深圳证券交易所
SHENZHEN
STOCK EXCHANGE

Technical Document

User Manual for Market Data Gateway of Trading System

Version (20190523)

Trading System Construction Project Team

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Document Description

Document Name	User's Manual for Market Data Gateway of Trading System
Content Description	This document provides daily operating instruction and guide for the market data gateway of trading system.

Revision History		
Date	**Version**	**Revision Note**
2015-03-10	20150306	Creation of document
2015-03-30	20150407	Added description of gateway monitoring service
2015-09-23	20150923	Updated the in the fifth version
2015-12-11	20151211	Added multicast source address translation function and reception function for Level1 satellite static transaction reference information
2016-03-15	20160315	Added Linux platform to the running environment
2016-05-18	20160520	Added FAQ and solutions in the appendix
2016-08-11	20160811	Updated FAQ
2017-05-05	20170505	EKey driver file path configuration
2017-05-12	20170505	Deleted the dependence on the description of VC2012 runtime library
2019-05-23	20190523	Added password management specifications

Contents

User's Manual for Market Data Gateway of Trading System

I. Introduction

1.1 Purpose

This document describes the installation, configuration, and use of the market data gateway.

1.2 Definitions and abbreviations

None.

1.3 Overview

This software is mainly used to provide investors with the service of publishing relevant market data including index information, market snapshots, tick-by-tick filled transaction and order, real-time statistical information, and real-time bulletins.

II. System installation and configuration

2.1 System installation

2.1.1 Operating environment

Hardware	CPU: RAM: 2G or more Hard disk: Network card: 100MKbps Network: Support TCP/IP and UDP
Software	Windows7/Windows Server2008, 32-bit or 64-bit operating system. Red Hat Enterprise Linux 6, 64-bit operating system.

2.1.2 System Installation

As green software, the software can be decompressed to any directory on your local hard disk after the corresponding compressed file is downloaded.
The program configuration file is saved in the cfg subdirectory of the installation directory. The configuration file is named config.xml.

2.1.3 Install Ekey

For the network version market data gateway, if users use EKey for authentication, the EKey driver shall be installed and the authentication mode configured according to the "Basic Configuration" chapter. For the specific steps of installing Ekey, please refer to the relevant materials in the "http://ca.szse.cn/" File Download section of the website of Shenzhen Stock Exchange.

On Linux system, it is recommended to copy the Ekey driver file to libshuttle_p11v220.so.1.0.0 in the current directory; otherwise, refer to section 2.2.1 and change the path of the Ekey driver file in the ekey_driver_file configuration.

2.1.4 Install electronic certificate

When using electronic certificate for authentication, the user need only store the certificate information issued by the Shenzhen Stock Exchange in the cfg directory, and configure the authentication method by referring to the "Basic Configuration" chapter.

2.2 System configuration

Note: The configuration parameters (such as server address and multicast address) in this document are for reference only. For valid configuration please check the information published by Shenzhen Stock Exchange.

2.2.1 Basic configuration

<!-The protocol type (BINARY or STEP) used by the user. Each market data gateway can only support either the STEP or BINARY protocols, the STEP and the BINARY protocol cannot be used simultaneously. However, different protocols can be used for different gateways or for the primary and backup gateway.

-->

<protocol>STEP</protocol>

<!-- Gateway ID, assigned by Shenzhen Stock Exchange>

<id>_GWID_</id>

<!--Gateway type (live version LIVE or network version NETWORK), network version has retransmission service -->

<type>NETWORK</type>

<!-- Encrypted "Gateway Login Password", please refer to the password management section in the "User's Manual for the Monitoring Interface of Trading System Gateway" for the password rules -->

<password>_PASSWORD_</password>

<!—Environment No. -->

<env_id>1</env_id>

<!-- Static transaction reference information storage path, optional field, valid in Level1 satellite products. If the path is set to the gateway working directory, it cannot be the same as the directory used by the gateway (such as cfg, log, persistenec, file_dir, etc.) -->

<file_path>Absolute path< /file_path >

<!-- Print interval of gateway status log in seconds -->

<status_log_interval>180</status_log_interval>

<!-- Size of user's downlink buffer -->

<user_send_queue_len>10000</user_send_queue_len>

<!-- SSL related configuration -->

<!-- Authentication mode 0: TCP; 1: SSL, certificate not required; 2: SSL, use an electronic certificate; 3: SSL, use Ekey -->

<!-- If the electronic certificate or Ekey certificate is enabled, it is required to modify the auth_mode, cert_name, cert_file, private_key_file, private_key_password and other items

under config according to the feedback request from the gateway.

If the electronic certificate is used, it is required to configure auth_mode to 2, place the received electronic certificate pfx file in the cfg directory where the configuration file is located, enter the file name in cert_file and the certificate password in private_key_password.

If the Ekey certificate is used, it is required to change auth_mode to 3, enter the certificate name of the Ekey certificate specified in cert_name and the Ekey password in private_key_password.

