FORTS Plaza-2 gate

build
18.01.2013

Table of Contents

Introduction

Document purpose

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

- The FORTS system general overview, including overview of trading instruments, trading participants, trading operations, risk management, limiting of operations, specifics of trading on the RTS Standard and RTS Money markets etc.
- Configuration, installation and setup of the FORTS 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 FORTS 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.

Target group

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

FORTS system overview

Trading participants

Trading participants are:

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

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 settlements on complete trades directly with RTS;
- 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 Federal Financial Markets Service of Russia;
- Pay fees to Insurance fund;
- Provide collaterals for their own trades and for their clients' trades.

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.

Clients

Any physical or corporate person can participate in the FORTS market as a client on the authority of trading service agreement signed with a brokerage firm or with clearing firm directly. VAT identification number and passport number are required, in accordance with Russian Federation legislation, as a measure to prevent cross trades (trades where the same person represents both seller and byer).

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

Disclosure of data on participants

The list of clearing and brokerage firms is stored in the 'diler' table of the 'FORTS_FUTINFO_REPL' stream, and the list of clients is stored in the 'investr' 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.

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 FORTS when sending any message. Applications which use the client or the brokerage firm account are exempt from this rule.

Instruments

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

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;
  - The asset delivery by opening a position in the spot-market;
  - 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;
  - USD — when cost of price step is indicated in Russian roubles. The cost is converted into USD at the opening according to the exchange rate issued by the Central Bank of Russia. Cost of price step is also a subject to change upon every opening.
  - USR — when cost of price step is indicated in Russian roubles. The cost is converted into USD by using a special RTS method of convertion (for details, see http://fs.rts.ru/files/5307). 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.

Futures

Futures contracts are the main trading instruments in the FORTS 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. 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 typically quoted in price points; however, the future contracts for interest rates and bonds are quoted in annual percentage rate.

The price in roubles for the futures quoted in price points is calculated as following:

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

, where:

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

The price in roubles for the futures quoted in annual percentage rate is calculated as following:

$$PriceRub = \frac{1\ 000\ 000}{\left(1 + \frac{PricePoints}{36500}\right)^{d}}$$

- PricePoints — indicates price in points;
- d — indicates number of days left to expiration of the futures contract.

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 a trading instrument is put into system, it becomes available only upon opening of the evening trading session (for more info, see Trading and clearing schedule).

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. These data are necessary for client application to calculate volatility index and variable margin values.
- '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.

Options

At present, the FORTS 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.

RTS Standard and RTS Money instruments

The FORTS system supports both spot-market and derivatives market trades and provides a consistent accounting and margining for all the instruments. While the spot-market instruments are very similar to futures, they still have some significant differencies.

Spot-market allows to perform operations with the specifyed fixed excersise dates. These dates may vary from the current trading date up to a specified maximal date. Therefore, a pull of instruments is put into system, where each instrument is dedicated to a certain date, and one of the instruments is specified as the 'main' one (T+4 date for RTS Standard and T+1 date for RTS Money). All the spot-instruments are traded outside the orderbook by private trades and repo, except the main one, which is traded in the common mode. Therefore, unlike the futures, the spot-instruments trading volumes are shown strictly as a sum which includes the main instrument trading volume.

There are some additional features, which spot-market instrument have in contrast to futures:

- Sign of the main spot-instrument or and additional spot-instrument;
- The date of exercice shift value (in working days, starting from the day of the current session);

- The main spot-instrument is linked to the underlying asset.

Spot-instruments data are stored in the following tables:

- 'FORTS_FUTINFO_REPL' stream, 'fut_sess_contents' table. The main table, containing a list of spot-instruments, available on the current trade session;
- 'FORTS_FUTINFO_REPL'stream, 'fut_instruments' table. The table contains limited data amount about all spot-instruments put into the system, including non-tradable ones. These data is necessary for client application to calculate volatility index and variable margin value.
- 'FORTS_INFO_REPL' stream, 'futures_params' table. This table contains data about spot-instruments. According to the data format the table can be loaded by the ClientGo client application.

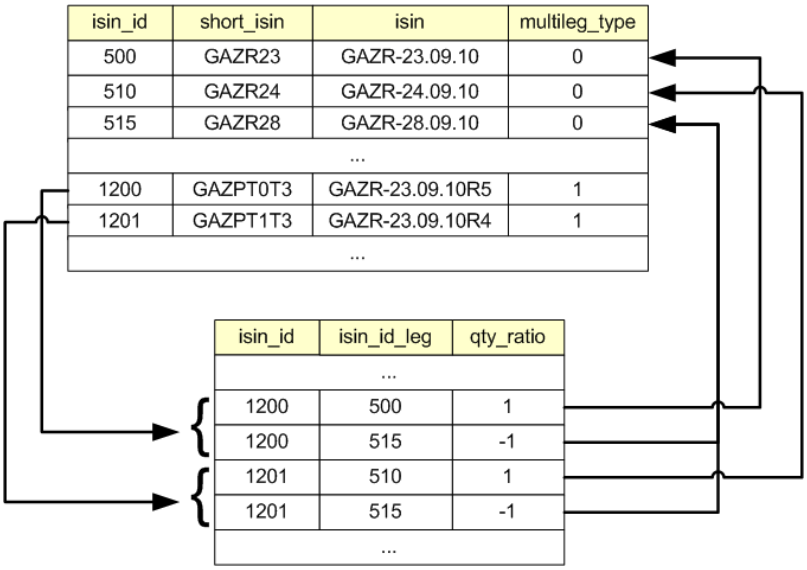
Multi-leg instruments

The FORTS 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 the repo instruments on RTS Standard and currency swaps on RTS Money.

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. Compound instruments



Repo multi-leg instruments

Repo compound instruments at RTS standard are quite simple; they consist of two components: a spot-instrument with the close exercise data in one direction, and another spot-instrument with a distant exercise data in the opposite direction. Both instruments in the bundle have equal shares.

The scheme above (pic. 1) shows two multi-leg repo instruments at RTS Standard having isin_id 1200 and isin_id 1201. There are two records in the 'multileg_dict' table for each instrument, where each record describes both of the the repo parts — repo and reverse repo. The repo direction is assigned by the value of the 'qty_ratio' field: '1' indicates the repo part, whereas '-1' indicates reverse repo.

Swap-contracts for currencies

Technically, a swap-contract for currencies and repo bonds are alike. The difference is their market instruments — in case of swaps it is not securities but currencies. The main feature of a swap-contracts is the order, according to

which prices are ranked in openbook. Normally, compound instruments are ranked in both directions (min - max, max - min) according to business-logic specifications, but in case of swap-contracts the opposite order of ranking is typical due to the fact that the price for repo reverse is always the price for the bundle.

Identification of instruments

The FORTS 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 a short alternative contract code, which has been implemented for needs of world information services, i.e. to make it simplier for them to work with the FORTS data. Unlike the 'isin' field value, values in the 'short_isin' field can change. For example, when a spot-instrument meets the T-4 date of exercise, it becomes the main spot-instrument, and then a value in the 'short_isin' field becomes equal to that of the corresponding security in the RTS Classica market. The RTS money values and the repo instruments values change in the similar way.

Trading operations

Orders — general information

Order — a command, which is sent into the trading system by a trading participant, aimed to perform an action of bying or selling an instrument at specified price. There are two main types of orders available: private 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 offseting 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 FORTS 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' and 'FORTS_OPTTRADE_REPL' streams. The tables contain orders changing log, where every change is recorded as a separate record in the table. By default, the table contain only the 'own' records, which 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.

Users can subscribe to complete the 'orders_log' table; after that, they will receive the complete history of changes regarding all orders in the system. After subscribed, users receive full and complete info about the 'own' orders and minimal info about all other orders.

Users can do the following:

- Add an order;
- Delete a single order according to its code in the FORTS 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: private order or system order;
  - Client's code;
  - Underlying asset's code;
  - Order's ID in the client system ('ext_id');
  - Instrument's code.

Private orders

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

- When listing a private order, it is impossible to specify any other counterpart except a brokerage firm. Also, it is impossible to make trades between two random tradin accounts.
- 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 private orders.
- Instead of moving, the private orders can only be deleted and listed anew manually.
- Private orders can only be exercised fully, when price and amount of instrument exactly match those in the counerpart's order. Private orders cannot be exercised partly.

Trades

In the FORTS trade 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: private and system. Many trade's attributes are equialent of that of the orders. Trades cannot be edited or deleted from the system.

Data on trades are stored in the 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 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 are:

- Delivery of assets is made upon the expiration of the instrument.
- Expiration of options.
- If a client does not provide the required collateral, the position is closed.

These trades are called 'technical trades'. You can tell them from the common trades by values of the 'status_sell' and 'status_buy' fields of the 'deal' table (for details see Trade types, created upon exercising and expiration of futures and options).

Specifics of trading at RTS Standard and RTS Money

The FORTS system supports both spot-market and derivatives market trades and provides a consistent accounting and margining for all the instruments. Technically, the spot-market instruments are very similar to short-term futures.

Spot-market allows to perform operations with the specifyed fixed excersise dates. These dates may vary from the current trading date up to a specified maximal date. Therefore, a pull of instruments is put into system, where each instrument is dedicated to a certain date, and one of the instruments is specified as the "main" one (T+4 date for RTS Standard and T+1 date for RTS Money). The main spot-instruments in the 'fut_sess_contents' ('opt_sess_contents') table are marked with a special sign.

All the spot-instruments are traded by private trades and repo trades, except the main one, which is traded in common mode.

At RTS-Standard, a brokerage firm may set limits (as sum of money) to its client for buying the RTS Standard shares, as well as set limits for selling the RTS standard shares as quantity of lots, which the client is allowed to sell during one trading session. When the client reaches the limit, a error occures, and the order will not be listed.

The same limitations are also available at RTS Money.

Specifics of trading multileg instruments

The FORTS 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 now available instruments are the repo instruments at RTS Standard and currency swaps at RTS Money.

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 oblidged 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.

Delivery of assets and expiration of options

Deliveries on the RTS Standard and RTS Money markets.

Delivery is the act of exchanging assets between buyer and seller in accordance with the current day (T+0) trading instruments. During delivery, a seller transfers stocks or currencies to buyer's account, while buyer transfers money back to seller's account.

For the RTS Standard and RTS Money markets the delivery period of time is 5:00 PM till 6:45 PM (Moscow time). Additionally, there are two more timepoints scheduled in the trading session, 4:00 PM and 4:30 PM (Moscow time), which are principal for trades with T+0 instruments. Before 4:00 PM, any private trades are available with T+0 instruments. Between 4:00 PM and 4:30 PM, such 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. Allocation of positions is made through offset trades, specially marked in the 'status_sell' and 'status_buy' fields (for details see Trade types, created upon exercising and expiration of futures and options). At 4:30 PM the trading positions will have been fixed, and at 5:00 PM the calculation starts.

Delivery from the technical point of view	When executing a position, the FORTS system creates a technical trade with the price equal to that of the instrument, with the direction opposite to the direction of the open position, and with the RTS clearing center acting as the counterpart. As a result, the position is set to zero, the assets are unpledged, and the assigned fee is paid according to the exchange rates.This technical trade is marked with the special sign in the 'status_sell' and 'status_buy' fields of the deal table.
Acting on nondelivery	In case of nondelivery, when there is not enough assets to close the trade, assets of the RTS clearing center or donor firm are used to commit the delivery. The nondelivered positions are transferred through repo trades by the following algorythm: • The participant is marked as 'non-executed'. • The non-executed position is closed with an opposite T+0 trade between the participant and the RTS clearing center or a donor (1st part of the repo).

- At the same time, another trade is created (T+1), opposite to the previous part, with the same counterparts (2nd part of the repo).
- Both trades are enumerated as two parts of the same repo trade, and marked with a special signs in the 'status_sell' and 'status_buy' fields.

