Eurex Exchange's T7

Release 3.0

Participant Simulation Guide

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Abstract

This document describes the timeline, new and changed features as well as simulation focus days for the release 3.0 of Eurex Exchange's T7 Simulation. Eurex Exchange participants should use this document to plan and prepare their T7 release 3.0 simulation participation. This document should be read alongside the **EUREX EXCHANGE'S T7 RELEASE NOTES**, all required technical interface descriptions, the regular **SIMULATION CALENDAR** and the regularly updated **IMPLEMENTATION NEWS** on www.eurexchange.com > Technology.

Keywords

Self-Match Prevention, Eurex Enhanced Trading Interface, Eurex Enhanced Market Data Interface, Eurex Enhanced Order Book Interface, Eurex Extended Market Data Service, Eurex Reference Data Interface, Eurex FIX Gateway, Common Report Engine, Eurex Trader GUI, Eurex Admin GUI, GUI Administration and Restart, T7.

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Definitions and abbreviations

Term	Explanation
CEF®	Deutsche Börse Group Real Time Data Feed
CRE	Common Report Engine
EMDI	Eurex Enhanced Market Data Interface
EOBI	Eurex Enhanced Order Book Interface
ETI	Eurex Enhanced Trading Interface
FESX	Dow Jones EURO STOXX 50® Index Futures
FGBL	Euro-Bund Futures
FIX	Financial Information eXchange protocol
FIXML	Financial Information Exchange Mark-up Language
GCM, DCM, NCM	General-, Direct-, Non-Clearing member
MDI	Market Data Interface (netted)
T7	Eurex Exchange's T7 developed by Deutsche Börse Group
RDF	Reference Data File
RDI	Reference Data Interface
SMP	Self-Match Prevention (prevention of cross matches)
XML	eXtensible Mark-up Language

1. Simulation Overview

1.1 Introduction

The purpose of T7 release 3.0 simulation is to provide an opportunity for participants and independent software vendors (ISVs) to become familiar with the new and enhanced functional and technical setup and features of T7 release 3.0 and to prepare for production.

The key objectives of the T7 release 3.0 simulation:

- Provide high quality information and simulation to support participant and independent software vendor (ISV) readiness.
- Familiarize participants with the new trading services functionality.
- Early identification of issues both from Eurex Exchange and from the participants' side to minimize risk of T7 release 3.0 launch and production operation.

Release 3.0 of Eurex Exchange's T7 simulation execution is scheduled for the period from Friday, 25 September 2015 until Friday, 20 November 2015. From 18 until 24 September the simulation environment will not be available due to conversion to the release 3.0. The production launch of T7 release 3.0 is planned for Monday, 23 November 2015.

Eurex Exchange offers several dedicated focus days during the simulation phase to help participants become accustomed to new or changed features of the Eurex Exchange's T7. On those days, which are marked in the simulation calendar, special testing scenarios will be provided too. This document describes the different test scenarios for Eurex Exchange's T7 Simulation.

The latest Simulation Calendar is always available on the Eurex website under the following path:

www.eurexchange.com -> Technology -> Simulation Calendar

A description of the new/changed functionality and technical enhancements has been communicated in the form of the document "**T7 3.0 Release Notes**" (one single document for functional and technical aspects in both, preliminary and final version), as well as Interface Specifications and User Manuals:

www.eurexchange.com -> Technology -> T7 -> System documentation -> Release 3.0

1.2 Intended audience

This document serves as the guide for all simulation participants, i.e. current and future users of the Eurex Exchange T7 system. In particular, the following participants will be involved in the simulation:

- Eurex Exchange's trading participants
- ISVs (Front, Middle and Back office)

In order to achieve a common understanding of the responsibilities and tasks, the distribution of this Simulation Guide to the appropriate project teams and line organizations of participants and ISVs is recommended as soon as possible. All parties involved, e.g. central coordinators, system administrators, traders and ISV representatives, should be aware of their tasks before the start of the simulation.

1.3 Timeline

Below the key dates concerning the introduction of Eurex Exchange's T7 release 3.0 are outlined.

- T7 release 2.5 to release 3.0 simulation conversion — 18 – 24 September 2015
- Start of T7 release 3.0 simulation — 25 September 2015
- Conversion of production environment 2.5 to 3.0 — 20 (eob)/21 November 2015
- Connection Test — 21 November 2015
- T7 release 3.0 production launch — 23 November 2015

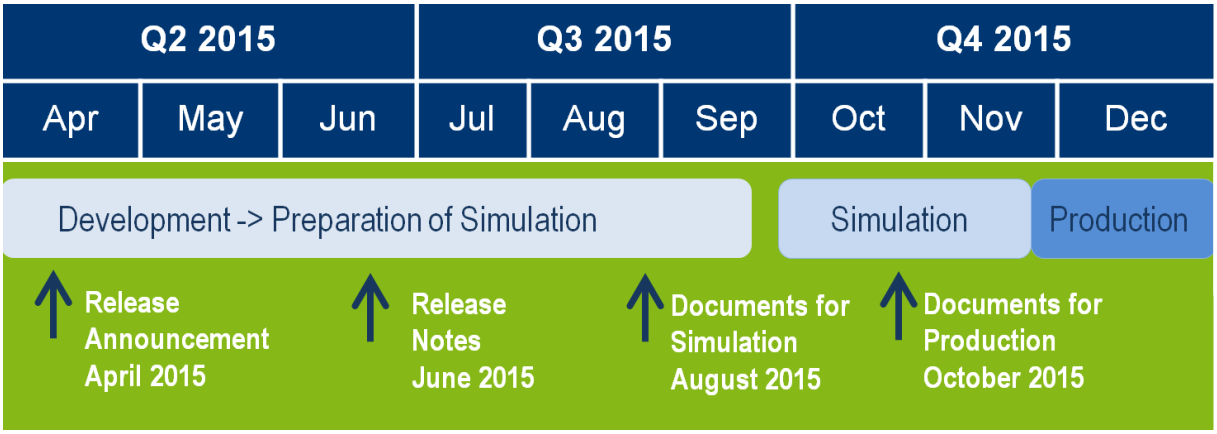


Figure 1: T7 release 3.0 document publication timeline

Please note: Eurex Exchange's T7 simulation will be available without Trade Entry Services (TES), Reports and STP (straight through processing) to clearing from 16 to 23 October due to maintenance and preparation for the start of Eurex Clearing's C7 Release 3.0 simulation. All trades generated in this period shall be discarded (and will therefore not be available on Eurex Clearing's systems).

