

T7 Release 12.1

**Derivatives and Cash Markets
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 T7 Release 12.1 Simulation. Trading participants should use this document to plan and prepare their T7 Release 12.1 Simulation participation. This document should be read alongside the T7 Release 12.1 Release Notes, all required technical interface descriptions, the regular Simulation Calendar and the regularly updated Implementation News either on

- eurex.com > Support > Information Channels > Implementation News for the derivatives markets
- xetra.com > Technology > Implementation News for the cash markets

Keywords

T7 Enhanced Trading Interface, T7 Enhanced Market Data Interface, T7 Enhanced Order Book Interface, T7 Extended Market Data Service, T7 Reference Data Interface, T7 FIX LF, Common Report Engine, Common Upload Engine, T7 Trader GUI, T7 Admin GUI, T7 Trade Entry Services

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1. Definitions and Abbreviations

Term	Explanation
BF	Börse Frankfurt
C7 SCS	Central Counter Party
CEF®	Consolidated Exchange Feed
CRE	Common Report Engine
CUE	Common Upload Engine
DBAG	Deutsche Börse AG
EEX	European Energy Exchange
EMDI	T7 Enhanced Market Data Interface (non-netted)
EMDS	T7 Extended Market Data Service
EOBI	T7 Enhanced Order Book Interface
ETI	T7 Enhanced Trading Interface
Eurex EnLight	Eurex EnLight is a price discovery service offered on the T7 platform to negotiate off-book transactions electronically
FIX	Financial Information eXchange protocol
FIXML	Financial Information Exchange Mark-up Language
GMC	Middleware Cluster for T7 Trader GUI, T7 Admin GUI, T7 Clearer GUI
GUI	Graphical User Interface
ISV	Independent Software Vendor
LF	Low Frequency
MDI	T7 Market Data Interface (netted)
RDI	Reference Data Interface
RDF	Reference Data File
RLP	Retail Liquidity Provider
RMO	Retail Member Organisation
SMP	Self-Match Prevention
SPoC	Single Point of Contact
T7	T7 trading system developed by Deutsche Börse Group
TES	T7 Entry Services
TKAM	Technical Key Account Manager
Xetra EnLight	With Xetra EnLight, Frankfurt Stock Exchange offers an on-exchange request-for-quote functionality for off-book trading in the cash market

2. Simulation Overview

2.1 Introduction

The purpose of T7 Release 12.1 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 12.1 and to prepare for production. The production launch date for T7 Release 12.1 is planned for 13 May 2024.

The key objectives of the T7 Release 12.1 Simulation:

- Provide high quality information and simulation to support participant and ISV readiness.
- Familiarize participants with the new trading services functionality.
- Early identification of issues both from the Exchange and from the participants' side to minimize risk of T7 Release 12.1 launch and production operation.

The T7 Release 12.1 Simulation covers both, the cash and the derivatives markets which means all markets on the T7 Simulation environment and T7 Börse Frankfurt Simulation environment. The "T7 Release 12.1 Simulation" always includes all the environments described above, unless explicitly stated otherwise.

The simulation period for T7 Release 12.1 is planned to start on 25 March 2024.

Please note: The start of the EMDS Customer Simulation is planned for 02 April 2024.

In addition to the T7 Release Simulation, Deutsche Börse AG offers a T7 Release 12.1 Cloud Simulation to allow trading participants and ISVs to test against the current T7 production and simulation software versions. In the Cloud Simulation, participants can initiate predefined market scenarios and test specific strategies more easily than in a shared environment. The Cloud Simulation is available around the clock for a fixed price per hour and has started on 26 February 2024.

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

2.2 Note on Interfaces

T7 Release 12.1 will provide backwards compatibility for the T7 ETI/FIX LF interface version 12.0, which means that even participants who do not want to use the new functionality will still be able to connect to T7 with the interface layout version 12.0 after the production launch of T7 Release 12.1.

The interfaces for public market and reference data, including EOBI, EMDI, MDI, RDI/RDF as well as reports and data files are not backward compatible.

2.3 Further Information

Please note and be aware of the following T7 Release 12.1 Simulation condition:

The T7 Release Simulation is a shared simulation environment with the purpose of providing participants the opportunity to test functional and technical enhancements for the forthcoming T7 Release. Following a release, the environment will be available with the current software for further testing of all T7 related functionality. The T7 Simulation is not designed for very extensive or even performance testing. Participants who would like to test scenarios involving an unusually large amount of order and quote transactions and/or trades shall contact their Technical Key Account Manager (TKAM). The TKAM will ask for the purpose of the test and a detailed description of the participants test scenario (including number of expected orders, quotes and trades). The TKAM together with the participant will evaluate the request and attempt to find a solution which can realistically be provided together with a potential date and time for the execution.

2.4 Intended audience

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

- Exchange 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 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.

2.5 Timeline

Deutsche Börse AG is planning to launch Release 12.1 of T7 on 13 May 2024.