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 delivery, the futures position turns into the RTS Standard instrument position with the standard date of expiration (T+4). The delivery is performed as technical closing of the position in the derivatives market and opening a position in the spot market. Both trades are marked with a special sign in the 'status_sell' and 'status_buy' fields of the 'deal' table.

Option expiration

At present, the FORTS system supports American futures options. When expiring, the option position turns into a futures position with the price equal to strike of the expiring option. The expiration is executed at clearing session as technical closing of the option position and opening a futures position. Both of the positions are 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.

There are two modes of expiration available:

- Prescheduled expiration, executed by 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 executed only twice a day: in the intermediate clearing session and in the evening clearing sessions.
- Automatic expiration, taking place on the day of option maturity period. In the evening session, each margining option, which is in the money by more than 1 futures limit value (according to the current clearing session calculation result), expires automatically. This rule overrides all other expiration rules set by participants.

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

Bitmask of signs of the deal table, the 'FORTS_FUTTRADE_REPL' and 'FORTS_OPTTRADE_REPL' streams (the 'status_buy' and 'status_sell' fields):

- 0x4: 1 — a non-system trade (non-market price); 0 — an outright trade (price is close to the market price).
- 0x20: 1 — an option execution trade; 0 — not an option execution trade.
- 0x80: 1 — instrument expiration indicator (execution for futures and expiration for options), supported to guarantee compatibility.
- 0x8000: 1 — the T+0 trade on position rollover; 0 — not the T+0 trade on position rollover.
- 0x20000: 1 — a repo trade; 0 — not a repo trade.
- 0x40000: 1 — set of trades; 0 – not a set of trades.
- 0x800000: 1 — a trade on option expiration; 0 — not a trade on option expiration.
- 0x1000000: 1 – a trade on delivery via RTS Standard; 0 – not a trade on delivery via RTS Standard.
- 0x2000000: 1 – a trade commited out of trading session.
- 0x4000000: 1 — a private trade; 0 — a system trade.
- 0x8000000: 1 – a multileg trade ; 0 – not a multileg trade.
- 0x10000000: 1 — a trade on non-delivery; 0 — not a trade on non-delivery.
- 0x40000000: 1 — a trade on execution of futures or RTS instrument (except execution of futures via RTS Standard); 0 — not a trade on execution.

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 autures 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
Delivery of stocks traded at RTS Standard	• id in reports is 0, id in gateways is nonzero. • Trade price is rounded to 5 places. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x80 (expiration of the instrument), 0x40000000 (futures execution trade).	No.	Available in the gateway on the delivery date at the beginning of the morning trading session. Available in the report after the next evening clearing session.
Execution of futures via RTS Standard	• 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): 0x4 (non-system trade), 0x80 (expiration of the instrument), 0x1000000 (delivery trade via RTS Standard).	• id in reports is equal to 0, id in gateways is nonzero. • Trade price is rounded to 5 places. The trade volume (in amount of stocks) at RTS Standard is equal to that of the futures position. • This trade is a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system), 0x80 (expiration of the instrument), 0x1000000 (delivery trade via RTS Standard).	Available in report and in the gateway on the day of futures execution at the evening clearing session.
Classical execution of 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): 0x4 (non-system trade), 0x80 (expiration of the instrument), 0x40000000 (futures execution trade).	No.	On the execution day, in the morning.
Execution of non-deliverable 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): 0x4 (non-system trade),	No.	On the execution day, in the evening.

Operation type	Position closing trade	Position opening trade	Date and time of trades availability in reports and in the gateway
	0x80 (expiration of the instrument), 0x40000000 (futures execution trade).		
Exercising 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. • Technical trade is not a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x20 (trade on option execution).	• id in gateways is nonzero. id in reports is 0. • Trade price is rounded to 5 places. • This trade is a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x20 (trade on option exercising).	• At the intermediate clearing session • At the evening clearing session Depending on time of applying the option (the next clearing session after applyinh).
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): 0x4 (non-system trade), 0x80 (expiration of the instrument), 0x800000 (option expiration trade).	No.	On the futures execution day, in the evening.

Trades are shown as following:

Operation type	Operations info
Stock futures trade based on a private 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): 0x4 (non-system trade), 0x4000000 (private trade).
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 private 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): 0x4 (non-system trade), 0x4000000 (private trade).
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.

Operation type	Operations info
	• Signs in gateways and reports (bitmask):bits value is 0.
Trade on position rollover between two clients of the same brokerage (T+0)	• 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): 0x4 (non-system trade), 0x8000 (position rollover trade (T+0), 0x4000000 (private trade).
Technical trade based on repo private order (1st part)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally. • BSigns in gateways and reports (bitmask): 0x4 (non-system trade), 0x20000 (repo trade), 0x4000000 (адресная сделка), 0x8000000 (multi-leg trade).
Technical trade based on repo private order (2nd part)	• 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): 0x4 (non-system trade), 0x20000 (repo trade), 0x4000000 (private trade), 0x8000000 (multi-leg trade).
Technical trade based on repo system order (1st part)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is not a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x20000 (repo trade), 0x8000000 (multi-leg trade).
Technical trade based on repo system order (2nd part)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is not a trade legally. • Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x20000 (repo trade), 0x8000000 (multi-leg trade).
Technical trade based on the private pseudo-repo (1st part)	• 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): 0x4 (non-system trade), 0x40000 (bulk of trades), 0x4000000 (адресная сделка), 0x8000000 (multi-leg trade).
Technical trade based on the private pseudo-repo (2nd part)	• 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): 0x4 (non-system trade), 0x40000 (bulk of trades), 0x4000000 (private trade), 0x8000000 (multi-leg trade).
Technical trade based on the system pseudo-repo (1st part)	• id in gateways and reports is unique and nonzero. • Trade price is rounded to 5 places. • This trade is a trade legally.

Operation type	Operations info
	• Signs in gateways and reports (bitmask): 0x4 (non-system trade), 0x40000 (bulk of trades), 0x8000000 (multi-leg trade).
Technical trade based on the system pseudo-repo (2nd part)	• 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): 0x4 (non-system trade), 0x40000 (bulk of trades), 0x8000000 (multi-leg trade).

Trading and clearing schedule

Tradings schedule. Trading sessions.

In the FORTS 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 FORTS 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).

Intermediate clearing session

There is a gap in the main trade session (2 PM - 2.03 PM, Moscow time), during which the itermediate 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.

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.

How different entities act on assigning a new trading session

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.

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 and the 'diler_params' and 'client_params' tables).

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.

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.

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'.

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 FORTS. The following events are used to start synchronization:

- All data for a new trading session are loaded and calculated
- All data after the intermediate clearing session (2 PM - 2.03 PM, Moscow time) are recalculated anew
- All data after the main clearing session are recalculated anew
- Intermediate clearing session has started
- Main clearing session has started

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

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'

The rules of the synchronization are 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 occured:

- All the data are ready for a new trading session (event_type = 1)
- All the data are ready after the intermrdiate clearing session (event_type = 2)
- All the data are are ready after the main clearing session (event_type = 3)
- Intermediate clearing session has started (event_type = 4)
- Main clearing session has started (event_type = 5)

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 multy-day orders rolled over from the previous session, before adding records into the 'sys_events' table.

Game and test mode trading schedule

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

X-points — a point on the arrow of time, upon reaching which the private 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: 7:15 PM — 10:00 PM.
- Morning trading session: 06:00 AM — 09:00 AM.
- Main trading session: 09:00 AM — 18:45 AM.
- Intermediate clearing session: 2:00 PM — 2:03 PM.
- X-points and delivery: 4:00 PM — 4:30 PM.

Test system trading schedule (for outsourcers):

- 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.
- Intermediate clearing session: 12:00 AM — 12:05 AM.
- X-points: 1:00 PM, 1:15 PM.
- Delivery: 1:30 PM — 2:00 PM.

Risk management and limitation of trading operations

Collaterals

The Risk Management System implemented into FORTS allows to dramatically reduce risks of non-fullfilment obligations by permanent evaluation of market risks for every participant's position. The core of the system is the initial margin calculation algorithm.

One of the key features of the FORTS system is the calculating collaterals 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 collateral is always checked before any relating order appears in the system.

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

- Clearing firm, which incur liabilities for risks and cover risks of their clients and sub-brokers. Clearing firms are obliged to:
  - Belong to the Derivatives Market Section.
  - Obtain the exchange intermediary license issued by the Federal Financial Markets Service, which allows to perform commodity, futures and option trades.
  - Pay fee to the Insurance fund.
  - Provide collaterals for own trades, the clients and sub-brokers' trades.
- Brokerage firm. 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 oblidged to provide collaterals for own trades and for the clients and sub-brokers' trades.
- Client. Any physical or corporate person can participate in the FORTS market as a client on the authority of trading service agreement signed with a brokerage firm or with clearing firm directly. Any action taken by clients is taken on behalf of their brokerage or clearing firm.

According to the implemented solution, risks and amount of collateral are calculated separately for each group: clearing firms, brokerage firms and clients. This makes the solution unique and guarantees that clients will never exceed the limits they had been set for.

Trading limits

Trading limitations of clearing firms and brokerage firms are the firms' funds allocated on trading accounts of the RTS Clearing Center. The brokerage firm's funds is the sum all its clients' funds, while the clearing firm's funds is the sum of all its brokerage firms and include the funds of the clearing firm itself. A clearing firm is eligible to transfer funds between its brokerage firms and also between the brokerage firms and the clearing firm directly; the amount of clearing firm's funds remains unchanged.

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

The trading limitations for clients are set up by brokerage firm or by clearing firm and are called the client trading limit. If there is any funds limitation set for a client, then, after the client order has been put into the system, the system checks if there are enough funds available on the client's account. In case there is no limitation has been set, the system checks funds availability on the accounts of brokerage firm and its clearing firm. Generally, an order will be listed only if there are enough funds available on all three accounts: the client's, brokerage firm's and clearing firm's.

There are only two types of funds available in the FORTS trading system: money and pledges. The pledges may consist of securities or of currencies, which the RTS Clearing Center accepts as collateral. Funds and non-monetary pledges are accepted in non-equal shares: the share of pledge cannot exceed 50% of the whole funds amount.

There is the 'FutChangeClientMoney (Setting up the client limits)' method available, which is used for setting up the client limits. It provides the following possibilities:

- Set up/change/delete trading limits (separately for funds and for pledges)

- Tightening/releasing demands for collaterals by adding a special multiplier to the total amount of collaterals.
- Automatic accounting mode for the client trading result. This affects limits values for the next trading session.

The 'FutChangeBFMoney (Setting up the brokerage firms limits)' method is used for setting up the brokerage firms limits. The method allows only to set up or change trading limits.

Additional limitations on the RTS STandard and RTS Money markets.

The RTS Standard and RTS Money markets have their own trading limits for brokerage firms and clients. A brokerage/clearing firm is able to set to to its client/brokerage firm limitation on bying the RTS Standard stocks or the RTS Money currencies by limiting an amount of funds which can be spent in a single trading session. The limitation can be also set to the amount of stocks to be sold (in lots). When the limits are reached, the system returns an error message, and the order is declined.

The following methods are available in the gateway for managing the trading limits:

- FutChangeClientMoney method — Changing client limits (funds limitations).
- FutChangeMoney method — Changing brokerage firm limits to buy on spot market (funds limitations).
- FutChangeClientVcb method — Changing client parameters on underlying assets (stocks limitations).
- FutChangeBrokerVcb method — Changing brokerage firm parameters values on underlying assets (stocks limitations).

Limitations on trading operations and opening positions for clients

The FORTS 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.

Pausing trading session for extending limits of trading prices fluctuations

Technically, the following actions take place in the FORTS 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.

Trading gate description

Components of the FORTS Plaza-2 gate. Installation and setup.

