T7 Release 5.0

Participant Simulation Guide

3

Abstract

This document describes information necessary for Participants to successfully participate in the T7 Release 5.0 Cash Market Simulation. The document covers the preparation and execution activities.

Keywords

Xetra, Cash Market, T7, Simulation, Simulation Schedule, Simulation Calendar, Cloud Simulation, Integrated Simulation

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1   Introduction

To improve and extend its exchange infrastructure, Deutsche Börse will migrate its Cash Market trading (Xetra) to the T7 architecture already used by the Derivatives Markets (Eurex, EEX).

The migration of the whole Cash Market functionality will be executed in two steps. Step 1 concentrates on the migration of the trading venue Xetra (XETR) and its functionality while the trading venue Börse Frankfurt (XFRA) will be part of step 2. Step 1 of the migration will be executed along with the introduction of T7 Release 5.0.

A two-phase Simulation approach has been defined to support Cash Market Participants with their migration activities.

The initial phase of the Simulation has begun with the start of the T7 Release 5.0 Cloud Simulation as planned from 6 March 2017 onwards. The second phase of the Simulation will commence with the launch of the T7 Release 5.0 Integrated Simulation environment on 18 April 2017.

The T7 Integrated Simulation will offer the T7 Trader-, Clearer and Admin GUIs, allowing Participants to become familiar with the new GUIs. It also provides access the other downstream functions currently available in the Xetra Classic Simulation environment e.g. reports or clearing and settlement functionalities (see chapter 1.3.1.4).

Please note that the migration of Vienna Stock Exchange and Irish Stock Exchange is not in scope of this document.

1.1   Document structure

This document has the following structure.

Chapter 1 – Introduction

An overview of T7 Release 5.0 Simulation is given. The intended audience is addressed.

The objectives of the Simulation are outlined. The timeline, daily timetable and Simulation calendar details are given. Furthermore, general information about the Cloud Simulation and Integrated Simulation (including participating systems) is given.

Chapter 2 – Participant Activities

The general Participant-required activities, including preparation and activities recommended for Integrated Simulation execution are explained.

Chapter 3 – Simulation Support by DBAG

Contact numbers and availability times of the helpdesks involved are listed.

Chapter 4 – Simulation Setup

All relevant information for Integrated Simulation setup and execution on the trading environment Xetra (XETR) is summarized in this chapter.

Chapter 5 – Focus Days

A description of the details of all focus days planned for the T7 5.0 Integrated Simulation.

Chapter 6 - Appendix

Available XML and text reports are listed. Documentation references are given.

Chapter 7 – Change Log

The Change Log contains the changes compared to the previous versions of this document.

1.2 Intended Audience

This document is a guide for the Participants' project coordinators and testers responsible for coordinating the introduction of T7 Release 5.0 - Cash Market. Various Participants' departments as well as third parties may be involved in Simulation efforts, such as:

- Trading departments
- Back office and other settlement functions, including Participants' clearing banks
- IT departments
- Network operations (WAN and LAN)
- Organizational departments
- Software vendors

We recommend that this document is distributed as soon as possible within the Participants' project teams and to the involved line organizations.

1.3 Simulation Concept

Main focus of the T7 Release 5.0 Cash Market Simulation is to provide trading Participants the opportunity to perform comprehensive testing of their trading applications before going live.

DBAG offers several dedicated focus days during the Integrated Simulation phase to help Participants become accustomed to the features of T7. On those days, which are marked in the Simulation calendar, special testing scenarios will be provided too.

