M7 Public Message Interface Terms of Reference

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Summary

Objective of the document	Describe the duties of Exchange Members developing their own Software Implementation
Concerned persons	SEMOpx Members developing their Software connected to M7 API

Historical of the document

Evolution	Date	Version	Author	Comments
Creation	25/05/2016	1.0	SEMOpx	
Update	10/08/2016	1.1	SEMOpx	
Update	14/06/2022	1.2	SEMOpx	Addition of safeguards obligation (Monitoring and order withdrawing)

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Related Documents

Document Name
DFS 180 – M7 – Public Message Interface

M7 Public Message
Interface - Terms of
Reference

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1. Introduction

1.1   Reference

This document is an amendment of the M7 Public API specification document DFS 180 (M7 Public Message Interface).

This document takes over topics and terminology of this specification document. In case more information is needed regarding the items hereafter refer to the above mentioned document.

1.2   Target Group

This document is addressed to the Exchange Members developing applications for M7 Trading System API.

Moreover and if relevant the Exchange Members is responsible for ensuring that its software provider implementing its Exchange Member Software complies with these Terms of Reference.

1.3   Purpose

The Terms of Reference have been designed to ensure a fair and stable use of the M7 Trading System and prevent from any incorrect implementation that might endanger the M7 Trading System stability.

The Exchange Member will find in Section 2 a description of the expected behaviour of applications using the M7 Trading System API as **a set of obligations** which need to be adhered to when using the M7 Trading System API to establish a connection between the Exchange Member Software of the Exchange Member on one side and SEMOpx M7 Trading System hosted by Deutsche Börse on the other side.

1.4   Obligation to cooperate

The rules laid out throughout the Terms of Reference document are part of the Exchange Member **obligations to cooperate in order to ensure the good functioning of the market as provided by the SEMOpx RULES.**

The Exchange Member **commits to comply with all of them without any reserve** via the Technical Term of Reference Compliance Sheet available on demand from SEMOpx MARKET OPERATION.

SEMOpx may request Deutsche Börse to block access to the M7 Trading System API or disconnect the Exchange Member Software from SEMOpx M7 Trading System hosted by Deutsche Börse at any time if the Exchange Member or the Exchange Member Software is not compliant to Section 2 of this document or M7 Public API specification document DFS 180 (M7 Public Message Interface).

1.5   M7 Exchange Member liability

The Exchange Member shall be aware of its responsibilities under SEMOpx Rules– **and its liability for improper use of the services offered by SEMOpx procuring a damages to SEMOpx or any other Exchange Members as provided by SEMOpx Operating Procedures and SEMOpx Rules.**

The Exchange Member warrants the accuracy of the materials and information provided to SEMOpx MARKET OPERATION, either expressly or impliedly.

1.6   Exchange Member Software Implementation Change

Prior to any change in the Exchange Member Software connected to SEMOpx M7 Trading System, the Exchange Member shall:

i.   notify the Software Change to SEMOpx MARKET OPERATION;
ii.   update the Technical Term of Reference Compliance Sheet;
iii.   perform by its own tests of its Software covering all functionalities of the application until all tests are successful
iv.   pursuant to the fulfilment these first 3 obligations, contact SEMOpx MARKET OPERATION to conduct the Software Conformance Process in collaboration with SEMOpx MARKET OPERATION

1.7   SEMOpx M7 Trading System stability

At any time and pursuant to its obligation to ensure the proper functioning of the SEMOpx Market**, SEMOpx reserves the right to refuse the access to M7 to an application which could endanger the stability of the M7 Trading System.**

2. Requirements

2.1 Testing

Software Tests by the Exchange Member

Before a Software Implementation or a Software Change is released for production, the Exchange Member is requested to perform tests in the Simulation Operation covering all technical and functional features of its application until all tests are successful.

Software Conformance Process

Pursuant to the successful testing of its Software by its own, the Exchange Member shall contact SEMOpx MARKET OPERATION to conduct the Software Conformance Process in collaboration with SEMOpx MARKET OPERATION.

The fulfillment of the Technical Term of Reference Compliance Sheet is a condition precedent to the initiation of the Software Conformance Process. **Hence, the Software Conformance Process won't be initiated by SEMOpx until the form is duly filled and up to date.**

The Software Conformation Process consists in a test session driven by SEMOpx MARKET OPERATION in collaboration with the Exchange Member, during which the Exchange Member will be requested to demonstrate that its Software Implementation respect all the present Terms of Reference.

To demonstrate this, SEMOpx MARKET OPERATION will require the Exchange Member to fulfill several tasks within a "Dummy Market".

Moreover for quality assurance reasons the execution of specific test cases in Simulation Operation and the provision of the associated log files can as well be requested after the client application has started in the Production Operation.

2.2 Connectivity

2.2.1 Connections

Exchange Member Softwares are requested to open a maximum of 3 AMQP connections for each login id.

2.2.2 Channels

Each AMQP connection must have a maximum of 5 RabbitMQ channels.

2.3 Requests

2.3.1 Application ID

Two application IDs will be assigned to each Exchange Member Software and shall be kept confidential by the Exchange Member. **A single application-ID shall not be used by several Software.**

Thus, **each Software shall use one of its designated application IDs when sending requests.** Any request sent with no or unregistered application IDs will be rejected by SEMOpx M7 Trading System.

In case a Software Implementation threaten or harm the frictionless operation of SEMOpx M7 Trading System, the used application-ID will be suspended by Deutsche Börse on the request of SEMOpx. The second application ID can be used for an older version of this Exchange Member Software, under the condition that the smooth processing of this older version has been already demonstrated in Simulation and Production Operations, or for a new version of this Exchange Member Software when the smooth processing of this new version has been ensured and proved via the Software Conformance Process.

