures

Table 88. Fields of table fut_vm_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem

Field	Type	Description
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
settlement_account	c12	Settlement Account
vm	d26.2	The accumulated variation margin on futures trades calculated according to the current quote
vm_real	d26.2	The accumulated variation margin on futures trades calculated based on the current market quote

4.21.1.4. Table opt_vm_sa: Variation margin for options

Table 89. Fields of table opt_vm_sa

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
settlement_account	c12	Settlement Account
vm	d26.2	The accumulated variation margin on futures-style options trades calculated based on the current option quote
vm_real	d26.2	The accumulated variation margin on futures-style options trades calculated based on the current option quote

4.22. Stream FORTS_VOLAT_REPL - online volatility information

4.22.1. Data scheme

Tables:

- volat - Volatility

4.22.1.1. Table volat: Volatility

Table 90. Fields of table volat

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
volat	d16.5	Option’s volatility
theor_price	d16.5	Option’s theoretical price
theor_price_limit	d16.5	Theoretical option price with limits
up_prem	d16.5	Upper limit for option price
down_prem	d16.5	Lower limit for option price

4.23. Stream FORTS_INFO_REPL - additional reference information

4.23.1. Data scheme

Tables:

- currency_params - FX parameters
- base_contracts_params - Base contracts parameters
- futures_params - Futures parameters

- virtual_futures_params - Virtual futures parameters
- options_params - Options parameters
- investor - Clients directory
- dealer - Companies directory
- common_params - Collateral calculation parameters
- sys_events - Table of events

4.23.1.1. Table currency_params: FX parameters

Table 91. Fields of table currency_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
currency_id	i4	FX ID taken from directory 'rates' of stream 'FUTINFO'
radius	f	FX price fluctuation radius (specified during the last evening clearing session)
signs	i1	Reserved

4.23.1.2. Table base_contracts_params: Base contracts parameters

Table 92. Fields of table base_contracts_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
code_vcb	c25	Code of the underlying contract
code_mcs	c25	Intercontract spread ID
volat_num	i1	Number of volatility curves
subrisk_step	f	Number of risk subpoints
is_percent	i1	Flag of futures contract
has_options	i1	Option on futures for given underlying asset. 0 - none, 1 - yes
percent_rate	d16.5	Variation margin rate for interest rate futures
currency_volat	d16.5	Volatility of currency rate
is_usd	i1	Sign of USD contract
somc	f	Collateral rate for uncovered sells
msp_type	i1	Price pitch value type. 0 - fixed, 1 - taken from FX indicator value
currency_id	i4	FX ID taken from directory 'rates' of stream 'FUTINFO'
spot_price	f	Theoretical price value of underlying asset on spot market reduced to number of lots of primary futures.
mr1	f	Market risk rate value
mr2	f	Market risk rate value (Concentration Limit 1)
mr3	f	Market risk rate value (Concentration Limit 2)
lk1	i8	Amount of underlying asset, in units (Concentration Limit 1)
lk2	i8	Amount of underlying asset, in units (Concentration Limit 2)
risk_points_n	i4	Number of contract price fluctuation scenarios near risk calculation point.

Notes:

- Field is_percent may contain the following values:

  0 common futures

  1 interest rate futures

2 weather and electricity futures

3 eurobonds futures

4 futures on repo rate

4.23.1.3. Table futures_params: Futures parameters

Table 93. Fields of table futures_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin	c25	Instrument ID
isin_id	i4	Instrument unique ID
code_vcb	c25	Code of the underlying contract
settl_price	d16.5	Settlement price
spread_aspect	i1	Flag of making up futures spread
subrisk	i1	Sign of accounting risks in risks subpoints
step_price	f	Value of the minimum price increment
exp_date	t	Date of expiration
settl_price_real	d16.5	Real settlement price
min_step	f	Minimal price increment
lot	i4	Number of underlying asset in instrument, in units
interest_rate_risk_up	f	Interest risk variable rate on rate up scenario
interest_rate_risk_down	f	Interest risk variable rate on rate down scenario
time_to_expiration	f	Time before instrument expiration, in fraction of year
normalized_spot	f	Theoretical price value of underlying asset on spot market, in points, reduced to dimension of the primary one

Notes:

- Field spread_aspect can take the following values:

  0 It is not included in spread

  2 It is included into calendar spread

4.23.1.4. Table virtual_futures_params: Virtual futures parameters

Table 94. Fields of table virtual_futures_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin	c25	Instrument ID
isin_base	c25	Real futures ID
a	f	Parameter a
b	f	Parameter b
c	f	Parameter c
d	f	Parameter d
e	f	Parameter e
exp_date	t	Date of expiration
use_null_volat	i1	Sign of zero volatility
s	f	Parameter s
strike_step	f	Strike pitch

Field	Type	Description
exp_clearings_sa	i4	Number of clearing sessions for SA, before commencing to block the collateral, preliminary calculated for the whole SA according to the given expiration model. Specified by NCC.
exp_clearings_bf	i4	Number of clearing sessions for BF, before commencing to block the collateral, preliminary calculated for the whole BF according to the given expiration model. Specified by NCC.
exp_clearings_cc	i4	Number of clearing sessions, before ExpWeight will apply for BF clients. Specified by NCC.
volatility_risk	f	Volatility risk range rate
volatility_risk_mismatch	f	Volatility risk variable rate for different maturity dates of series of options
time_to_expiration	f	Time before expiration, in fraction of year

4.23.1.5. Table options_params: Options parameters

Table 95. Fields of table options_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
isin	c25	Instrument ID
isin_id	i4	Instrument unique ID
isin_base	c25	Virtual futures ID
strike	d16.5	Option's strike
opt_type	i1	Option's type: 1 - PUT, 2 - CALL
settl_price	d16.5	Settlement price

4.23.1.6. Table investor: Clients directory

Table 96. Fields of table investor

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code
calendar_spread_margin_type	i1	Margin type for client calendar spread, current value: • 3 - half nett • 4 - nett
num_clr_2delivery	i4	Number of clearing sessions before expiration to start expiration scenarios calculation.
exp_weight	d3.2	Expiration scenario weight, in total collateral.
go_ratio	d16.5	Total collateral ratio value.
no_fut_discount	i1	Discount on futures: • 1 - Discount prohibited • 0 - Discount allowed