From 26 October onwards the T7 simulation will be linked to Eurex Clearing's C7 Release 3.0 simulation. In order to test production like work flows, "cloned" products can be traded on-exchange in T7 and using the Eurex Trade Entry Service. Detailed information will be available in Eurex Clearing's C7 Simulation Guide.

1.4 Simulation calendar

During Simulation, generally three end-of-day batches per week will be performed.

The Simulation Calendar will be available on Eurex Exchange's website under the following path:

www.eurexchange.com -> Technology -> Simulation Calendar

1.4.1 Guiding principles for simulation calendar

- The simulation will be set up and run from both a functional and technical perspective as production-like as possible to help simulate business processes under realistic conditions. In order to provide a production-like system environment, the different Eurex components will be set up as an integrated simulation environment. Nevertheless, system availability and technical performance will be scaled to simulation requirements and will differ from production.
- The Eurex Exchange's T7 release 2.5 permanent simulation will terminate with the end of day processing on 17 September 2015. Eurex Exchange's T7 simulation environment will not be available for participants and ISVs from 18 September until and including 24 September 2015 in order to prepare the Eurex Exchange's T7 release 3.0 simulation environment.
- The T7 release 3.0 simulation is planned to start on 25 September 2015 and will last for approximately eight weeks until 20 November 2015. All functional and technical preparations should be completed before the start of the simulation.
- After the T7 3.0 release simulation has finished on 20 November 2015, the Eurex Exchange's T7 release 3.0 permanent simulation will continue.
- On batch days, calendar days correspond to actual business days. The following days until the next batch day have the business date of this forthcoming batch day. Here several calendar days (with 24 hours trading availability) constitute one business day.
- Weekends are generally open for simulation, but no technical and functional support will be available on weekends.
- In order to provide those participants and independent software vendors (ISVs) not located in a European time zone with the maximum possible access to the simulation environment, it is envisaged that the Eurex Exchange's T7 release 3.0 participant simulation back-end system and network will be re-opened as soon as the batch has been successfully completed.
- Quarterly and monthly last trading/maturity & expiration dates for standard products are planned throughout the T7 release 3.0 simulation. Details are listed in the Simulation Calendar.
- During the T7 release 3.0 simulation, two month-end batches for September and October 2015 will be executed and month-end reports will be provided. Further month-end batches with the respective reports will be provided in T7 release 3.0 permanent simulation from November 2015, onwards.

1.5 Liquidity for selected products in the simulation environment

1.5.1 Liquidity (bid/ask prices)

Liquidity (bid/ask prices) will be provided on each trading day throughout T7 release 3.0 simulation in the following products:

Options

- **OESX** and **ALV**: only best bid, best ask
- **OGBL, OGBM** and **DB1**: Bid and ask prices with an order book depth up to 3
- **OTX**: Bid and ask prices with an order book depth up to 3
- **OTX1-OTX5**: only best bid, best ask

Futures

- **FGBL**: Bid and ask prices with an order book depth up to 20
- **FESX:** Bid and ask prices with an order book depth up to 30
- **FTX**: Bid and ask prices with an order book depth up to 10
- **EVAR:** Bid and ask prices with an order book depth up to 3

Futures Calendar Spread orders

- **FESX**: Bid and ask prices with an order book depth up to 5
- **FGBL**: Bid and ask prices with an order book depth up to 10

Complex Instrument Types (in FEU3):

- **Packs:** 1st white pack
  1st red pack
  1st green pack
- **Bundles:** 2-year bundle and 3-year bundle

1.5.2 Self-Match Prevention

Eurex will provide Self-Match Prevention (SMP) events every hour in the instrument FTDX from 19 October onwards on each trading day throughout T7 release 3.0 simulation. Participants will receive the corresponding messages via EMDI and EOBI.

- Eurex will initially enter orders into the order book and then submit SMP relevant orders which will be fully matched against the sitting orders (with the same CrossID). The new field RestingCxlQty in the Execuction Summary (EOBI) and MDIncGrp/TradeEntryGrp for Trade Entries in Depth Incremental messages (EMDI) will show the deleted quantity due to SMP. In EMDI the field MDEntrySize will show the adjusted (remaining) open interest quantity.

- In addition Eurex will enter orders which will not be fully matched by the sitting order(s). Any quantity of the incoming order left after matching on this price level will be deleted. In this case, the RestingCxlQty field will show the deleted quantity due to the SMP events. For the part of the incoming order which could not be matched in EMDI the field MDEntrySize will be zero and the TrdType, TradeCondition and MDEntryID will also not be set.

2. Overview of all new and modified features to be introduced by Eurex Exchange's T7 release 3.0

T7 release 3.0 will introduce important new enhancements:

2.1 Self-Match Prevention (prevention of cross matches)

2.1.1 Overview

The Self-Match Prevention (SMP) functionality will help Exchange Participants in preventing an unintended execution of an incoming order or quote against a resting order or quote on the opposite side of the order book in the same instrument from the same business unit. The new functionality has been designed by Eurex Exchange to prevent unintended cross matches in T7 and thereby being compliant with regulatory requirements.However, the SMP functionality does not release Participants from their own responsibility to take appropriate action for reasons of regulatory compliance. Please note that the use of the SMP functionality is optional for Participants.

A new 4-byte, numeric optional SMP-ID field *MatchInstCrossID* will be included in the layout of all order add and modify requests as well as to the layout of the mass quote request (for FIX and ETI). The field name in the T7 Trader GUI will be *CrossID*. The Eurex Exchange´s T7 SMP functionality will prevent an incoming order or quote from being executed against a resting order or quote with the same SMP-ID and belonging to the same business unit. With the help of the *MatchInstCrossID*, a business unit will have the flexibility to make its individual setup (e.g. with respect to traders, trader groups and/or sessions) provided that the setup of the *MatchInstCrossID* lies solely within a business unit's responsibility.