The following timeline gives an overview of the introduction schedule:

T7 12.1 Cloud Simulation Start	26 February 2024	T7 Simulation
T7 12.0 Simulation last batch	19 March 2024	T7 Simulation
T7 12.1 Simulation Software Installation and Conversion	20 March- 24 March 2024	T7 Simulation
T7 12.1 Simulation Execution	25 March 2024- onwards	T7 Simulation
T7 12.1 Conversion & Support Window	11 May 2024	T7 Production
T7 12.1 Production Launch	13 May 2024	T7 Production

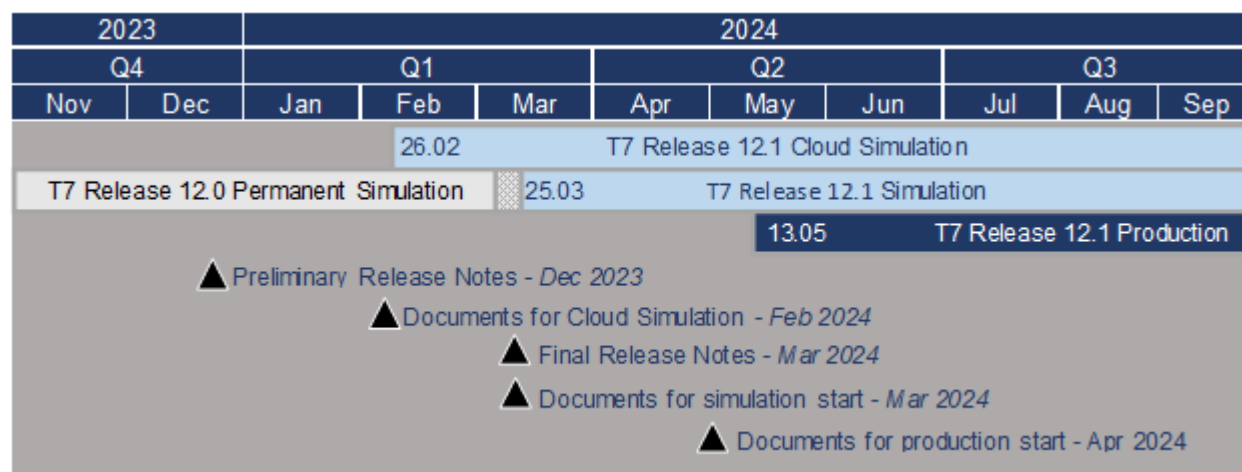


Figure 1 T7 Release 12.1 document publication and introduction timeline

2.6 T7 Cloud Simulation

In addition to T7's release simulation participants can also use the T7 Cloud Simulation which allows trading participants and ISVs to test against the current T7 production and simulation software version. In this environment participants can initiate predefined market scenarios and test specific strategies more easily than in a shared environment. The T7 Cloud Simulation is available 24/7 for a fixed price per hour and is accessible using an SSL-encrypted internet connection.

For more information on the T7 Cloud Simulation please refer to:

eurex.com > *Support* > *Technology* > *T7 Cloud Simulation*

xetra.com > *Technology* > *T7 Trading Architecture* > *Cloud Simulation*

2.7 Simulation Calendar

The Simulation Calendar for the derivatives market is available under the following path:

eurex.com > *Support* > *Initiatives & Releases* > *Simulation Calendar*

Whereas the Simulation Calendar for the cash market can be found on the following link:

xetra.com > *Trading* > *Trading calendar and trading hours*

2.7.1 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 stimulate business processes under realistic conditions. In order to provide a production-like system environment, the different T7 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.
- T7 Release 12.0 permanent simulation will terminate with the end of day processing on 19 March 2024. The T7 Simulation will not be available for participants and ISVs from 20 March 2024 to 24 March 2024 in order to prepare the T7 Release 12.1 Simulation. Participants are encouraged to use the T7 Cloud Simulation for testing purposes during this period.
- The T7 Release 12.1 Simulation is planned to start on 25 March 2024 and will last until 10 May 2024. All functional and technical preparations should be completed before the start of the T7 Release 12.1 Simulation.
- After the release simulation, we will continue with the permanent simulation on 13 May 2024.
- 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.
- In order to provide those participants and ISVs not located in a European time zone with the maximum possible access to the simulation environment, it is envisaged that the T7 Release 12.1 Simulation back-end systems and network will be re-opened as soon as the batch has been successfully completed.
- Quarterly, monthly and weekly last trading/maturity & expiration dates for standard products are planned throughout the T7 Release Simulation.

2.8 Liquidity for selected products in the simulation environment

2.8.1 Derivatives Market: Liquidity (bid/ask prices)

Liquidity (bid/ask prices) will be provided on each trading day throughout T7 Release 12.1 Simulation in the following products:

Product	Product Type	Order Type
OESX	Option	Only best bid, best ask
ALV	Option	Only best bid, best ask
ODAX	Option	Only best bid, best ask
OGBL	Option	Only best bid, best ask
OGBM	Option	Only best bid, best ask
DB1	Option	Only best bid, best ask
OKS2	Option	Only best bid, best ask
OEXP	Option	Only best bid, best ask
FGBL	Future	Only best bid, best ask
FESX	Future	Only best bid, best ask
FSTB	Future	Only best bid, best ask
FESX	Futures Calendar Spread	Only best bid, best ask
FGBL	Futures Calendar Spread	Only best bid, best ask
NOA3	Option	Only best bid, best ask
OEU3	Option	Only best bid, best ask
OEM1	Option	Only best bid, best ask
OEM2	Option	Only best bid, best ask
OEM3	Option	Only best bid, best ask
OEM4	Option	Only best bid, best ask
BAY	Option	Only best bid, best ask
FEU3	Future	Only best bid, best ask

2.8.2 Cash Market XETR Liquidity (bid/ask prices)

For the duration of the member Release Simulation, the liquidity (bid / ask quantities in the order book) will be provided via automated scripts for the following instruments.