Components

The FORTS Plaza-2 gate consists of the following software components (see pic. 2):

- The 'P2MQRouter' module. This module provides the following services:
  - Establishing TCP-connections to the RTS exchange servers.
  - Receiving/sending P2-messages.
  - Encrypting data sent by participants and decrypting data received from the exchange.

- Authentication of participants in the exchange network.

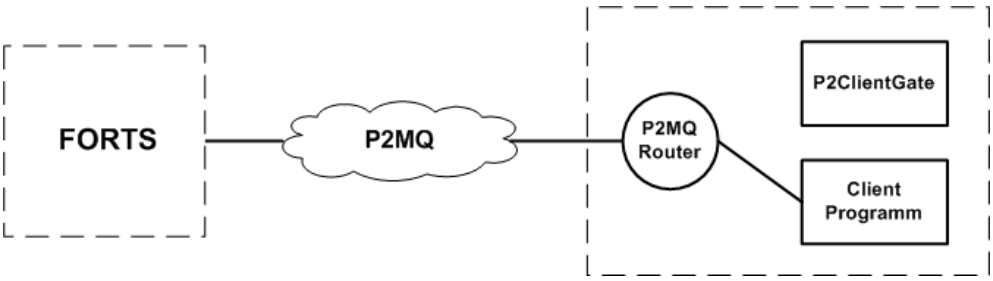
- The P2ClientGate COM-objects library. The library is the official software interface, provided to outsourcing vendors for developing softwares for the RTS market. The interface provides availability to create and send messages into the trading system and receive trading data from the trading system (data replication).

  There are two versions of the library exist, supporting different COM data-flow models:

  - 'P2ClientGate.dll' file, which contains objects supporting the COM STA-model.
  - 'P2ClientGateMTA.dll' file, which contains objects supporting the COM MTA-model.

  Also, there are different 'P2ClientGate' versions available for either 32-bit or 64-bit versions of Windows.

Figure 2. Components of the FORTS Plaza-2 gate



Hardware and software requirements

Hardware requirements

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

Minimum system requirements for individual login without disk saving option:

- CPU: Intel Core 2 duo 1 Ghz or better
- Memory: 2 GB or more, 4 GB or more for 64-bit OS
- Operating system: Windows XP, Vista or Windows 7. Both 32-bit and 64-bit versions are supported.

Minimum system requirements for brokerage firm login without disk saving option:

- CPU: a 2-CPU server, powered with Intel Xeon 53xx or with similar AMD CPUs (2 CPUs with 2 or more cores)
- Memory: 24 GB or more
- HDD: External SAS controller, 2 or more disks in the RAID1 array, 2 partitions with 30 GB free space each
- Operating system: Windows Server 2003, Windows Server 2008, Windows Vista or Windows 7. Both 32-bit and 64-bit versions are supported.

Minimum system requirements for brokerage firm login with disk saving option:

- CPU: a a 2-CPU server, powered with Intel® Xeon 53xx or with similar AMD CPUs (2 CPUs with 2 or more cores)
- Memory: 4 GB or more
- HDD: External SAS controller with write-back caching mode. 4 or more disks in RAID10 array, 2 partitions with 30 GB free space each
- Operating system: Windows Server 2003, Windows Server 2008, Windows Vista or Windows 7. Both 32-bit and 64-bit versions are supported.

Software requirements

The following operating systems are supported:

- Desktop OS: Windows XP, Windows Vista and Windows 7
- Server OS: Windows Server 2003 and Windows Server 2008

Both 32-bit and 64-bit versions are supported.

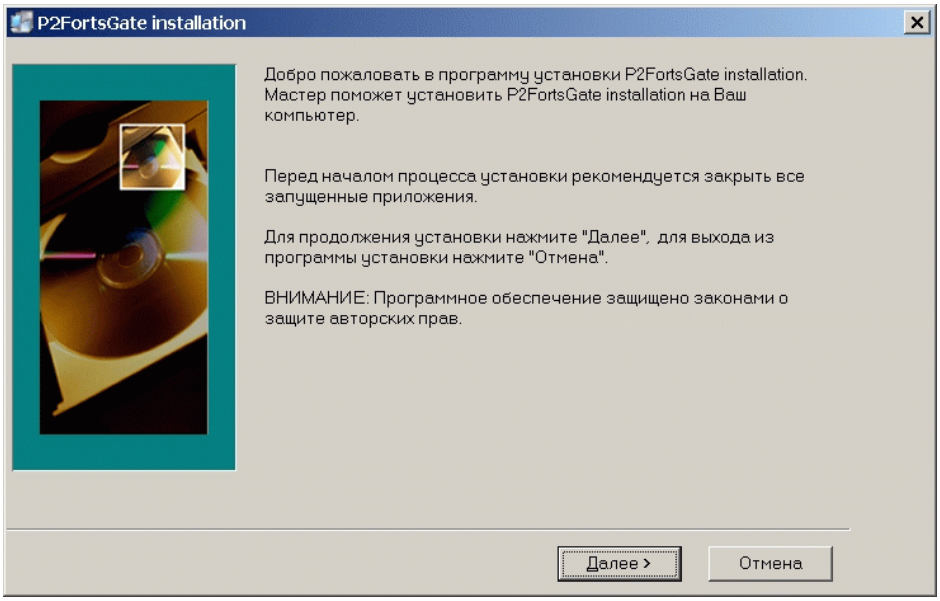
Any programming language with COM-technology support can be used for software developing, for example C++, Delphi, .NET languages etc.

Installation

Download the latest version of the Plaza-2 gate from ftp://ftp.rts.ru/pub/FORTS/Plaza2/. The name of the installation file is 'P2_ClientGatex.xx.x_32.exe' ('P2_ClientGatex.xx.x_64.exe') where x.xx.x is the software version number, for example 1.10.8.

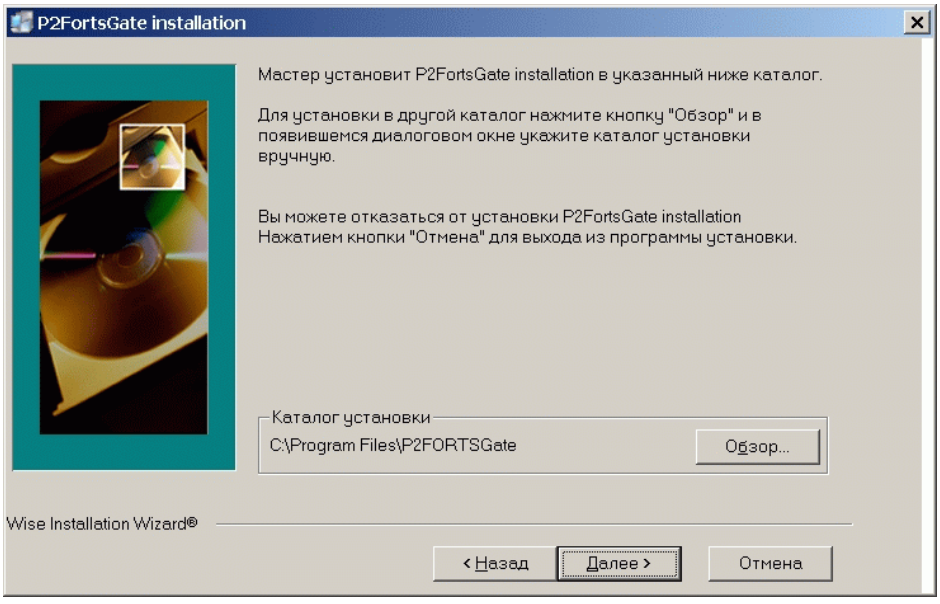
The installation wizard will guide you through the installation process:

Figure 3. Installation wizard. Start of the installation



Click the 'Next' button to continue with installation:

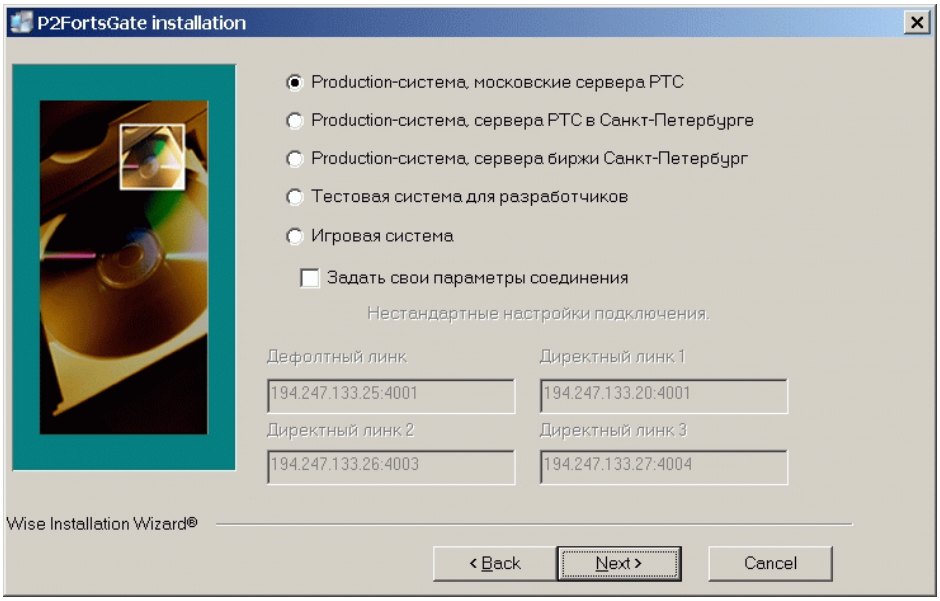
Figure 4. Installation wizard. Select installation folder



Select a folder for installation and press the 'Next' button:

The destination folder should be chosen in accordance with the administrative recommendations. Please make sure that your libraries are registered properly in case of having more than one folder with different gate versions installed.

Figure 5. Installation wizard. Select an address to connect

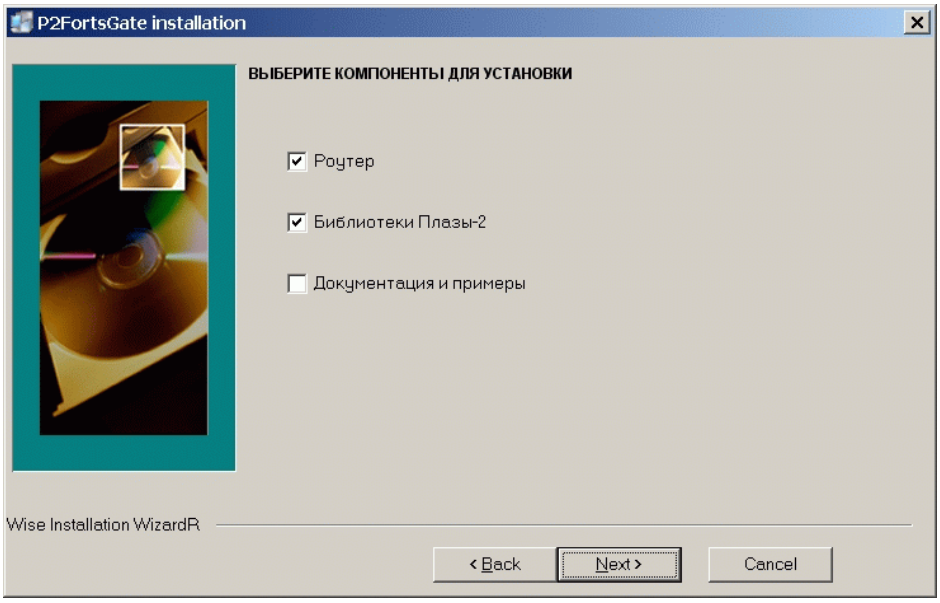


Select a trading system (production, testing or gaming) to which you would like to connect or specify the parameters manually. After setup is complete, the parameters will be added into the in-file of the 'P2MQRouter' module.