-->

<auth_mode>1</auth_mode>

<!-- CA server certificate file name (required when using SSL) -->

<ca_file>ca.crt</ca_file>

<!--Certificate number. When using an Ekey certificate, fill in the certificate number marked on the Ekey certificate. -->

<cert_name></cert_name>

<!--Local certificate file name (required when the electronic certificate is used, it is not required when using an Ekey certificate) -->

<cert_file></cert_file>

<!-- Local private key file name, which needs to be entered when using the electronic certificate -->

<private_key_file></private_key_file>

<!-- The encrypted "certificate file or Ekey password" is generated through the gateway monitoring interface, please refer to the password management chapter in the "User's Manual for the Monitoring Interface of Trading System Gateway". -->

<private_key_password></private_key_password>

<!-- EKEY driver file name, not required, supports relative path and absolute path -->

<!--The relative path is relative to the current directory by default, which can be specified by the -w parameter when starting the gateway program -->

<ekey_driver_file></ekey_driver_file>

<!-- Automatically clear historical logs and persistent data -->

<auto_clean>

<!—ON/OFF 0 OFF 1 ON-->

<enable>1</enable>

<!--Retention days of file, the minimum value is 1 day -->

<keep_days>14</keep_days>

</auto_clean>

<!--Data persistence, 0 OFF, 1 ON. Persistence will affect the processing performance of the gateway and occupy more system resources. The persistent data can only be used to assist in troubleshooting, and should not be used as normal transaction data. -->

<data_persistence>

<server_enable>0</server_enable>

```
        <user_enable>0</user_enable>
    </data_persistence>
```

2.2.2 Communication server configuration

```
<comm_server>
        <!-- # igmp version, valid values are V2 and V3. The default value is V2-->
        <igmp_version>V3<igmp_version>
        <!-- Receipt buffer corresponding to a single multicast channel N*8KByte -->
        <realtime_service_buffer_size>10240</realtime_service_buffer_size>
        <!-- Channel type list, different types of channels can receive data from the same or different network cards -->
        <!-- The channel type line_type-> type is the keyword, 1 represents the receiving network card of the Futian Center multicast -->
        <!--If users want to adjust the priority of the channel, that is, to send data using the Binhai multicast address as preferentially as possible, then migrate the entire entry of type = 2 to the first entry, type=2->type=1->type=3  -->
        <line_type_list>
            <line_type>
                <type>1</type>
                <description> Futian Center</description>
                <!--The receiving network card address used by this type of channel, that is, the address of a network card on the server running this gateway -->
                <interface>_RE_LOCAL_IP_</interface>
            </line_type>
            <line_type>
                <type>2</type>
                <description>Binhai Center</description>
                <!-- Address of receiving network card used by this type of channel -->
                <interface>_RE_LOCAL_IP_</interface>
            </line_type>
            <line_type>
                <type>3</type>
                <description>Satellite line</description>
                <!-- Address of receiving network card used by this type of channel -->
                <interface>_RE_LOCAL_IP_</interface>
            </line_type>
        </line_type_list>
        <!--Management channel, this configuration is mainly used to receive online configuration information used by this gateway -->
```

```
        <admin_service>
            <line>
                <id>9901</id>
                <group_id>99</group_id>
                <!-- Type in channel type list -->
                <line_type_id>1</line_type_id>
                <!--Multicast source address, namely server network card address that sends multicast and supports NAT.
  Required when igmp_version=V3 -->
                <source>172.27.0.25</ source >
                <!-- Multicast address, NAT not supported -->
                <address>237.2.101.29</address>
                <!—Multicast port, NAT not supported -->
                <port>6017</port>
</line>
<line>
                <id>9902</id>
                <group_id>99</group_id>
                <line_type_id>2</line_type_id>
                <source>172.27.0.25</ source >
                <address>237.2.101.30</address>
                <port>6018</port>
</line>
</admin_service>
<!-- Retransmission server configuration information that must be configured for network version -->
<resend_service>
<line>
                <id>1</id>
                <!--The listening address and port provided by the communication retransmission server, NAT supported. -->
                <address>172.25.128.81</address>
                <port>7018</port>
</line>
<line>
                <id>2</id>
                <!--The listening address and port provided by the communication retransmission server, NAT supported.-->
```

```
                    <address>172.25.0.81</address>
                    <port>7018</port>
</line>
        </resend_service>
    </comm_server>
```

2.2.3 Client configuration

```
    <access_user>
        <!-- Login password used when connecting to the gateway -->
        <password> PASSWORD </password>
        <!--Client addresses to which access is allowed (such as 192.168.0.1, 192.168.0.0/24), blank means no access address restriction, it shall be explicitly specified on the software system without blank -->
        <allowed_addresses></allowed_addresses>
        <!--Real-time service user configuration. A gateway can support multiple ports in real time, but the channel data received between different ports cannot be repeated. This function is mainly used for load balancing under high throughput. A single TCP can only support <= tick-by-tick data transmission at 50,000 transactions per second. -->
        <realtime_service_list>
            <realtime_service>
                <!--The gateway listens to the network card address, which is used to receive user connection requests. The default is 0.0.0.0, listening on all network cards. -->
                <interface>0.0.0.0</interface>
                <!-- Gateway listening port, can be modified the user -->
                <port>8016</port>
                <!-- Real-time session ID, corresponding to the sender_comp_id of the login message, it is alright to keep the default configuration -->
                <sender_comp_id>realtime</sender_comp_id>
                <!--Users may specify the receiving channel information. Different session channels cannot be repeated. The channel supports two wildcard characters * ,?. * means all, and "10 ??" means receiving all channels starting with 10 and 4 digits in length -->
                <user_channel_list>
                    <channel>*</channel>
                </user_channel_list>
            </realtime_service>
        </realtime_service_list>
        <!-- User configuration for retransmission service access -->
        <resend_service>
```