ISIN	Currency	Order Type	Order Book depth level (Bid/Ask prices)
LU0419741177	EUR	Standard	3
LU1291108642	EUR	Standard	3
DE0005140008	EUR	Standard	3
DE0005557508	EUR	Standard	3

AT0000730007	EUR	Iceberg	3
DE0005200000	EUR	Iceberg	3
IE00BZ2GV965	EUR	Multi-Currency ETFs and ETPs	3
IE00BZ2GV965	USD	Multi-Currency ETFs and ETPs	3
CH0454664001	EUR	Multi-Currency ETFs and ETPs	3
CH0454664001	USD	Multi-Currency ETFs and ETPs	3
LU0599612842	EUR	Multi-Currency ETFs and ETPs	3
LU0599612842	USD	Multi-Currency ETFs and ETPs	3
US5738741041	EUR	Xetra Retail - RLP Quote	3
US2605571031	EUR	Xetra Retail - RLP Quote	3
DE000A0LBFE4	EUR	Xetra Retail - RLP Quote	3
FR0010242511	EUR	Xetra Retail - RLP Quote	3
ES0109067019	EUR	Xetra Retail - RLP Quote	3
DE000A2DA588	EUR	Xetra Retail - RLP Quote	3
DE0006578008	EUR	Xetra Retail - RLP Quote	3
GB00B24CGK77	EUR	Xetra Retail - RLP Quote	3
DE0006048432	EUR	Xetra Retail - RLP Quote	3
DE000A254294	EUR	Xetra Retail - RLP Quote	3

2.8.3 Cash Market Börse Frankfurt: Liquidity provision

Liquidity is provided for a selection of instruments by DBAG.

The list of all instruments also including the test scenario instruments can be found on the Xetra website under the following path:

www.xetra.com > Technology > T7 Trading Architecture > System documentation > Release 12.1 > Simulation

3. Functional and Technical Enhancements

The following new features and enhancements will be introduced with T7 Release 12.1:

For cash markets:

- Enhancements of the Xetra Retail Execution service
- Max Order Value and Max Order Quantity Enhancements

For derivatives markets:

- Introduction of market-wide Self-Match Prevention
- Introduction of Non-Standard Options Volatility Strategies
- Volatility Interruption Enhancements
- Extension of Trading Hours for MSCI Index Total Return Futures
- Adding TSL and Max Order Value to RDF and RDI
- New field for the ContractDate in RDI / RDF
- Removal of TES Compression
- Flexible instruments now are allowed for EFP-Index TES trades

Details on each of these features and the changes to the affected interfaces, reports and GUIs are communicated to the participants in the form of two T7 Release 12.1 Release Notes documents, directed at the Eurex and Xetra customer base respectively:

Eurex:

www.eurex.com > Support > Initiatives & Releases > T7 Release 12.1 >
System documentation > Overview and Functionality > T7 12.1 Release Notes

Xetra:

www.xetra.com > Technology > T7 Trading Architecture > System documentation >
Release 12.1 > Overview and Functionality > T7 12.1 Release Notes

4. Simulation preparation

Preparation activities should be completed prior to the start of T7 Release 12.1 Simulation.

4.1 Organisational preparation

Prior to the start of T7 Release 12.1 Simulation, the following organisational preparatory activities need to be completed by all participants to ensure readiness for the simulation phase:

- All participants and 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 in the Member Section at <https://membersection.deutsche-boerse.com>.
- Documents will be made available to facilitate and support general simulation needs. However, 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 process.

4.2 Functional preparation

Participants and ISVs planning to participate in the simulation should verify their individual setup/clearing-relationship and inform the 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.

4.3 Technical preparation

To ensure technical readiness for simulation, members/ISVs should consider the following topics:

- The changes for the following interfaces must be implemented
 - T7 Enhanced Trading Interface ETI
 - T7 FIX LF
 - T7 Market and Reference Data Interfaces
 - Common Report Engine (new and changed reports)
- A technical connection to 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.

5. Focus Day Overview

This chapter outlines which focus days will be offered. Focus days are planned and triggered by the Exchange. Specific actions must be done by the Exchange to enable the scenario of the focus days. Focus days can be of technical nature (e.g. Matching Engine Processing Delay), or of functional nature (e.g. Corporate Action). In either case participants cannot test without the Exchange acting first.

Recommended test scenarios on the other hand can be done by the participants without any initiating action by the Exchange. Participants can run through these scenarios at their own discretion. These scenarios usually highlight new or changed features of the current release and participants are highly advised to perform these scenarios and verify their procedures and software used to be fit for these scenarios.

In the overview below, all focus days offered and recommended test scenarios for this release simulation are listed and described:

Technical Focus Days – Triggered by the Exchange:

- Gateway & Matching Engine Failover & Failure, EMDI & EOBI Failure
- Matching Engine Processing Delay
- FIX LF Interface Failover & Gap Test
- GUI (forced user log out)
- T7 RDI Failure (derivatives markets)

Functional Focus Days – Triggered by the Exchange:

- Corporate Actions
- MSCI Index Total Return Trading Hours Extension (derivatives markets)

Functional Focus Days – On request only:

- Stressed market conditions / exceptional circumstances
- Product Halt
- Market Halt
- Instrument Suspend (*cash markets*)
- Special Auction (*T7 Börse Frankfurt*)
- Trading Halt on Product level (*T7 Börse Frankfurt*)
- Instrument Stop (*T7 Börse Frankfurt*)

Recommended Test Scenarios to be executed by participants:

- Xetra Retail Orders/Quotes
- Xetra Enlight
- SMP and Matching Cascades
- Full Spread Matrix (*derivatives markets*)
- New Strategy Setup – complex instruments (*derivatives markets*)
- Trade Traceability
- Risk Events (*derivatives markets*)
- Locked Stock (*T7 Börse Frankfurt*)
- Enhancements of the Transaction Size Limits regime (*derivatives markets*)
- New Crossing Procedure and Pre-Arranged Trade Entry (*derivatives markets*)

5.1 Technical Focus Days – Triggered by the Exchange

Technical focus days will be offered on several occasions during the Simulation and will be triggered by the Exchange. Participants should use this opportunity to test the behaviour of the T7 trading and market data interfaces in conjunction with their own front office applications as well as their order book- and session management systems. Technical focus days will be provided simultaneously across multiple partitions (Cash & Derivatives).