For selecting the proper connections you should contact your brokerage firm and/or the RTS technical support service at 007 495 7339507, help@rts.ru.

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

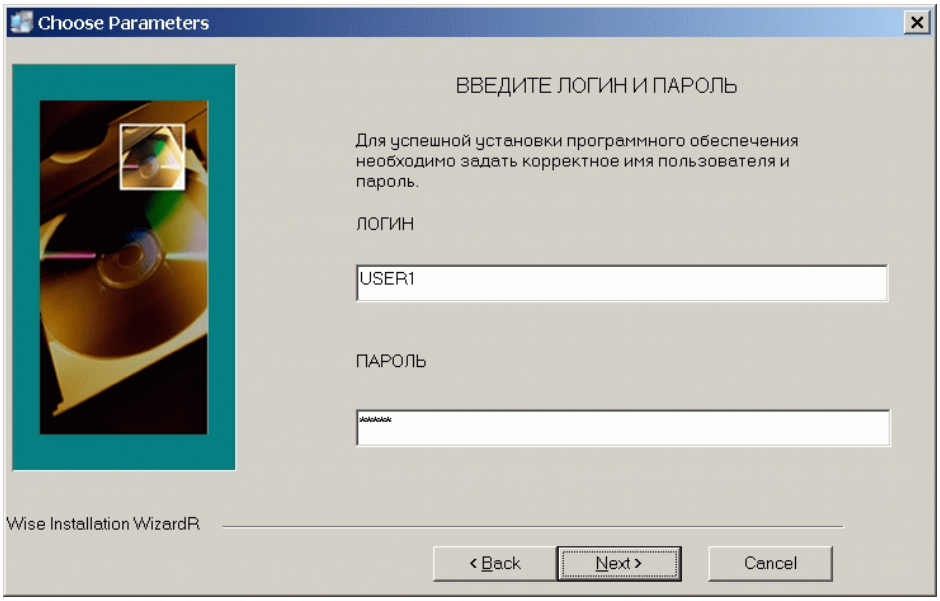
Figure 6. Installation wizard. Select components to install.



Select components to install by checking the checkboxes. Select 'Router' to install the transport part only, 'Plaza-2 libraries' to install the runtime environment only, or select both 'Router' and 'Plaza-2 libraries' components to run the full installation mode. If you need to install documentations and examples, please check the appropriate checkbox.

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

Figure 7. Installation wizard. Enter username and password.



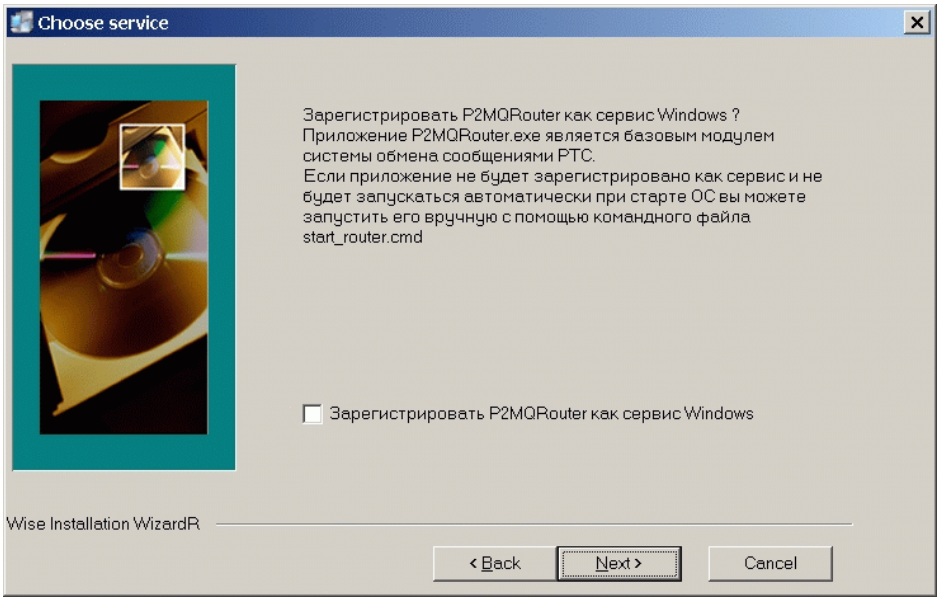
Enter a username and a password to get access to the FORTS trading system. After the installation complete, the username and the password will be added to the ini-file of the 'P2MQRoutel' module for automatic authentication in the RTS network on next login. Please note that usernames and passwords differ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

Note

It is strictly not recommended to change username and password directly in the ini-file. Instead, you are recommended to reinstall the gate software and register a new username/password pair.

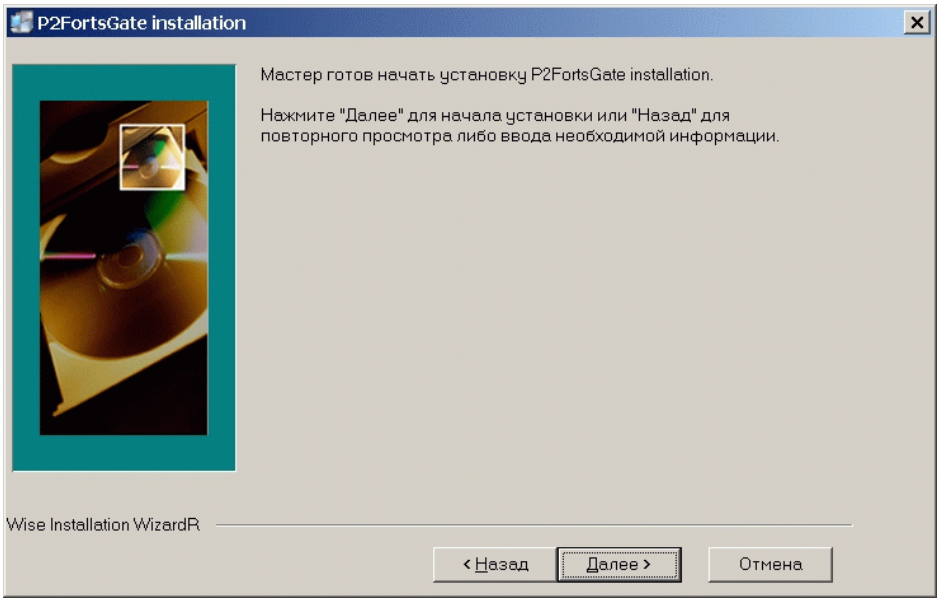
Click the 'Next' button to continue with the installation:

Figure 8. Installation wizard. Registering router as anI OS service



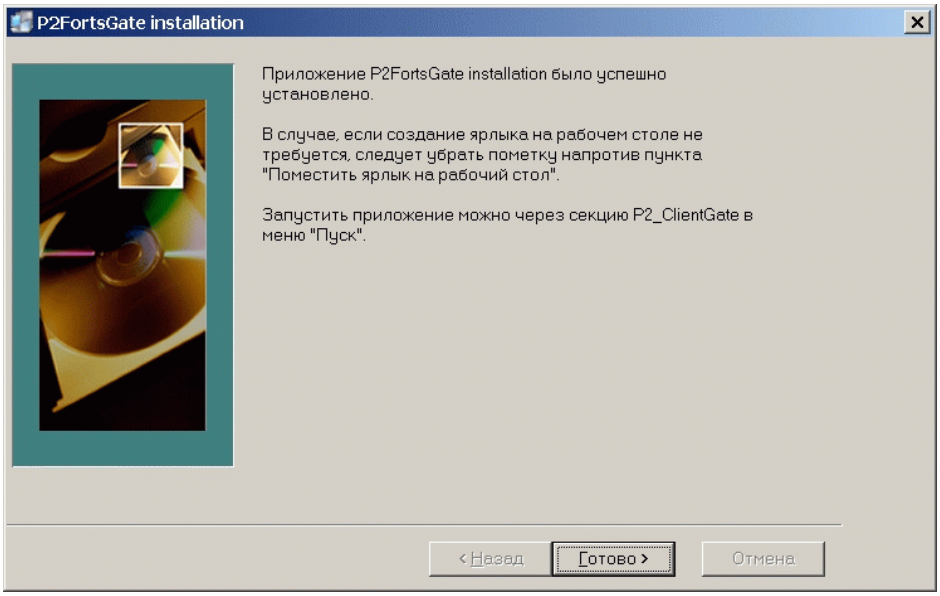
If you need to install the Router as an Windows service, check the appropriate checkbox and click the 'Next' button to continue with the installation:

Figure 9. Installation wizard. Start of installation



Click the 'Next' button to start the installation:

Figure 10. Installation wizard. Finish of installation



Click the 'Finish' button to finish the installation.

Distributed configurations

The 'P2ClientGate' 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 RTS network; b) install 'P2ClientGate' to the client computer with the client application installed; c) specify the following settings:

- By 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 applyed 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!
- By 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.

To hide the password in the router ini-file you can use the 'P2MQLocPwdsUtil.exe' command prompt utility, which is distributed as a part of the gate installation package, and is also available for downloading at the RTS ftp-server:

- The simple password encryption. Enter the following string into the command prompt:

  ```
  P2MQLocPwdsUtil.exe<clear_password>
  ```

  After the command is executed, the command prompt returns an encrypted password value (<clear_password>), which can be manually added into the [AS:Local] section of the 'client_router. ini' file.

- Password encryption with adding data into the ini-file. Enter the following string into the command prompt:

  ```
  P2MQLocPwdsUtil.exe<clear_password>/i<AppName>/sAS:Local/fclient_router.ini
  ```

  After the command is executed, the <AppName> key is added into the [AS:Local] section of the 'client_router.ini' file with the encrypted password value (<clear_password>).

  # Note

  No spaces are allowed between the command prompt keys and parameter values!

Fault tolerance securing

To improve the system fault tolerance, it is recommended to maintain redundant connections to the exchange. Also, it is recommended to obtain two user name/password pairs with the same rights in order to run two client applications simultaneously, with the possibility to switch between them in case of any fault.

Developer guidelines

Guidelines on adding the RTS runtimes into the client application when the user software is distributed by the third party representatives.

The files which are installed into the gate installation folder using the 'Only libraries' mode ((P2ClientGate.dll, P2DBSQLite3.dll, P2Sys.dll etc.), as well as data and messages schemes from the 'Scheme' folder must be manually copied by user into his/her application folder before preparing an installation pack.

It is not allowed to use 'P2MQRouter' module with any versions of the 'P2Client 'gate library due to their incompatibility.

Usage of test code examples

There are typical examples of code located at ftp://ftp.rts.ru/pub/FORTS/test/Plaza2/P2Samples/, which are aimed to help developers to create their own algorithms to work with the Plaza-2 protocol.

List of examples:

- AsyncSend — an example of sending order (as message) using the asynchronous API, written in C#.
- BaseClient — an example of receiving three replication streams (FORTS_FUTAGGR20_REPL, FORTS_FUTTRADE_REPL and FORTS_FUTCOMMON_REPL) in the 'base' mode. Written in C#.
- BaselessClient — an example of receiving the FORTS_FUTAGGR20_REPL stream in the 'baseless' mode. Written in C#.
- Baseless_VCL — an example of receiving the FORTS_FUTTRADE_REPL replication stream in the 'baseless' mode. Written in Delphi.
- Baseless_VCL_OrderBook — an example of the GUI-application, which fills the orderbook with data transmitted in the FORTS_FUTAGGR20_REPL replication stream. Written in Delphi.
- Baseless_VCL_Privod — and example of the GUI-based scalping utility. Written in Delphi.
- P2AddOrderConsole — an example of receiving the FORTS_FUTINFO_REPL stream in the 'base' mode and sending an order (as message). Written in MS Visual C++ using the ATL Library.
- SimpleSend.js — a simple example of synchronised message sending, written in JavaScript.