4.23.1.7. Table dealer: Companies directory

Table 97. Fields of table dealer

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
client_code	c7	Client code

Field	Type	Description
margin_type	i1	Margin type, according to BF's sections, current value: • 3 - half nett • 4 - nett
calendar_spread_margin_type	i1	Margin type for calendar spreads, for BF portfolio, current value: • 3 - half nett • 4 - nett
check_limit_on_withdrawal	i1	Verify collateral sufficiency, for BF, upon funds depositing/withdrawal, current value: • 1 - Verify • 0 - Do not verify
limit_tied_money	i1	BF trading limit accordance with the BF's total funds amount (all sections): • 1 - maintain accordance • 0 - virtual (independent) limit. The value may change according to the profit/loss values only, resulting from the evening clearing session. Current value.
num_clr_2delivery	i4	Number of clearing sessions before expiration to start BF expiration scenarios calculation. Current value.
exp_weight	d3.2	Expiration scenario weight for BF, in total collateral. Current value.
go_ratio	d16.5	Total collateral ratio value, for BF. Current value.
no_fut_discount	i1	Discount on futures for BF portfolio, current value: • 1 - Discount prohibited • 0 - Discount allowed
num_clr_2delivery_client_default	i4	Number of clearing sessions before expiration to start clients expiration scenarios calculation (default value). Current value.
exp_weight_client_default	d3.2	Expiration scenario weight for clients, in total collateral (default value). Current value.
no_fut_discount_client_default	i1	Discount on futures for BF's clients, default value: • 1 - DIscount prohibited • 0 - DIscount allowed Current value.

4.23.1.8. Table common_params: Collateral calculation parameters

Table 98. Fields of table common_params

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
common_rev	i4	Revision number - surrogate key
edge_coeff	f	Marginal risk factor ratio

4.23.1.9. Table sys_events: Table of events

Table 99. Fields of table sys_events

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
event_type	i4	Type of the event

Field	Type	Description
event_id	i8	Unique ID of the event
sess_id	i4	Session number
message	c64	Description of the event
server_time	t	Server date and time

Notes:

- Possible types of events

  event_type = 1
  message = "session_data_ready"
  All data from the clearing system have been loaded into the trading system

  event_type = 6
  message = "extension_of_limits_finished"
  Limits have been extended

4.24. Stream FORTS_TNPENALTY_REPL - information about Transaction fees

4.24.1. Data scheme

Tables:

- fee_all - Information on the number of points accrued
- fee_tn - Detailed information on the number of incorrect transaction

4.24.1.1. Table fee_all: Information on the number of points accrued

Table 100. Fields of table fee_all

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
time	i8	Time value in 'YYYYMMddhhmmssSSS' format
p2login	c64	Login
sess_id	i4	Session number
points	i4	Number of points assessed for a second time from
fee	d16.2	Incorrect transaction fee at the time of time

4.24.1.2. Table fee_tn: Detailed information on the number of incorrect transaction

Table 101. Fields of table fee_tn

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
time	i8	Time value in 'YYYYMMddhhmmssSSS' format
p2login	c64	Login
sess_id	i4	Session number
tn_type	i4	Transaction type
err_code	i4	Error code
count	i4	Number of invalid transactions

4.25. Stream MOEX_RATES_REPL - online currency rates

4.25.1. Data scheme

Tables:

- curr_online - Currency values

4.25.1.1. Table curr_online: Currency values

Table 102. Fields of table curr_online

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
rate_id	i4	Payment currency identifier
value	d16.5	Current rate of payment
moment	t	Time calculation currency rate payment

4.26. Stream FORTS_FORECASTIM_REPL - Risk forecast after limits extension

4.26.1. Data scheme

Tables:

- part_sa_forecast - Free funds for SA volume forecast

4.26.1.1. Table part_sa_forecast: Free funds for SA volume forecast

Table 103. Fields of table part_sa_forecast

Field	Type	Description
replID	i8	Service field of the replication subsystem
replRev	i8	Service field of the replication subsystem
replAct	i8	Service field of the replication subsystem
settlement_account	c12	Settlement account
money_free	d26.2	Funds available
MarketDataRev	i8	Revision number (field 'replRev' value) of the most recent data change (for streams transmitting orders and trades data) included into risk parameters forecast. Orders and trades with the 'replRev' revision value less than field 'MarketDataRev' value will be included into the forecast. Orders and trades with the 'replRev' revision value greater than field 'MarketDataRev' value will NOT be included into the forecast. For more information about field 'replRev' see section 3.3.1. Service replication fields.

5. Commands description

5.1. Method FutAddOrder - Add order

Message type: 64

Reply message type: 101

Table 104. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
isin	c25		Instrument ID
client_code	c3		Client code
type	i4		Order type
dir	i4		Order direction
amount	i4		Amount
price	c17		Price
comment	c20	""	Order comment
broker_to	c20	""	RTS code of the company to whom the direct order is addressed
ext_id	i4	0	External ID
du	i4	0	Sign of asset management order
date_exp	c8	""	Order's expiration date
hedge	i4	0	Sign of hedging order
dont_check_money	i4	0	Whether to calculate client risks for given order
match_ref	c10	""	Identical text values entered by both trade parties to match negotiated orders

Table 105. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id	i8		Order's ID

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'type'*** field may contain the following values:

  1 quotation order (remains in queue after being partly matched)

  2 counter-order (removed after auction end)

  3 Fill-or-Kill order

- The ***'dir'*** field may contain the following values:

  1 buy order

  2 sell order

- The ***'price'*** field contains the order price as string: 'nnnnnnnnnn.mmmmm'.

- The ***'date_exp'*** field contains order expiration date as 'YYYYMMDD'. Empty string indicates a common order. If there is certain date set in the string, the order are automatically relisted in the next session with a new number and a new time, untill the date expires (multiday order). Orders with the expired date are removed automatically after the end of the evening session (if there is any on this day). When relisted, the orders are verified for instrument availability, client details and funds availability. Date may vary in the range from >= today to <= 1 year ahead.

- The ***'dont_check_money'*** order parameter may contain the following values:
  - 0 – verify collaterals for client section
  - 1 – do not verify collaterals for client section

  The parameter is eligible for using by a login with the sufficient rights. All other logins using this parameter will have their orders rejected.