<!--The gateway listens to network card address, used to receive user connection requests. The default is 0.0.0.0, listening on all network cards. -->

<interface>0.0.0.0</interface>

<!-- Gateway listening port -->

<port>8018</port>

<!--Retransmission session ID. The sender_comp_id in the login message should be consistent with the configuration, and the default configuration can be used. -->

<sender_comp_id>resend</sender_comp_id>

</resend_service>

</access_user>

2.2.4 Gateway monitoring service configuration

<monitor_service>

<!-- Gateway monitoring service listening port -->

<port>7501</port>

<!--The encrypted "monitoring interface login password" is generated through the gateway monitoring interface, refer to the password management chapter in the “User’s Manual for the Monitoring Interface of Trading System Gateway". -->

<password>_PASSWORD_</password>

<!--Client addresses to which access is allowed (such as 192.168.0.1, 192.168.0.0/24), blank means no access address restriction, it shall be explicitly specified on the software system without blank -->

<allowed_addresses></allowed_addresses>

</monitor_service>

2.2.5 Multicast source address translation list

If, when using IGMP V3, it is necessary to perform NAT on the **multicast source address**, first use the original address published by Shenzhen Stock Exchange to configure config.xml in the cfg directory (NEVER use the translated address), and then configure the destination_nat_list.xml file under the gateway cfg directory;

Note: Please first configure the gateway without multicast source address NAT and then conduct the NAT test after the previous configuration.

<?xml version="1.0" encoding="UTF-8"?>

<destination_nat_list>

<row>

<!--The original address published by the Shenzhen Stock Exchange corresponds to line.source in config.xml, and each source address corresponds to an entry -->

<orig_source_address>192.168.0.1</orig_source_address>

<!--Translated multicast source address-->

```
        <nat_source_address>192.168.1.1</nat_source_address>
    </row>
    <row>
        <orig_source_address>192.168.0.2</orig_source_address>
        <nat_source_address>192.168.1.2</nat_source_address>
    </row>
    </destination_nat_list>
```

Note: The multicast source address is composed of two files. If NAT is required, convert the sources in both cfg / config.xml (static) and cfg / mdgw_realtime_line_list.xml (dynamic, generated after startup).

2.2.6 System Configuration

1. Please configure the windows firewall correctly or turn off the firewall;
2. Multicast packets up to 8Kbytes are allowed to pass through the network;

III. Instructions for operation and maintenance

3.1 Instructions for daily operation and maintenance

3.1.1 Start the gateway

After the market data gateway is configured, run mdgw.exe to start market data gateway, and current directory serves as the work directory. If necessary, the user can also specify the work directory of the executable program with the -w parameter (for example: mdgw.exe-wworkspace), and view the descriptions of all gateway startup parameter, please run: mdgw.exe --help. After startup, the market data receiving system can establish a connection with the market data gateway through ports 8016 and 8018 and start receiving market data.

3.1.2 Stop the gateway

Press: Ctrl + c on the terminal interface of the gateway to stop gateway operation.

3.1.3 Restart the gateway

See chapter "Starting the gateway"

3.2 Instructions for using the monitoring function

The gateway can provide its real-time working status through the TCP/IP-based gateway monitoring interface. Specific monitoring protocols and monitoring information can be found in the following documents:

"Specification of Shenzhen Stock Exchange for Gateway Monitoring Session Interface of Trading System"

"Specification of Shenzhen Stock Exchange for Market Data Gateway Monitoring Data Interface of Trading System"

Users could follow the above description of gateway monitoring interface to integrate gateway monitoring into the user's monitoring system, or use the gateway monitoring program separately provided by the Shenzhen Stock Exchange to monitor the gateway status.

IV. Standards or norms to be followed

4.1 Legal, copyright and other statement

1. No copyright piracy or infringement of third parties.

2. Copyrights to the customized software, including documents and source codes, are the property of Shenzhen Stock Exchange.

4.2 Applicable standards

1. Information Security Management System of Shenzhen Stock Exchange (ISMS): ISO 27001: 2005

V. Other constraints

None

VI. Appendix

6.1 FAQ

6.1.1 Service hotline of Shenzhen Stock Exchange (operation or network)

0755-83182222;

6.1.2 Introduction to the access environment

Environment	Market data service		
	L1 satellite	L1 ground	L2
Software Environment			
Options Real Environment			
Networked test environment			

The gateway installation package provides configuration examples for different environments. Please select a configuration template based on the environment you are in and rename it to config.xml.

After that, you can view the matters that shall be noted during market data gateway configuration in the "Introduction to the Market Data Service Access and Gateway Configuration of Trading System" through "http: //www.szse.cn--> Inquiry-->Other Information", as well as the implementation details and architecture of the market data gateway in the "Brief Introduction of Online Market Data Information Vendor of Trading System".

6.1.3 Prerequisites required using the STEP

First, an adequate understanding of FIX and FAST protocol is required. For detailed information about the two protocols, please visit the official website of FIX.

