MOSCOW EXCHANGE

ASTS Bridge (v. 4.4)

Interface for connecting
external systems to the Moscow Exchange
ASTS trading & clearing system

User Guide

Linux OS

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INTRODUCTION

This guide describes the ASTS Bridge software package that is used to connect external systems (such as brokerage systems, market data distribution systems, HFTs, risk management, back offices) to the Moscow Exchange ASTS trading & clearing system in real time over the native API.

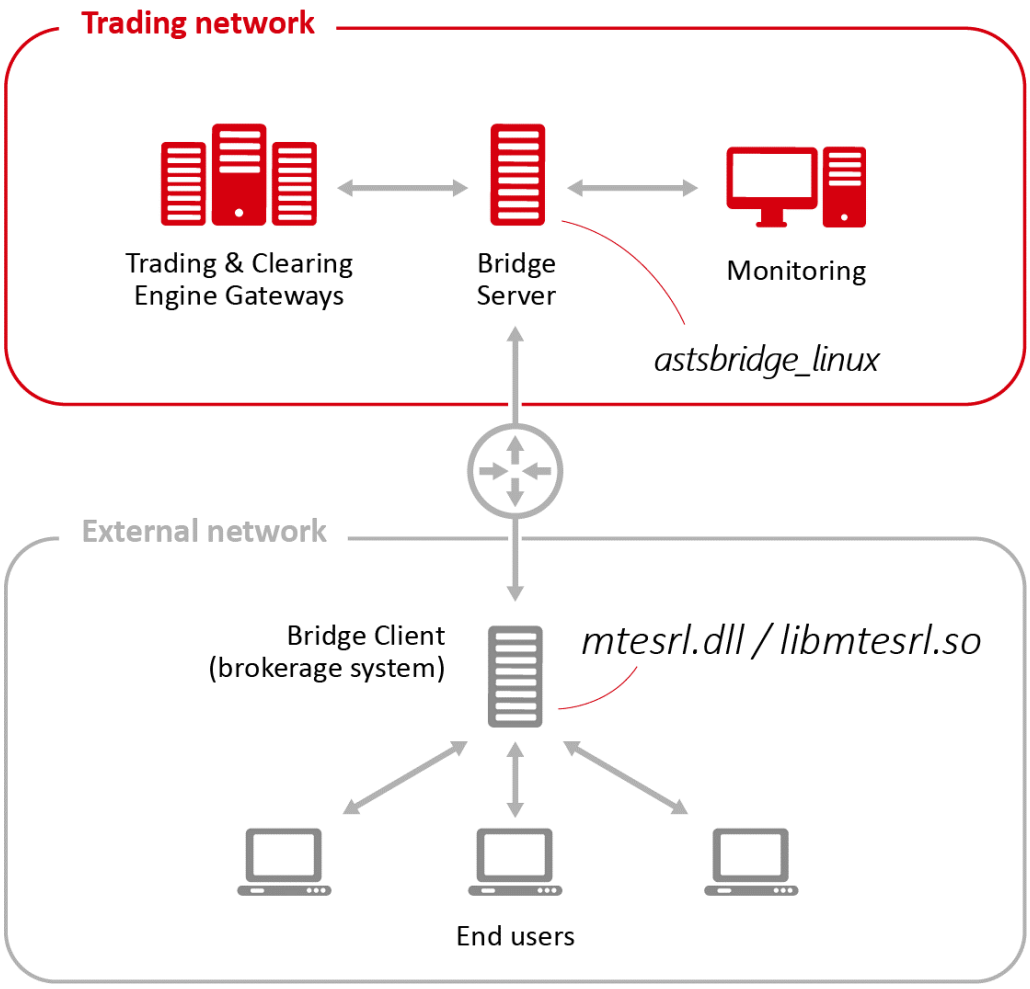
ASTS Bridge provides bidirectional connection to the trading & clearing system and includes an application programming interface (API), which provides functions for obtaining data from trading and clearing systems (orders, trades, instruments, etc.) as well as for executing transactions (enter and cancel

orders, etc.). The API itself is described in a separate document: "Application Programming Interface for connecting external systems to the Moscow Exchange ASTS Trading & Clearing System".

A client library libmtesrl.so that provides application programming interface (ASTS Connectivity API) to connect to ASTS trading and clearing systems is included into the ASTS Bridge package.

SYSTEM ARCHITECTURE

The system architecture is shown on the following diagram:



PIC. 1 ASTS BRIDGE SYSTEM ARCHITECTURE

MAIN FUNCTIONS OF ASTS BRIDGE

ASTS Bridge supports following main operations:

- connect to the ASTS trading & clearing system (TS);
- receive requests for trading or clearing data from an external system, and pass them to the TS;
- receive replies (data updates) from TS and pass this information to the external system;
- receive requests for transactions (enter or cancel orders, etc.) from the external system and transmit them to the TS;
- receive reply to the transaction from TS and pass it to the external system;
- receive error messages (resulting from processing requests for data or transactions) from TS and pass them to the external system;
- pass the description of "bridge interface" to the external system;
- state recovery after connection loss or any failures in the trading system, external system or bridge;
- disconnect from TS.

ASTS Bridge provides logging for the following events:

- connection to trading/clearing system;
- transaction requests from an external system;
- requests for data (updates) from an external system;
- disconnection from the TS.

ASTS Bridge provides connection to the Moscow Exchange equity & bonds market, FX and precious metal market, money market.