5.1.1 Gateway & Matching Engine Failover & Failure, EMDI & EOBI Failure

The T7 simulation environment runs on separate partitions. Every process in the partition has a standby process that can take over in case the primary process fails. During simulation, a failover and a failure of a matching engine & gateway will be simulated. This focus day will shut down both matcher and gateway processes belonging to one partition consecutively allowing participants to verify the failover mechanisms in their applications.

Prior to this focus day scenario, participants are advised to insert several non-persistent vs. persistent and standard vs. lean orders and quotes in the simulation environment. The exchange will cut connections twice and affected participants will be able to verify their internal failover processes.

On this focus day, Deutsche Börse performs a failover for the consolidated gateway and matching engine processes (Matching Engine Failover), thereafter the secondary gateway and matching engine process will be stopped (Matching Engine Failure). All processes will subsequently be restarted, and the scenario will then be repeated.

Participants are encouraged to subscribe the service availability notifications; they may receive service availability (10030) with matching engine status “unavailable” for the partition in question because of the matcher failure/failover and service availability (10030) with matching engine status “available” for the partition in question as soon as order/quote maintenance is possible again.

Matching Engine Failover

When the primary matcher process in the partition will be stopped, the standby matcher process will take over. During the failover non-persistent orders and quotes are deleted. A Trading Session Event ‘Market reset’ states the technical problem and includes the message key, which is the last reproducible order message, followed by Extended Order Information (with ExecRestatement-Reason order book restatement) and Trading Session Events ‘End of Restatement’.

Low frequency sessions stay connected during the failover and receive these notifications, while high frequency sessions get disconnected and must establish a new TCP/IP connection to an available matching engine & gateway process, before they can retransmit these data. Availability of order/quote maintenance is announced via Service Availability (10030).

Please note: This scenario automatically triggers an “EMDI & EOBI Failure”, listed below.

Matching Engine Failure

For the execution of a matching engine failure both matcher processes will be stopped for a partition in simulation. Before the partition is re-started, the matching engine & gateway process for that partition will be shut down, so high frequency sessions will get disconnected.

During the re-start of the matcher processes, non-persistent orders and quotes are deleted. A Trading Session Event ‘Market reset’ states the technical problem and includes the message key, which is the last reproducible order message, followed by Extended Order Information (with ExecRestatement-Reason order book restatement) and Trading Session Events ‘End of Restatement’.

Low frequency sessions stay connected and receive these notifications, while high frequency sessions must establish a new TCP/IP connection to an available matching engine & gateway process, before they can retransmit these data. Availability of order/quote maintenance is announced via Service Availability (10030).

Please note: The Matching Engine failure automatically triggers an EMDI & an EOBI failure as well.

EMDI & EOBI Failure

Prior to the focus day, participants should check whether they are able to receive market data via EMDI & EOBI, i.e. they should try to send some orders on benchmark futures products and equities which are available in the T7 simulation environment.

When the market data failure is initiated by DBAG, a crash will be simulated within the partition for EMDI and EOBI. During this 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. If 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, all partitions in Simulation will be affected and therefore the test will refer to all products, which are available at that time in the Simulation.

- **EMDI:**

Market data information will be provided in packages marked with a SenderCompID, PartitionID and PacketSeqNum (contiguous numbering format), the PacketSeqNum (contiguous per SenderCompID multicast address and port combination) and MsgSeqNum (contiguous per MarketSegmentID). The SenderCompID always remains constant for a product during the whole business day if there is no failover.

Participants can identify the failure 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 EMDI partition failure. The Restart of an EMDI market data sender could only be detected reliably, if a change of SenderCompID is detected for a specific product.

- **EOBI:**

Public market data information from T7 EOBI will be provided in packages marked with a MarketSegmentID, i.e., product identifier, PartitionID and 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 Failure, both the ApplSeqNum and the MsgSeqNum for a specific MarketSegmentID will restart from 1.

Participant applications should detect the EOBI failure, whenever an ApplSeqNum is received which is smaller than one which has already been received for a specific MarketSegmentID and multicast address:port combination.

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

FIX LF Interface

For the FIX LF Interface the Order Management availability will change to unavailable during the gateway and matcher shutdown and start-up phase. Participants will have to probe the FIX LF Interface

for each market to find the active gateway until they get a successful login (see also the description of the FIX LF Interface Failover & Gap Test scenario).

- The Gateway & Matching Engine Failover & Failure, EMDI & EOBI Failure scenario will be offered between 15:00-16:00 CET/CEST

5.1.2 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 partitions and deletion notification will be triggered. 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 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'

If 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 can still send deletion requests for any persistent orders they want to remove.

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

- The Matching Engine Processing Delay scenario will be offered between 15:00-16:00 CET/CEST.

5.1.3 FIX LF Interface Failover & Gap Test

In case of a FIX LF Interface Failover, all FIX LF interface sessions connected to the (active) FIX LF Interface will be disconnected, and the corresponding port will be closed.

Customers should then activate the connection to the secondary (standby) FIX LF interface.