Second, after fully understanding FIX and FAST protocol, please read carefully the "Lightweight STEP Session Layer Interface Specification" and "Specification of Shenzhen Stock Exchange for STEP Market Data Interface" and "Specification of Shenzhen Stock Exchange for Binary Market Data Interface" on the official website. Reading "Specification of Shenzhen Stock Exchange for Binary Market Data Interface" will help you to better understand “Specification of Shenzhen Stock Exchange for STEP Market Data Interface ".

Finally, a test system can be developed based on data examples in the installation package "Test Data" directory.

6.1.4 Can a market data gateway establish multiple real-time sessions?

A gateway can support multiple ports in real time, but the channel data received by different ports cannot be repeated. This function is mainly used for load balancing under high throughput. At present, a single TCP can only support <= 50,000 tick-by-tick transaction data per second. User system shall support receiving data from multiple TCP connections simultaneously.

6.1.5 Why interruption occurs during real-time data reception?

If, when the market data gateway sends data to the user, the buffer is blocked, the connection with the user will be interrupted. This is mainly because the market data gateway receives data from the server using multicast. If the user's receiving speed cannot match, a large number of multicast packets will be lost.

If users frequently encounter session interruption during use, please try the following solutions:

1. When receiving data, the data is saved in the buffering queue after message header and ending are parsed, and the message body will be processed by the subsequent process.
2. Deploy market data gateway separately on a server. Since more CPU and memory resources are required when using the STEP, users using the STEP are strongly recommended to deploy a separate server for the market data gateway.
3. Multiple data ports can be configured for concurrent data processing.
4. If your server has a lot of resources, you can try to adjust the <user_send_queue_len> parameter. This method will increase the delay and may cause program exception due to server resource exhaustion. Therefore, this method is not recommended.

6.1.6 After starting the gateway through a remote connection, it is found that the gateway is sluggish, and the counter’s connection to the gateway sometimes times out

The gateway will output some logs to the console. If the gateway is started remotely using tools such as telnet, radmin, the gateway may be sluggish when outputting logs due to the slow speed of the remote connection, causing slow operation speed or connection timeout. You can add the -q parameter when starting the gateway to output only logs at warning level or above from the console, avoid affecting the normal operation of the gateway due to the slow console speed.

6.1.7 Can I start the gateway program in a minimized window on Windows system?

Yes, you can create a shortcut for the gateway program. In the shortcut, click on the drop-down menu under Run, select "Minimized".

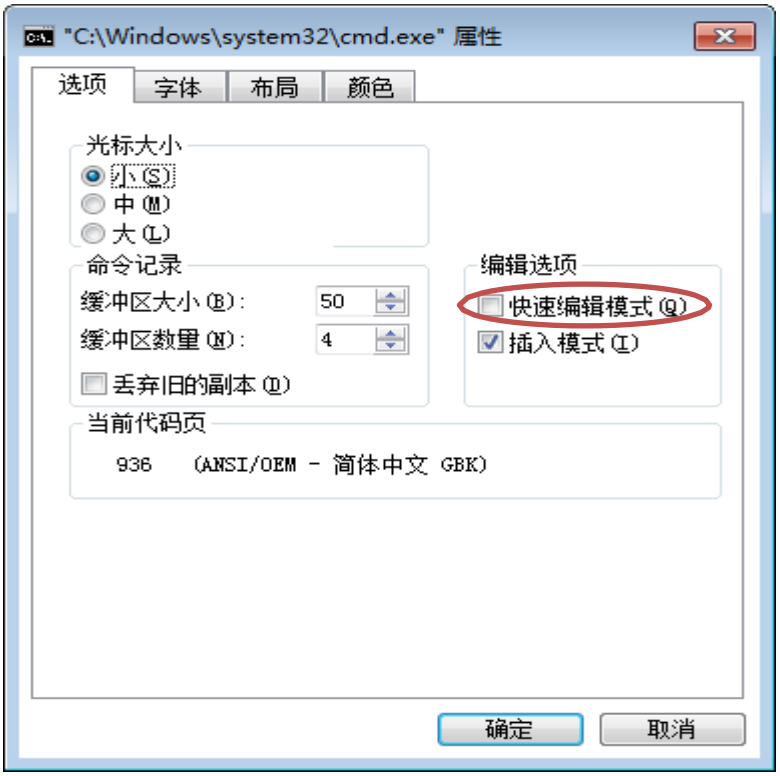
Gateway can also be started from the Command Prompt or in batch using the start /min command.

In the Linux version gateway, you can add the -d parameter at startup to let the gateway run in the background.

6.1.8 Under Windows, sometimes there are highlighted characters in the DOS window running the gateway, and the gateway freezes. Why? How to avoid it?

This is due to the operator's misoperation in the Command Prompt, such as click to dragwhich causes the flag state. Windows freezes the operation of the gateway. Hit Enter to unfreeze.

This can be avoided by disabling the "Quick Edit Mode" of the Command Prompt properties.



6.1.9 What does it mean when “Counter not connected” is displayed on the gateway monitoring interface?

"Counter not connected" means that the counter is not connected to the gateway. It may be that the counter is not activated. It is required to check whether the counter is activated and the gateway's IP address and port are configured correctly, or it may be that the counter fails to log in the gateway. Refer to the "Communication Error between the Counter and the Transaction Gateway" in the appendix for troubleshooting.