Note

Attention! The examples above are not eligible for being copied and used with data other than testing data. Using these examplese to work in real mode is strictly ptohibited!

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

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

  FORTS, RTS Standard, RTS money Instruments assigned to the trading session are available in the 'fut_sess_contents' table of the 'FORTS_FUTINFO_REPL' stream. Compound istruments (REPO, for example) 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 referenecs.

- 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 FORTS 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)

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, RTS Standard, RTS money and REPO 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, RTS Standard and RTS Money instruments; the 'orders_log' table of the 'FORTS_OPTTRADE_REPL' stream for options; the 'multileg_orders_log' table of the 'FORTS_FUTTRADE_REPL' stream for REPO isntruments orders from RTS Standard.

  In case the user configures his login with option to receive "full orders log", he will receive in this table a complete log of all operations with orders on market (including his operations with orders) in anonymous mode.

- User's deals log

  It contains a list of user's commited deals in the current session. User's deals log are available in the 'user_deal' table of the 'FORTS_FUTTRADE_REPL' stream for futures, RTS Standard, RTS Money instruments and the 'user_deal' table of the 'FORTS_OPTTRADE_REPL' for options.

- All trade system deals log

  It contains a list of all commited 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_FUTTRADE_REPL' stream for futures, RTS Standard, RTS Money instruments and the 'FORTS_OPTTRADE_REPL' stream for options; table 'multileg_deals' of the 'FORTS_FUTTRADE_REPL' stream for REPO isntruments deals from RTS Standard.

Recovery information

To ensure fast recovery of trade information receiving after losing the connection with RTS, and same with late start scenario connecting to exchange, Plaza-2 gateway receives periodic snapshots from recent orderbooks in a non-aggregatedPo 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. In case of late join to RTS without recieving historical information snapshot mode doesn't turn on.

Snapshots of active orders are sent with 1 minute interval in 'FORTS_FUTORDERBOOK_REPL' for futures, RTS Standard, RTS Money instruments and 'FORTS_OPTORDERBOOK_REPL' for options. Repo orders are currently not present due to the fact that the volume of transmitted data by such an instruments is small and allows the recovery with the use of the trade information stream.

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 postion's 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.

- Clients' limits information on RTS Standard

  Contains sales limits for RTS Standard in the context of the client code - underlying asset. Is sent in 'broker_params' (for brokerage firms) and 'client_params' (for clients' accounts) of the 'FORTS_INFO_REPL' stream.

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, RTS Standard, RTS Money instruments and 'opt_intercl_info' of the 'FORTS_OPTINFO_REPL' stream for options.

- Delivery report

  Provides information about delivered and not delivered assets in the context of client - instrument. Report is available in the 'delivery_report' table of the 'ORTS_FUTINFO_REPL' stream.

- Реестры отвергнутых в клиринг заявок 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_CLMONEY_REPL' stream.

- Option execution orders

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, RTS2, RTS-Standard, as well as the sectoral indices. 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. Currently, the only sent currency rate is USD/RUB pair. The currencies values are available in the 'usd_online' table of the 'FORTS_FUTINFO_REPL' stream.

Auxiliary information streams

That group includes the streams providing the following additional functions:

- Current values of varation margin

  are sent in the 'FORTS_VM_REPL' in the context of client's positions. This stream can be sent from a central RTS datacenter with an interval of 1 minute or with local calculation service of variation margin which should be installed on the user's machine. in that case intervals can be set by the user himself in accordance with his own preferences.

- Current volatility values and theoretical prices for options

  Are sent in the 'FORTS_VOLAT_REPL' stream. This stream can be sent from a central RTS datacenter with an interval of 1 minute or with local calculation service of volatility which should be installed on the user's machine. in that case intervals can be set by the user himself in accordance with his own preferences.

Gate usage specifics

Commands

Each command is identified by the message type.

A command is executed in the following steps:

- Fields are filled with the command parameters
- Service fields are filled as following (message type and category, destination node):
  - The 'P2_Category' field is filled with the 'FORTS_MSG' value.

- The 'P2_Type' field is filled with the message type value.
- The 'DestAddr' message property value is set equal to the FORTS_SRV service address. The value should be obtained by calling the ResolveService ('FORTS_SRV') method of the connection.

- Sending the message.
- Receiving and analysing of the reply message.

In case of the message delivery and handling errors, the client receives either sending message function error (a nonzero return code in the 'Send' or 'SendAsync' functions) 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.

Recovery procedures and late start

The 'FORTS_FUTORDERBOOK_REPL' and 'FORTS_OPTORDERBOOK_REPL' streams are designed for systems that receive orders log ('orders_log table') in baseless mode of replication client. If the data are not stored in client's application or this information is lost due to some failrue, it assumes the next steps for application to avoid full redownload of huge orders_log table:

- application opens the 'FORTS_FUTORDERBOOK_REPL' stream in the 'REMOTE_SNAPSHOT' mode. You should open two tables — 'orders' and 'info'
- get the data in orders table and stoer them in internal structures
- after FORTS_FUTORDERBOOK_REPL goes online (and closing the stream), you need to read the 'logRev' value from the 'info' table. The 'info' table always has only one entry.
- initialize the object for the 'FORTS_FUTTRADE_REPL' stream, create the 'TableSet' object with a scheme, set the 'orders_log' table with maximum revision calling

  ```
  TableSet.set_rev(“orders_log”, logRev)
  ```

- open FORTS_FUTTRADE_REPL stream in baseless mode

> **Note**
>
> You can use this mechanism only for baseless client, because base client always read information about maximum revision from database indicated in connection string.

Applications which are unable to handle the last revision number will not be allowed to work the FORTS_FUTTRADE_REPL/FORTS_OPTTRADE_REPL stream, i.e. an user application, which repititevly reopens the datastream without saving the lifenumber and the last revision number (i.e, always using 0 as the revision number) will be declined during certification procedure and not allowed to be used for trading.

Abnormal activity control

The control system of clients' application abnormal activity is functioning in the FORTS trade system. It restricts client's application to send more transactions per time unit (for single login on FORTS) than it is decided in agremeent when purchasing the login in our Sales Department. At present moment you can acquire login on FORTS with 30, 60, 90, 120,150, 180, 210, 240, 270 and 300 trade transactions per second. Trade operations are all transactions associated with order driving. Amount of non-trade (all the rest) operations for any type of login is limited in 500 transations 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 in single user's queue
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 size of the queue for 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 won't be processed at all.

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

Latency monitoring by the client side

There is a possibility in P2ClientGate 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 RTS centralized monitoring system. Please note that you should install the Plaza2 software and use the new messages scheme versions compatible with FORTS 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!

Replication scheme FORTS_PUBLIC

FORTS_FUTTRADE_REPL stream - Futures: orders and trades

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

> **Note**
>
> Please, note that the table orders_log contains only orders submitted by your brokerage company or direct orders addressed to your brokerage company. Orders from other companies can be received only in aggregated form as a stream of aggregated orders (please, see section 4.5). Trades are sent together (including your trades and trades by other companies), with all data except for your data filtered out.

Table user_deal contains only own deals. This table may be useful for late join.

Data scheme

Tables:

- orders_log - Log of operations with orders
- deal - Trades
- multileg_orders_log - Log of operations with multileg orders
- multileg_deal - Multileg trades
- heartbeat - Server times table
- sys_events - table of events

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
client_code	c7	Client code
moment	t	Time when the order's status was changed
status	i4	Order's status
action	i1	Operation with the order

Field	Type	Description
isin_id	i4	Instrument unique ID
dir	i1	Direction
price	d16.5	Price
amount	i4	Number of lots in the operation
amount_rest	i4	Remaining number in 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
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
id_deal	i8	Deal ID for this operation
deal_price	d16.5	Price of the deal
local_stamp	t	User's local time

Notes:

- Field status is a bit mask

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x1000 End-of-transaction bit

  0x80000 Fill-or-kill

  0x100000 The record is a result of moving the order

  0x200000 The record is a result of cancelling the order

  0x400000 The record is a result of cancelling the group of orders

  0x20000000 Sign of cancelling the left balance of the order because of the cross-trade

- Field action describes an action with the order

  0 Order cancelled

  1 Order added

  2 Order is exercised in the trade

Table deal: Trades

Table 2. Fields of table 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
id_deal	i8	Deal ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID

Field	Type	Description
price	d16.5	Price
amount	i4	Volume, number of units of the instrument
moment	t	Time when the deal was made
code_sell	c7	Seller's code
code_buy	c7	Buyer's code
id_ord_sell	i8	ID number of the seller's order
ext_id_sell	i4	External ID number from the seller's order
comment_sell	c20	Comment from the seller's order
trust_sell	i1	Sign of an asset management company's order from the seller's order
status_sell	i4	Status of the trade from the seller's side
id_ord_buy	i8	ID number of the buyer's order
ext_id_buy	i4	External ID number from the buyer's order
comment_buy	c20	Comment from the buyer's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order
status_buy	i4	Status of the trade from the buyer's side
pos	i4	Number of positions in the instrument in the market after the trade
nosystem	i1	Sign of non-system deal
id_repo	i8	ID number of the other leg of a repo trade
hedge_sell	i1	Sign of a hedging deal from the seller's side
hedge_buy	i1	Sign of a hedging deal from the buyers's side
fee_sell	d26.2	Fee of the seller's deal
fee_buy	d26.2	Fee of the buyer's deal
login_sell	c20	Login of the seller user
login_buy	c20	Login of the buyer user
code_rts_sell	c7	RTS code of the seller company
code_rts_buy	c7	RTS code of the buyer company
id_deal_multileg	i8	Deal ID number for multileg deals

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:

0x20	The deal is an expiration deal
0x80	Sign of instrument's expiration
0x8000	T+0 trade for transferring position
0x20000	Technical (repo) trade
0x40000	Technical trade (Paired order)
0x1000000	Delivery trade via RTS Standard
0x2000000	Non trade deal
0x4000000	Negotiated trade
0x8000000	Multileg trade
0x10000000	Trade concluded because of fail in delivery
0x40000000	Trade of exercise of futures contracts or RTS Standard instrument (except futures that are exercised via RTS Standard)

- 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.

Table multileg_orders_log: Log of operations with multileg orders

Table 3. 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
client_code	c7	Client code
moment	t	Time when the order's status was changed
status	i4	Order's status
action	i1	Operation with the order
isin_id	i4	Multileg instrument ID
dir	i1	Direction
price	d16.5	Price
amount	i4	Number of lots in the operation
amount_rest	i4	Remaining number in 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
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
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
broker_from_rts	c7	RTS code of the company who has entered the order
id_deal	i8	Deal ID for this operation
deal_price	d16.5	Price of the deal
local_stamp	t	User's local time

Notes:

- Field status is a bit mask

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x1000 End-of-transaction bit

  0x2000 REPO Order with Clearing Center

0x20000 REPO Order

0x40000 Paired order

- Field action describes action with order

  0 Order cancelled

  1 Order added

  2 Order exercised in a trade

Table multileg_deal: Multileg trades

Table 4. 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
id_deal	i8	Deal ID number
sess_id	i4	Trading session ID
isin_id	i4	Multileg instrument ID
price	d16.5	Price of the first part of multileg trade
amount	i4	Volume, number of units of the instrument
moment	t	Time when the deal was made
code_sell	c7	Seller's code
code_buy	c7	Buyer's code
id_ord_sell	i8	ID number of the seller's order
ext_id_sell	i4	External ID number from the seller's order
comment_sell	c20	Comment from the seller's order
trust_sell	i1	Sign of an asset management company's order from the seller's order
status_sell	i4	Status of the trade from the seller's side
id_ord_buy	i8	ID number of the buyer's order
ext_id_buy	i4	External ID number from the buyer's order
comment_buy	c20	Comment from the buyer's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order
status_buy	i4	Status of the trade from the buyer's side
nosystem	i1	Sign of non-system deal
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
hedge_sell	i1	Sign of a hedging deal from the seller's side
hedge_buy	i1	Sign of a hedging deal from the buyers's side
code_rts_buy	c7	RTS code of the buyer company
code_rts_sell	c7	RTS code of the seller company
buyback_amount	d16.2	Price of the second part of multileg trade

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.