IMPLEMENTATION DETAILS

The application is implemented as two software components that can be executed on two separate machines. The server component (ASTS Bridge), implemented as separate application 64 bit versions of Linux-based operating systems, connects to ASTS trading & clearing System via the internal Mustang protocol (a new transport protocol backwards compatible with the old TSMR protocol). The client component ASTS Connectivity API (libmtesrl.so for 64 bit Linux) provides an application programming interface (API) to external system. API is described in a separate document: "Application Programming Interface for connecting external systems to the Moscow Exchange ASTS Trading & Clearing System". Data is transferred between components over the TCP/IP protocol.

In order to provide connection flexibility all the interaction between external systems and trading/clearing systems is carried out through particular versions of bridge interfaces with appropriate access permissions granted to connecting users. Description of the allowed bridge interfaces can be requested by external system dynamically. This description has a specific structure and includes:

- description of tables (table names, types and additional information) available to the client;
- description of table fields (field names, types, formats and additional information) available to the client;
- description of transactions (transaction names, types, formats and additional information) available to the client;
- description of transaction fields (field names, types, formats and additional information) available to the client;
- description of specific constants (so called enumerations) used to encode field values in tables and transactions.

Bridge interface descriptions are stored and maintained centrally, and the required description is transferred from a trading system to the bridge on request at the beginning of working session.

Usually, most of external systems establish two or more connections. Any connection may be used either for market data transmission or for transaction execution or for both. It is up to external system developers to decide how to utilize each connection.

Several connection profiles for parallel connection to different trading/clearing systems can be set up on a single instance of ASTS Bridge. It is also possible to run multiple instances of ASTS Bridge on a single machine with different configuration files and working directories.

HARDWARE AND SOFTWARE REQUIREMENTS

For proper operation of ASTS Bridge server and external systems that use the mtesrl library, the following minimal software and hardware requirements are established:

Operation system of one of the following versions for Linux clients and server component:

- RedHat/CentOS 7 and newer;

— Using of other distributions is possible.

Hardware – minimum:

— CPU – Intel Core or compatible 1,4GHz or higher;

— RAM –4GB or more;

— HDD with 10 GB free space for logging;

— Ethernet network card.

Hardware – recommended:

— CPU – Intel Core or compatible 3GHz or higher x 4 core;

— RAM –16GB or more;

— HDD with 10 GB free space for logging;

— Ethernet network card.

Bit rate:

— From 100 Mbit/s. Recommended is 1 Gbit/s.

These requirements do not consider specific characteristics of an external system and may be adjusted upwards depending on the resources required for external system proper operation.

INSTALLATION, UNINSTALLATION, UPDATES

The product is supplied as a ZIP archive.

To install ASTS Bridge just unzip the archive to any directory on your hard drive.

SECURITY NOTE:

> Place the executable files of the bridge into a write-protected folder, for example into "**/opt/moex/astsbridge**" folder.

The distribution package has the following directory structure:

server	ASTS Bridge server component;
mtesrl	client library (API) for external systems;
demo	API examples on C++, Delphi, Java, C#, Python;
doc	product documentation;
embedded	client library for direct connection to ASTS trading/clearing system. Can be used only from the Moscow Exchange colocation zone (so-called embedded

bridge).

To run ASTS Bridge server run the program file from the server directory:

astsbridge_linux

For information on connecting your own external system to ASTS trading & clearing system, refer to the developer manual - "Application Programming Interface for connecting external systems to the Moscow Exchange ASTS Trading & Clearing System".

NOTE:

When updating the product be sure to backup configuration files of previous version.

Do not unzip the distribution archive to the working folder of previous version. This can cause loss of important data and break ASTSBridge and external systems operability.

Default format for configuration files is XML. Refer to

To uninstall the product delete its folder. If products working folder differs from its installation folder, it's necessary to delete working folder first.

WORKING WITH ASTS BRIDGE

Clients connect to ASTS Bridge server over the TCP/IP protocol. The key software functions are:

- possibility to indicate bridge interface (set of tables, fields and transactions) and list of trading boards for each client connection;
- possibility to specify several Bridge addresses at connection time, so connection will dynamically switch between them in case of network problems;
- support for TLS 1.2 encryption;
- support for Validata electronic digital signature and streaming encryption from;

ASTS Bridge server accepts incoming client connections and establishes connection to the ASTS trading & clearing system for each client individually.

Settings

Current version uses configuration files in XML format. XML configuration files support several connection profiles to establish connection to different trading/clearing systems.

By default, ASTS Bridge server loads its parameters from configuration file whose name matches the name of the main executable. So, astsbridge_linux will first try to load astsbrigde_linux.xml. For astsbridge_linuxEQ it will be astsbridge_linuxEQ.xml and so on.

Configuration file name (and full path) can be specified at ASTSBridge server startup from the command line:

```
./astsbridge_linux -config configfilename.xml
```

Working with encrypted connection channel

To work with secured connection channel encrypted via TLS protocol it is recommended to generate a unique secret key and the certificate, using the script from the /server folder of the distribution package:

```
create_test_key.sh
```

openssl package of version 1.1 is required to be installed in the operation system.

To configure encryption parameters, use the Security section in the XML configuration file.

Setting the localization variable

NOTE:

When downloading the libmtesrl.so library for an external system application process, changing the value of the localization variable will be forced twice.

1. To the ‘POSIX’ value.
2. To the value used in the LANG environment variable with the mandatory ‘.utf8’ encoding. If the value of the LANG variable is not set, ‘en_US’ will be used as the default value.

Examples:

- `LANG=ru_RU.utf8`. Value after libmtesrl.so download: `LANG=ru_RU.utf8`.
- `LANG=en_US.iso88591`. Value after libmtesrl.so download: `LANG=en_US.utf8`.