6.1.10 Other questions

For other FAQ relating to the gateway, please refer to the official website of Shenzhen Stock Exchange-> Trading System Section

"Access" chapter in "FAQ of Trading System of Shenzhen Stock Exchange"

6.2 Configuration examples

6.2.1 Example of electronic certificate configuration

```
<!-- SSL  related configuration -->
<!-- Gateway authentication method (2 SSL electronic certificate, 3 SSL EKey certificate)--
>
<auth_mode>2</auth_mode>
  <!-- Name of CA server certificate file (required when using SSL)-->
<ca_file>ca.crt</ca_file>
```

<!-- Local certificate file name -->

<cert_file> ********.pfx</cert_file>

<!—Certificate file or Ekey password; for the input rules, please refer to the certificate password in 3.4.2 Password Management in the "User's Manual for Gateway Monitoring Interface of Trading System". -->

<private_key_password>!@#_cbdaqbTKaeUM7778e627294bfc89f4a96459f1b12a89</private_key_password>

Note: Certificate files such as ca.crt, ********. Pfx are saved in the gateway cfg directory, and ****** is generally the gateway ID

Note: The private_key_password of the electronic certificate is set by your company's IT administrator when downloading the certificate. Please contact your company's IT administrator .

6.2.2 Example of EKEY certificate configuration

<!-- SSL related configuration -->

<!--Gateway authentication method (2 SSL electronic certificate, 3 SSL EKey certificate) -->

<auth_mode>3</auth_mode>

<!-- name of CA server certificate file (required when using SSL) -->

<ca_file>ca.crt</ca_file>

<!-- Certificate number. When using an Ekey certificate, fill in the certificate number marked on the Ekey certificate. -->

<cert_name>Certificate number</cert_name>

<!-- Certificate file or Ekey password -->

<private_key_password>!@#_cbdacToOc0o64f71b471821a39394a6f39cbeb034759</private_key_p assword>

Note: Certificate files such as ca.crt are saved in the gateway cfg directory

Note: The default password of Ekey's private_key_password is "111111". Users can modify the password after receiving it. If the password is changed, please contact the person in charge of Ekey . If the certificate password is entered incorrectly multiple times and is locked, please dial the operational hotline of Shenzhen Securities Communication Co. Ltd.

<!-- Ekey driver file path -->

<ekey_driver_file>cfg/libshuttle_p11v220.so.1.0.0</ekey_driver_file>

6.2.3 Adjust multicast priority

The market data gateway can receive multicast data from multiple centers of the market data server simultaneously, and the gateway preferentially selects the first channel to receive data according to

the order of channel type table in the gateway configuration. If the gateway has data on the multicast addresses of Futian and Nanfang when making the selection, then:

1. Select the first available multicast address in the configuration order of line_type_list

2. After the selection is completed, the selection will not be performed again until the local multicast address times out.

3. If the current multicast address reception times out, it will choose again using the same strategy

4. When selecting, if all the multicast addresses have timed out, it will continue to receive at the current address and wait for the next time when the reception times out, and then select again.

Priority to Futian Center

```
<line_type_list>
    <line_type>
        <type>1</type>
        <description>Futian Center</description>
        <interface>IP1</interface>
    </line_type>
    <line_type>
        <type>2</type>
        <description>Binhai Center</description>
        <interface>IP2</interface>
    </line_type>
<line_type_list>
```

Priority to Binhai Center

```
<line_type_list>
    <line_type>
        <type>2</type>
        <description>Binhai Center</description>
        <interface>IP2</interface>
    </line_type>
    <line_type>
        <type>1</type>
        <description>Futian Center</description>
        <interface>IP1</interface>
    </line_type>
<line_type_list>
```

Note: When adjusting the priority, it is "only" allowed to adjust the overall position of different <line_type> entries, and it is prohibited to adjust the attributes in the entries

Note: When adjusting the priority, it is "not" allowed to modify the attribute value of line_type_id in admin_service

6.2.4 Configure multiple gateways on the same server

Ensure that the ports configured under the <access_user> and <monitor_service> entries in different gateway configurations are not in conflict.

6.3 Description of common market data gateway error message

6.3.1 Exit when market data gateway starts

Log	**Causes**	**Solution**
Loading configuration	Failed to load configuration file	First, check whether the xml file is complete (for example, open the xml through IE browser to see if the xml file is valid and complete). Secondly, check whether the configuration file node is missing, and use this log to "locate which configuration item has a problem in the first few lines of logs". Finally, determine the correct value of related settings according to the "System Configuration" section of this manual.
Set IP_ADD_SOURCE_MEMBERSHIP error	There is a problem with your company's network configuration, therefore the gateway failed to join the multicast group	Confirm whether the network card address configured under <line_type_list> is correct, and then ask your network administrator to troubleshoot the network
init multicast socket failed, set_option: No such device	The IP address under <line_type_list> in the gateway configuration is incorrectly configured.	Please confirm that the gateway server has the IP address in <line_type_list>