All FIX LF interface sessions use the same target FIX LF interface IP address and port number per environment (simulation and production) and marketplace. At any one point of time only one of the FIX LF interface will be active and accept requests. Under normal circumstances, the FIX LF Gateway IP labelled as "active" in the N7 Network Guide is the one to which participants should initially attempt their session logins. The standby gateway will only become active in the event of a FIX LF interface failover.

During failover, the active FIX LF interface will go down and the standby FIX LF interface will become active.

In the second step, the process is repeated, i.e. the now active standby FIX LF interface is shut down and the inactive FIX LF interface becomes activated.

Recovery notes:

- During the start-up of the FIX LF interfaces, listen ports for both the active and standby interfaces will be created and activated. If a connection attempt to the listen port is refused, then the interface is either not available or in an early phase of the start-up process. Once the interfaces have been completely started, a differentiation between the active and standby interfaces, from a participant perspective, is not possible at this point as both gateways will accept TCP connections on the respective IP address and port.
- Following the start-up of the FIX LF interfaces the states of the individual markets (e.g.) XETR, XEUR will be recovered. If a request is sent either during the recovery process of the first market on the active gateway or to the standby gateway, the connection will be terminated. Once the recovery process for a market has been completed, the interface will switch to the normal operation mode for the market which has been completely recovered and a session logon for the market will be possible. If a connection request is accepted but the logon to a specific market is still rejected, this indicates that at least one market has been completely recovered but the market for which the logon request was sent is still in the recovery process.
- During the transition to the normal mode of operation, all existing TCP connections will be terminated before new TCP connections will be accepted. In the event of an interface failover, during the transition phase to become the new active interface, the standby interface will behave in the same way as previously the active gateway during its transition phase to the normal operating mode.
- To be certain that the connection to the correct interface has been established, the FIX LF gateways should be polled alternately with session logon requests until the session logon is successfully processed. A successful login indicates that a participant has connected to the active interface.

Gap Test:

Participants can submit transactions via another interface (i.e. ETI or GUI) in order to initiate a gap test. In this case the participant will face a gap in their outbound traffic (tag 34, MsgSeqNum) and must recover the previously generated transactions after a successful re-login to the FIX LF Interface.

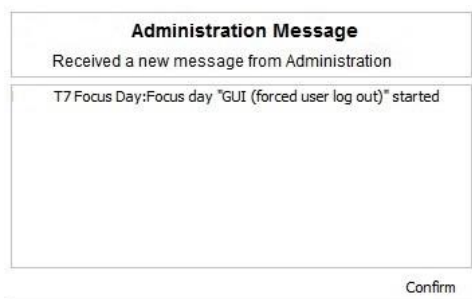
5.1.4 GUI (forced user log out)

The GUI Focus Day scenario is provided primarily to make participants aware of a function within T7 whereby in an emergency/exceptional situation T7 Operations can not only send messages directly to the user's 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

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 “T7 Focus Day: Focus Day “GUI (forced user log out)” started”. This message will appear in a new popup window.



This window can be closed by pressing the Confirm button.

Admin Message + Forced Trader GUI Shutdown

After this first message the following message will be sent 10 minutes prior to the GUI environment shutdown: “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.

Full GUI environment restart

Following a full restart of the GUI environment in Simulation will be performed. On the scheduled focus day 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 remain unchanged after a restart.

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

5.1.5 T7 RDI Failure (derivatives market)

In this test scenario both the failover and the restart of the T7 RDI will be simulated (EEX RDI is independent of T7 RDI and will not be affected by the T7 RDI Failure). As a precondition for the tests derivatives markets, 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 T7 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 T7 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/CEST.

5.2 Functional Focus Days – Triggered by the Exchange

The exact dates for the functional focus days triggered by the exchange are displayed in the Simulation calendar available on the websites

eurex.com > Support > Initiatives & Releases > Simulation Calendar

xetra.com > Trading > Trading calendar and trading hours

5.2.1 Corporate Actions

Cash & Derivatives Market

Participants will have the opportunity to test Corporate Action processing. 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.

The products will be announced via Implementation News on Eurex Exchange's and Xetra website for T7 under following path:

eurex.com > Support > Information Channels > Implementation News

xetra.com > Technology > Implementation News

5.2.2 MSCI Index Total Return Futures Trading Hours Extension

Derivatives Market

Participants will have the opportunity to test the extended trading hours for MSCI Index TRF. In particular the intraday trading break which will occur in production for the TRF products MSCI World Index (TMWO), MSCI EAFE Index (TMFA) and MSCI Emerging Markets Index (TMEM).

This can be tested in simulation from mid April and will be scheduled to trade in SIMU from start of day to 12:00 CET and recommence at 13:00 to the end of day. In between both trading phases will be an hour long interruption during which the product will be set back to on-book product state 'PRETRADING' and TES activity state 'OFF'. During this time the funding rate (SOFR) used for the calculation of prices in clearing notation will be updated to the latest published funding rate by the New York Fed.

The exact dates of the MSCI Index TRF testing are displayed in the current simulation calendar. The trading hours will be adjusted to SIMU Online Times of the respective day.

5.3 Functional Focus Days – On request only

5.3.1 Stressed market conditions / exceptional circumstances

The regulatory relevant states of market conditions for market making will be normal market conditions, stressed market conditions and exceptional circumstances. Stressed market conditions will be established on product level for the derivatives market and instrument level for the cash market, whereas exceptional circumstances will typically affect the whole market. The product will be in normal market conditions, when neither stressed nor exceptional market conditions apply. There are no market making obligations during exceptional circumstances.