To avoid resetting the localization variable to an unsuitable value for your system, it is recommended to do one of the following:

1. Ensure that the proper value of the LANG environment variable is used
2. Use a known non-existent LANG value. In this case, the localization variable will be set to ‘POSIX’.
3. Save the required value of the localization variable, restore it after initializing the libmtesrl.so library, and use one of the libmtesrl.so library loading options:
   - Via a dynamically loaded proxy library
   - Via dlopen() and dlsym() functions at the application runtime.

XML configuration file structure

<Element> Tag / Attribute	Description
<Bridge>	**Root element.**
<Settings>	**ASTS Bridge general settings.**
<Service>	Name or number of the TCP service of the server. For example "15005".
<DisconnectIfIdleFor>	Maximum idle time (in seconds), after which the client will be forcibly disconnected. Clients, who do not query the server for a long time, are considered to be "hanged up". It's recommended not to set this parameter to less than 60 seconds.
<AutoStopTime>	Time of automatic server shutdown. On specified time, ASTS Bridge will automatically stop and all connected clients will receive an appropriate message. If not specified, the server will work non-stop.
<Language>	Language for error messages. Possible values are: "English", "Russian".
<MinSupportedClientVer>	The minimum version of libmtesrl.so, which is permitted to connect to the server. Default value is "6.71".
<Compression>	Compression of transmitted data: "0" — No compression; "1" — Zlib — default and recommended value; "2" — BZip2.
<LogoffAfterTimeout>	Values: "0" or "1". Forbids or allows sending a LOGOFF transaction for idle clients. If not specified, ASTS Bridge will send the transaction by default.
</Settings>	
<Logging>	**ASTS Bridge logging settings.**
<WorkingFolder>	Full path to ASTS Bridge working directory, which will be used for log files and TS interface caching. If value is not specified installation directory will be used.
<KeepLogFiles>	Number of days to keep log files on the server hard drive. If set to 0, the log will never be removed.
<SaveUserLogsToFile>	Values: "0" or "1". Forbids or allows collecting and storing statistics of user activity. In case of high client applications activity, statistic data may require a large amount of memory and it is recommended to disable this function.
</Logging>	
<Monitoring>	**ASTS Bridge monitoring settings.**
<Service>	The name or number of the service, on which http-agent for server monitoring is running. Monitoring is available using a web-browser at:

	http://{server_address}:{service}.
<HostName>	If this parameter is set, the http-agent checks the Host header in the HTTP-request to match the specified value (protects against Anti-DNS Pinning attack).
<StatsInterval>	Interval to collect statistics on client connections. For each client the following data is collected: bytes received and sent, number of requests, average time of request processing by the Trading System, packet delays.
<KeyExpireDays>	Number of days before Validata key expiration when system administrator will be informed about this. This parameter is valid only when cryptography is enabled.
<LowDiskSpace>	The lowest free drive space (in MB) when the notification on the low disk space is sent to the system administrator.
<MailServer>	Mail server IP or name (SMTP) to send diagnostic e-mail notifications to the administrators.
<MailSender>	E-mail address for the FROM field of diagnostic notifications.
<AdminEmails>	List of e-mail addresses (comma separated) of recipients who would like to get notifications on the server startup & shutdown and other system messages. Empty value means not to send any such messages.
<ConnectErrorEmails>	List of e-mail addresses (comma separated) of recipients who would like to get notifications on client connection problems. Empty value means not to send any such messages.
<NetworkErrorEmails>	List of e-mail addresses (comma separated) of recipients who would like to get notifications on the client's network problems. Empty value means not to send any such messages.
<NetworkErrorEvent>	Condition for sending a network problem notification – number of failures during the specified time interval (minutes); for example: <NetworkErrorEvent>3,2</NetworkErrorEvent>.
<SlowTsmrEmails>	List of e-mail addresses (comma separated) of recipients who would like to get notifications on the slow connection to the ASTS trading system or its absence. Empty value means not to send any such messages.
<SlowTsmrEvent>	Condition for sending a slow connection notification – number of times the value of MaxProcessingTime was exceeded during the specified time interval (minutes); for example: <SlowTsmrEvent>5,5</SlowTsmrEvent>.

</Monitoring>

<Engines>	**Trading/clearing systems connection settings.**
<Engine …Id="…">	Bridge connection profile ID for example EQ_TEST. This ID is defined by user at connection time in order to verify the connection to the needed server.
…	
…Name="…">	For example: "Equities & Bonds Market".
<TSMR>	**Connection parameters.**
<Broadcast>	List of trading/clearing server broadcast addresses. If not specified, the value from TSMR.INI will be used.