5.2. Method FutAddMultiLegOrder - Add multileg order

Message type: 65

Reply message type: 129

Adds order on multileg instrument - calendar spread on futures

Table 106. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
sess_id	i4	0	Trading session ID
isin_id	i4		Multileg instrument ID
client_code	c3		Client code
type	i4		Order type
dir	i4		Order direction
amount	i4		Amount
price	c17		Price
rate_price	c17		Swap price
comment	c20	""	Order comment
hedge	i4	0	Sign of hedging order
broker_to	c20	""	RTS code of the company to whom the direct order is addressed
ext_id	i4	0	External ID
trust	i4	0	Sign of asset management order
date_exp	c8	""	Order's expiration date
trade_mode	i4		Order type
dont_check_money	i4	0	Whether to calculate client risks for given order
match_ref	c10	""	Identical text values entered by both trade parties to match negotiated orders

Table 107. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id	i8		Order's ID

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'type'*** field may contain the following values:

  1 quotation order (remains in queue after being partly matched)

  2 counter-order (removed after auction end)

  3 Fill-or-Kill order

- The ***'dir'*** field may contain the following values:

1 buy order

2 sell order

- The ***'price'*** ield contains the order price as string: 'nnnnnnnnnn.mmmmm'.
- The ***'date_exp'*** field contains order expiration date as 'YYYYMMDD'.
- The ***'trade_mode'*** field may contain the following values:

  1 Repo

  2 Regular multileg order

- The ***'sess_id'*** field must contain the session number. If the field contains 0, then the order will be placed at the current session.
- The ***'dont_check_money'*** parameter may contain the following values:
  - 0 – verify collaterals for client section
  - 1 – do not verify collaterals for client section

  The parameter is eligible for using by a login with the sufficient rights. All other logins using this parameter will have their orders rejected.

5.3. Method FutDelOrder - Cancel order

Message type: 37

Reply message type: 102

Table 108. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
order_id	i8		Order ID to remove

Table 109. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
amount	i4		Order's amount on deletion moment

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The return code = 14 (order is not found for removing) indicates that there is no such order in queue. Possible reasons: wrong order number, or the order has not been placed today. It does not make sense to continue sending removal requests for the same order number (may be useful for automatic systems).

5.4. Method FutDelUserOrders - Mass cancel order

Message type: 38

Reply message type: 103

Table 110. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
buy_sell	i4		Whether to cancel orders on their directions
non_system	i4		Whether to cancel orders on their non-system sign

Name	Type	Default value	Description
code	c3		Client code
code_vcb	c25		Underlying asset code
ext_id	i4	0	External ID
isin	c25	""	Instrument ID

Table 111. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
num_orders	i4		Number of cancelled orders

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'buy_sell'*** parameter may contain the following values:

  1 Buy orders

  2 Sell orders

  3 All orders

- The ***'non_system'*** parameter may contain the following values:

  0 Common orders

  1 Non-system orders

  2 All orders

- If the ***'code'*** parameter is not set or is '%%%', then all orders for all clients' accounts are removed.
- If the ***'code_vcb'*** parameter is not set or is '%', then all orders for all contracts are removed.
- If the ***'ext_id'*** parameter value is not 0, then all orders with the corresponding ***'ext_id'***are removed. All other parameters values are ignored (the values must fit the appropriate range).
- This command cannot be used to remove orders for multi-leg instruments.

5.5. Method FutMoveOrder - Modify order

Message type: 39

Reply message type: 105

Table 112. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
regime	i4		Mode
order_id1	i8		ID of the 1st order to remove
amount1	i4	0	New amount for the 1st order
price1	c17	"0"	New price for the 1st order
ext_id1	i4	0	New external ID for the 1st order
order_id2	i8	0	ID of the 2nd order to remove
amount2	i4	0	New amount for the 2nd order
price2	c17	"0"	New price for the 2nd order
ext_id2	i4	0	New external ID for the 2nd order

Table 113. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id1	i8		New ID of the 1st modified order
order_id2	i8		New ID of the 2nd modified order

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'regime'*** parameter defines the command work mode. It may contain the following values:

  0 Do not change volumes of orders. The current volume of orders remains unchanged, the newly sent volumes are ignored.

  1 Change volumes of orders. If there is any order found, it will be replaced with the new order with new price and volume.

  2 Remove old orders. If any order volume does not coincide with the newly sent one, both orders are removed. Otherwise, the orders will be shifted.

  3 Set orders volumes to that of received, excluding the matched part (not less than 0). If the volume received is less than the volume of the matched part, both orders will be removed.

- All new orders will be auctioned.
- Orders can be shifted only within the same trading instrument and only within the same client register.
- Orders are not shifted by multy-legs.
- Negotiated orders are not shifted.
- When shifting, the direction of order is not changed.
- Once an order has been removed (or shifted, or fully matched), it is not relisted, and the error message appears.
- If one order of a pair cannot be shifted, then another order is not shifted, too, and the error message appears.
- If two orders with opposite directions are shifted in the way their prices coincide, then the parameters are considered as incorrect, shifting is not performed, and the error message appears.
- If, when shifting a pair of orders, one order meets a cross-trade (matching an order sent from either the same VATIN or the same clien register), than it is rejected, and another order of the pair is shifted.
- Upon moving orders, the ***'date_exp'*** parameters are transferred into new orders.
- After the command has been processed, the ***'order_id1'*** field and ***'order_id2'*** field are filled with new orders numbers. If no order has been placed, the corresponding field is set to 0.

5.6. Method OptAddOrder - Add order

Message type: 66

Reply message type: 109

Table 114. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
isin	c25		Instrument ID
client_code	c3		Client code
type	i4		Order type
dir	i4		Order direction
amount	i4		Amount

Name	Type	Default value	Description
price	c17		Price
comment	c20	""	Order comment
broker_to	c20	""	RTS code of the company to whom the direct order is addressed
ext_id	i4	0	External ID
du	i4	0	Sign of asset management order
check_limit	i4	0	Flag of checking price limits
date_exp	c8	""	Order's expiration date
hedge	i4	0	Sign of hedging order
dont_check_money	i4	0	Whether to calculate client risks for given order
match_ref	c10	""	Identical text values entered by both trade parties to match negotiated orders

Table 115. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id	i8		Order's ID

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'type'*** field may contain the following values:

  1 Quotation order (remains in queue after being partly matched)

  2 Counter-order (removed after auction end)

  3 Fill-or-Kill order

- The ***'dir'*** field may contain the following values:

  1 buy order

  2 sell order

- The ***'price'*** field contains the order price as string: 'nnnnnnnnnn.mmmmm'.

