

OMS Server 1.2.0.16 Release Notes

The Proquote team is proud to present Proquote OMS Server 1.2.0.16.

This release includes a few new features, a variety of bugfixes and some non-functional changes. Message flow control is being introduced and Limit-minding orders can now be set to trigger on the last traded price. Full details of these two changes are provided at the end of this document. In addition, the database version is being upgraded and server components are being updated to use the latest version of the .NET framework.

Some items have already been implemented on Production in the form of a hotfix. These are indicated in red.

The current production server version is 1.2.0.15.

Version 1.2.0.16 will be available on the Proquote UAT environment on 21/09/2009 for the purposes of customer regression testing. Version 1.2.0.16 will be available on the production environment on 12/10/2009.

Client Versions

This server version is certified compatible with Proquote client versions 1.2.0.6 and above, however it is recommended that the latest version of the client applications be used to take advantage of new features and enhancements.

Client application release notes will be issued separately.

Summary

Ticket	Type	Name	Affects
26954	Bugfix	Input settlement date ignored if auto-executed via SETS.	All PCFI users
26720	Bugfix	Order modification generates multiple filled messages. HOTFIX APPLIED TO PRODUCTION	All users trading on SETS
26850	Bugfix	ISE orders being rejected. HOTFIX APPLIED TO PRODUCTION	All users trading on ISE
26883	Bugfix	Trade reports rejected by system, client not notified of rejection. HOTFIX APPLIED TO PRODUCTION	All users trading on ISE
26947	Bugfix	Filled message received before order completion. HOTFIX APPLIED TO PRODUCTION	All users trading on SETS
26788	Change	Switch off cache restore on failover for PCFI	All users
26789	Change	Upgrade server components to use .NET 3.5	All users
26790	Change	Upgrade database to MS SQL server 2005	All users
26939	Change	FIX server memory consumption and stability.	All users

27374	Change	Sending unknown BIC in tag 115 when order is sent to Limit Minding would have no effect as the BIC was ignored.	All PCFI users
26460	Change	Increase the size of the order reference field (Tag 8109) HOTFIX APPLIED TO PRODUCTION	All PCFI users
26510	New feature	Option for price monitoring to look at the last traded price as the trigger.	Users of PCFI limit minding
26786	New feature	Message flow control	All users

Detail

Ticket	26954
Type	Bugfix
Name	Input settlement date ignored if auto-executed via SETS.
Affects	All PCFI users
Description	There is a feature within the software known as auto-execution. This feature allows market orders to be automatically routed to the venue with the best price (SETS or RSP). An issue was identified where orders that had a settlement period other than T+3 were incorrectly being routed to SETS and getting rejected by the venue.
Reason	The settlement period for At Best orders on SETS was being ignored. Therefore, if an order was submitted with a settlement period other than T+3 but SETS has the best price, the system would attempt to send the order to SETS and SETS would reject the order.
Resolution	The behaviour of At Best orders was changed to take into account the settlement period so non T+3 period orders will not be considered on SETS.

Ticket	26720
Type	Bugfix
Name	Order modification generates multiple filled messages. HOTFIX APPLIED TO PRODUCTION
Affects	All users trading on SETS
Description	Orders on SETS can be modified. In the event that the modified order generated multiple executions an issue was identified where all of these execution messages would contain 39=2 (Filled) instead of the correct behaviour of 39=1 (Partially filled) for all executions except the final one which would be 39=2.
Reason	The SETS interface was handling the fills coming back from SETS included in a modify acknowledgement incorrectly and treating them all as fills.
Resolution	A change was made to ensure correct behaviour.

Ticket	26850
Type	Bugfix
Name	ISE orders being rejected. HOTFIX APPLIED TO PRODUCTION
Affects	All users trading on ISE
Description	Orders to ISE were being rejected when sent at a rate of greater than 4 messages per second.

Reason	The ISE gateway contains a protection feature to ensure that message rates cannot be above a certain rate. This rate was set to 4 messages per second.
Resolution	The maximum message rate was increased to 12 messages per second.

Ticket	26883
Type	Bugfix
Name	Trade reports rejected by system, client not notified of rejection. HOTFIX APPLIED TO PRODUCTION
Affects	All users trading on ISE
Description	ISE trade reports were being rejected by the system and the user not notified of the rejection.
Reason	Trade reports were being rejected due to reference data for instrument groups not existing on ISE gateway. The gateway uses the reference data to validate the trade report request. However, in addition the rejection was malformed (tag 56 - destination) and therefore not passed back to the client.
Resolution	The ISE gateway was updated to download the correct list of tradable and reportable instruments and the trade report rejection message changed to send the correct value in tag 56.