<Server>	Trading/clearing system server name.
<Service>	Trading/clearing system TCP and UDP services name or port numbers.
<PrefBroadcast>	Preferred broadcast address.
<MaxProcessingTime>	Maximum time for trading system to process the requests, in ms. On timeout the warning will be given.
<ConnectTimeOut>	Timeout for UDP-reply from the Trading System during the connection sequence (seconds). If set to 0 (zero) then the default value will be used (30 seconds).
<Timeout>	Timeout of the Mustang connection (seconds) in range [1... 300] If set to 0 then the default value will be used (30 seconds).
<BufSize>	Mustang buffer size in bytes. If set to 0 (zero) then default value will be used (60000).
<IgnoreUserBufSize>	"0" — allow users to choose Mustang buffer size, by specifying values from 10000 to 60000 in PACKETSIZE parameter, when calling MTEConnect; "1" — user buffer size settings are ignored. Mustang buffer size, defined in BufSize parameter, is used. This is the default value.
<TEUpTime>	Time after which the trading system is supposed to be accessible. If the system is not accessible then the notification will be sent to the administrator. 0:00:00 – do not send any notifications.
<LogUsers>	Enable logging for the following users. Comma-separated list of user identifiers.
<Compression>	Enable or disable internal Mustang compression: "0" — compression disabled; "1" — compression enabled.
<IpSrcOrder>	Comma-separated list of IP addresses of network interfaces that are allowed to connect to trading systems. The order of IP addresses in the list defines the priority.
<RestrictList>	If this option is enabled, search for trading system gateways will be performed only from network interfaces specified in the previous option. If disabled – all network interfaces will be involved.: "0" — all network interfaces will try to connect to the trading system; "1" — search for trading system gateways will be performed only from network interfaces specified in `IpSrcOrder` parameter.
<LogLevel>	Level of Mustang internal logging: "0" — logging disabled; "1.."30" — logging enabled with specified level of depth.
<Transport>	Transport library name: "TSMR" — use libtsmr.so for all connections; "Mustang" — use libmustang.so for all connections. Value not specified — client can choose the library when connecting, TSMR by default.
<DirectConnect>	Enable or disable Trading System server UDP discovering: "0" — use UDP discovering (recommended);

	"1" — do not UDP discovering.
</TSMR>	
<IPAddresses>	**Allowed IP addresses.**
<Firms>	Firms
<Firm… …Id="…">	Firm identifier in the trading system.
<IP… …From="…" To="…"/>	Range of allowed IP addresses for the firm.
</Firm>	
</Firms>	
<Users>	Users
<User… …Id="…">	User identifier in the trading system.
<IP… …From="…" To="…"/>	Range of allowed IP addresses for the user.
</User>	
</Users>	
</IPAddresses>	
<Security>	**Security settings.**
<ProfileName>	"Validata" profile name, which is used by the server for traffic encryption (in case of "Validata" version supports the function) and digital signature validation, e.g. "Default profile". If digital signature is not required, this parameter should not be specified.
<CryptoServers>	Group of "Validata" crypto servers' settings.
<CryptoServer>	Settings of "Validata" crypto server that is used for traffic encryption and digital signature validation.
<Address>	Crypto server IP-address.
<Alias>	Alias of crypto server session.
<Password>	Password of crypto server session.
</CryptoServer>	
</CryptoServers>	
<SignRequired>	"0" — digital signature is not required; "1" — digital signature is required.
<OnlyKnownUsers>	0 — all clients are allowed; 1 — a limited list of clients is allowed (can be configured <CryptoNames> container in XML configuration file).
<OpenSSLSupport>	TLS 1.2 channel encryption support: "0" — channel encryption is not supported; "1" — channel encryption is supported.
<OpenSSLKeyFile>	A path to a private key in PEM format

<OpenSSLCertFile>	A path to a certificate in PEM format.
<EncryptRequired>	"0" — channel encryption is not required; "1" — channel encryption is required.
</Security>	
<CryptoNames>	**Allowed users. Is valid when OnlyKnownUsers = 1.**
<Firm… …Id="…" Name="…">	Firm identifier in the trading system.
<User… ..Id="…" CryptoName="…"/>	User identifier in the trading system and the name of certificate holder in X.509 format: «CN=User,O=Company name,DC=pki,DC=micex,DC=ru».
</Firm>	
</CryptoNames>	
<BannedUsers>	**Banned user list.**
<User… …Id="…" Reason="…"/>	Banned user identifier in the trading system. “Reason” attribute is mandatory and can’t be empty, otherwise the ban will have no effect.
</BannedUsers>	
</Engine>	
</Engines>	
</Bridge>	

Monitoring

ASTS Bridge server supports monitoring from a web browser. The default monitoring port is 8085. Server status, logs, connected clients can be viewed at: **http://{server_address}:8085**. Direct link is available in ASTS Bridge main window.

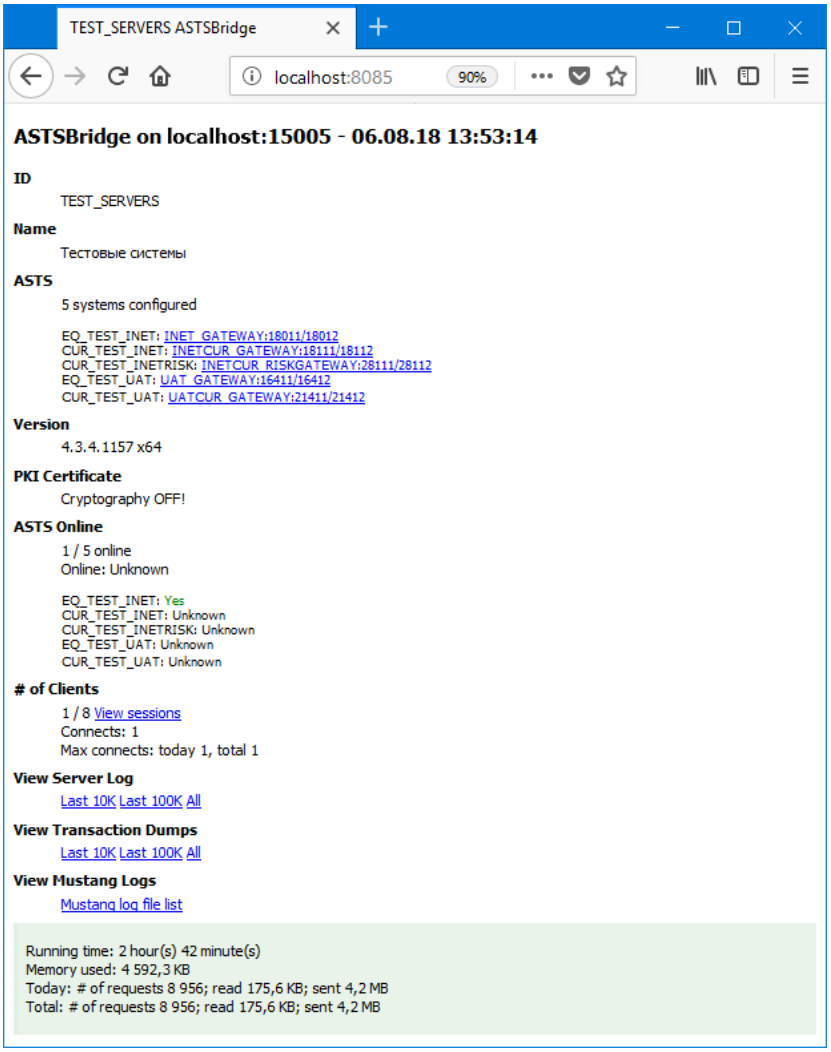
Server operation protocols and client transaction logs are stored in a **Logs** subdirectory of the server working directory.