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 5. 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

Table sys_events: table of events

Table 6. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_OPTTRADE_REPL stream - Options: orders and trades

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

> **Note**
>
> Please, note that the table orders_log contains only orders submitted by your brokerage company or direct orders addressed to your brokerage company. Orders from other companies can be received only in aggregated form as a stream of aggregated orders (please, see section 4.5). Trades are sent together (including your trades and trades by other companies), with all data except for your data filtered out.

Table user_deal contains only own deals. This table may be useful for late join.

Data scheme

Tables:

- orders_log - Log of operations with orders
- deal - Trades
- heartbeat - Server times table
- sys_events - table of events

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
client_code	c7	Client code
moment	t	Time when the order's status was changed
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

Field	Type	Description
amount_rest	i4	Remaining number in 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
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
id_deal	i8	Deal ID number
deal_price	d16.5	Price of the deal
local_stamp	t	User's local time

Notes:

- Field status is a bit mask

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x1000 End-of-transaction bit

  0x80000 Fill-or-kill

  0x08 RFQ. Request for quote

  0x10 RFQ. Timeout

  0x100000 The record is a result of moving the order

  0x200000 The record is a result of cancelling the order

  0x400000 The record is a result of cancelling the group of orders

  0x2000000 Sign of cancelling the left balance of the order because of the cross-trade

- Field action describes an action with the order

  0 Order cancelled

  1 Order added

  2 Order is exercised in the trade

Table deal: Trades

Table 8. Fields of table 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
id_deal	i8	Deal ID number
sess_id	i4	Trading session ID
isin_id	i4	Instrument unique ID
price	d16.5	Price
amount	i4	Volume, number of units of the instrument

Field	Type	Description
moment	t	Time when the deal was made
code_sell	c7	Seller's code
code_buy	c7	Buyer's code
id_ord_sell	i8	ID number of the seller's order
ext_id_sell	i4	External ID number from the seller's order
comment_sell	c20	Comment from the seller's order
trust_sell	i1	Sign of an asset management company's order from the seller's order
status_sell	i4	Status of the trade from the seller's side
id_ord_buy	i8	ID number of the buyer's order
ext_id_buy	i4	External ID number from the buyer's order
comment_buy	c20	Comment from the buyer's order
trust_buy	i1	Sign of an asset management company's order from the buyer's order
status_buy	i4	Status of the trade from the buyer's side
pos	i4	Number of positions in the instrument in the market after the trade
nosystem	i1	Sign of non-system deal
hedge_sell	i1	Sign of a hedging deal from the seller's side
hedge_buy	i1	Sign of a hedging deal from the buyers's side
login_sell	c20	Login of the seller user
login_buy	c20	Login of the buyer user
code_rts_buy	c7	RTS code of the buyer company
code_rts_sell	c7	RTS code of the seller company
fee_sell	d26.2	Fee of the seller's deal
fee_buy	d26.2	Fee of the buyer's deal
id_deal_multileg	i8	Deal ID number for multileg deals

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 and define the following values:

  0x20 The deal is option's excersice deal

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 9. 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

Table sys_events: table of events

Table 10. Fields of table sys_events

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
event_id	i8	Unique ID of the event
sess_id	i4	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_ORDLOG_REPL stream – System orders_log

Data scheme

Tables:

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

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
moment	t	Time when the order's status was changed
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
amount_rest	i4	Remaining number in the order
id_deal	i8	Deal ID for this operation
deal_price	d16.5	Price of the deal

Notes:

- Field status is a bit mask

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x1000 End-of-transaction bit

  0x80000 Fill-or-kill

  0x100000 The record is a result of moving the order

  0x200000 The record is a result of cancelling the order

  0x400000 The record is a result of cancelling the group of orders

  0x20000000 Sign of cancelling the left balance of the order because of the cross-trade

- Field action describes an action with the order

0 Order cancelled

1 Order added

2 Order is exercised in the trade

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
moment	t	Time when the order's status was changed
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
amount_rest	i4	Remaining number in the order
rate_price	d16.5	Rate price
swap_price	d16.5	Swap price
id_deal	i8	Deal ID for this operation
deal_price	d16.5	Price of the deal

Notes:

- Field status is a bit mask

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x1000 End-of-transaction bit

  0x2000 REPO Order with Clearing Center

  0x20000 REPO Order

  0x40000 Paired order

- Field action describes action with order

  0 Order cancelled

  1 Order added

  2 Order exercised in a trade

Table sys_events: table of events

Table 13. 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

Field	Type	Description
sess_id	i4	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_FUTORDERBOOK_REP stream - Futures: order book snapshot

Data scheme

Tables:

- orders - Orders
- info - Orderbook snapshots information

Table orders: Orders

Table 14. 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	Time when the order's status was changed
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
amount_rest	i4	Remaining number in 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
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

Notes:

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

  0x01 Quote

  0x02 Couter

0x04	Non-system
0x100000	The record is a result of moving the order
0x200000	The record is a result of cancelling the order
0x400000	The record is a result of cancelling the group of orders
0x20000000	Sign of cancelling the left balance of the order because of the cross-trade

- Field action describes an action with the order

  1 Order added

  2 Order is exercised in the trade

Table info: Orderbook snapshots information

Table 15. 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
moment	t	Snapshot time

FORTS_OPTORDERBOOK_REPL stream - Options: order book snapshot

Data scheme

Tables:

- orders - Orders
- info - Orderbook snapshots information

Table orders: Orders

Table 16. 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	Time when the order's status was changed
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
amount_rest	i4	Remaining number in the order
comment	c20	Trader's comment
hedge	i1	Attribute of a hedging order

Field	Type	Description
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

Notes:

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

  0x01 Quote

  0x02 Couter

  0x04 Non-system

  0x100000 The record is a result of moving the order

  0x200000 The record is a result of cancelling the order

  0x400000 The record is a result of cancelling the group of orders

  0x20000000 Sign of cancelling the left balance of the order because of the cross-trade

- Field action describes an action with the order

  1 Order added

  2 Order is exercised in the trade

Table info: Orderbook snapshots information

Table 17. 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
moment	t	Snapshot time

FORTS_FUTCOMMON_REPL stream - Futures: common information

Data scheme

Tables:

- common - Market fundamentals

Table common: Market fundamentals

Table 18. 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
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
best_sell	d16.5	Best bid
amount_sell	i4	Size of the best bid
best_buy	d16.5	Best offer
amount_buy	i4	Size of the best offer
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
deal_time	t	Date and time of the last trade
min_price	d16.5	The low
max_price	d16.5	The high
avr_price	d16.5	Average weighted price
old_kotir	d16.5	Settlement price of the previous session
deal_count	i4	Number of trades
contr_count	i4	Total number of contracts in the trades
capital	d26.2	Total volume of trades in Russian rubles
pos	i4	Current open interest
mod_time	t	Date and time of changing the entry in the table
cur_kotir	d16.5	Current quote
cur_kotir_real	d16.5	Market quote
orders_sell_qty	i4	Number of offer orders
orders_sell_amount	i4	Total number of contracts in offer
orders_buy_qty	i4	Number of bid orders
orders_buy_amount	i4	Total number of contracts in bid
open_price	d16.5	Open price
close_price	d16.5	Close price
local_time	t	Time stamp for monitoring purposes

FORTS_OPTCOMMON_REPL stream - Options: common information

Data scheme

Tables:

- common - Market fundamentals

Table common: Market fundamentals

Table 19. 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
isin_id	i4	Instrument unique ID
sess_id	i4	Trading session ID
best_sell	d16.5	Best bid
amount_sell	i4	Size of the best bid

Field	Type	Description
best_buy	d16.5	Best offer
amount_buy	i4	Size of the best offer
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
deal_time	t	Date and time of the last trade
min_price	d16.5	The low
max_price	d16.5	The high
avr_price	d16.5	Average weighted price
old_kotir	d16.5	Settlement price of the previous session
deal_count	i4	Number of trades
contr_count	i4	Total number of contracts in the trades
capital	d26.2	Total volume of trades in Russian rubles
pos	i4	Current open interest
mod_time	t	Date and time of changing the entry in the table
isin_is_spec	i1	Currently you may submit a request for quote for this instrument
orders_sell_qty	i4	Number of offer orders
orders_sell_amount	i4	Total number of contracts in offer
orders_buy_qty	i4	Number of bid orders
orders_buy_amount	i4	Total number of contracts in bid
open_price	d16.5	Open price
close_price	d16.5	Close price
local_time	t	Time stamp for monitoring purposes

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_FUTAGGR20_REPL – 5 quotes depth

For options:

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

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

Data scheme

Tables:

- orders_aggr - Netted orders

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 20. 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
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.

FORTS_POS_REPL stream - information on positions

Data scheme

Tables:

- position - Client positions
- sys_events - table of events

Table position: Client positions

The table contains information on clients positions.

Table 21. Fields of table position

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
open_qty	i4	Number of positions at the start of the session
buys_qty	i4	Number of contracts bought during the session
sells_qty	i4	Number of contracts sold during the session
pos	i4	Current position
net_volume_rur	d26.2	Net value of trades in Russian rubles. Positive number – cash is credited, negative number – cash is debited
last_deal_id	i8	ID of the last deal
waprice	d16.5	Average weighted price

Table sys_events: table of events

Table 22. 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

Field	Type	Description
event_id	i8	Unique ID of the event
sess_id	i4	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_PART_REPL stream - information on limits

Data scheme

Tables:

- part - Client's funds and limits
- sys_events - table of events

Table part: Client's funds and limits

The table contains information on clients limits.

Table 23. 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
coeff_go	d16.5	Client's collateral ratio
coeff_liquidity	d16.5	Liquidity ratio
money_old	d26.2	Total amount of funds at the end of the previous session
money_amount	d26.2	Total cash amount
money_free	d26.2	Available cash amount
money_blocked	d26.2	Blocked cash amount
pledge_old	d26.2	Collateral in form of securities at the start of the session
pledge_amount	d26.2	Total collateral in form of securities
pledge_free	d26.2	Available collateral in form of securities
pledge_blocked	d26.2	Blocked collateral in form of securities
vm_reserve	d26.2	Amount reserved for negative variation margin on closed positions
vm_intercl	d26.2	Variation margin debited or credited during the intraday clearing
fee	d26.2	Debited fee
fee_reserve	d26.2	Blocked amount reserved for fees under the orders
limit_spot_buy	d26.2	Limit for buying RTS standard instruments
limit_spot_buy_used	d26.2	Limit used for buying RTS standard instruments
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.
is_auto_update_spot_limit	i1	Flag of automatic adjustment of limits for RTS standard instruments (limit for sell trades and limit for buy trades) when downloading after clearing: 0-no, 1-adjust.
no_fut_discount	i1	Flag of ban to provide discounts for futures: 1-ban, 0-no.
limits_set	i1	Flag of set limits. 0 for no limits
premium	d26.2	Premium
premium_order_reserve	f	Premium reserve for orders
balance_money	d26.2	Money transfers balance for current trading session
vm_order_reserve	f	Amount reserved for negative variation margin on orders

Table sys_events: table of events

Table 24. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_FUTINFO_REPL stream - Futures: reference and session information

Data scheme

Tables:

- delivery_report - Delivery report
- 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_registry - Guide on parameters of bonds
- fut_bond_isin - Guide on bond instruments
- fut_bond_nkd - Accrued interest as of the coupon payment date
- fut_bond_nominal - Payment of bonds' face value
- usd_online - USD rate online
- fut_vcb - Traded assets dictionary
- session - Information about a trading session
- multileg_dict - Multileg instruments dictionary
- fut_sess_contents - Traded instruments dictionary
- fut_instruments - Instruments dictionary
- diler - Companies' names dictionary
- investr - Clients dictionary
- fut_sess_settl - Clearing results: settlement prices
- sys_messages - Trading system messages
- sys_events - table of events

Table delivery_report: Delivery report

Table 25. Fields of table delivery_report

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
date	t	Date of clearing
client_code	c7	Client code

Field	Type	Description
type	c2	Flag of Clearing Member/Brokerage Company/client. Here it is always 'CL'.
isin_id	i4	Instrument ID number
pos	i4	Number of positions subject to settlement, as of the start of the current delivery stage (except for positions excluded based on the coinciding Taxpayer ID (codes))
pos_excl	i4	For the first delivery stage – it is the number of futures positions that were closed out because they were recorded in registers with the same Taxpayer ID (code). For the second delivery stage is always 0
pos_unexec	i4	Number of positions that were not settled during the current delivery stage
unexec	i1	Flag of settlement/failure to settle by the client whose positions are referred to in the field pos_unexec
settl_pair	c12	Settlement accounts pair code
asset_code	c25	Trading code of the asset being delivered
issue_code	c25	Depository code of the asset being delivered
oblig_rur	d16.2	Amount of obligations in Russian rubles
oblig_qty	i8	Amount of obligations in units of securities
fulfil_rur	d16.2	Amount of performed obligations in Russian rubles
fulfil_qty	i8	Amount of performed obligations in units of securities
step	i4	Number of delivery stage
sess_id	i4	Trading session ID
id_gen	i4	ID number of the stage of report generation

Notes:

- Field unexec can take the following values:

  0 Settlement

  1 Non-settlement

- Field step always has a value of 1 when delivery of RTS Standard instrument

Table fut_rejected_orders: register of orders rejected during the clearing

Table 26. 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
client_code	c7	Client code
moment	t	Time when the order's status was changed
moment_reject	t	Time when the order was rejected
isin_id	i4	Instrument unique ID
dir	i1	Direction
amount	i4	Volume, in units of the instrument
price	d16.5	Price
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order
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

Field	Type	Description
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

Table fut_intercl_info: Information of the variation margin calculated based on the results of the intraday clearing

Table 27. 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

Table fut_bond_registry: Guide on parameters of bonds

Table 28. 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	i1	Type: share/bond
year_base	i2	Day-count basis

Table fut_bond_isin: Guide on bond instruments

Table 29. 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

Table fut_bond_nkd: Accrued interest as of the coupon payment date

Table 30. 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

Field	Type	Description
bond_id	i4	ID of the bond
date	t	Coupon payment date
nkd	d16.7	Accrued interest as of the coupon payment date

Table fut_bond_nominal: Payment of bonds' face value

Table 31. 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

Table usd_online: USD rate online

Table 32. 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)

Table fut_vcb: Traded assets dictionary

The table contains dictionary of base contracts for instruments.

Table 33. 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	Contract name
exec_type	c1	Settlement type
curr	c3	Payment currency
exch_pay	d16.2	Exchange fee per 1 contract in Russian rubles
exch_pay_scalped	i1	Flag of scalping the exchange fee
clear_pay	d16.2	Clearing fee per 1 contract in Russian rubles
clear_pay_scalped	i1	Flag of scalping the clearing fee
sell_fee	d7.3	Commission payable by the seller. Not relevant
buy_fee	d7.3	Commission payable by the buyer. Not relevant
trade_scheme	c1	Trading mode
section	c50	Market section. 'Securities', 'Commodities', 'Money'
exch_pay_spot	d16.5	Exchange fee for RTS standard instrument per 1 lot in percentage of the price

Field	Type	Description
client_code	c7	Client code
exch_pay_spot_repo	d16.5	Exchange fee on repo

Notes:

- Field exec_type can take the following values:

  A Alternative

  D Delivery

  I Index

  S RTS Standard

- Field trade_scheme can take the following values:

  F With 100% collateral

  G With pledge

Table session: Information about a trading session

The table contains trading sessions timetable.

Table 34. Fields of table session

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
begin	t	Opening time
end	t	Closing time
state	i4	Status of the session
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 profibited 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 interclearing 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.

Table multileg_dict: Multileg instruments dictionary

Table 35. 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

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.

Table fut_sess_contents: Traded instruments dictionary

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

Table 36. 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
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	Settlement price at the start of the current 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

Field	Type	Description
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.
coeff	d9.6	Ratio of the intermonth spread
d_exp	t	Instrument's settlement date
is_percent	i1	Flag of an interest rate futures contract. 1 – futures on interest rate, 0 – other than futures on interest 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

Notes:

- Trading session state has priority over instrument state. That is, if a session is in "suspended" or "finished" state, then all intruments 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

  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't 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)

  0x04 RTS Standard instrument

  0x08 Primery RTS Standard instrument

  0x10 Sign of anonymous trading

  0x20 Sign of non-anonymous trading

  0x40 Sign of trading in the main session

  0x100 Sign of multileg-instrument

  0x800 Sign of RTS Money 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 multileg one

  1 The instrument that is traded in the REPO mode

  2 The instrument is RTS Money swap

Table fut_instruments: Instruments dictionary

Table 37. 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	Скорректированная расчетная цена предыдущей сессии
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.
coeff	d9.6	Ratio of the intermonth spread
d_exp	t	Instrument's settlement date
is_percent	i1	Flag of an interest rate futures contract. 1 – futures on interest rate, 0 – other than futures on interest 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
step_price_curr	d16.5	Value of the minimum increment in USD

Field	Type	Description
d_start	t	Instrument's start trade date

Table diler: Companies' names dictionary

Table 38. Fields of table diler

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
transfer_code	c7	Account code for position transfer
status	i4	Sign of segregated account

Notes:

- Fields client_code, name, transfer_code are filled only for client's brokerage company (-ies).

Table investr: Clients dictionary

Table 39. Fields of table investr

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

Notes:

Table fut_sess_settl: Clearing results: settlement prices

The table contains settlement instruments prices of the last clearing.

Table 40. 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 ID number
settl_price	d16.5	Settlement price

Table sys_messages: Trading system messages

Table 41. 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

Field	Type	Description
moment	t	Message date and time
lang_code	c8	Message language
urgency	i1	Urgency
status	i1	Message status
text	c255	Text

Table sys_events: table of events

Table 42. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_OPTINFO_REPL stream - Options: reference and session information

Data scheme

Tables:

- 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_vcb - Traded assets dictionary
- opt_sess_contents - Traded instruments dictionary
- opt_sess_settl - Clearing results: volatility and theoretical prices
- sys_events - table of events

Table opt_rejected_orders: register of orders rejected during the clearing

Table 43. 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
client_code	c7	Client code
moment	t	Time when the order's status was changed
moment_reject	t	Time when the order was rejected
isin_id	i4	Instrument unique ID
dir	i1	Direction
amount	i4	Volume, in units of the instrument
price	d16.5	Price
date_exp	t	Order's expiration date
id_ord1	i8	ID number of the first order

Field	Type	Description
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

Table opt_intercl_info: Information of the variation margin calculated based on the results of the intraday clearing

Table 44. Fields of table opt_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

Table opt_exp_orders: Register of orders for expiration of option

Table 45. 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
sess_id	i4	Trading session ID
date	t	Date and time
amount_apply	i4	Number of positions detailed in orders as of intraday clearing

Table opt_vcb: Traded assets dictionary

The table contains dictionary of base contracts for instruments.

Table 46. 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	Contract name
exec_type	c1	Settlement type
curr	c3	Payment currency
exch_pay	d16.2	Exchange fee per 1 contract in Russian rubles
exch_pay_scalped	i1	Flag of scalping the exchange fee
clear_pay	d16.2	Clearing fee per 1 contract in Russian rubles
clear_pay_scalped	i1	Flag of scalping the clearing fee
sell_fee	d7.3	Commission payable by the seller. Not relevant

Field	Type	Description
buy_fee	d7.3	Commission payable by the buyer. Not relevant
trade_scheme	c1	Trading mode
coeff_out	d7.3	Approximation ratio for options priced beyond limits
is_spec	i1	Flag of an RFQ specialist for this contract
spec_spread	d16.5	Maximum width of the specialist's spread
min_vol	i4	Minimum volume of quotes from the specialist
client_code	c7	Client code

Table opt_sess_contents: Traded instruments dictionary

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

Table 47. 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

Примечания:

- Trading session state has priority over instrument state. That is, if a session is in "suspended" or "finished" state, then all intruments can't be traded regardless their states.
- 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

Table opt_sess_settl: Clearing results: volatility and theoretical prices

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

Table 48. 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

Table sys_events: table of events

Table 49. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_MISCINFO_REPL stream - miscellaneous information

Data scheme

Tables:

- volat_coeff - Parametric volatility curve's parameters

Table volat_coeff: Parametric volatility curve's parameters

Table 50. 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

Field	Type	Description
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

FORTS_MM_REPL stream - information about MM's obligations

Data scheme

Tables:

- fut_MM_info - MM's obligations in futures
- opt_MM_info - MM's obligations in options

Table fut_MM_info: MM's obligations in futures

Table 51. Fields of table fut_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
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
mm_spread	d16.5	Agreed spread
mm_amount	i4	Number in accordance with the agreement
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
agmt_id	i4	Number of the MM agreement

Table opt_MM_info: MM's obligations in options

Table 52. 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

Field	Type	Description
amount_sells	i4	Number of contracts in the sell order included in the spread
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
mm_spread	d16.5	Agreed spread
mm_amount	i4	Number in accordance with the agreement
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
agmt_id	i4	Number of the MM agreement

FORTS_CLMONEY_REPL stream - information on client's limits and funds in clearing

Data scheme

Tables:

- money_clearing - Status of clients' cash accounts after clearing
- sys_events - table of events

Table money_clearing: Status of clients' cash accounts after clearing

Table 53. 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

Table sys_events: table of events

Table 54. 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

Field	Type	Description
event_id	i8	Unique ID of the event
sess_id	i4	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

FORTS_CLR_REPL stream - clearing information

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
- sys_events - table of events

Table money_clearing: Status of clients' cash accounts after clearing

Table 55. 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

Table clr_rate: Currency and Index rates

Table 56. 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
id	c12	Index or rate ID
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

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

Table 57. 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
isin	c25	Symbol code of the instrument
client_code	c7	Client code
account	i1	Account type
pos_beg	i4	Position on trading session start
pos_end	i4	Position on trading session end
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

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

Table 58. 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
pos_beg	i4	Position on trading session start
pos_end	i4	Position on trading session end
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

Table fut_sess_settl: Futures settlement prices

Table 59. 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

Field	Type	Description
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	Уникальный числовой идентификатор иструмента
settl_price	d16.5	Settlement price

Table opt_sess_settl: options' settlement price

Table 60. 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	Уникальный числовой идентификатор иструмента
volat	d16.5	Option’s volatility
theor_price	d16.5	Option’s theoretical price

Table sys_events: table of events

Table 61. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

RTS_INDEX_REPL stream - online indices

Data scheme

Tables:

- rts_index - Indices

Table rts_index: Indices

The table contains data about Stock Exchange Indices values.

Table 62. 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

Field	Type	Description
prev_close_value	d18.4	Close value
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

RTS_INDEXLOG_REPL stream - indices history

Data scheme

Tables:

- rts_index_log - Indices values log

Table rts_index_log: Indices values log

The table contains history of Stock Exchange Indices values. The table is truncated every night during technical break.