Ticket	26947
Type	Bugfix
Name	Filled message received before order completion. HOTFIX APPLIED TO PRODUCTION
Affects	All users trading on SETS
Description	When a SETS order generates more than 15 fills, a 39=2 message (order filled) is produced after the 15th fill followed by further unsolicited 39=1 (partial fill) messages.
Reason	A SETS order acknowledgement contains two pieces of information - the acknowledgement itself and up to 15 partial fills (due to SETS messages being fixed length). A further message of RemainingOrderSize = 0 is also provided by SETS to denote that no further volume remains to be filled on the order. SETS also sends a further NumberOfRelatedMessages message which denotes the number of partial fill messages that are remaining (in addition to the first 15). OMS incorrectly used the RemainingOrderSize field to determine that the order was filled.
Resolution	A change was made to use the NumberOfRelatedMessages field to determine a fill.

Ticket	26788
Type	Change
Name	Switch off cache restore on failover for PCFI
Affects	All users
Description	If one PCFI application server fails, the other one currently tries to restore the cache of order details so that it can fail over effectively. An issue was identified that when an instance of PCFI failed due to excessive quote requests, the second instance would also fail due to caching all requests from the first server. This change switches off this functionality. There is no impact to users since the current configuration is set to restart the instance in the event of software failure and manual failover in the event of hardware failure.
Reason	NA
Resolution	NA

Ticket	26789
Type	Change
Name	Upgrade server components to use .NET 3.5
Affects	All users
Description	The existing framework being used for the server components is .NET 1.1. This change is non-functional and involves recompiling the server components with .NET 3.5 in order to make use of the enhancements to the framework at a later date. GUI components are not affected.
Reason	NA
Resolution	NA

Ticket	26790
Type	Change
Name	Upgrade database to MS SQL server 2005
Affects	All users
Description	The current version of the database is SQL Server 2000. This change is non-functional and involves upgrading the database to SQL Server 2005 in order to make use of the enhancements to the platform at a later date.
Reason	NA
Resolution	NA

Ticket	26939
Type	Change
Name	FIX server memory consumption and stability.
Affects	All system users
Description	The PCFI application server stores order-related information in a memory cache to expedite processing. The cache is loaded at system start-up from information in the database. This cache did not have a limitation set of the number of days of information to be stored and has caused the application to consume a large amount of memory. This can lead to system instability. This change ensures that the cache only contains information from the last 30 days.
Reason	NA
Resolution	NA

Ticket	27374
Type	Change
Name	Sending unknown BIC in tag 115 when order is sent to Limit Minding would have no effect as the BIC was ignored.
Affects	All PCFI users
Description	This change is to guarantee a response to the user in the event that the BIC is unknown.
Reason	NA
Resolution	NA

Ticket	26460
Type	Change
Name	Increase the size of the order reference field (Tag 8109) HOTFIX APPLIED TO PRODUCTION
Affects	All PCFI users
Description	This change increases the maximum allowable size for this field from 16 characters to 50 characters.
Reason	NA
Resolution	NA

Ticket	26510
Type	New feature
Name	Option for price monitoring to look at the last traded price as the trigger.
Affects	Users of PCFI limit minding
Description	See notes at the end of this document
Reason	NA
Resolution	NA

Ticket	26786
Type	New feature
Name	Message flow control
Affects	All system users
Description	See notes at the end of this document
Reason	NA
Resolution	NA

Appendix - Change Details

This section contains details of the changes that warrant more comprehensive description.

1 26510 - Option for price monitoring to look at the last traded price as the trigger

1.1 Overview

An issue has been identified where AIM stocks don't trigger in the limit minding module. This is because the bid and ask prices from Infolect do not accurately reflect the current trading price.

The limit minding module is to be updated so that limit orders can also be triggered on trade price. This will be a configurable option at company level.

The trade price is to come from the 5OZ Trade Report messages coming from Infolect

- When the trade price is equal to or less than a buy order limit price, the order will trigger.
- When the trade price is equal to or more than a sell order limit price the order will trigger.

1.2 FIX Communication

None

1.3 Non-FIX Communication

None

1.4 Implementation

The following OMS items will be updated as part of this change:

- OMS PCFI server
- OMS Admin client app
- Prices Cache service (config only)

1.5 Code Changes

1.5.1 OMS PCFI server

The Limit Minding Module within the PCFI server will be updated to check trade prices from Infolect against the limit prices of limit orders being monitored. Hidden orders and Hidden icebergs will not trigger on trade price.

1.5.2 OMS Admin application

A checkbox will be added to the company tab to allow triggering on trade price. This change will only take effect on a PCFI server restart.

1.5.3 IFS Prices Cache service (config only)

The filter file will be updated to not discard trade prices.

1.5.4 OMS LMIL (Infolect) Feed handler service (config only)

The config file will be updated so that 5OZ messages are not ignored. An investigation will be carried out to see what extra load this puts on the feed handler.

1.6 Impact Assessment

This change will impact clients that enter limit minding orders.

This change will affect the Prices Cache service which will now need to store trade prices.