- The ***'check_limit'*** field may contain the following values:

  0 Do not verify limits

  1 Verify limits

- The ***'date_exp'*** ield contains order expiration date as 'YYYYMMDD'. Empty string indicates a common order. If there is certain date set in the string, the order are automatically relisted in the next session with a new number and a new time, untill the date expires (multiday order). Orders with the expired date are removed automatically after the end of the evening session (if there is any on this day). When relisted, the orders are verified for instrument availability, client details and funds availability. Date may vary in the range from >= today to <= 1 year ahead.

- The ***'dont_check_money'***order parameter may contain the following values:

  - 0 – verify collaterals for client section

  - 1 – do not verify collaterals for client section

  The parameter is eligible for using by a login with the sufficient rights. All other logins using this parameter will have their orders rejected.

5.7. Method OptDelOrder - Cancel order

Message type: 42

Reply message type: 110

Table 116. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
order_id	i8		Order ID to remove

Table 117. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
amount	i4		Order's amount on deletion moment

Return codes:

0 operation completed successfully

Any other value error

5.8. Method OptDelUserOrders - Mass cancel order

Message type: 43

Reply message type: 111

Table 118. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
buy_sell	i4		Whether to cancel orders on their directions
non_system	i4		Whether to cancel orders on their non-system sign
code	c3		Client code
code_vcb	c25		Contract code
ext_id	i4	0	External ID
isin	c25	""	Instrument ID

Table 119. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
num_orders	i4		Number of cancelled orders

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'buy_sell'*** parameter may contain the following values:

  1 Buy orders

  2 Sell orders

  3 All orders

- The ***'non_systemm'*** parameter may contain the following values:

  0 Common orders

  1 Non-system orders

2 All orders

- If the ***'code'*** parameter is not set or is '%%%', then all orders for all clients' accounts are removed.
- If the ***'code_vcb'*** parameter is not set or is '%', then all orders for all contracts are removed.
- If the ***'ext_id'*** parameter value is not 0, then all orders with the corresponding ***'ext_id'***are removed. All other parameters values are ignored (the values must fit the appropriate range).

5.9. Method OptMoveOrder - Modify order

Message type: 44

Reply message type: 113

Table 120. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
regime	i4		Mode
order_id1	i8		ID of the 1st order to remove
amount1	i4	0	New amount for the 1st order
price1	c17	"0"	New price for the 1st order
ext_id1	i4	0	New external ID for the 1st order
check_limit	i4	0	Flag of checking limits
order_id2	i8	0	ID of the 2nd order to remove
amount2	i4	0	New amount for the 2nd order
price2	c17	"0"	New price for the 2nd order
ext_id2	i4	0	New external ID for the 2nd order

Table 121. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id1	i8		New ID of the 1st modified order
order_id2	i8		New ID of the 2nd modified order

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'regime'*** parameter defines the command work mode. It may contain the following values:

  0 Do not change volumes of orders. The current volume of orders remains unchanged, the newly sent volumes are ignored.

  1 Change volumes of orders. If there is any order found, it will be replaced with the new order with new price and volume.

  2 Remove old orders. If any order volume does not coincide with the newly sent one, both orders are removed. Otherwise, the orders will be shifted.

  3 Set orders volumes to that of received, excluding the matched part (not less than 0). If the volume received is less than the volume of the matched part, both orders will be removed.

- The ***'check_limit'*** may contain the following values:

  0 Do not verify limits

  1 Verify limits

- All new orders will be auctioned.

- Orders can be shifted only within the same trading instrument and only within the same client register.
- Orders are not shifted by multy-legs.
- Negotiated orders are not shifted.
- When shifting, the direction of order is not changed.
- Once an order has been removed (or shifted, or fully matched), it is not relisted, and the error message appears.
- If one order of a pair cannot be shifted, then another order is not shifted, too, and the error message appears.
- If two orders with opposite directions are shifted in the way their prices coincide, then the parameters are considered as incorrect, shifting is not performed, and the error message appears.
- If, when shifting a pair of orders, one order meets a cross-trade (matching an order sent from either the same VATIN or the same clien register), than it is rejected, and another order of the pair is shifted.
- Upon moving orders, the ***'date_exp'*** parameters are transferred into new orders.
- After the command has been processed, the ***'order_id1'*** and ***'order_id2'*** field are filled with new orders numbers. If no order has been placed, the corresponding field is set to 0.

5.10. Method FutChangeClientMoney - Change client limits

Message type: 67

Reply message type: 104

The command allows to change funds limits for a client's account.

Table 122. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code	c3		Client code
limit_money	c17	"0"	Funds limit
limit_pledge	c17	"0"	Not used. To be removed in SPECTRA version 6.1.
coeff_liquidity	c17	"0"	Not used. To be removed in SPECTRA version 6.1.
coeff_go	c17	"1"	Clients collateral ratio
is_auto_update_limit	i4	-1	Flag of automatic adjustment of the limit by the amount of income after clearing
no_fut_discount	i4	0	Flag of prohibition to provide discounts for futures
check_limit	i4	0	Funds sufficiency verification flag

Table 123. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Command work mode (the ***'mode'*** field):

  9 Remove limits for roubles and collaterals (starting from SPECTRA v. 3.10, identical to mode **11**)

  10 Remove limit for collaterals

  11 Remove limits for roubles and collaterals (starting from SPECTRA v. 3.10, identical to mode **9**)

  12 Set limits for roubles, collaterals

13 Change limits for funds and collaterals

- ***coeff_go*** – an additional coefficient the total client collaterals are multiplied by upon placing an order. Upon verification for funds sufficiency, this coefficient is also included in calculation.
- The ***is_auto_update_limit*** flag, being set to '1', allows to automatize the limit changing process in accordance with the previous day results. Also, '-1' value must be set for operations in the '12' and '13' modes. If there have been any change made to other parameters, the 'is_auto_update_limit' parameter must remain unchanged.
- To change parameters ***coeff_liquidity*** and/or ***coeff_go*** and/or ***is_auto_update_limit*** , the mode '13' must be used. The ***'limit_money'*** parameter value must be set to '0'.
- In the ***no_fut_discount*** parameter the following values can be set:

  0 Use collaterals discount for futures

  1 Do not use collaterals discount for futures

- The following values are set in the ***check_limit*** parameter:

  0 Do not verify funds sufficiency. Change limit unconditionally.

  1 Verify funds sufficiency. Do not change limit if there are insufficient funds

- For the field type 'c17', it is possible to specify empty string in order to prevent changing the parameter (limits, collaterals, etc.) value, which had been sent into the trading system before.
- For the field type 'i4', it is possible to specify '-1' in order to prevent changing the parameter value, which had been sent into the trading system before.