The SMP functionality will be offered via all trading interfaces (Eurex ETI, Eurex FIX Gateway and the T7 Trader GUI) and is supported for all order types (limit order, market order, stop order and OCO order) as well as for mass quotes. The SMP functionality can be applied to simple and complex instruments in the same manner. SMP will be supported for all allocation schemes during continuous trading but will not be applied to any matches resulting from auctions. SMP will also not be supported for synthetic matching, i.e. it will not prevent matches of orders or quotes from the same business unit and with the same *MatchInstCrossID* in instruments different to the instrument of the incoming order.

By default, SMP is supported for all business units. Eurex Exchange reserves the right to withdraw the SMP functionality for a business unit in case of misuse.

The availability of SMP is configurable by Eurex Exchange on product level. The information which product does support the SMP functionality, is published in the Functional Product and Instrument file.

For each incoming request with an entry in the *MatchInstCrossID* field, a verification whether the respective Business Unit of the entering user is entitled to use the SMP functionality and whether SMP is switched on/off for the respective instrument will be performed. If the user is not entitled or SMP is

switched off for the respective instrument, the incoming request will be rejected with a corresponding rejection message.

2.1.2 SMP actions

A SMP condition is fulfilled in the event that the incoming order (or a triggered order or a (re-activated) quote) is facing for execution to a book order (or quote) having the same *MatchInstCrossID* value and the same business unit ID.

When the SMP condition is fulfilled, both the quantity of the incoming order and the quantity of the SMP book order are reduced by the quantity which would have matched without SMP.

- SMP book order or quote: In case the quantity reduction results to a remaining book order or quote quantity larger than zero, the remaining order or quote stays in the book. In case the quantity reduction consumes to its whole quantity, the order or quote is deleted.
- Incoming order or quote: In case the quantity reduction results to a remaining incoming order or quote quantity larger than zero, the remaining incoming order or quote continues with the matching on the same price level. In case the quantity reduction consumes the whole quantity or it can not continue the matching on the same price level, the incoming order or quote is deleted.

The Self-Match Prevention (SMP) functionality should be tested during Eurex Exchange's T7 Release 3.0 simulation.

2.2 Distribution of reference data on weekends and exchange holidays

With Eurex Exchange´s T7 release 3.0 the distribution of reference data will be harmonised. Prior to release 3.0 reference data is delivered directly after a business day rollover. As a result reference data for a business day on Monday is usually delivered on a Saturday. Following the introduction of release 3.0, with the exception of the connection test weekend (currently planned for 21 November 2015), reference data will only be distributed in the morning of each new business day and no longer during weekends or on exchange holidays.

2.3 Entitlement – New role "Market Maker Protection"

With Eurex Exchange's T7 release 3.0 a new role will be available for entitlement. The role "Market Maker Protection" will enable users to inquire and maintain Market Maker Protection parameters. The maintenance of these parameters is currently included in the role "Market Maker", but will be moved to the new role. Inquiry of parameters will still be possible with the "Market Maker" role while the role "Market Maker Protection" is the only role supporting the modification of the Market Maker Protection parameters.

Eurex Exchange will provide a conversion during the implementation of T7 release 3.0 to ensure that all users with the role "Market Maker" will also receive the new role "Market Maker Protection" as well ensuring that all users will have the same entitlement as before.

The new role will be introduced to enable Exchange traders to separate Market Making from the ability to set the Market Making parameters as a risk control measure. The new role can be assigned or de-assigned to users just like any other role.

All traders with the role Market Maker are requested to test this functionality during Eurex Exchange's T7 Release 3.0 simulation.

2.4 Impact on existing interfaces

Market Data Interfaces (EOBI, EMDI)

Eurex Exchange plans to publish the SMP events via Eurex Enhanced Order Book Interface (EOBI) and Eurex Enhanced Market Data Interface (EMDI). Participants are therefore required to adapt their applications to the mandatory changes accordingly.

Private Interfaces (ETI, FIX)

A new optional field will be added to order and quote management messages. Backward compatibility to version 2.5 ETI message layouts will be provided for the SMP functionality. The Eurex FIX Gateway will be backward compatible if the client application does not use the new optional field and is able to ignore the other new fields.

The following interfaces will be changed with Eurex Exchange T7 release 3.0:

- Eurex Enhanced Trading Interface (backwards compatible)
- Eurex FIX Gateway (backwards compatible)
- Market and reference data interfaces
- Eurex Trader GUI
- Reports

For a full overview of all new and changed features with Eurex Exchange's T7 release 3.0 please see the document "**T7 3.0 Release Notes**" which can be downloaded following this path:

www.eurexchange.com -> Technology -> T7 -> System documentation -> Release 3.0

3. Simulation preparation

Preparation activities should be completed prior to the start of Eurex Exchange's T7 release 3.0 simulation.

3.1 Organisational preparation

Prior to the start of T7 release 3.0 simulation, the following organisational preparatory activities need to be completed by all participants to ensure readiness for the simulation phase:

- All participants and independent software vendors (ISVs) will be asked to name a person acting as a single point of contact (SPoC) during the simulation. This person shall coordinate all internal activities, functional as well as technical, and shall communicate with affiliated participants during simulation, when collaboration is required. The SPoC maintenance is available to the participant via the web application under the following path:

  www.eurexchange.com -> *Member Section -> Technical Service -> Release Contacts*

- Documents will be made available in order to facilitate and support general simulation needs. However, in order to simulate the individual requirements participants are encouraged to define specific simulation objectives and scenarios on their own.
- Personnel for participation in simulation on the focus days (specified in the simulation calendar) should be identified and confirmed.
- Participants are encouraged to set up an internal issue management processes.

3.2 Functional preparation

Participants and independent software vendors (ISVs) planning to participate in the simulation should verify their individual setup/clearing-relationship and inform Eurex Exchange of any changes that may be required prior to the start of their simulation testing activity.

The completion of functional preparations prior to production start is mandatory.

3.3 Technical preparation

In order to ensure technical readiness for simulation, members/ISVs should consider the following topics:

- The changes for the following interfaces have to be implemented:
    - Eurex Enhanced Trading Interface (backwards compatible)
    - Eurex FIX Gateway (backwards compatible)
    - Eurex Market and reference data interfaces
    - Reports (Common Report Engine)
- A technical connection to Eurex Exchange T7 systems needs to be established (if not existing).
- Internal resources for timely installation of simulation software should be identified and confirmed.
- Related in-house systems should be set up to simulate subsequent processing.