Automatically triggered stressed market conditions will have a fixed duration (e.g. 10 minutes). Ongoing automatically set stressed market conditions will be prolonged by this period, when the trigger conditions are detected again. The following trigger events for automatically set stressed market conditions will be supported, depending on the type of the affected product:

Derivatives Market

- Simultaneous significant change of price and volume – applies to equity index futures, single stock futures and ETF futures.
- End of a volatility interruption – applies to equity index futures, single stock futures and ETF futures.
- Stressed Market Signals in a related futures product – in case a futures product is in stressed market conditions and there is a corresponding options product with the same underlying, the options product will be automatically set in stressed market conditions. Note that a volatility interruption in such a futures product is considered as a stressed market signal. Corresponding options products are ETF options, equity options and equity index options.

During stressed market conditions, the maximum quote spread for quotes and Request for Quote requests is widened and the minimum quote quantity for quotes is changed.

Cash Market

- significant short-term change in price, i.e. the cash market instrument is in an extended volatility interruption on T7,
- Significant short-term change in volume, i.e. significantly above-average traded volume in the price determination after an extended volatility interruption.

According to the regulatory technical requirements, T7 must support the state of exceptional circumstances under the following triggering conditions:

- Extreme volatility – a state of extreme volatility is established when most products, which are subject to market making regulation is in stressed market conditions or in a volatility

interruption.

The state of extreme volatility is set for the whole market.

- War, industrial action, civil unrest or cyber sabotage – this state is declared by the Exchange Management Board with simultaneous effect for the whole market.
- Disorderly trading conditions at the exchange – this state is declared when there is either a significant increase of processing times, or multiple erroneous executions of transactions, or loss of connectivity for many participants. The state of disorderly trading conditions is declared by the Exchange Management Board with simultaneous effect for the whole market.
- Suspension of pre-trade transparency obligation – the declaration of this state rests upon the decision of the responsible regulator. This condition applies per product.

Exceptional circumstances will be declared for a period of one hour and will end as soon as the triggering conditions are no longer met. The state of exceptional circumstances may be extended until the end of the business day, if the criteria are repeatedly breached. Exceptional circumstances will end automatically at the end of the business day. In case the triggering conditions remain in effect, they will be declared again on the next business day.

T7 will publish exceptional circumstances only via news messages (Eurex webpage, Xetra webpage, T7 GUI and ETI). Exceptional circumstances will not be communicated via the T7 market data interfaces. Thus, there might be situations where stressed market conditions in a product are set during a state of exceptional circumstances. In this case, exceptional circumstances always trump stressed market conditions, regardless of the sequence of setting the regulatory trading conditions.

On the Focus Day “Stressed market conditions / exceptional circumstances” first “Stressed market conditions” will be triggered by the exchange for 3 products for a defined period of 10 minutes.

Afterwards exceptional circumstances will be declared for the period of one hour for the whole market.

5.3.2 Product Halt

As a possibility to reflect a product halt in T7, DBAG offers to schedule the Simulation of the product halt scenario on request.

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 products. With the transition of the trading phase to HALT, this product will not be tradable between the given times in 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)

OrderMassActionReport (UBZ) messages will be sent to all FIX sessions.

5.3.2.1 Market Halt

As a possibility to reflect a market halt in T7, DBAG offers to schedule the Simulation of the market halt scenario on request.

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 in the affected market. As a result of the market halt, products will not be tradable between the given times. 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 aka DeleteAllOrderQuoteEventBroadcast aka BC CleanupOQ)

5.3.3 Instrument Suspend (Cash Markets)

As a possibility to reflect an instrument suspend in T7, DBAG offers the Simulation of the following focus day on request.

Test scenario and expected result:

Prior to the planned Instrument Suspend participants are recommended to enter non-persistent- and persistent orders and quotes in the affected instrument. As a result, this instrument will not be tradable between the given times in T7. In this scenario all orders (persistent and all non-persistent) and all quotes will be deleted after the market reset and participants must re-enter them. Additionally, the following message occurs:

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

5.3.4 Special Auction (T7 Börse Frankfurt)

To support participants during their testing of the trading restriction “Special Auction (SA)”, DBAG will initiate the special auction on request.

5.3.5 Trading Halt on Product level (T7 Börse Frankfurt)

As a possibility to reflect a product halt in T7, DBAG offers to schedule the simulation of the product halt scenario on request.

Test scenario and expected result:

Prior to the planned Product Halt participants are recommended to enter orders and quotes in the affected products. With the transition of the trading phase to HALT, this product will not be tradable between the given times in T7. In this scenario, all standard quotes will be deleted after the market reset and specialists must re-enter them. Orders for the affected product will stay in the system.

5.3.6 Instrument Stop (Börse Frankfurt)

As a possibility to reflect an instrument stop in T7, DBAG offers to schedule the simulation of the Instrument Stop scenario on request.

Test scenario and expected result:

Prior to the planned Instrument Stop, participants are recommended to enter orders and quotes in the affected products. With the transition of the trading phase to STOP, this instrument will not be tradable between the given times in T7. In this scenario, all standard quotes will be deleted after the market reset and Specialists must re-enter them. Orders for the affected product will stay in the system.

5.4 Recommended test scenarios executed by participants

The following test scenarios should be executed anytime by participants in Simulation. There are no special tasks to be performed by the exchange.

5.4.1 Xetra Retail Orders/Quotes

In the Xetra Simulation environment technically supports with launch of T7 Release 12.1 the quotation by Retail Liquidity Providers of trading capacity flagged orders / quotes and execution of order flow provided by Retail Member Organizations.