5.11. Method FutChangeBFMoney - Change brokerage firm limits

Message type: 7

Reply message type: 107

The command allows to change amounts of money in your brokerage firms' accounts. Once the account size increases, the required amount of money is transferred from the clearing firm's account. When you decrease the account size, the required amount of money is deposited back to the clearing firm's account.

Table 124. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code	c2		Brokerage firm code
limit_money	c17	"0"	Funds limit
limit_pledge	c17	"0"	Collateral limit

Table 125. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Comand work mode (the ***'mode'***field):

  12 Set limits equal to***limit_money*** and***limit_pledge***

  13 Change limits***limit_money*** and***limit_pledge***

- To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trade administrator.

5.12. Method OptChangeExpiration - Add order for expiration of options

Message type: 12

Reply message type: 112

Table 126. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
order_id	i4		ID of the order for expiration
code	c3		Client code
isin	c25		Instrument ID
amount	i4	0	Volume of expiration

Table 127. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
order_id	i4		Unique order ID

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Command work mode (the ***'mode'*** field):

  11 Remove

  12 Paste/Refresh

- The key fields for expiration orders are: ***'isin'*** and ***'code'***.
- When executing 'Delete' or 'Update', it is allowed to set:
  - rather 'order_id' (in this case, ***code*** and ***isin*** are not used for searching)
  - or code and isin (only if***order_id*** is not set or equal to 0)
- Upon placing a new order, set***order_id***=0. This will show the necessity for placing a new order instead of editing the previously placed one.

5.13. Method FutChangeClientProhibit - Modify client's restrictions for futures

Message type: 15

Reply message type: 115

Table 128. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code	c3		Code of the client's account or '%%%' – for all
code_vcb	c25		Code of the underlying asset or '%' - for all
isin	c25		Futures or '%' - for all
state	i4	0	Restriction
state_mask	i4	3	Mask for parameter 'state'

Table 129. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- The ***'mode'*** field specifies the command work mode:

  11 remove

  12 set

- The ***'state'*** field may contain the following values:

  0 no prohibitions applied

  1 prohibited to open positions

  2 prohibited to place any order

  3 prohibited to open sell positions

- The 'state_mask' parameter values are defined by the bit mask. At the moment, the parameter value must be '3'.
- When setting a certain instrument in the ***'isin'*** field, the code of the corresponding underlying asset must be set in the ***'code_vcb'*** field.

5.14. Method OptChangeClientProhibit - Modify client's restrictions for options

Message type: 17

Reply message type: 117

Table 130. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code	c3		Code of the client’s account or '%%%' – for all
code_vcb	c25		Code of the underlying asset or '%' - for all
isin	c25		Futures or '%' - for all
state	i4	0	Restriction
state_mask	i4	8	Mask for parameter 'state'

Table 131. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Command work mode (the ***'mode'*** field):

11 remove

12 set

- The ***'state'*** field is a bit mask
  - The first two bits define the numerical value:

    0 no prohibitions applied

    1 prohibited to open positions

    2 prohibited to place any order

    3 prohibited to open sell positions
  - 4 – reserved
  - 8 – broker's prohibition for placing expiration orders
- Status bit mask. Defines the bits of the ***'state'*** field which values are to be changed upon the command execution. At the moment, the parameter value must be '0x0F'.
- Limits for futures and options are applied independently.

5.15. Method FutExchangeBFMoney - Tranfer funds within brokerage firm

Message type: 35

Reply message type: 130

The command allows to transfer funds between two BF belonging to the same CF.

Table 132. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code_from	c2		Source account code
code_to	c2		Destination account code
amount_money	c17		Amount of collateral to transfer in roubles
amount_pledge	c17		Amount of collateral to transfer in securities/currency

Table 133. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Command work mode (the ***'mode'*** field):

  1 Transfer only at trading

  3 Transfer at trading and clearing
- At the moment, the system supports only funds transfer. Collaterals transfer is not yet supported, therefore, the 'amount_pledge' field must contain 0.

5.16. Method OptRecalcCS - Recalculate central strike request

Message type: 45

Reply message type: 132

The command allows to recalculate the central strike in accordance with the market-maker's obligations (for which the "Offset by demand" recalculation option is selected). Developed for market-makers.

Table 134. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
isin_id	i4		Base instrument ID

Table 135. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

5.17. Method FutTransferClientPosition - Transfer futures client position

Message type: 61

Reply message type: 137

The command allows to transfer futures positions between your brokerage firms' accounts.

Table 136. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
code_from	c7		Donor code
code_to	c7		Recipient code
isin	c25		Instrument ID
amount	i4		Amount of position to transfer

Table 137. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trading administrator.

5.18. Method OptTransferClientPosition - Transfer options client position

Message type: 62

Reply message type: 138

The command allows to transfer options positions between your brokerage firms' accounts.

Table 138. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code

Name	Type	Default value	Description
code_from	c7		Donor code
code_to	c7		Recipient code
isin	c25		Instrument ID
amount	i4		Amount of position to transfer

Table 139. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trade administrator.

5.19. Method OptChangeRiskParameters - Risk parameters settings for options

Message type: 69

Reply message type: 140

The command allows to change risk parameters of options.

Table 140. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
client_code	c3		Client code
num_clr_2delivery	i4	0	Number of clearing sessions (including intraday clearing sessions) to turn on automatic exercise scenario of risk calculation for the non-quarterly series of options with the closest expiration date for this account
use_broker_num_clr_2delivery	i1	0	Use broker num_clr_2delivery
exp_weight	c4	0	Expiration Risk Weight
use_broker_exp_weight	i1	0	Use broker exp_weight

Table 141. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trade administrator.

5.20. Method FutTransferRisk - Risk transfer

Message type: 68

Reply message type: 139

The command allows to transfer risk between trading systems.

Table 142. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
code_from	c7		Trading account code
isin	c25		Instrument ID
amount	i4		Amount of position to transfer

Table 143. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text
deal_id1	i8		Deal ID in Futures market
deal_id2	i8		Deal ID in FX market

Return codes:

0 operation completed successfully

Any other value error

Notes:

To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trade administrator.

5.21. Method FutChangeBFParameters - Change BF's parameters by a clearing participant

Message type: 95

Reply message type: 162

The command allows a Clearing participant to change BF's parameters. Please note that the Clearing participant must belong to a Clearing Firm to use the command. All changes made will be applied during the evening clearing session.