4. Focus Day Overview

In the overview below, all focus days offered during the permanent simulation are listed and described:

Technical Focus Days – Triggered by Eurex Exchange:

- Fix Gateway Failover
- Matching Engine Failover / Failure and Market Data Failure
    - Matching Engine Failover
    - Matching Engine Failure
    - Market Data Services Failure
- Eurex Enhanced Order Book Interface (EOBI) Failure
- Eurex RDI Failover
- ETI Session to Gateway Reassignment
- Matching Engine Processing Delay
- GUI (forced user log out)
- Move products from one partition to another (emergency procedure)

Functional Focus Days – Triggered by Eurex Exchange

- Corporate Actions
- Market Halt
- Product Halt
- Volatility Interrupt

Functional Focus Days – Executed by Exchange Participants

- Self-Match Prevention
- Full Spread Matrix
- Instrument / product state changes
- New Strategy Setup – complex instruments
- Market Maker Protection
- Trade Traceability
- Quote Handling
- Risk Events
- Stop/Release User / Risk Controls view

4.1 Technical Focus Days – Triggered by Eurex Exchange

Technical focus days will be offered on several occasions during the simulation and will be triggered by Eurex Exchange. Participants should use this opportunity to test the behaviour of the Eurex trading and market data interfaces in conjunction with their own front office applications as well as their order book- and session management systems.

4.1.1 FIX Gateway Failover

In case of a FIX Gateway Application Failover, all FIX sessions connected to this FIX Gateway will be disconnected and the corresponding port will be closed.

Customers should then activate the connection to the secondary FIX Gateway. The first FIX session logon to the secondary FIX Gateway may take some seconds. So if a connection or a session logon fails or is not responded to immediately, a second attempt should only be made after a few seconds (30 seconds recommended).

Schedule:

- 15:00 CEST: Application Failover FIX Gateway
  (IP address: 90.150.253.32 becomes unavailable)
- 15:15 CEST: Restart of FIX Gateway
  (IP address: 90.150.253.32 available again)

- 15:30 CEST: Application Failover FIX Gateway
  (IP address: 90.151.253.32 becomes unavailable)

- 15:45 CEST: Restart of FIX Gateway
  (IP address: 90.151.253.32 available again)

These tests are recommended for all T7 participants (Members/Vendors) using the Eurex FIX Interface.

In the event of a FIX Gateway failure, active FIX sessions will be disconnected. FIX sessions may be resumed for the same SenderCompID (49) on the secondary FIX Gateway, using the secondary IP address and port number.

Recovery notes:

In the event that the disconnection was due to an outage on the FIX Gateway side, members should consider the following recovery mechanisms:

- After reconnection of the FIX session, the FIX Gateway may receive a sequence number higher than the one expected and sends a Resend Request (2) message to the member.
- The member should resend all potentially missed messages with PossDupFlag (43) ="Y", to indicate that a message may have been previously transmitted with the same MsgSeqNum (34).

- Please note: No Gap Fill messages should be sent by the member during the resend series for application messages. Application messages should always be re-transmitted since the Eurex FIX Gateway requires all missed application messages for the purpose of reconciliation with Eurex Exchange's T7 trading system fall-back.
- If a participant sends Gap Fill messages during the resend series for application messages the related orders might not be accessible any more via the FIX Gateway and related order specific information will not be forwarded to the FIX session.

4.1.2 Matching Engine Failover / Failure and Market Data Failure

The T7 simulation system runs on separate partitions. Every process in the partition has a standby partner process that can take over in case the primary process fails. During simulation a failure / failover within a matching engine will be simulated in three different ways.

4.1.2.1 Matching Engine Failover

As a precondition participants are advised to enter non-persistent orders and quotes in the simulation environment before the matching engine failover takes place.

In this test scenario the existing matcher processes in the partition will be terminated and the standby partner process will take over. Shortly after the takeover, participants will receive a 'Market Reset Event' message, stating the technical problem and including the message key which is the last reproducible order message.

As a result of the failover, the products from the failed partition will still be tradable. A Market Reset Event message will be triggered. Non-persistent orders and quotes which were inserted earlier will be deleted after the restore of the order book.

There is a "failover time parameter" defined per product. If the failover happens in between that timeframe and the product did NOT have a continuous trading status prior to the corruption, the product will change to product state "halt", after the failover is finished.

Afterwards an order book replay will be sent including the persistent orders which were recoverable. Participants with low frequency sessions will receive an extra end of replay message on a product level. Participants with high frequency sessions will only receive the previously mentioned Market Reset Event Message. Hence, there are no extra deletion messages.

➔ The Matching Engine Failover scenario will be offered between 15:00-16:00 CET. All available products are affected.

4.1.2.2 Matching Engine Failure

For the execution of a partition failure both matcher processes will be crashed for all partitions in simulation. The test case will have an impact on all products available in the permanent simulation. If participants try to send orders and quotes during the failure, an error will be given stating that the order management is not available. A Market Reset Event message will be sent out to participants, when the matching engine has been restarted. Additionally the market data service will still be available but will send only unchanged data to participants.

➔ The Matching Engine Failure scenario will be offered between 15:00-16:00 CET.

4.1.2.3 Market Data Services Failure

Prior to the focus day participants should check whether they receive market data from the Eurex Exchange's T7, i.e. they should try to send some orders on products which are available in permanent simulation. Market data information will be provided in packages marked with a *SenderCompID; PartitionID; PacketSeqNum* (continuous numbering format); the *MessageSeqNum* (contiguous per *SenderCompID* multicast address and port combination) and a *MarketSegmentID*. If there is no failure, the *SenderCompID* always remains constant for a product during the whole business day.

When the market data failure is initiated by Eurex Exchange, a crash will be simulated within the partition for market data services. During that time participants can try to insert new orders and quotes for that product. As a result they will receive a message that the associated partition is not available. As long as the partition is not available, i.e. not restarted by the exchange, participants will neither be able to receive market data for products linked to that partition, nor be able to enter orders. In this test scenario both partitions in simulation will be affected and therefore the test will refer to all products which are available at that time in the permanent simulation.

Participants can identify this failover scenario by comparing the *SenderCompID* value with the previous value. A new *SenderCompID,* which is available in the packet header and in each data message for incremental and snapshots, indicates the partition failure. Additionally the *PacketSeqNum* will be reset to 1.