SECURITY NOTE:

Set a non-empty value for the **HostName** parameter to eliminate the possibility of an Anti DNS Pinning attack.

Monitoring Web interface

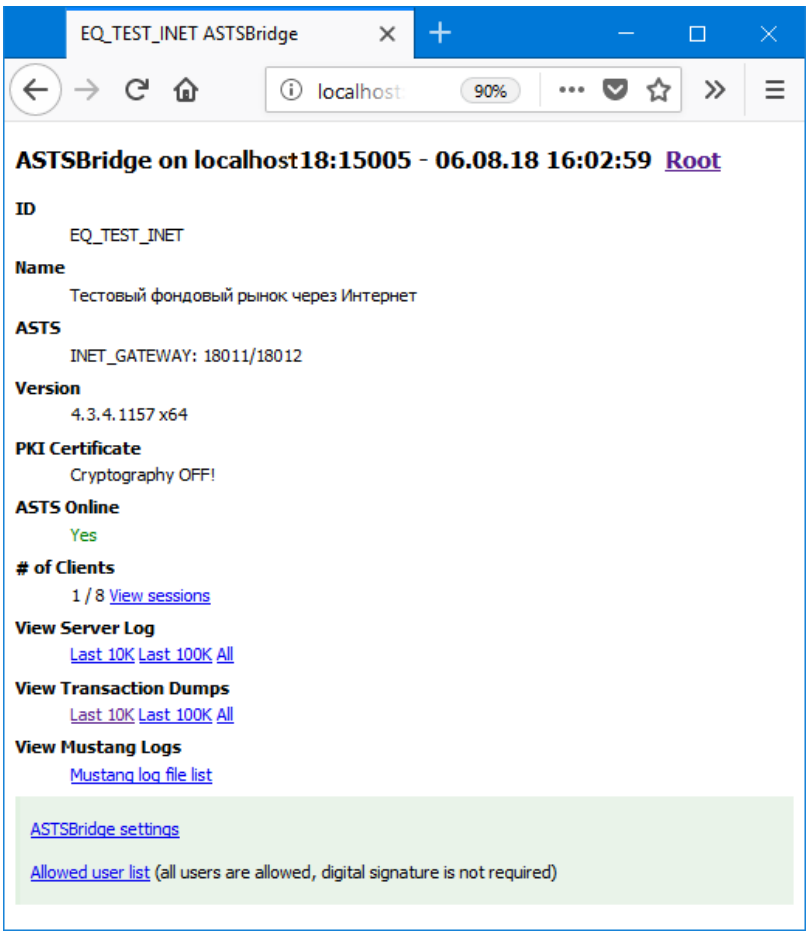
The main monitoring page displays brief connection information (see **ASTSBridge user interface**) and provides links to pages with more details on current settings, transactions, server log and connected clients.



PIC. 2 ASTS BRIDGE MONITORING MAIN PAGE

Connection profiles

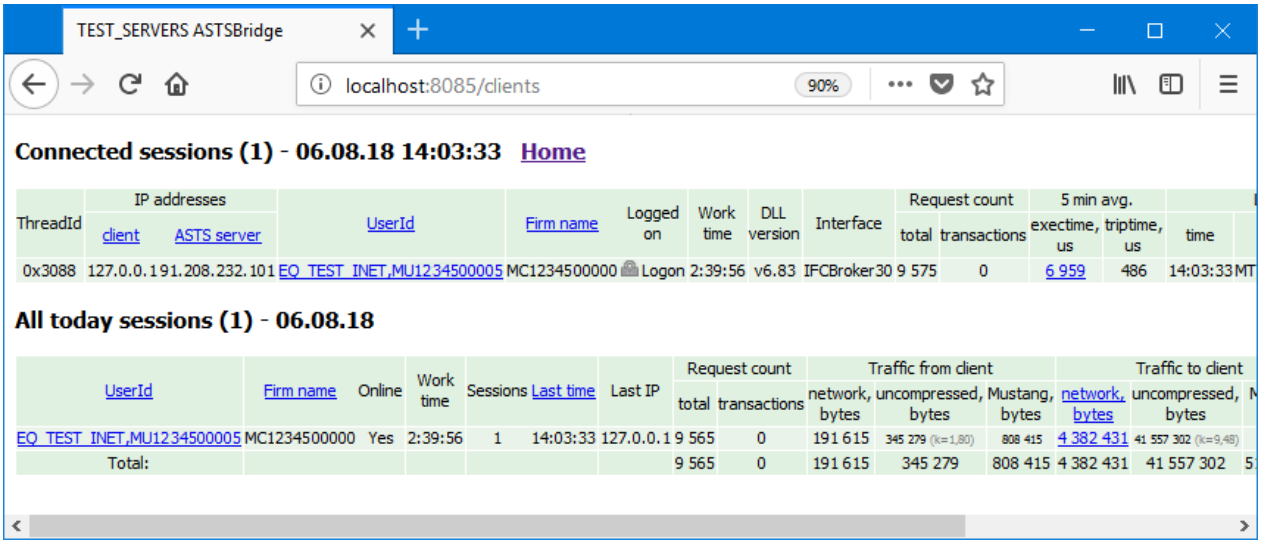
If several connection profiles are set up, click a corresponding profile ID in the ASTS list to go to the profile specific page.