Table 144. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
code_bf	c2		BF code
margin_type	i4		Margin type, according to BF's sections: • 3 - half nett • 4 - nett
calendar_spread_margin_type	i4		Margin type for calendar spreads, for BF portfolio: • 3 - half nett • 4 - nett
num_clr_2delivery	i4		Number of clearing sessions before expiration to start BF expiration scenarios calculation.
exp_weight	c17		Expiration scenario weight for BF, in total collateral.
go_ratio	c17		RESERVED FOR FUTURE USAGE. May be omitted while sending commands. Any value entered will be ignored by Trading System.
check_limit_on_withdrawal	i4		Verify collateral sufficiency, for BF, upon funds depositing/withdrawal: • 1 - Verify • 0 - Do not verify

Name	Type	Default value	Description
limit_tied_to_money	i4		BF trading limit accordance with the BF's total funds amount (all sections): • 1 - maintain accordance • 0 - virtual (independent) limit.
check_limit_for_orders	i4		Verification of collateral sufficiency upon adding orders, for BF: • 1 - Verify • 0 - Do not verify
no_fut_discount	i4		Discount on futures for BF portfolio: • 1 - Discount prohibited • 0 - Discount allowed

Table 145. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- For the field type 'c17', it is possible to specify empty string in order to prevent changing the parameter value, which had been sent into the trading system before.
- For the field type 'i4', it is possible to specify '-1' in order to prevent changing the parameter value, which had been sent into the trading system before.

5.22. Method FutChangeClientParameters - Change parameters of client sections

Message type: 96

Reply message type: 163

The command allows to change parameters for client sections by a Clearing participant. Please note that the Clearing participant must belong to a Brokerage Firm/Clearing Firm to use the command. All changes made will be applied during the evening clearing session.

Table 146. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
code	c3		Client code
calendar_spread_margin_type	i4		Margin type for calendar spreads, for client: • 3 - half nett • 4 - nett

Table 147. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

5.23. Method FutChangeBFClientDefaultParameters - Change default parameters of client sections

Message type: 402

Reply message type: 602

The command allows to change default parameters for client sections of a single BF. Please note that the login must belong to a Brokerage Firm/Clearing Firm to use the command. All changes made will be applied during the evening clearing session.

Table 148. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
code_bf	c2		BF code
num_clr_2delivery_client_default	i4	0	Number of clearing sessions before expiration to start clients expiration scenarios calculation.
exp_weight_client_default	c17	0	Expiration scenario weight for client, in total collateral.
no_fut_discount_client_default	i4	0	Discount on futures for client section portfolios: • 1 - Discount prohibited • 0 - Discount allowed

Table 149. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- For the field type 'c17', it is possible to specify empty string in order to prevent changing the parameter value, which had been sent into the trading system before.
- For the field type 'i4', it is possible to specify '-1' in order to prevent changing the parameter value, which had been sent into the trading system before.

5.24. Method FutChangeBFLimit - Change BF trading limits

Message type: 94

Reply message type: 161

The command allows to change BF trading limits

Table 150. Input parameters

Name	Type	Default value	Description
broker_code	c4	""	Brokerage Firm code
mode	i4		Mode
code	c2		Brokerage firm code
limit_money	c17		Funds limit
check_limit	i4		Verify BF funds sufficiency

Table 151. Execution result

Name	Type	Default value	Description
code	i4		Return code
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Notes:

- Command work mode (the ***'mode'*** field):

  12 Set limits value to that of ***limit_money***

  13 Change limits value to that of ***limit_money***

- The following values are set in the ***check_limit*** parameter:

  0 Do not verify

  1 Verify

5.25. Method CODHeartbeat - Heartbeat message for Cancel on Disconnect Service

Message type: 10000

The heartbeat message informs the client connection monitoring service that this client login is active.

Table 152. Input parameters

Name	Type	Default value	Description
seq_number	i4	0	Sequence number of heartbeat (currently not used)

A client of COD (Cancel on Disconnect) service is should send heartbeat messages to the trading system not less than once per 10 second. If the user stays inactive (sends no messages to the trading system) within 20 seconds, all their orders will be automatically cancelled.

Note:

Only the COD service clients are obliged to send heartbeat messages.

The monitoring service does not send any replies on heartbeat messages. Please set flag value to '0' (no reply expected) when calling the heartbeat message sending function (cg_pub_post(pub, msgptr, 0).

Calling function 'cg_pub_post' with flag 'CG_PUB_NEEDREPLY' for sending heartbeat messages will cause a notification error 'CG_MSG_P2MQ_TIMEOUT'.

Plaza-2 data types

Plaza-2	C++	ODBC	Details
u1	UINT8	SMALLINT	Integer, size: 1 byte
u2	UINT16	INTEGER	Integer, size: 2 bytes
u4	UINT32	NUMERIC,10	Integer, size: 4 bytes
u8	UINT64	NUMERIC,20	Integer, size: 8 bytes
i1	INT8	SMALLINT	Integer with sign, size: 1 byte
i2	INT16	SMALLINT	Integer with sign, size: 2 bytes
i4	INT32	INTEGER	Integer with sign, size: 4 bytes
i8	INT64	BIGINT	Integer, size: 8 bytes
a	CHAR	VARCHAR	Symbol string, size: 1 byte.
cN	CHAR[N+1]	VARCHAR,N	Symbol string, ended with zero.
dN.M sN.M	P2BCDII	NUMERIC,N,M	Fixed-point decimal number coded in binary system, where: • N is the whole quantity of digits • M is quantity of digits in the fractional part
t	P2TIME	TIMESTAMP	Date and time.
f	DOUBLE	REAL	Double-precision number with flowing point, size: 8 bytes.
bN		VARBINARY,N	Data unit.
zN		VARBINARY,N	Data unit., where the buffer lenght is set by the first 4 bytes.