Once this condition is observed, it can be assumed that a fail-over scenario took place and the rebuild of the order book can be started. All non-persistent orders entered prior to the failover will be deleted. The receiving application needs to invalidate its view of the order book until an explicit message has been received containing new information.

➔ The Market Data Services Failure scenario will be offered between 15:00-16:00 CET.

4.1.3 Eurex Enhanced Order Book Interface Failure

Prior to the focus day, participants should check whether they are able to receive market data from the Eurex Enhanced Order Book Interface (EOBI) in advance, i.e. they should try to send some orders on benchmark futures products which are available in Eurex Exchange's T7 permanent simulation (e.g. FGBL, FGBM, FGBS, FGBX, FBTM). Public market data information from Eurex EOBI will be provided in packages/UDP datagrams marked with a *MarketSegmentID*, i.e., product identifier; *PartitionID*; *ApplSeqNum* (continuous numbering format); Packages are sent over redundant multicast address and port combinations. Each package is uniquely identified by its *MarketSegmentID* and *ApplSeqNum* combination. In addition to the packet sequence numbering, individual messages are sequenced by *MsgSeqNum* which is contiguous per *MarketSegmentID*.

In case of an EOBI Failover, the *ApplSeqNum* for a specific *MarketSegmentID* will restart from 1 while the *MsgSeqNum* continue to be contiguous on the Eurex EOBI incremental channel.

In case of an EOBI Failure, both the *ApplSeqNum* and the *MsgSeqNum* for a specific *MarketSegmentID* will restart from 1.

The following failure/failover test scenarios will be initiated by Eurex Exchange.

- First a failover will be simulated within the partition for Eurex EOBI services. Participant applications should notice this whenever an *ApplSeqNum* is received which is smaller than one which has already been received for a specific *MarketSegmentID* and multicast address:port combination. While an "optimistic" participant application can try to keep the order books as long as they get the next expected *MsgSeqNum* for that specific *MarketSegmentID* in the packet starting with *ApplSeqNum* 1. The safest approach in that case would be to rebuild all order books for this *MarketSegmentID* again from the Eurex EOBI snapshot channel.
  Participant applications are required to distinguish between an *ApplSeqNum* smaller than one which has already been received and an "out of order" arrival of a packet on the receiver side.

- Thereafter a failure will be simulated within the partition for Eurex EOBI services. Participant applications should notice this the same way as before. Whenever a participant application detects a restart of the *MsgSeqNum* as well, it must rebuild all order books for this *MarketSegmentID* again from the Eurex EOBI snapshot channel.
  During that time participants can try to insert new orders and quotes for that product.
  As a result a message indicating that the associated partition is not available will be received.
  As long as the partition is not available, i.e. not restarted by the exchange, participants will neither be able to receive public market data for products linked to that partition, nor will they be able to enter orders. In this test scenario, both partitions in simulation will be affected and therefore the test will refer to all products which are available at that time in the permanent simulation.

All non-persistent orders entered prior to the failover will be deleted. The receiving application needs to invalidate its view of the order book and refresh once an explicit message has been received containing new information.

➔ The Eurex EOBI failure scenario will be offered between 15:00-16:00 CET.

4.1.4 Eurex RDI Failure

In this test scenario both the failover and the restart of the Eurex RDI will be simulated. As a precondition for the tests, participants are advised to create some complex instruments in the simulation environment before the failover and restart of the RDI are performed.

In the first part of the test scenario when the Eurex RDI fails over, a new initial reference file will be generated with a new file set identifier. This file will contain any complex instruments, already created and deleted during the day, i.e. the entire history.

In the second part of the test scenario, when the Eurex RDI is restarted, a new initial reference file will be generated with a new file set identifier. This file contains the existing complex instruments but not the entire history of creations and deletions.

➔ The RDI Failure scenario will be offered between 15:00-16:00 CET.

4.1.5 ETI Session to Gateway Reassignment

Participants interact with the trading gateways by means of high frequency or low frequency sessions. The primary and secondary gateway, to which a session is assigned, is contained in the response to the gateway request message which is issued as the first step in the connection process. Under normal circumstances the assignment of the session to a trading gateway will not change on a day-to-day basis but either as a result of hardware failure or due to the re-assignment of sessions for load balancing purposes the session to gateway assignment can and will change.

Participants must not only ensure that their applications support the automatic gateway reassignment but also that their application can handle a logon to the primary or secondary gateway should one of the logins fail. Hardcoding of gateway assignments may lead to the inability to connect to the trading gateways.

To assist participants in preparing for the ETI session to gateway reassignment and to ensure that trading applications are able to handle the scenario once it occurs, focus days will be offered whereby the session to gateway assignment will be changed for all sessions.

There will be two focus days for this scenario whereby both focus days will take place in the same week. In the simulation environment the end-of-day processing usually takes place on a Tuesday, Wednesday and a Thursday.

In the end-of-day processing on the first day where the focus day is specified, all session to gateway mappings will be deleted. Once the simulation environment becomes available again after the end-of-day processing, the assignment of the sessions to the trading gateways will be performed on a "round robin" principle and there will be no way to ascertain which gateway will be assigned in advance. Applications will be required to process the response from the gateway request message to find out which trading gateways can be used for a particular session.

A list of all the possible trading gateways together with their IP addresses is listed in the "Eurex Network Access to T7" document which is available Eurex Exchange's website www.eurexchange.com > Technology

In the end-of-day processing on the following batch day, the original session to gateway mappings will be restored.

➔ The ETI to Gateway Session Reassignment scenario will be offered over a time spanning two batch days with part 1 deleting all existing mapping and part two restoring the original session to gateway mappings.

4.1.6 Matching Engine Processing Delay

This focus day scenario is provided to assist participants in testing the very rare event where massive processing delays occur on a partition. In this scenario the following events will be triggered:

- All non-persistent Orders and Quotes will be deleted for the affected product(s)
- Product-specific DeleteAllOrderQuoteEventBroadcast messages will be sent to all ETI and FIX sessions with MassActionReason set to (111) Product_temporarily_not_tradable.
- For a minimum time period of 10 seconds or until the slow processing is resolved, all transactions except order deletions will be rejected with SessionRejectReason set to (102) Service_Temporarily_Not_Available and VarText 'TRANSACTION REJECTED DUE TO SLOW PARTITION'
- In the event that a product is temporarily not tradable, Participants will be informed when the matching engine will accept transactions again by a TradingSessionStatus message (MsgType (tag 35) = "h") specifying TradSesEvent (tag 1368) = 105 ("Service Resumed").