PIC. 3 CONNECTION PROFILE PAGE

Connected clients

Click "**View sessions**" link on the main monitoring page to open page with details on client connections.



PIC. 4 CONNECTED CLIENTS MONITORING PAGE

Click "**Home**" button to return to the main monitoring page.

Connected client list

This table lists currently connected clients. The number in brackets is the total number of active connections, followed by the date and time when the table has been refreshed.

Column	Description
ThreadId	Unique connection ID.
IP addresses	IP address of the client and of the ASTS trading/clearing server.
UserId	Client User ID in the ASTS trading/clearing system. Click this ID to show user transaction log (see **below**).
Firm name	Client firm name.
Logged on	The client has connected to the trading/clearing system:  — the client uses encryption;  — the client has established a non-secured connection.
Work time	Client work time in the trading/clearing system in the current session (i.e. since the last login).
DLL version	Version of the client access protocol.
Interface	ID of the interface to the trading/clearing system.
Request count	Number of requests: total number of requests and number of transactions.
N min avg.	Average time for processing requests for the last N minutes. N is a value of StatsInterval parameter from the ASTS Bridge configuration; exectime – time to execute in ms; triptime – packet trip time in ms. Click the exectime value to view client transaction log (see **Client transaction log**).
Last request	Information about the last request: time of the request, its body and execution time in ms.
Feedback Info	Additional information, defined by the client in Feedback field.

Click an underlined column title to sort the table by the corresponding parameter.

All today clients

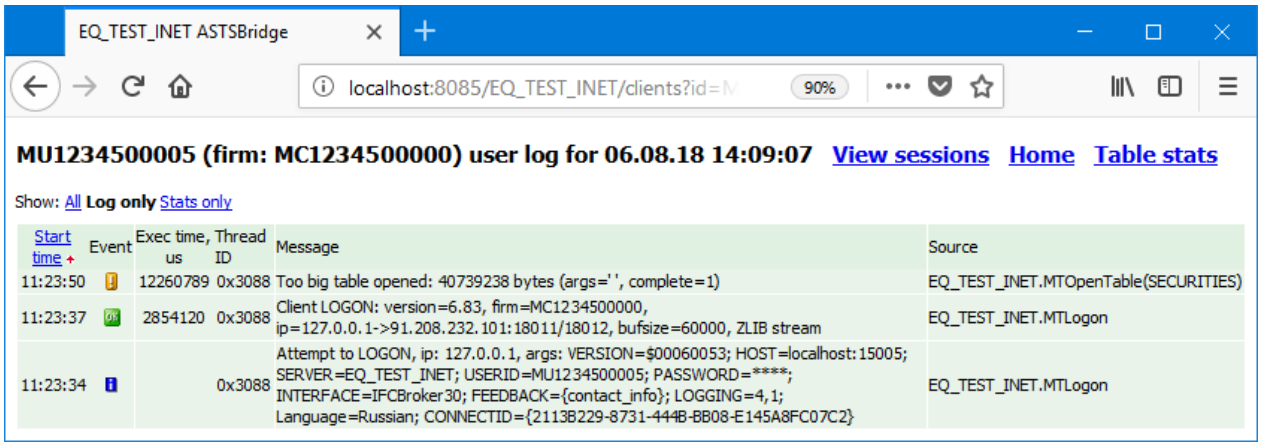
This table lists all the today's client connections. The number in brackets is the total number of connections for the current day, followed by the date and time when the table has been refreshed.

Column	Description

Column	Description
UserID	Client User ID in the trading/clearing system. Click this ID to view client transaction log (see **Client's transaction log**)
Firm name	Client firm name.
Online	Shows whether the client is currently connected to the trading/clearing system or not. indicates that client has been disconnected because of some error.
Work time	Total client work time in the trading/clearing system.
Sessions	Number of connection sessions during this day.
Last time	Last time the client was seen in the trading/clearing system.
Last IP	IP address, from which the client connected to the system last time.
Request count	Number of requests: total number of requests and number of transactions.
Traffic from client	Statistics for traffic from the client to the server, in bytes: — real amount of transferred data (network); — amount of uncompressed data (uncompressed), compression ratio is indicated in brackets; — amount of data, transferred to TS via Mustang protocol.
Traffic to client	Statistics for traffic from the server to the client, in bytes: — real amount of transferred data (network); — amount of uncompressed data, compression ratio is indicated in brackets; — amount of data, transferred from TS via Mustang protocol.

Client transaction log

Click the UserID in the clients table to show the client transactions and requests log.