List of return codes

Return code	Description
-1	Error performing operation.
0	Operation successful.
1	User not found.
2	Brokerage Firm code not found.
3	Session inactive.
4	Session halted.
5	Error performing operation.
6	Insufficient rights to perform operation.
7	Wrong account. Cannot perform operation.
8	Insufficient rights to perform order deletion.
9	Operations with orders are blocked for the firm by the Clearing Centre.
10	Insufficient funds to reserve.
12	Options premium exceeds the limit allowed.
13	Total amount of positions exceeds the market limit.
14	Order not found.
25	Unable to add order: prohibited by the Trading Administrator.
26	Unable to open position: prohibited by Trading Administrator.
27	Unable to open short position: prohibited by Trading Administrator.
28	Unable to perform operation: insufficient rights.
31	Matching order for the same account/ITN is not allowed.
32	Trade price exceeds the limit allowed.
33	Operations with orders are blocked for this firm by the Clearing Administrator.
34	Cannot perform operation: wrong client code.
35	Invalid input parameters.
36	Cannot perform operation: wrong underlying.
37	Multi-leg orders cannot be moved.
38	Negotiated orders cannot be moved.
39	Price is not a multiple of the tick size.
40	Unable to add Negotiated order: counterparty not found.
41	User's trading rights have expired or are not valid yet.
42	Operations are prohibited by Chief Trader of Clearing Firm.
44	Clearing Firm's Chief Trader flag not found for this firm.
45	Unable to add Negotiated orders: no RTS code found for this firm.
46	Only Negotiated orders are allowed for this security.
47	There was no trading in this security during the session specified.
48	This security is being delivered. Only Negotiated orders from all Brokerage Firms within the same Clearing Firm are allowed.
49	Unable to add Negotiated order: a firm code must be specified.
50	Order not found.
53	Error setting input parameter: amount too large.
54	Unable to perform operation: exceeded operations quota for this client.
56	Unable to perform operations using this login/code pair: insufficient rights. Please contact the Trading Administrator.
57	Unable to connect to the Exchange server: insufficient rights. Please contact the Trading Administrator.
58	Unable to add orders without verifying client funds sufficiency: insufficient rights.
60	Auction halted for all risk-netting instruments.
61	Trading halted in all risk-netting instruments.
62	Trading halted on the MOEX Derivatives Market.

Return code	Description
63	Auction halted in all risk-netting instruments with this underlying.
64	Trading halted in all risk-netting instruments with this underlying.
65	Trading halted on all boards in all securities with this underlying.
66	Trading halted in this risk-netting instrument.
67	Unable to open positions in this risk-netting instrument: prohibited by the Trading Administrator.
68	Unable to add orders for all risk-netting instruments: prohibited by the Brokerage Firm.
69	Unable to add orders for all risk-netting instruments: prohibited by the Chief Trader.
70	Trading operation is not supported.
71	Position size exceeds the allowable limit.
72	Order is being moved.
73	Aggregated buy order quantity exceeds the allowable limit.
74	Aggregated sell order quantity exceeds the allowable limit.
75	Non-trading operation was unsuccessful due to timeout.
200	Collateral calculation parameters are being changed by the Trading Administrator.
201	Collateral calculation parameters are being changed by the Trading Administrator.
202	Collateral calculation parameters are being changed by the Trading Administrator.
203	Collateral calculation parameters are being changed by the Trading Administrator.
204	Collateral calculation parameters are being changed by the Trading Administrator.
205	Collateral calculation parameters are being changed by the Trading Administrator.
206	Collateral calculation parameters are being changed by the Trading Administrator.
207	Collateral calculation parameters are being changed by the Trading Administrator.
208	Collateral calculation parameters are being changed by the Trading Administrator.
310	Unable to add order: prohibited by Clearing Administrator.
311	Unable to open position: prohibited by Clearing Administrator.
312	Unable to open short position: prohibited by Clearing Administrator.
314	Unable to add orders in the client account: prohibited by the Trader.
315	Unable to open position in the client account: prohibited by the Trader.
316	Unable to open short position in the client account: prohibited by the Trader.
317	Amount of buy/sell orders exceeds the limit allowed.
318	Unable to add order for the client account: client does not have a deposit account for settlement of Money Market securities. Prohibited by Clearing Administrator.
320	Amount of active orders exceeds the limit allowed for the client account for this security.
331	Insufficient funds in the Settlement Account.
332	Insufficient client funds.
333	Insufficient Brokerage Firm funds.
334	Insufficient Clearing Firm funds.
335	Unable to buy: amount of securities exceeds the limit set for the client.
336	Unable to buy: amount of securities exceeds the limit set for the Brokerage Firm.
337	Unable to sell: amount of securities exceeds the limit set for the client.
338	Unable to sell: amount of securities exceeds the limit set for the Brokerage Firm.
339	Collateral recalculation in progress.
380	Trading restricted while intraday clearing is in progress.
381	Trading restricted while intraday clearing is in progress: cannot delete orders.
382	Trading restricted while intraday clearing is in progress: cannot move orders.
383	Non-trading operations restricted while intraday clearing is in progress.
680	Insufficient client funds.
681	Insufficient Clearing Firm funds.
4000	Invalid input parameters.

Return code	Description
4001	Unable to perform operation: insufficient rights.
4002	Unable to change trading limit for the client: no active trading sessions.
4004	Unable to change trading limit for the client: client code not found.
4005	Unable to change the trading limit for the client: insufficient funds.
4006	Unable to set trading limit for the client: error performing operation.
4007	Unable to set trading limit for the client: error performing operation.
4008	Unable to set trading limit for the client: error performing operation.
4009	Unable to set trading limit for the client: error performing operation.
4010	Unable to set trading limit for the client: error performing operation.
4011	Unable to set trading limit for the client: error performing operation.
4012	Unable to set trading limit for the client: error performing operation.
4013	Unable to set trading limit for the client: error performing operation.
4014	Unable to change parameters: no active trading sessions.
4015	Unable to change parameters: client code not found.
4016	Unable to change parameters: underlying's code not found.
4017	Unable to set trading limit for the client: amount too large.
4018	Collateral calculation parameters are being changed by the Trading Administrator.
4021	Unable to set requested amount of pledged funds for Clearing Firm: insufficient amount of free funds.
4022	Unable to set requested amount of funds for Clearing Firm: insufficient amount of free funds.
4023	Unable to change trading limit for the Brokerage Firm: no active trading sessions.
4024	Unable to change trading limit for the Brokerage Firm: the Brokerage Firm is not registered for trading.
4025	Unable to set requested amount of pledged funds for the Brokerage Firm: insufficient amount of free funds in the Clearing Firm.
4026	Unable to set requested amount of funds for the Brokerage Firm: insufficient amount of free funds in the balance of the Separate Account.
4027	Unable to set requested amount of pledged funds for the Clearing Firm: insufficient amount of pledged funds in the balance of the Separate Account.
4028	Unable to set requested amount of funds for the Brokerage Firm: insufficient amount of free funds in the Clearing Firm.
4030	Unable to change parameters for the Brokerage Firm: no active sessions.
4031	Unable to change parameters for the Brokerage Firm: Brokerage Firm code not found.
4032	Unable to change parameters for the Brokerage Firm: underlying's code not found.
4033	Unable to change parameters for the Brokerage Firm: insufficient rights to trade this underlying.
4034	Transfer of pledged funds from the Separate account is prohibited.
4035	Transfer of collateral is prohibited.
4040	Unable to change Brokerage Firm limit on risk-netting: no active sessions.
4041	Unable to change Brokerage Firm limit on risk-netting: Brokerage Firm is not registered for trading.
4042	Unable to change Brokerage Firm limit on risk-netting: Brokerage Firm code not found.
4043	Unable to change Brokerage Firm limit on risk-netting: error performing operation.
4044	Unable to change Brokerage Firm limit on risk-netting: error performing operation.
4045	Unable to delete Brokerage Firm limit on risk-netting: error performing operation.
4046	Unable to remove Chief Trader's restriction on trading in risk-netting instruments: insufficient rights.
4050	Unable to process the exercise request: restricted by the Chief Trader.
4051	Unable to process the exercise request: restricted by the Brokerage Firm.
4052	Unable to process the exercise request: wrong client code and/or security.
4053	Unable to process the exercise request: cannot delete orders during the intraday clearing session.
4054	Unable to process the exercise request: cannot change orders during the intraday clearing session.
4055	Unable to process the exercise request: order number not found.
4060	Unable to process the exercise request: insufficient rights.
4061	Unable to process the exercise request: deadline for submitting requests has passed.