Failed to create listener 'realtime_****' at **.**.**.**:****, maybe port **** is in use	Realtime listening port conflict	Please confirm whether other market data gateways or other programs have been occupied, modify the port under <realtime_service>.
Failed to create listener 'resend_****' at **.**.**.**:****, maybe port **** is in use	Retransmission listening port conflict	Please confirm whether other market data gateways or other programs have been occupied, modify the port under <realtime_service>.
Failure： Failed to start monitor listener at *****: SSCC_WANM:23 SSCC_WANM error CONFIG_INVALID	Gateway monitoring service listening port conflict	Check if the listening port configured in the <monitor_service> in the gateway configuration is in use
SSCC_WANM error EKEY_NOT_FOUND	Ekey device could not be found	Check if the Ekey is inserted correctly and whether the certificate is listed in the Ekey manager; The cert_name setting in the gateway configuration file config.xml should be filled with the certificate number of the Ekey
Failure: ekey certificate extension '*****' not match cert name '*****'	No Ekey matching cert_name	Check that the value of the cert_name setting in config.xml is correct
Failure: Unsupported protocol	The gateway protocol doesn’t match	At present, the gateway only supports two protocols: BINARY and STEP. STEP is written in the template. Users who use BINARY should pay attention to spelling.

6.3.2 Market data gateway is not ready or ready but no market data is received

"Not Ready" or "Ready" is displayed on the gateway monitoring interface but no market data is received

Log	**Cause**
Realtime line *** socket ***:*** interface *** source *** timeout, error_code ***”	It is caused by your company's network, please ask your company's network administrator to troubleshoot multicast problems. All the multicast addresses and ports in cfg / realtime_line_list.xml and config.xml must be enabled in the router settings.

online cfg not arrived	The gateway should be synchronously configured from the server. This information will be displayed until the configuration synchronization is complete. If it lasts more than 2 minutes, please check whether there is Realtime line *** timeout information in the log, and check it based on the previous multicast timeout.

Troubleshooting steps to be taken:

A. First, please contact the Operation and Network Consulting Hotline 0755-83182222 of Shenzhen Securities Communication. Test or access is currently available.

B. Ensure that the operating system's firewall of the server of the market data gateway is disabled.

C. Ask the gateway administrator to ensure that the management channel address admin_service is the same as the template in the installation package (if the L1 ground and L2 users display " server connected" on the monitoring interface, the gateway configuration is correct). In this case, the multicast timeout can basically be considered as a network problem of your company, and your network administrator must help to solve it.

D. Please ask your company's network administrator to confirm that the local IP address specified in line_type_list-> line_type-> interface in cfg /config.xml and the Futian (type = 1) and Binhai (type = 2) station of Shenzhen Stock Exchange are correctly matched.

E. L1 ground market data and L2 users ensure that igmp_version in cfg / config.xml exists and is equal to V3;

F. L1 satellite market data users ensure that igmp_version does not exist in cfg / config.xml; or exists and equals V2;

G. Start the packet capture tool (such as wireshark) on the server of the market data gateway, and then start or restart the market data gateway:

L1 ground market data and L2 market data users:

a) If the report message of igmp v3 sent from the server of the market data gateway to the router can be captured, it means that the market data gateway has correctly sent the group joining message. In this case, ask your company's network administrator to check why the multicast data cannot be sent from the router to the server of the gateway.

b) If the report message of igmp v2 sent from the server of the market data gateway to the router can be captured, and igmp_version = V3 in cfg/config.xml, it means that your company's network environment can only use the igmp v2 protocol, which does not meet the requirements of igmp v3 protocol issued by Shenzhen Stock Exchange. In this case, please ask your company's network administrator to confirm with the operation and maintenance hotline of the communication company for the network configuration requirements.

L1 satellite user

a) If the igmp v2 report message sent from the server of the market data gateway to the router can be captured, please confirm with your company's network manager and the operation and maintenance hotline of the communication company whether the satellite receiver is normal and whether there is multicast data. If so, please check whether the network settings between the satellite receiver and the server of the market data gateway are correct.

H. If the problem is not solved, please call the operation and network consultation hotline 0755-83182222 of Shenzhen Securities Communication Co., Ltd.

6.3.3 Real-time channel status is displayed abnormal on the gateway monitoring interface

1. Channels with channel ID> = 9,000 are management channels, and channels with <9000 are data channels

2. State of the primary gateway = Yes, it means the gateway is currently using the data on this channel.

3. Under normal circumstances, the number of channels of L1 satellite gateway "channel status = normal" should be 1/4 of the total number of channels

4. Under normal circumstances, the number of channels of the L1 ground gateway "channel status = normal" should be 1/2 of the total number of channels

5. Under normal circumstances, the number of channels of the L2 gateway "channel status = normal" should be 1/4 of the total number of channels

6.3.4 Market data gateway failed to connect to communication server

“Failed to connect to the server” is displayed on the gateway monitoring interface (note that the L1 satellite is not connected to the server)

Log	Causes	Solution
Channel list is invalid, invalid channel no:***	The wrong channel is configured under realtime_service	Please delete the wrong channel according to the prompt in the log, or retain only the <channel> * </ channel>. See configuration examples in the installation package cfg directory
Admin line list is invalid	The Admin_service management channel is incorrectly configured and the wrong template is used.	Please select the correct template in the market installation package cfg directory, and use the admin_service in the template to configure the gateway.