Table 63. Fields of table rts_index_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
name	c25	Index ID
moment	t	Time of the last update
value	d18.4	Index value
prev_close_value	d18.4	Close value
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

FORTS_VM_REPL stream - online variational margin stream

Data scheme

Tables:

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

Table fut_vm: Variation margin for futures

Table 64. 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

Field	Type	Description
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

Table opt_vm: Variation margin for options

Table 65. 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

FORTS_VOLAT_REPL stream - online volatility information

Data scheme

Tables:

- volat - Volatility

Table volat: Volatility

Table 66. 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

FORTS_INFO_REPL stream - additional reference information

Data scheme

Tables:

- base_contracts_params - Base contracts parameters
- futures_params - Futures parameters
- virtual_futures_params - Virtual futures parameters
- options_params - Options parameters
- broker_params - Brokerage firms parameters

- client_params - Clients parameters
- sys_events - table of events

Table base_contracts_params: Base contracts parameters

Table 67. 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
points_num	i1	Number of risk points
subrisk_step	f	Number of risk subpoints
is_percent	i1	Sign of contract in terms of interest rate
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
usd_rate_curv_radius	f	USD rate curvature radius
somc	f	Collateral rate for uncovered sells

Table futures_params: Futures parameters

Table 68. 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
limit	f	Limit of contract price variations
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 incrememnt
base_go	d26.2	Basic collateral
exp_date	t	Date of expiration
spot_signs	i1	Sing of RTS Standard instrument
settl_price_real	d16.5	Real settlement price
min_step	f	Minimal price increment

Notes:

- Field spread_aspect can take the following values:

  0 It is not included in spread

  2 It is included into caalendar spread

- Fieldspot_sings can take the following values:

  0 Ordinary futures

  1 RTS Standard instrument

3 Primery RTS Standard instrument

Table virtual_futures_params: Virtual futures parameters

Table 69. 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
is_net_positive	i1	Sign of accounting positive risk on this virtual futures
volat_range	f	Volatility range
t_squared	f	Value of the square root from time to date of expiration of options to this virtual futures
max_addrisk	f	Upper limitation on additional risks
a	f	
b	f	
c	f	
d	f	
e	f	
s	f	
exp_date	t	Date of expiration
fut_type	i1	Sign of marginal calculation system for the options to this virtual futures
use_null_volat	i1	Sign of zero volatility

Table options_params: Options parameters

Table 70. 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
base_go_sell	d26.2	Base collateral to sell
synth_base_go	d26.2	Base collateral of synthetic sell position
base_go_buy	d26.2	Base collateral to buy

Table broker_params: Brokerage firms parameters

Table 71. Fields of table broker_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
broker_code	c7	Brokerage company code

Field	Type	Description
code_vcb	c25	Base contract code
limit_spot_sell	i4	Limit on opening sell position on RTS Standard for given underlying
used_limit_spot_sell	i4	Used limit on opening sell position on RTS Standard for given underlying

Table client_params: Clients parameters

Table 72. Fields of table client_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
client_code	c7	Client code
code_vcb	c25	Base contract code
coeff_go	d16.5	Collateral coefficient
limit_spot_sell	i4	Limit on opening sell position on RTS Standard for given underlying
used_limit_spot_sell	i4	Used limit on opening sell position on RTS Standard for given underlying

Table sys_events: table of events

Table 73. 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	Number of the session
event_type	i4	Type of the event
message	c64	Description of the event

Commands description

Method FutAddOrder - Add futures order

Message type: 36

Reply message type: 101

Table 74. Input parameters

Name	Type	Default value	Description
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

Name	Type	Default value	Description
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

Table 75. 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.

Method FutAddMultiLegOrder - Add multileg order

Message type: 40

Reply message type: 129

The command allows to place a multileg order (repo or RTS Money swap)

Table 76. Input parameters

Name	Type	Default value	Description
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

Name	Type	Default value	Description
price	c17		Price
rate_price	c17		Either rate or swap price (depends on instrument type)
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

Table 77. 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: 'nnnnnnnnn.mmmmm'.

- The ***'rate_price'*** contains order price for multi-leg instrument:

  - Rate – for repo instruments
  - Swap-price – for RTS Money swap instruments

  Generally, the field is defined by the 0x1000 flag value (quotation method) in the instrument description section (see fut_sess_contents)

- The ***'date_exp'*** field contains order expiration date as 'YYYYMMDD'.

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

  1 Repo

  2 Pair of multileg orders

- 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.

Method FutDelOrder - Cancel futures order

Message type: 37

Reply message type: 102

Table 78. Input parameters

Name	Type	Default value	Description
order_id	i8		Order ID to remove

Table 79. 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 sence to continue sending removal requests for the same order number (may be useful for automatic systems).

Method FutDelUserOrders - Mass cancel futures order

Message type: 38

Reply message type: 103

Table 80. Input parameters

Name	Type	Default value	Description
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 81. 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

4 all orders out of limits (may be useful after intermrdiate clearing session)

- 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.

Method FutMoveOrder - Modify futures order

Message type: 39

Reply message type: 105

Table 82. Input parameters

Name	Type	Default value	Description
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 83. 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 take on 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.
- Private 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.
- f 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.
- При передвижке заявок 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.

Method OptAddOrder - Add futures order

Message type: 41

Reply message type: 109

Table 84. Input parameters

Name	Type	Default value	Description
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
check_limit	i4	0	Flag of checking 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

Table 85. 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:

- Поле The ***'type'*** 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: 'nnnnnnnnn.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.

Method OptDelOrder - Cancel futures order

Message type: 42

Reply message type: 110

Table 86. Input parameters

Name	Type	Default value	Description
order_id	i8		Order ID to remove

Table 87. Execution result

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

Method OptDelUserOrders - Mass cancel futures order

Message type: 43

Reply message type: 111

Table 88. Input parameters

Name	Type	Default value	Description
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

Name	Type	Default value	Description
code_vcb	c25		Contract code
ext_id	i4	0	External ID
isin	c25	""	Instrument ID

Table 89. Execution result

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

Method OptMoveOrder - Modify futures order

Message type: 44

Reply message type: 113

Table 90. Input parameters

Name	Type	Default value	Description
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 91. 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

Method FutChangeClientMoney - Modify client limits

Message type: 4

Reply message type: 104

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

Table 92. Input parameters

Name	Type	Default value	Description
mode	i4		Mode
code	c3		Client code
limit_money	c17	"0"	Funds limit
limit_pledge	c17	"0"	Collateral limit
coeff_liquidity	c17	"0"	Liquidity ratio for futures
coeff_go	c17	"1"	Client’s collateral ratio
is_auto_update_limit	i4	-1	Flag of automatic adjustment of the limit by the amount of income after clearing

Name	Type	Default value	Description
is_auto_update_spot_limit	i4	-1	Flag of automatic adjustment of limits for RTS standard instruments (buy and sell) when downloading after clearing
limit_spot_buy	c17	"-1"	Limit for buying RTS standard instruments
no_fut_discount	i4	0	Flag of prohibition to provide discounts for futures

Table 93. 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 limit for roubles

  10 Remove limit for collaterals

  11 Remove limits for roubles, collaterals and spots

  12 Set limits for roubles, collaterals and spots

  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.

- For changing only***coeff_liquidity*** and/or ***coeff_go*** and/or ***is_auto_update_limit*** and/or ***is_auto_update_spot_limit***the mode '13' must be used. The ***'limit_money'*** parameter must be set to '0'.

- The***is_auto_update_spot_limit***flag, being set to '1', allows to automatize the limit changing process for buy or sell spots trades in accordance with the previous day results. Therefore, the calculated limit will be applied for all the period of the instrument lifetime. The '-1 value' should be set for operations in the '12' and '13' modes. If there have been any change made to other parameters, the 'is_auto_update_spot_limit' parameter must remain unchanged.

- The parameter ***limit_spot_buy*** format is '16.2', set in roubles.

- 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

Method FutChangeClientVcb - Modify client's parameters for an underlying asset

Message type: 33

Reply message type: 106

The command allows to change client parameters for underlying assets.

Table 94. Input parameters

Name	Type	Default value	Description
mode	i4		Mode
code	c3		Client code

Name	Type	Default value	Description
code_vcb	c25		Code of the underlying asset
coeff_go	c17	"1"	Ratio of the client's collateral on the underlying asset
limit_spot	c10	"-1"	Client's limit for short positions in RTS standard instruments on the underlying asset

Table 95. 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 limit

  12 set limit

- ***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.

- ***limit_spot*** if no client limit is necessary and ***'mode'*** cannot be set as '=11' as the string is reserved, then the parameter should be set as '-1'. The variable internal type is 'int'.

Method FutChangeBrokerVcb - Modify brokerage company's parameters for an underlying asset

Message type: 14

Reply message type: 114

The command allows to change underlying assets parameters for brokerage firm.

Table 96. Input parameters

Name	Type	Default value	Description
mode	i4		Mode
code_vcb	c25		Code of the underlying asset
limit_spot	c10	"-1"	Brokerage company's limit for short positions in RTS standard instruments on the underlying asset

Table 97. 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:

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

  11 remove limit

  12 set limit

- ***limit_spot*** if no client limit is necessary and ***'mode'*** cannot be set as '=11' as the string is reserved, then the parameter should be set as '-1'. The variable internal type is 'int'.

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 98. Input parameters

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

Table 99. 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.

Method FutChangeMoney - Modify limits for buying RTS standard instruments on underlying assets

Message type: 16

Reply message type: 116

The command allows to change the funds parameters for a BF.

Table 100. Input parameters

Name	Type	Default value	Description
mode	i4		Mode
limit_spot_buy	c17	"-1"	Funds limit
is_auto_update_spot_limiti4		-1	Flag of automatic adjustment of limits for RTS standard instruments (buy and sell) when downloading after clearing
state	i4	-1	Ban to submit orders to RTS Standard

Table 101. Execution result

Name	Type	Default value	Description
code	i4		Return code

Name	Type	Default value	Description
message	c255		Message text

Return codes:

0 operation completed successfully

Any other value error

Примечания: Notes:

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

  11 Remove

  12 Set

- To get access to the procedure, a clearing firm's login must obtain the sufficient rights from the Trade administrator.
- Funds limit (the ***'limit_spot_buy'*** field). If set to '-1', then no verification will be made for the specified limit. If set to '-2', then the limit is not a subject to change. If not set, then the default value is '-1'.
- The ***'is_auto_update_spot_limit'*** field, 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' mode. If there have been any change made to other parameters, the parameter must remain unchanged.
- To change only the ***'is_auto_update_spot_limit'*** parameter you can set the parameter value in the '12' mode. The ***'limit_spot_buy'*** parameter value must be ='.

Method OptChangeExpiration - Add order for expiration of options

Message type: 12

Reply message type: 112

Table 102. Input parameters

Name	Type	Default value	Description
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 103. 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.

Method FutChangeClientProhibit - Modify client's restrictions for futures

Message type: 15

Reply message type: 115

Table 104. Input parameters

Name	Type	Default value	Description
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 105. 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

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

  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.

Method OptChangeClientProhibit - Modify client's restrictions for options

Message type: 17

Reply message type: 117

Table 106. Input parameters

Name	Type	Default value	Description
mode	i4		Mode

Name	Type	Default value	Description
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 107. 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

Примечания: 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:

    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.

Method FutExchangeBFMoney - Tranfer funds within brokerage firm

Message type: 33

Reply message type: 130

Table 108. Input parameters

Name	Type	Default value	Description
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 109. Execution result

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

Method OptRecalcCS - Recalculate central strike request

Message type: 45

Reply message type: 132

Table 110. Input parameters

Name	Type	Default value	Description
isin_id	i4		Base instrument ID

Table 111. Execution result

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

A. 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 bynary system, where: • N — the whole quantity of digits • M — 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.

<xi:include></xi:include>