Return code	Description
4062	Unable to process the exercise request: client code not found.
4063	Unable to process the exercise request: request not found.
4064	Unable to process the exercise request: insufficient rights.
4065	Unable to process the exercise request: option contract not found.
4066	Unable to process the exercise request: request to disable automatic exercise may only be submitted on the option's expiration date.
4067	Unable to process the exercise request: error performing operation.
4068	Unable to process the exercise request: error performing operation.
4069	Unable to process the exercise request: error performing operation.
4070	Unable to process the exercise request: insufficient amount of positions in the client account.
4090	No active sessions.
4091	Client code not found.
4092	Underlying's code not found.
4093	Futures contract not found.
4094	Futures contract does not match the selected underlying.
4095	Partial selection of futures contracts not accepted: underlying flag set 'For all'.
4096	Unable to remove restriction: no restriction set.
4097	Unable to remove: the Chief Trader's restriction cannot be removed by Brokerage Firm trader.
4098	Security not found in the current trading session.
4099	Both securities must have the same underlying.
4100	Exercise date of the near leg of a multi-leg order must not be later than that of the far leg.
4101	Unable to make a multi-leg order: lots are different.
4102	No position to move.
4103	The FOK order has not been fully matched.
4104	Anonymous repo order must contain a repo type.
4105	Order containing a repo type is restricted in this multi-leg order.
4106	Multi-leg orders can be added only on the Money Market.
4107	This procedure is not eligible for adding orders for multi-leg securities.
4108	Unable to trade risk-netting instruments in T0: insufficient rights.
4109	Rate/swap price is not a multiple of the tick size.
4110	The near leg price differs from the settlement price.
4111	The rate/swap price exceeds the limit allowed.
4112	Unable to set restrictions for multi-leg futures.
4115	Unable to transfer funds between Brokerage Firm accounts: no active sessions.
4116	Unable to transfer funds between Brokerage Firm accounts: the donor Brokerage Firm is not registered for trading.
4117	Unable to transfer funds between Brokerage Firms: the receiving Brokerage Firm is not registered for trading.
4118	Broker Firm does not have sufficient amount of free funds.
4119	Brokerage Firm does not have sufficient amount of collateral.
4120	Insufficient amount of free funds in the balance of the Separate account.
4121	Insufficient amount of collateral in the balance of the Separate Account.
4122	Clearing Firm does not have sufficient amount of free funds.
4123	Brokerage Firm does not have sufficient amount of collateral.
4124	Brokerage Firm code not found.
4125	Unable to transfer funds between accounts of different Clearing Firms.
4126	Unable to transfer: error while transferring.
4127	Insufficient free funds in the Settlement Account.
4128	Brokerage firm does not have sufficient amount of free funds.
4129	Insufficient amount of free funds in the balance of the Separate Account.

Return code	Description
4130	Clearing Firm does not have sufficient amount of free funds.
4131	Brokerage Firm code not found.
4132	Unable to withdraw: error in withdrawal logic.
4133	No requests to cancel.
4134	Brokerage Firm does not have sufficient amount of funds.
4135	Clearing firm does not have sufficient amount of funds.
4136	Prohibited to transfer pledged funds.
4137	Brokerage Firm does not have sufficient amount of pledged funds.
4138	Insufficient funds to withdraw from the Settlement Account.
4139	Insufficient free collateral in the Settlement Account.
4140	Unable to transfer: position not found.
4141	Unable to transfer: insufficient number of open positions.
4142	Cannot transfer positions from the client account to an account with a different ITN.
4143	Unable to transfer position: the Brokerage Firms specified belong to different Clearing Firms.
4144	Cannot transfer positions to 'XXYY000' Brokerage Firm account.
4145	Unable to transfer positions for the selected Brokerage Firm: restricted by the Trading Administrator.
4146	Transferring positions in the selected securities is prohibited.
4147	Option contract not found.
4148	Settlement Account does not have sufficient amount of pledged funds.
4149	Settlement Account does not have sufficient amount of funds.
4150	Unable to balance risk using specified futures instrument.
4151	Specified FX Market Firm code not found.
4152	Specified FX Market Settlement Account not found.
4153	Specified FX Market financial instrument not found.
4154	Unable to add request for FX Market: the required parameters are not registered in the system.
4155	Required Administrator login for adding a risk balancing request is not registered in the system.
4160	Funds transfer between settlement accounts is prohibited. Settlement account is included in the Unified Collateral Pool.
4161	Withdrawal is prohibited. Settlement account is included in the Unified Collateral Pool.
4162	Unable to perform operation. The Brokerage Firms must be of the same Settlement account.
4163	Unable to perform operation. To transfer funds for Brokerage Firm with virtual limit, you are required to apply to NCC.
4164	Unable to perform operation. It is prohibited to change settings for client accounts.
4165	Unable to perform operation. Only Clearing Firm logins are able to perform the operation.
4166	Incorrect combination of flag values.
9999	Too many transactions sent from this login.
10000	System level error while processing message.
10001	Undefined message type.
10004	Invalid message type.
10005	MQ address is too large
10006	Error parsing message.