Furthermore the usage of the Deutsche Börse test client application ID is not admitted, neither in Simulation nor in Production Operations. Generally the test client ID is disabled in Production Operations and will only be enabled in emergency cases.

2.3.2 Login and Logout

Login and/or logout requests are not to be initiated after single requests. A user session usually shall span a larger amount of requests.

The Exchange Member Software shall Login/Logout only **on the purpose of initial connection, after suffering from an unexpected disconnection from the SEMOpx M7 Trading System or after the reception of a Logout Response.**

The Exchange Member Software shall not disconnect on purpose, for instance after a specific period of time, at a fix time or after a certain amount of requests.

Exchange Member Software is requested to listen to the Logout Response broadcast messages and perform a logout of the current trader upon reception of this message. If the trader does not logout he admits a parallel login and a consumption of broadcast messages from the same trader response queue.

After logout the trader can re-login to force the concurrent user to be logged out.

2.3.3 Private response queue creation

When connecting to the RabbitMQ broker an Exchange Member Software needs to generate its private response queue which is used for any synchronous responses. The private response queue has to follow this pattern:
m7.private.responseQueue.<login_id>.<unique_id>

It is sufficient to create the queue once as long as the Exchange Member Software is logged in. After logout the queue needs to be deleted by the Exchange Member Software. The unique ID needs to be generated by the Exchange Member Software (e.g. UUID, GUID, etc.).

Exchange Member Software are requested to create a maximum of 1 private response queue per connection.

2.3.4 Inquiry requests

The use of Inquiry requests by an Exchange Member Software shall kept to a minimum.

The transmission of Inquiry Requests is only to be initiated when encountering the following scenarios:

- After start of the client application in order to retrieve initial status. After the initial state is established client application state is maintained by receiving and processing of broadcasts.
- To fill a gap in broadcasted information which can be detected based on the sequence number. Sequence numbers are counted per routing key.

The use of Inquiry Request in any other cases is not permitted.

SEMOpx M7 Trading System rejects inquiry requests that exceed the specified inquiry request limit currently set to a specific amount per minute and also a specific amount per hour. Depending on the experienced behavior of the Software this request limit will be adjusted to ensure the frictionless processing of SEMOpx M7 Trading System.

2.3.5 Message Validation

XML validation

The Exchange Member Software shall not send any invalid message and ensure that messages (as described in DFS180 M7 Public Message Interface) sent to SEMOpx M7 Trading System are valid according to the specified XML schema. Any message sent with an invalid XML schema that cannot be processed by SEMOpx M7 Trading System will be rejected using a native error response message (utf-8 message).

If an Exchange Member Software Implementation is erroneous and sends defective messages in short frequency this could have the effect of a denial of service attack and will result in a suspension of the related application ID.

AMQP properties validation
On top of the message validation, all mandatory AMQP message properties shall be set by the Exchange Member Software when sending a request to SEMOpx M7 Trading System.

SEMOpx M7 Trading System will reject messages with insufficient message properties. SEMOpx M7 Trading System delivers a validated XML error message including information about missing and/or wrong data.

If an Exchange Member Software is erroneous and sends defective messages in short frequency this could have the effect of a denial of service attack and will result in a suspension of the related application ID.

2.3.6 Re-Send of Request

The Exchange Member Software Implementation request timeout parameters should be tuned in a way that the network latency is taken into account and excessive re-sent of requests to SEMOpx M7 Trading System is avoided.

2.3.7 Connection loss

In case the connection to M7 gets lost, the Exchange Member Software shall use exponential back-off if also the re-connection fails. In case of a network problem the sufficient back-off ensures that re-connect attempts from Exchange Member Software Implementation are spread over time.

2.4   Broadcasts

2.4.1 Queue Registration

Private Response Queue and Broadcast Queue

The Exchange Member Software is requested to register a consumer to the private response queue and to the broadcast queue.

Message consumption

The Exchange Member Software Implementation is requested **to immediately consume the messages entered in the private response queue** as well as in the broadcast queue to avoid too many messages stacking in the queues.

In other word, the messages shall be **consumed (hence removed) immediately after their reception in these queues and save them locally within the Exchange Member Software Implementation prior to a further processing by the Software Implementation.**

The size of queues (amount of messages present in the queue) is constantly monitored in SEMOpx M7 Trading System API; a too high number will result in a suspension of the related application ID.

Since messages inserted in the queues will be deleted after some times, messages could be missing if not promptly retrieved.

2.4.2 Acknowledgements

The Exchange Member Software is requested to either use auto acknowledgment on RabbitMQ channels or to use manual acknowledgment to acknowledge the reception of **all** response messages and broadcast messages consumed from the trader's private queues as

soon as the message has been received (before processing of the message). **The auto acknowledgment method is mandatory and the manual acknowledgment can only be considered in case of impossibility to implement the auto acknowledgment. Such impossibility should be justified to SEMOpx MARKET OPERATION prior to any conformance test.**

In other word, the messages shall be all **acknowledged at their reception in these queues, during or right after their consumption.**

The number of unacknowledged is constantly monitored in SEMOpx M7 Trading System API; a too high value will result in a suspension of the related application ID.

2.4.3 Return Listener

The Exchange Member Software shall register a return listener on the channel being used to send requests. Thereby the detection of undeliverable requests is enabled.

2.5   Safeguards

2.5.1 Monitoring

An Exchange Member should always monitor its trading activity and implement real-time alerts which identify signs of disorderly trading by its applications using the API Public message interface.

2.5.2 Order withdrawal

Any application using the API Public message interface should be able to withdraw from the market all or some of its orders where this becomes necessary ('kill functionality') and/or to stop generating orders on SEMOpx Systems.