To test the retail execution service in Simulation contact your Key Account Manager in advance for further details e.g. setup as Retail Liquidity Provider and/or Retail Member Organization.

If your member is setup as a Retail Liquidity Provider, then you can send orders and quotes with trading capacity "L" to the instruments mentioned on Chapter 2.8.2 with automatic generated Retail Member Organization order flow.

If your member is setup as a Retail Member Organization, then you can send orders with trading capacity "B" to the instruments mentioned on Chapter 2.8.2 with automatic generated Retail Liquidity Provider orders / quotes (this service is just available in continuous trading outside of auctions and volatility interruptions. Orders with this trading capacity can also be sent to not-retail-instruments, but they are

treated like normal “A” agent orders, if matched against another non-retail-order/-quote. Same behavior applies in retail instruments if not Retail-Liquidity-Provider orders/quotes are available (e.g in auctions and volatility interruptions outside of continuous trading).

In contrast to regular orders/quotes, the orders/quotes of Retail Liquidity Providers are just visible via CEF, but not on the XETR orderbook. Please note that the Xetra Retail product will be offered by CEF as of 02.04.2024 in T7 Release 12.1 Simulation.

All participations, traded volumina and execution should be verified in the following reports depending on the tested simulation role:

- PM700 Xetra Retail Liquidity Provider
- PM710 Xetra Member Organization

5.4.2 Xetra EnLight

With Xetra EnLight, Deutsche Börse offers a request for quote (RFQ) service which is fully integrated into the T7 trading system. It allows for on-exchange execution of off-order book transactions in equities, ETFs and ETPs and enables users to take full advantage of Deutsche Börse Group’s complete service chain – from trading, clearing and settlement to trade reporting and market data dissemination.

Banks and brokers (requesters) can send RFQs either to a selected group of market makers or to all market makers registered for an instrument (responders).

Xetra EnLight enables requesters to execute RFQ transactions either manually or automatically. Requesters can accept quotes by either automatically selecting the best quote response or by selecting a single quote response from a specific market maker. In addition, Xetra EnLight AutoEx allows users to define a set of rules under which RFQs are automatically executed based on parameters such as RFQ duration, minimum number of quote responses received, and price limits pegged to a reference price.

Please see here for further details on Xetra EnLight: <https://www.xetra.com/xetra-en/trading/trading-models/xetra-enlight-en>

To test this functionality, please contact Cash Market Operations to be set up as Responders or for their manual support in responding to your EnLight Requests.

5.4.3 SMP and Matching Cascades

The SMP functionality enhancement will allow an incoming SMP order or quote to match further into the next price levels, as far as quantity and limit permit, even when an SMP cancellation occurred on a previous price level. After the matching on all possible price levels has been completed, any remaining open quantity left for the incoming order or quote will be processed according to the respective validity

or order restriction. Furthermore, since T7 Release 10.0, Self-Match Prevention (SMP) is also possible for FOK orders (Xetra only).

Participants are requested to test the SMP functionality by entering orders, which are executable against each other, which provides the basis to create the necessary conditions and setup to match further into the next price levels.

In report TC812 “T7 Daily Prevented Self-Matches” Participants can see all order deletions, cancellations and modification due to Self-Match Prevention.

The following testscenario is recommended:

Requirements:

- One active Trader with role “Trader” for the product to be tested and sufficient trade size limits for order book trading.

Testscenario:

1. Enter a several buy limit orders into the order book ensuring different limit prices to ensure the order book gets filled up with orders. Also, ensure that some orders are send with the same SMP ID (for ETI: tag 28744 MatchInstCrossID; GUI: CrossID – e.g. “123”).

2. Enter a sell market order with sufficient quantity to execute multiple SMP flagged and non-SMP flagged of the previously entered limit orders into the same product with identical SMP ID (“123”)

As outcome of the test, the participant should receive:

- Respective partial execution messages for the incoming market orders highlighting the involvement of SMP with the respective match steps and fill groups for the involved price levels
- Respective deletion messages for the resting limit orders with SMP ID “123” that were involved in the execution but prevented by T7 due to Eurex SMP

5.4.4 Full Spread Matrix (Derivatives Markets)

In 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 Simulation:

Group	Product	Currency	Product Name
FINT	FEU3	EUR	THREE-MONTH-EURIBOR FUT. (ACI)
FINT	FST3	EUR	THREE-MONTH-EUR STR FUTURES

FINX	FEXD	EUR	FUT ON EuroSTOXX50 INDEX DIV
FVOL	FVS	EUR	FUT ON MINI VSTOXX

5.4.5 New Strategy Setup – complex instruments (Derivatives Markets)

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 business 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 if no open orders valid beyond the current business day are in the order book.

Traders may request complex instruments from 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.

5.4.6 Trade Traceability

T7 provides trade traceability, allowing orders to be linked to executions, trade confirmations and trades.

While sending a new order, participants can provide a client order ID and up to three free text fields, which are optional for ETI. For each new order received by the 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 T7 assigns identifiers unique within product and business day, to each aggregated price level, every order execution and every trade.

Derivatives Market: 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.

5.4.7 Risk Events (Derivatives Markets)

Risk parameters 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 receives a popup message which informs him that he has exceeded a predefined limit, no further actions happen.

2. *Threshold message*

The user is informed that he has exceeded the second limit and therefore a throttle mechanism is implemented for trading. For traders it is not possible to trade in a general way and volume as the trade volume is limited as per the threshold limitation given by the clearing members.

3. *Blocking message*

With this scenario, trading is 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.