PIC. 5 USER LOG

The page title shows: User ID in the trading/clearing system, ID of the user firm (in brackets), date and time when the table has been refreshed, followed by the links to the clients table (**View sessions**), main monitoring page (**Home**) statistics per loaded table (**Table stats**).

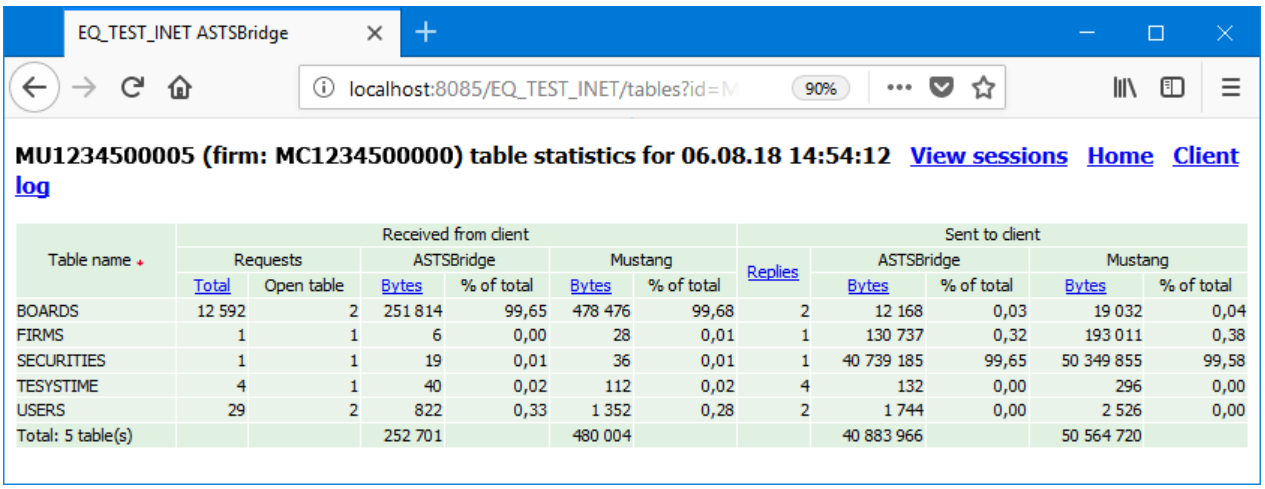
Click the **All**, **Log only** or **Stats only** to switch between different levels of details in the following table.

Column	Description
Start time	Time of transaction or event start.
End time	Time of event end.
Event	Event type: connection statistics; warning; successful transaction execution; important event; error.
Requests	Total number of requests.
Exec time, us.	Time of request execution in microseconds.
Avg. trip time, us	Average packet trip time in microseconds.
Read, bytes	Size of data received by the client in bytes.
Sent, bytes	Size of data sent by the client in bytes.
Thread ID	Unique ID of this client connection.
Message	Description of a transaction and the list of arguments that were passed to the server.
Source	Name of the function which invoked the transaction.

Click the Start time column header to sort the table either in ascending or descending order.

Statistics

To view statistics on tables, opened by the client, click the **traffic to the client** value in the client table or the **table stats** link in the client transaction log:



MU1234500005 (firm: MC1234500000) table statistics for 06.08.18 14:54:12 View sessions Home Client log

Table name	Received from client						Sent to client				
	Requests		ASTSBridge		Mustang		Replies	ASTSBridge		Mustang	
	Total	Open table	Bytes	% of total	Bytes	% of total		Bytes	% of total	Bytes	% of total
BOARDS	12 592	2	251 814	99,65	478 476	99,68	2	12 168	0,03	19 032	0,04
FIRMS	1	1	6	0,00	28	0,01	1	130 737	0,32	193 011	0,38
SECURITIES	1	1	19	0,01	36	0,01	1	40 739 185	99,65	50 349 855	99,58
TESYSTIME	4	1	40	0,02	112	0,02	4	132	0,00	296	0,00
USERS	29	2	822	0,33	1 352	0,28	2	1 744	0,00	2 526	0,00
Total: 5 table(s)			252 701		480 004			40 883 966		50 564 720	

PIC. 6 CLIENTS OPERATION STATISTICS

The page title shows: User ID, firm ID (in brackets), date and time when the table was refreshed; followed by the links to the clients table (**View sessions**), main monitoring page (**Home**) and client transaction log (**Client log**). The bottom row displays summary of data transmitted over the network.

Column	Description
Table name	**Name of the table in trading/clearing system.**
Received from client	**Data received from the client:**
Requests	Total number of requests; number of requests to open the table;
ASTSBridge	Size of data transferred from the client to ASTS Bridge server in bytes and in % of the total;
Mustang	Size of data transferred via Mustang protocol to the trading system in bytes and in % of the total.
Sent to client	**Data received by the client:**
Replies	A number of replies to client's requests;
ASTSBridge	Size of data transferred from the ASTS Bridge server to the client in bytes and in % of the total;
Mustang	Size of data, transferred via Mustang protocol from the trading system in bytes and in % of the total.

Click an underlined column title to sort the table.

Server log

To view the server log, click one of the links under the **View Server Log** title on the main monitoring page: **Last 10K** – to view the last 10 Kbytes of the log; **Last 100K** – to view the last 100 Kbytes of the log; **All** – to open the whole log.