Connecting Timeout. Reconnecting after * seconds...	The network is disconnected from the retransmission server.	ping the server address to confirm whether the network is normal; Check if the server address is mismatched; Ask network administrator to check if the network is connected.
Failed to create CsConnection ***** of tag***** to ***** WanM error code: 2: The remote computer rejected the network connection. Reconnecting after 10 seconds …	The connection to the retransmission server failed. It may be that the retransmission server has not been started or the firewall has blocked the corresponding port, and the gateway will automatically retry.	When the retransmission server is disabled, the gateway process will continuously try to connect to the retransmission server and in this case, the connection failure print message shall not be processed; If it is confirmed that the Shenzhen Stock Exchange server has started, please check whether the relevant network devices and firewalls have blocked the corresponding ports;
Failure: Failed to create server connection of tag ***** to ***** WanM error code 26 SSCC_WANM error CONFIG_INVALID	Parameters regarding the connection to the retransmission server are wrongly set.	View the previous logs to find the cause of this error
Received logout message, code: 1, Gateway id or password is invalid	Incorrect gateway password or gateway ID	Check if the gateway password is set correctly; Contact the Operation Department of Shenzhen Securities Communication Co., Ltd. to confirm whether the gateway has been enabled. Only gateways that have been approved can be used normally.
Received logout message, code: 3, Duplicated login or Gateway '********X' login duplicately	Two gateways use the same ID to connect to the retransmission server simultaneously	Two gateways are not allowed to use the same gateway ID to connect to the server simultaneously; It is possible that the previous connection has not been completely disconnected, please try again later.
Received logout message, code: 4,	Message format error	Check whether the gateway program version matches the version of the retransmission server. The message format used by different versions may not be the same.

Received logout message, code: 5, Gateway version '*****' is disabled	Gateway login is not allowed for this version	Upgrade to the latest version
Received logout message, code: 6, Gateway can't login from '*****'	Login from the current address is not allowed. The IP address of the server of the gateway does not match the one previously bound.	Check whether the IP address bound to the gateway on the member section is correct and whether it contains the currently used address; If it is required to change the binding address on the same day, contact the Operation Department of Shenzhen Securities Communication Co., Ltd.
Received logout message, code: 7, Env id should be '*****'	Environment number does not match the connected environment	Confirm whether the server address is incorrectly matched and a wrong environment is connected; Correct the evn_id value in config.xml according to the gateway configuration template.
Received logout message, code: 12, Gateway is not opened or disabled or Gateway '**********' not configured	Gateway is not enabled or has been disabled	The gateway cannot be used until apply for connection
Received logout message, code: 13, Need certificate from gateway '*****'	Gateway is provided without SSL certificate	In config.xml, auth_mode should be changed to 2 (electronic certificate) or 3 (Ekey); If there is a problem with the Ekey or the electronic certificate, apply for soft encryption with the Operation Department of Shenzhen Securities Communication Co., Ltd.
Gateway '**********' is forbidden	Gateway is disabled	Consult Operation Department of Shenzhen Securities Communication Co., Ltd.
Received logout message, code: 15, Gateway '*****' certificate file with wrong extension value.	The certificate provided by the gateway does not match the server requirements	Check whether the certificate file name or Ekey certificate name is configured correctly; If it is necessary to change the certificate urgently, contact the Operation Department of Shenzhen Securities Communication Co., Ltd.
Ip address '**.**.**.**' is only allowed '***' gateway to login	Only *** gateways can log in the same IP	Please log in other additional IP with gateways more than

		***.
SSCC_WANM error EKEY_LOCKED	Ekey device is locked	The Ekey might be locked because the wrong password is used many times, and the user cannot unlock it by himself. Contact the Operation Department of Shenzhen Securities Communication Co., Ltd.
SSCC_WANM error SSL_PRIVATE_KEY_PASSWORD_INVALI D	Private key password is wrong	Check the setting of the private_key_password configuration in config.xml
Failure： STEP convertor for ***** not found	The protocol conversion template could not be found when using the STEP, probably because the gateway has not logged in to the retransmission server.	Ensure that the gateway has successfully connected to the retransmission server before logging in the gateway at the counter. The log "start gateway ***** success" indicates that the login to the retransmission server was successful.
WanM error code: 3:Ssl Handshake Failed, certificate verify failed	Handshake failed	Check whether the local time of the computer running the gateway is correct, and calibrate it if necessary; certificate verification failure will also cause the handshake failure;

6.3.5 Communication error between counter and market data gateway

Log	Causes	Solution
Session is logouted, status: 5, Incorrect session login password	Incorrect login password	Check login message
Session is logouted, status: 101, 201 Session has been logined at another connection	Gateway session already exists	Log out session or stop trying to log in the gateway again
Session is logouted, status: 101, Gateway connection not logined	The gateway has not logged in the retransmission server	Reconnect when the gateway is ready
Session is logouted, status: 101, Session login SenderCompID is empty	SenderCompID field in login message is empty	Check login message
Session is logouted, status: 101, Session login TargetCompID is empty	TargetCompId field in login message is empty	Check login message
Session is logouted, status: 101, Invalid session login TargetCompID *****	TargetCompId field in login message is wrong	Please fill in the gateway number in this field