1.7 Testing

Testing will be performed on using the following applications:

1.7.1 FIX Message Tester (used to conduct tests)

- Test that existing limit orders trigger on bid or ask price.
- Test that existing limit orders trigger on trade price.
- Test that AIM stocks trigger and trade.
- Test that cancellations still work.
- Test that client orders still work.
- Test that hidden orders do not trigger on trade price.
- Test that hidden iceberg orders do no trigger on trade price.

1.7.2 Dealer and Order Taker applications

Repeat the tests in the FIX Message Tester section

1.7.3 Admin application

Check that clients can be configured to trigger orders on trade price.

1.7.4 Prices Cache Query tool

- This will be used to check that trade prices are being stored by the Prices Cache service.
- The extra load placed upon the prices cache will be checked.

1.7.5 OMS LMIL (Infolect) Feed handler service (config only)

- Test for the extra load placed on the OMS LMIL Feed handler.
- Test that processing of the 5OZ message causes no exceptions.

1.8 Assumptions

- Limit minding orders triggering on trade price will be configurable on a company basis via a checkbox on the admin app (default is turned off)
- All instruments for an enabled company will trigger on trade price.
- All orders for an enabled company will trigger on trade price.
- Hidden orders and Hidden Icebergs will not trigger on trade price.
- On a limit minding order being entered a check will be done against the last trade price in the prices cache.
- The limit minding periodic price check will also include checking against the last trade price in the prices cache.

2 26786 - Message flow control

2.1 Overview

The PCFI server manages FIX connections and messages from clients connected to OMS.

It has been identified that the current way of handling these FIX messages can be optimised.

2.1.1 Current message handling

Currently the FIX traffic going through the PCFI server is handled using the following functionality:

2.1.1.1 Order/trade report related messages

Single queue shared by all users, only 1 thread processing all messages, meaning that only 1 message is processed at any time.

2.1.1.2 Quote related messages

New thread is spawned for every message. This ensures that each quote related message does not hold another up, and many messages can be processed at the same time, with no ordering in place.

2.1.2 New message handling

The following functionality is suggested to improve the message handling for the PCFI server:

Each user will have two message queues, one for processing order flow messages, the other for processing quote requests. Each queue will be processed by a standalone thread. This means that each user will have 2 threads processing messages.

There will be a maximum message queue size in place. If a user exceeds this, subsequent messages will be rejected until the message queue goes below the maximum size.

This will give a number of advantages for FIX message processing:

- No one user will hold up order flow message processing for other users.
- If the PCFI server is flooded with messages, it will reach a limit after which it will start rejecting messages in order to prevent a failure of the application server.

2.1.2.1 Gateway FIX connection

The above technique will be implemented in the PCFI server on both the client-side as well as the gateway-side of FIX communication. This is implemented in order to prevent failures caused by a flooding of messages from either side.

The Gateway FIX connection will contain three message queues:

- Quote related messages
- SETS/EMS related messages
- RSP related messages

If the Gateway side exceeds the maximum message queue size, the message in question will be logged to the application log and then discarded. This to protect the PCFI server from failure but still save message details for subsequent support activities.

2.2 FIX Communication

The normal FIX messages to and from clients will not be changed.

If however a client exceeds the maximum size of its queue, the message will not be processed by the PCFI server but instead be responded to with a rejection message (FIX message type '3').

The main tags in the reject message will be:

- RefSeqNum (45) - sequence number of the message the rejection is for.
- Text (58) - Reason for rejection. The text will be: 'Message rate too high'.

2.3 Non-FIX Communication

There will be no changes to non-FIX communication with this change.

2.4 Implementation

The maximum message queue size will be guided by configuration settings in the PCFI server. The maximum queue size will be global and will apply to all users connecting to the PCFI server:

- **ClientQuoteRequestMaxQueueSize:** This will determine the maximum queue size for quote requests (per user).
- **ClientOrderflowMaxQueueSize:** This will determine the maximum queue size for order flow messages (per user).
- **GatewayMessageQueueMaxSize:** This will determine the maximum queue size for messages coming back to the PCFI from the Gateway (per message queue).

2.5 Impact Assessment

This will impact all FIX message delivery in the PCFI server, as both endpoints of FIX message input/output will be changed.

2.6 Testing

2.6.1 Phase 1 - client side

- Test that slow messages for a specific user does not affect other users' message flow.
- Test that messages gets correctly rejected if a user sends message at a higher rate than maximum allowed.
- Test that memory consumption does not significantly grow if the PCFI server is subjected to a continuous stream of messages from multiple users causing the queue size to be exceeded.

2.6.2 Phase 2 - Gateway side

- Test that PCFI memory consumption does not significantly grow if the PCFI server subjected to a continuous stream of messages from Gateway causing the queue size to be exceeded.

2.7 Assumptions

- Message queue maximum sizes will be global for all users, meaning the configuration setting for maximum queue size will apply to every user.
- No intraday changes to the configuration settings will be available.