Please Note: Participants will still be able to send deletion requests for any persistent orders which they would like to remove.

This focus day will be provided in the product **AFR** only.

Participants are requested to check that their applications can correctly handle order / quote deletions and transaction rejections due to the slow partition state.

Please refer to the simulation calendar on Eurex Exchange's website www.eurexchange.com > Technology for the days on which this focus day will be provided.

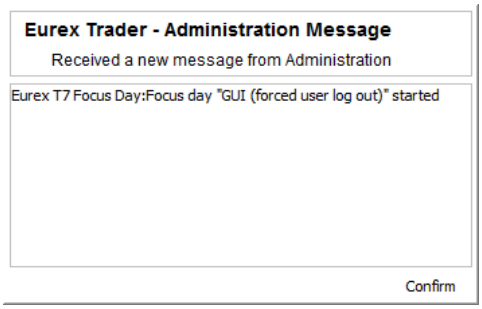
4.1.7 GUI (forced user log out)

The GUI Focus Day will be provided for the first time starting with T7 Release 3.0. This focus day scenario is provided to first of all make participants aware of a function within T7 whereby in an emergency/exceptional situation Eurex Operations can not only send messages directly to the users screen but also force the termination of the GUI itself. In addition, the focus day is also provided to make participants aware of the effects of a full GUI environment restart. The GUI (forced user log out) focus day will be sub-divided into three parts:

- Send Admin Message only
- Admin Message + Forced Trader GUI Shutdown
- Full GUI environment restart

4.1.7.1 Send Admin Message only

All GUI instances (both Admin and Trading) logged in at the point when the focus day is initiated will receive a message "Eurex T7 Focus Day: Focus day "GUI (forced user log out)" started". This message will appear in new popup window.



This window can be closed by pressing the Confirm button.

4.1.7.2 Admin Message + Forced Trader GUI Shutdown

After this first message the following message will be send 10 minutes prior to the GUI environment shutdown: "Eurex T7 GUI Focus Day: Automatic GUI shutdown has been triggered and the GUI environment will be restarted". On the Trader and Admin GUI the following pop-up windows will be displayed:



The colour of this popup window will turn to yellow 15 seconds prior to the forced shutdown and turns red for the last 5 seconds.

4.1.7.3 Full GUI environment restart

Following a full restart of the GUI environment in simulation will be performed. On the day where the focus day is scheduled, participants will be encouraged to suspend orders so that the effect on suspended orders caused by a GUI restart can be observed. Suspended orders will all be deleted, the rest of the order book will be unchanged after a restart.

➔ The GUI (forced user log out) focus day scenario will be offered between 15:00-15:30 CET.

4.1.8 Move products from one partition to another (emergency procedure)

This focus day scenario is intended to simulate the unlikely event that products need to be moved from one partition to another before the start of trading.

Under normal circumstances, the assignment of products to a partition will not change on a day-to-day basis but either as a result of hardware failure or due to a re-configuration, the assignment of products can and will change.

In this focus day scenario all products belonging to the product group FBND will be moved from one partition to another prior to the start of the trading phase (closed & pre-trading) in the T7 simulation environment.

As a consequence of the product move from one to another partition the entire T7 system will be restarted. All non-persistent orders, quotes entered and recoverable broadcast streams disseminated before restart will be deleted. The PartitionID in the reference data, product snapshot and packet header for EMDI and EOBI for the affected product(s) will change. When the Eurex RDI is restarted, a new initial reference file will be generated with a new file set identifier. Reference Data via RDI and RDF must be reprocessed by client applications following the restart. The SenderCompID in the Market Data for the product will change following the restart. The service on which the market data is published first for EMDI / EOBI may change (even to odd or vice versa). The multicast addresses on which the market data is disseminated will not change

Participants must ensure that their applications support the automatic reassignment of products. Hardcoding of product to partition assignments may lead to the inability to identify or trade these products.

- ➔ Affected products are: CONF, FBCM, FBON, FBTM, FBTP, FBTS, FCBL, FCBS, FGBL, FGBM, FGBS, FGBX, FOAM, FOAT.
- ➔ The Move products from one partition to another one (emergency procedure) focus day scenario will be performed in the morning after a batch run and should be completed before 11am (CET/CEST). Please note: The products which have been moved from one partition to another, will remain on the "new" partition until this focus day scenario is repeated.

4.2 Functional Focus Days – Triggered by Eurex Exchange

4.2.1 Corporate Actions

Participants will have the opportunity to test Corporate Action processing between the Eurex Exchange's T7 and the current Eurex Clearing classic system. On the first focus day, i.e. before end-of-day processing starts, participants are requested to generate positions in T7 in the defined products to check the system behaviour on the effective focus day (second business day).

➔ The exact dates of the Corporate Actions scenario are displayed in the current simulation calendar available on Eurex Exchange website www.eurexchange.com > Technology

4.2.2 Market Halt

As a possibility to reflect a market halt in the Eurex Exchange's T7 and Eurex Clearing classic system, Eurex Exchange has planned one predefined focus day. This market halt will be done on an intraday basis between 15:00 and 15:30 CET.

Test scenario and expected result:

Prior to the planned Market Halt participants are recommended to enter non persistent orders and quotes and persistent orders in any products which are available in the permanent simulation. As a result of the market halt, products will not be tradable between the given times in Eurex Exchange's T7 simulation. In this scenario all non-persistent orders and quotes will be deleted after the market reset and participants must re-enter those orders and quotes. Persistent orders will stay in the system.
Additionally the following message will be sent:

10308 - (ETI: Mass Cancellation Event)

➔ The exact dates of the Market Halt scenario are displayed in the current simulation calendar available on the Eurex website.

4.2.3 Product Halt

As a possibility to reflect a product halt in Eurex Exchange's T7, Eurex Exchange has planned one product halt on a predefined focus day. This test will be done on an intraday basis between 14:00 and 14:30 CET.