Session is logouted, status: 102, Session login HeartBtInt is out of range	Heartbeat timeout field value in login message is out of range	Check login message
Session is logouted, status: 102, Error reading session login request	Login message reading error	Check login message
Session is logouted, status: 102, Invalid DefaultAppVerID	Protocol version field in login message is incorrectly filled	Fill in correctly according to interface specifications
Session is logouted, status: 101, Too many concurrent sessions	The number of sessions exceeds the limit	Only one counter can be connected to the same market data gateway and the same platform simultaneously. Check if another counter is already connected, or wait a while until the previous connection is disconnected and then try again.
Unexpeted Data Format: Data Length of Message Exceeds Length Upperlimit	Message length exceeds the limit	Check whether the (STEP or BINARY) protocol setting in config.xml matches the protocol used by the counter; Check whether the length of the BINARY message packet sent by the counter is incorrect, and whether it is not converted to network endianness (Big-Endian); Check the length and format of the STEP message sent by the counter
Failure: Failed to create listener ***** at *****, maybe port ***** is in use.	Failed to create network listener, the port is in use.	If multiple market gateways are running on one server, consider modifying the port setting under the access_user node and the port setting under the monitor_service node in config.xml, different gateways may use different ports; Check whether this port is used by other processes, and stop the process occupying the port or change the port used by the gateway
Failure: Required tag '*****'	The STEP message has no required field	Check whether the message from the counter is correct according to the "Specification of Shenzhen Stock Exchange for STEP Trading Data Interface".
Session is logouted, status:102, Message not stared with [8=]	STEP header error	Check the STEP message format. It is required to start with "8 ="
Session is logouted, status:101, Gateway connection not ready	The gateway is not connected to the retransmission server	Wait for the gateway to successfully connect to the retransmission server before reconnection.

6.3.6 Other messages

Log	Causes	Solution
RecvQueue Full, may be LOW rate of message handling, Update timeout	Receive queue is full	It may be caused by slow reception of messages at the counter
SSCC_WANM error RECV_FAILED, detailed error info: short read	Network disconnected	Please look back from this line of log to see if there is an error log mentioned in the previous sections of this chapter.

6.3.7 WanM error code (look for the "SSCC_WANM" keyword in the log)

Error code	Cause	Solution
REACH_CONNECTION_LI MIT 1	Reach the maximum number of connections	Quit idle gateway connections or start multiple gateway processes to process connections.
CONNECTING_FAILED 2	Connection failed	When the gateway initiated, the connection failed due to the abnormality of the network to connect.
HANDSHAKE_FAILED 3	SSL handshake failed	Check whether the local time of the computer running the gateway is correct, and calibrate it if necessary; Certificate verification failure will also cause handshake failure;
SSL_CA_NOT_EXISTS 4	CA certificate file does not exist	Check if the ca file is provided in the ca_file setting in config.xml.
SSL_CA_LOAD_FAILE D 5	CA certificate verification failed (possibly the certificate file does not exist or an error occurred while loading the local CA file)	The CA certificate file may be modified, please try again using the CA certificate provided by the gateway installation package
SSL_CERTIFICATE_NO T_EXISTS 6	SSL local certificate file does not exist	Check if the cert_file setting in config.xml provides a local certificate file
SSL_CERTIFICATE_FO RM AT_INVALID 7	SSL local certificate format error (note whether the certificate's PEM or ASN1 format is set correctly)	When using a local certificate file with a non-*.pfx, *.p12 PKCS12 format, specify the certificate file format through the cert_file_format setting in config.xml.
SSL_PRIVATE_KEY_N OT_ EXISTS 8	The private key file does not exist	When using a local certificate file with a non-*. Pfx, * .p12 PKCS12 format, specify a private key certificate file
SSL_PRIVATE_KEY_FO R MAT_INVALID 9	The private key format is incorrect (note whether the PEM or ASN1 format of the private key is set correctly)	When using a local certificate file with a non-*. pfx, * .p12 PKCS12 format, specify the private key file format through the private_file_format setting in config.xml

SSL_PRIVATE_KEY_PASS WORD_INVALID 10	Private key password is wrong	Please check whether the private key password obtained when applying for the gateway certificate is consistent with the private_key_password setting in config.xm
LISTEN_FAILED 12	Listening failed	Failed to start the socket listening port, please check that the port configured under the access_user or monitor_service node in config.xml is not in use.
CONNECTION_NOT_ACTIVE 14	The connection is not active (connected)	Send and receive messages on a closed gateway connection, the error can be ignored
CONNECTION_BROKEN 15	Disconnected	Both ends are disconnected in the connection state, check the network for connection state
SEND_FAILED 16	Failed to send	Possibly disconnected
RECV_FAILED 17	Failed to receive	Possibly disconnected
SEND_TIMEOUT 18	Send timeout	Check if message sending timeout is caused by network reasons
RECV_TIMEOUT 19	Receive timeout	Check if message receiving timeout is caused by network reasons
QUEUE_FULL 21	Queue full	If the print queue by UserComm is full, check if the counter receives messages slowly
DATA_LEN_INVALID 24	Incorrect data length	Check whether the length of message packet sent by the counter is correct;
		Check if the (STEP or BINARY) setting of the protocol setting in config.xml is correct