The server log is opened as plain text which shows the event time, connection ID, ID of the event source, event type, description, name of function which caused the event:

```
[10:42:41 thrd:0x0988 id:<server>     evn] New connection accepted
(ip=127.0.0.1, threadid=0x0CA0) {serv.AuthorizeClient}
```

If Mustang logging is enabled in connection profile settings then use the **Mustang log file list** link to view the available log files.

Transaction dump

To view the binary transaction dump click one of the links under the **View Transaction Dumps** title on the main monitoring page: **Last 10K** – to view the last 10 Kbytes of the transaction log; **Last 100K** – to view the last 100 Kbytes of the transaction log; **All** – to view the whole transaction log. The log opens as plain text.

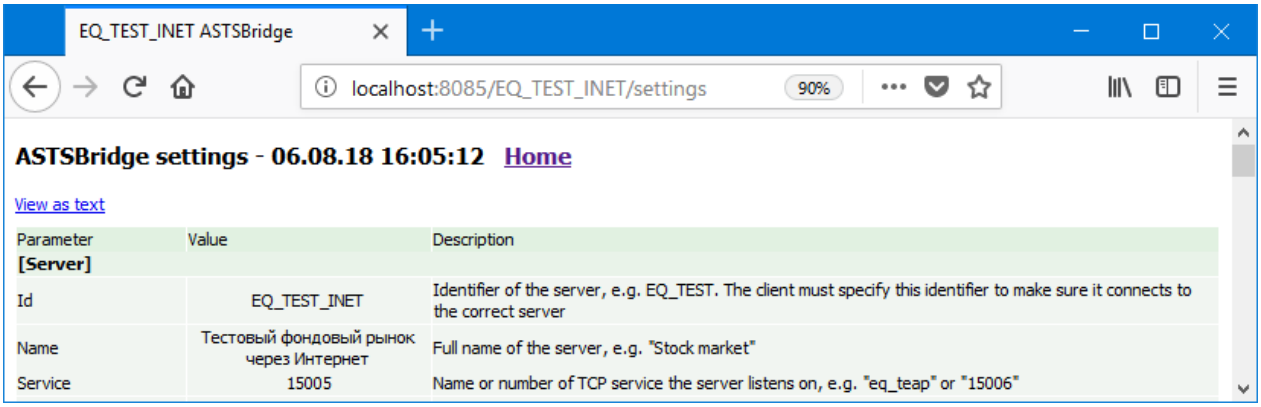
```
 ----- BEGIN TRANSACTION -----
User ID:        EQ_TEST_INET,MU1234500005
Exec time:      06.08.18 11:23:37.415152
Recv time:      06.08.18 11:23:34.483130
Client time:    06.08.18 11:23:34.483000
Command:        MT_LOGON
Transaction:    "LOGON"
Arguments:
        "VERSION=$00060053..HOST=localhost:15005..SERVER=EQ_TEST_INET
..USERID=MU1234500005..PASSWORD=****..INTERFACE=IFCBroker30..FEEDBACK
={contact_info}..LOGGING=4,1..Language=English..CONNECTID={2113B229-
8731-444B-BB08-E145A8FC07C2}"
ASTS OK  (2854120 us): "(206) Logon OK (firm:
MC1234500000).UT=3;FI=MC1234500000;FT=1;LN=R;ST=112337413169;"
 ----- END TRANSACTION -----
```

Field	Description
User ID	ID of the user, who performs the transaction.
Exec time	Time when the transaction or request has been executed. Stamped by the ASTS Bridge at the moment of receiving a reply from trading system.
Recv time	Time when the request to perform a transaction has been received from client.
Client time	Time when client has sent a request to ASTS Bridge, according to his local machine time.
Command	Function which submitted the transaction or request.
Transaction	Name of the transaction or request.
Arguments	Arguments that were sent to the trading system.

Field	Description
HEX Dump	Hexadecimal dump of the transmitted packet.

Current ASTS Bridge settings

Click the ASTSBridge settings link, to view the current server configuration (see **Settings)**.



PIC. 7 ASTS BRIDGE CONFIGURATION PARAMETERS

The page title shows the date and time when the page has been refreshed, followed by the link to return to the main monitoring page (**Home**). Click the **View as text** link to open the configuration file in plain text.

Allowed users

Click **Allowed user list** link in the main window, to load a form with a list of clients, which are allowed to connect to the trading system

The list is grouped by firms and contains user IDs and titles of their digital certificates. Click user ID to load **User Transaction Log.** The page title shows the date and time when page was refreshed followed by the link to return to the main monitoring page (**Home**). Allowed users list can be configured can be configured <CryptoNames> container in XML configuration file.

APPENDIX 1 – CONNECTION PARAMETERS

Connecting ASTS Bridge to ASTS trading/clearing system

WARNING:

BROADCAST addresses must be **separated by comma, without spaces.**

Market	[TSMR] Server	[TSMR] Broadcast	[TSMR] Service
Equity & Bonds – trading system	GATEWAY	10.63.1.255,10.63.3.255, 10.61.1.255,10.61.3.255	8011/8012
Equity & Bonds – clearing system	RISKGATEWAY	10.63.1.255,10.63.3.255, 10.61.1.255,10.61.3.255	8071/8072
Deposits & credits	GKO_GATEWAY	10.63.1.255,10.63.3.255, 10.61.1.255,10.61.3.255	9011/9012
FX – trading system	CUR_GATEWAY	10.63.1.255,10.63.3.255, 10.61.1.255,10.61.3.255	8111/8112
FX – clearing system	CUR_RISKGATEWAY	10.63.1.255,10.63.3.255, 10.61.1.255,10.61.3.255	8171/8172

To obtain information on connecting to test environment, please contact our technical support team help@moex.com.