Test scenario and expected result:

Prior to the planned Product Halt participants are recommended to enter non persistent- and persistent orders and quotes in the affected product. As a result this product will not be tradable between the given times in Eurex Exchange's T7. In this scenario all non-persistent orders and quotes will be deleted after the market reset and participants must re-enter them. Persistent orders for the affected product will stay in the system. Additionally the following message occurs:

10308 - (ETI: Mass Cancellation Event aka DeleteAllOrderQuoteEventBroadcast aka BC CleanupOQ)

➔ The exact dates and products of the Product Halt scenario are displayed in the current simulation calendar available on the Eurex website.

4.2.4 Volatility Interrupt

With volatility interrupts participants will be able to familiarize themselves with the product specific system handling. For this focus day the volatility interruption will be triggered by Eurex Exchange. between 15:00 and 15:30.

Test scenario and expected result

I. Prior to the planned volatility interruption, participants are recommended to enter non persistent orders and quotes in several maturities on both sides (bid & ask) on the respective product. As a result of this test scenario all non-persistent orders and quotes will be deleted and a clean-up message will be sent out after the volatility interrupt. Participants will have to re-enter those orders and quotes. During the time of the volatility interrupt the respective product is not tradable in the system.
Furthermore, the volatility interrupt leads to a volatility auction state, which is triggered before the affected order is matched outside the volatility range.

II. Prior to the planned volatility interruption participants are recommended to enter persistent orders in the respective product. As a result of this test scenario all persistent orders are still visible after the volatility interrupt. During the time of the volatility interrupt the product is not tradable in the system.
Furthermore the volatility interrupt leads to a volatility auction state, which is triggered before the affected order is matched outside the volatility range.

The exact dates and product of the Volatility Interrupt scenario are displayed in the current simulation calendar available on Eurex Exchang'e website www.eurexchange.com > T7

4.3 Functional Focus Days – Executed by Participants

The following focus days are offered, but must be executed by participants.

4.3.1 Self-Match Prevention

The Self-Match Prevention (SMP) functionality is introduced with Eurex Exchange's T7 Release 3.0 and should be tested during the T7 release 3.0 simulation. The changes affect the Eurex Exchange T7 GUI, the ETI and FIX interfaces and the marked data interfaces EMDI and EOBI.

Participants are requested to test the changes for all relevant interfaces. An in depth description of the changes is part of the interface manuals provided by Eurex on the Eurex Website at

www.eurexchange.com -> Technology -> T7 -> System Documentation -> Release 3.0

Participants which do not plan to make use of the SMP functionality are also requested to test their interfaces and make sure that they can handle changes due to the introduction of the new SMP functionality.

A new report "TE812 Daily Prevented Self-Matches" which contains the prevented self-matches during a trading day will be provided in simulation with T7 release 3.0.

The fee reports "CB165 Eurex Fee Statement", "CB192 Monthly Fee Statement" and "CB196 Daily Overall Fee Summary" will be enhanced to provide information about prevented self-matches. CB 165 will include new valid values for transaction type and trade type to cover SMP.

- Valid value "C" (Prevented Cross Trade) will be added xml tag "trdTyp" (trade type)
- Valid value "008" (Prevented Cross) will be added xml tag "trnTyp" (transaction type)

CB192 and CB 196 will include a new fee type "Prevented Cross Trade".

4.3.2 Full Spread Matrix

In the Eurex Exchange's T7 it is possible to set up and trade products with up to 20 different calendars spreads.

The exchange can configure which calendar spreads of a futures product are considered for synthetic matching; a synthetically linked full spread matrix is achieved by considering all calendar spreads of a futures product.

The following products are configured with a synthetically linked full spread matrix in the permanent simulation:

Group	Product	Currency	Product Name
FINT	FEU3	EUR	THREE-MONTH-EURIBOR FUT. (ACI)

FINX	FEXD	EUR	FUT ON EURO STOXX 50 INDEX DIV
FVOL	FVS	EUR	FUT ON MINI VSTOXX

4.3.3 Instrument / product state changes

Eurex Exchange's T7 applies trading states at both a product level and at an instrument level. Instruments of the same product can be in different instrument states. Product states apply to all instruments of a product.

While product states give structure to the trading day and control general access to the system, instrument states control order/quote maintenance, execution and availability of market information. The introduction of instrument states permits greater flexibility with auctions.

4.3.4 New Strategy Setup – complex instruments

Typically, complex instruments are requested by traders, however, some futures spreads are created by the exchange by default. Complex instruments requested by traders with open orders valid beyond the current trading day will be available the next day.

It is possible to have different trading parameters per instrument type, for example allocation schemes and price validations. Therefore, different instruments of the same product can vary in their trading behaviour.

Please note: Strategies are always created on a temporary basis and are cancelled during the end of day processing when their order book is empty.

Traders may request complex instruments from Eurex Exchange's T7 at any time during the simulation. If the requested complex instrument matches a predefined standard option strategy, then the matching engine will create a standard option strategy.

4.3.5 Market Maker Protection

A Market Maker protection mechanism on a session level is provided to prevent too many simultaneous executions on quotes provided by a Market Maker. Market Maker protection parameters can be specified on either the product level or the product/instrument type level.

The participant may use the *MMParameterDefinitionRequest* in Eurex ETI or the Eurex Trader GUI Market Maker Protection screen to define market maker protection parameters. There are additional features in Eurex Exchange's T7 provided for MMP:

- MMP is available for both futures and options.

- MMP can be applied to all simple and complex instrument types independently, supplementing the existing protection on a product level.
- MMP uses quote inactivation rather than quote deletion.
- MMP can be maintained separately via the Eurex Trader GUI, Eurex Admin GUI and Eurex ETI.

- An additional percentage limit supplementing the already existing volume, delta and vega limits can be used for MMP.

4.3.6 Trade Traceability

Eurex Exchange's T7 provides improved trade traceability, allowing orders to be linked to executions, trade confirmations, and trades in clearing for simple instruments and complex instruments.

While sending a new order participants can provide a client order ID and up to three free text fields, which are optional for Eurex ETI. For each new order received by Eurex Exchange a separate order ID by the exchange is assigned which is unique and returned to the participant on all private messages.

For every match event Eurex Exchange's T7 assigns identifiers unique within product and business day, to each aggregated price level, every order execution and every trade.

For the matching of a complex order in addition to the order leg, the execution ID and order leg execution ID is provided for each leg of the complex instrument match.

4.3.7 Quote Handling

This scenario describes the most important features related to quote handling, e.g. 'mass quote' functionality allowing participants to enter, modify and delete multiple quotes of a session simultaneously for both, options and futures.