5.4.8 Locked Stock (Börse Frankfurt)

Locked Stock refers to the condition when the order book is frozen by the Specialist for a price determination. During Freeze, all order transactions that can impact the potential execution price/quantity, will be kept "Pending" in Locked Stock. After unfreezing, the processing of these order transactions will be performed (if applicable).

All relevant scenarios, which can occur in connection with order add, modify and delete messages on Locked Stock, as well as basic information about order notifications created per action before, during and after Freeze, are listed in the document 'Functional Reference' (chapter 3.2.5.1, available on the following path):

Xetra.com > Technology > T7 trading architecture > System documentation > Release 12.1 > Overview and Functionality

5.4.9 Enhancements of the Transaction Size Limits regime (Derivatives Markets)

The Eurex Simulation environment technically supports with launch of T7 Release 12.1 the possibility to define Exception Transaction Size Limits (ETSLs) on the level of a *TSL user group and product combination* in addition to the existing ETSL definition for a user and a product.

As always, the effective TSL will be calculated as the minimum of the three limits defined by the exchange, the Clearing Member, and the Trading Participant, where an ETSL per user and product will have a higher priority than an ETSL per TSL user group and product.

The setup can be done in the *TSL Maintenance* view of the T7 Trader GUI.

Please find detailed information in the T7 12.1 Release Notes:

www.eurex.com > Support > Initiatives & Releases > T7 Release 12.1 >

System documentation > Overview and Functionality > T7 12.1 Release Notes

5.4.10 New Crossing Procedure and Pre-Arranged Trade Entry (Derivatives Markets)

The Eurex Simulation environment technically supports with launch of T7 Release 12.1 a new crossing procedure and entry possibility for on-exchange pre-arranged trades. The known workflow is automated to allow the entry and execution of such trade in one go.

It is available e.g. in the T7 Trader GUI via the *Order Entry* view in the *Add Cross Order* view. To select the new functionality, the order restriction must be selected to “CR_IOC” or “CR_GFD”.

Please find detailed information in the T7 12.1 Release Notes:

www.eurex.com > Support > Initiatives & Releases > T7 Release 12.1 >
System documentation > Overview and Functionality > T7 12.1 Release Notes

6. Documentation

The existing documents have been or will be revised for T7 Release 12.1. The following table provides an overview of the schedule for the publication:

T7 Release 12.1	Derivatives Markets	Cash Markets	Combined	2023		Q1/2024			Q2/ 2024	
				Dec	Jan	Feb	Mar	Apr	May	
Preliminary Release Notes	X	X		◆						
Enhanced Trading Interfaces Manual, incl. XSD, XML Representation and Layouts			X			◆	■	●		
FIX LF Manual, incl. XSD, XML Representation and Layouts			X			◆	■	●		
Market-, Enhanced Order Book- and Reference Data Interfaces Manual incl. XML Fast Templates & FIXML Schema Files			X			◆	■	●		
Trader, Admin and Clearer GUI – User Manual	X	X				◆	■	●		
Final Release Notes	X	X					◆			
Extended Market Data Services Manual & Underlying Ticker Data Manual incl. XML Fast Templates			X				◆	■		
XML Report Reference Manual, Modification Notes & XML Schema files			X				◆	■		
Functional Reference			X				◆			
Functional and Interface Overview			X				◆			
Trader, Admin and Clearer GUI – Installation Manual			X				◆			
Participant and User Maintenance Manual	X	X					◆			
Cross System Traceability			X				◆			
Incident Handling Guide			X				◆			
Participant Simulation Guide			X				◆			
T7 Known Limitations for Simulation			X				◆			
Cash Market Instrument Reference Data Guide		X					◆			
Exchange Rules & Regulations		X						◆		
Market Models		X						◆		
T7 Known Limitations for Production			X							◆

◆ Version 1 ■ Version 2 (optional) ● Version 3 (optional)

Figure 2 Communication Calendar for T7 12.1 Documentation Publication

Please note that the outlined schedule is subject to change.

The documents will be available on the websites

[eurex.com](https://www.eurex.com) > Support > Initiatives & Releases > T7 Release 12.1 > System Documentation

[xetra.com](https://www.xetra.com) > Technology > T7 trading architecture > System Documentation > Release 12.1

7. Support

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

7.1 Contacts and support hours

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

7.1.1 Group Client Key Account Management

Phone: individual number of Client Key Account Manager
(Monday - Friday 09:00 - 18:00 CET/CEST)

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

7.1.2 Functional Helpdesk Eurex

Phone: +49-69-211-1 12 10
(Monday - Friday 01:00 – 23:00 CET/CEST)

- Functional trading related issues for trading
- Functional focus days
- Product data management
- Market control
- Simulation participation and execution

7.1.3 Functional Helpdesk Cash Markets Operations

Phone: +49-69-211-1 14 00
(Monday - Friday 07:00 – 22:00 CET/CEST)

- Functional trading related issues
- Functional focus days
- Market control

- Simulation participation and execution

7.1.4 Helpdesk Clearing Data Control

Phone: +49-69-211-1 24 53

(Monday - Friday 08:00 - 20:00 CET/CEST)

- Entitlement management
- Participant- and user data management

7.1.5 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

7.2 Further sources of information

Changes and further information regarding the T7 Simulation will be provided via the following channels:

- Circulars
- Info-Mail
- Implementation News on Eurex Exchange's and Xetra website for T7 under following path:

eurex.com > Support > Information Channels > Implementation News

xetra.com > Technology > Implementation News

8. Change Log

No.	Chapter, page	Date	Change
1.0	all	11 March 2024	Initial Version for Release 12.1