Quotes per business unit:
Quotes belong to the session on which they are entered. It is possible to have multiple sessions for one business unit and each session can have different quotes in the same instrument.

Mass quote entry:
In this scenario it is possible for the trader to enter, modify and delete multiple quotes of a session simultaneously. This scenario can be tested with futures as well as options as well as in combination with simple and complex instruments. This function is different from the "delete all quotes" feature, which deletes all quotes in one session.

Quote check:
A newly inserted or amended quote which fails the price reasonability or extended price range validation results in a complete deletion of the quote. This scenario can be tested with a positive and negative test scenario.

Automatic deletion:
In this scenario it can be tested that quotes are automatically deleted when the instrument status changes to "closed" or "restricted" or when the instrument has expired.

Quote activation / inactivation:
Quotes of a given session or product (and instrument type) can be set to active/inactive. Inactive quotes will be hidden from trading and will not participate in matching. Furthermore they will not be visible in the order book depth. Traders can continue to add, modify and cancel individual quotes. The inserted status for quotes is always persisted for the current business day. At the start of the new business day all newly entered quotes will be reset via default to status active.

During the time of a session inactivation any new quotes which are inserted for the session become automatically inactive. When reactivating the quotes they get a new matching time priority.

4.3.8 Risk Events

Risk parameters are adjusted in a way that risk events will be triggered due to defined trading volume or quantity limits. Limits can be set by Clearing Members for their Non-Clearing Members (Exchange Participants) or by Non Clearing Members themselves on an intraday basis. There are three levels of limitation which can be defined by participants and is the same for all business units.

1. *Alert message*

   The user will receive a popup message which informs him that he has exceeded a predefined limit, no further actions will happen.

2. *Threshold message*

   The user will be informed that he has exceeded the second limit and therefore a throttle mechanism is implemented for the trading. For traders it is no longer possible to trade in a general way and volume as the trade volume will be limited as per the threshold limitation given from the clearing members.

3. *Blocking message*

   With this scenario trading will be disabled for the respective trading user if he exceeds his trading limits or any other given quantity limits for trading. User entitlements are independent of those extra limitations.

4.3.9 Stop/Release User / Risk Controls view

The Risk Controls View comprises of two different functions; the Panic Cancel actions which results in the deletion of orders and/or quotes and the Stop/Release actions, which will not only delete orders and quotes but will prevent a single or group of traders/machines from further entry of quotes and

orders. Please read more in the "Eurex Trader and Admin GUI Manual" available on the Eurex Website at

www.eurexchange.com -> Technology -> T7 -> System Documentation -> Release 3.0 -> Eurex GUI Solutions

5. Documentation

5.1 Documentation Schedule

The following existing documents will be revised for T7 release 3.0. Preliminary versions (identified by ◆) will be available prior to the start of simulation and final versions (identified by ●) will be available prior to the production launch.

Eurex Exchange's T7	Q2 2015			Q3 2015			Q4 2015		
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Eurex Exchange´s T7 Release 3.0, Release Notes			◆			●			
Simulation									
Participant Simulation Guide					●				
Overview and Functionality									
Functional and Interface Overview					◆		●		
Funtional Reference						●			
Eurex GUI Solutions									
Eurex Trader and Admin GUI – Manual					◆		●		
Eurex Trader and Admin GUI - Installation Manual					◆		●		
Trading Interfaces									
Eurex Enhanced Trading Interface – Manual					◆		●		
Eurex Enhanced Trading Interface – XML Representation					◆		●		
Eurex FIX Gateway - FIX 4.2 and 4.4 Manual					◆		●		
Eurex FIX Gateway - Fiximate FIX 4.2 and 4.4					◆		●		
Eurex FIX Gateway - FPL Repository					◆		●		
Market and Reference Data Interfaces									
Eurex Market + Reference Data Interfaces, Manual					◆		●		
Eurex Market + Reference Data Interfaces, XML FAST Templates					◆		●		
Eurex Reference Data File – FIXML Schema Files					◆		●		
Eurex Extended Market Data Services – Manual					◆		●		
Eurex Extended Market Data Interfaces, FAST Templates					◆		●		
Eurex Enhanced Order Book Interface – Manual					◆		●		
Eurex Reports									
Eurex XML Reports - Reference Manual					◆		●		
Network Access									
Eurex Network Access Manual					◆		●		

Published versions of these documents become available on the Eurex website:

www.eurexchange.com -> Technology -> T7 -> System Documentation -> Release 3.0

6. Support

The standard support times of Eurex Exchange will be in effect during the simulation phases. The helpdesk departments and further information sources are provided in the following section.

6.1 Contacts and support hours

The following helpdesks provide first level support for specific topics from Monday till Friday:

6.1.1 Member/ Vendor Services & Admission Team

Phone: +49-69-211-1 17 00 (09:00 - 18:00 CET)

- Participants readiness activities
- Participant preparation requirements
- Participant setup questions for simulation and production
- Participant data changes for simulation and production
- ISV related queries

6.1.2 Functional Helpdesk Eurex

Phone: +49-69-211-1 12 10 (07:00 - 22:30 CET)

- Functional trading related issues for Eurex Exchange's T7 and the Eurex system (clearing)
- Functional focus days
- Product data management
- Market Control
- Simulation participation and execution

6.1.3 Helpdesk Clearing Data Control

Phone: +49-69-211-1 24 53 (08:00 - 20:00 CET)

- Clearing functionality
- Entitlement Management
- Participant- and user data management

6.1.4 Customer Technical Support

Phone: individual VIP number (24 hours, Monday - Friday)

- All Technical issues related to the simulation environment (e.g. connectivity issues)
- Technical focus days

6.2 Further sources of information

Changes and further information regarding the simulation for Eurex Exchange's T7 will be provided via the following channels:

1. Circulars
2. Info-Mail
3. Implementation News on Eurex Exchange's website for T7 under following path:

www.eurexchange.com -> Technology -> T7 -> Implementation News

7. Change log

The document contains the following changes compared to the previous versions.

No	Date	Chapter	Change
1.0	12 August 2015	All	Initial version for Eurex Exchange's T7 Release 3.0
1.0	14 September 2015	All	Minor changes + amended timeline.
1.1	1 April 2016	4 /4.1.8	Added the focus day scenario "Move products from one partition to another (emergency procedure)"