The latest Simulation Calendar can be downloaded from the Xetra website www.xetra.com under the following path:

<div align="center">

Member Section > Cash Market Member Section > Cash Market Resources >

Documentation > Xetra > Simulation

</div>

A description of the new/changed functionality and technical enhancements has been communicated on the Xetra website www.xetra.com under the following path in the form of the document "T7 5.0 Release Notes", as well as Interface Specifications and User Manuals:

<div align="center">

Technology > T7 trading architecture

</div>

1.3.1 Timeline

Outlined below the key dates concerning the introduction of the T7 Release 5.0:

T7 5.0 Cloud Simulation Start   06.03.2017
T7 5.0 Integrated Simulation execution XETR   18.04.2017 – 16.06.2017
Cash market ETCs launch   26.06.2017
Cash market remaining products launch XETR 03.07.2017

The following timeline outlines the various milestones during the preparation and launch of the T7 Integrated Simulation environment. This timeline allows detailed production-like preparation and user entitlement maintenance leading to full trading functionality with all XETR instruments from 28 April 2017 onwards:
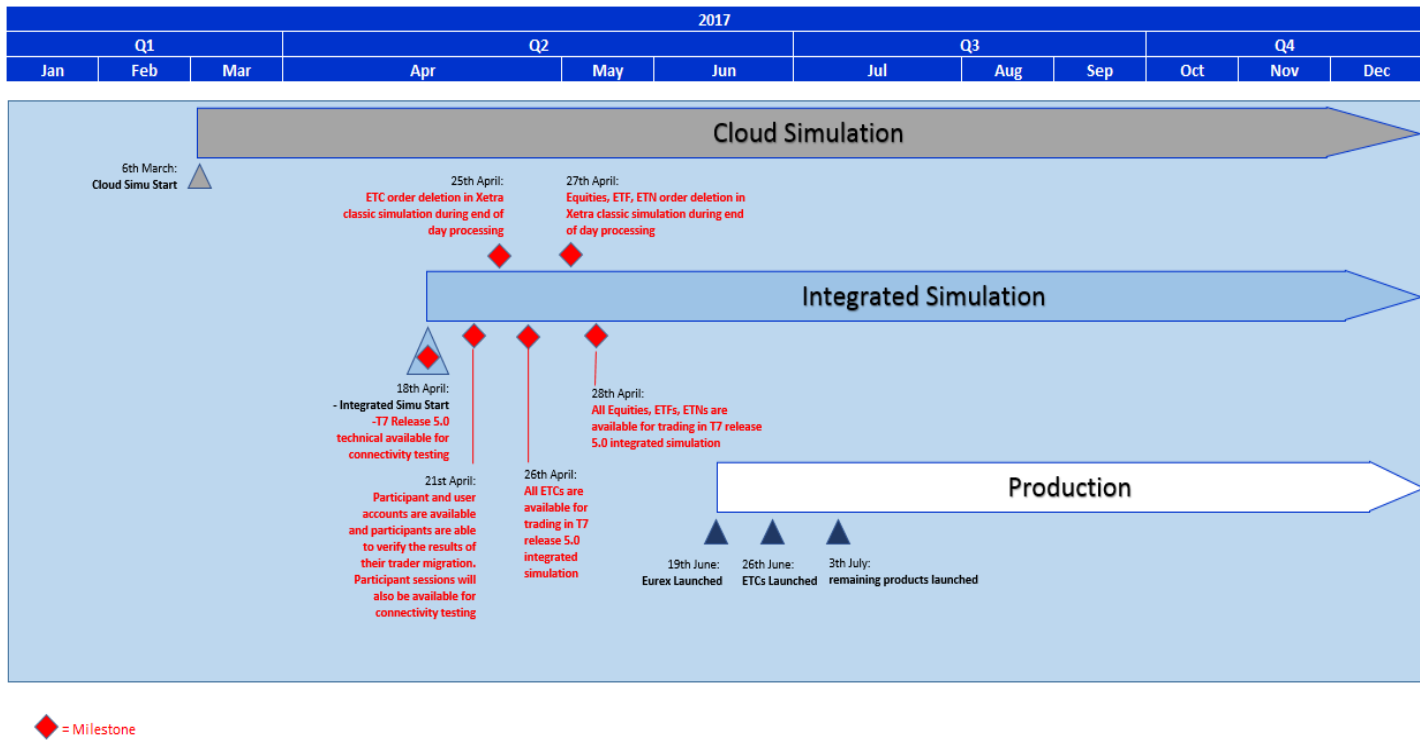
Figure 1: T7 Release 5.0 Cash Market - Introduction schedule

1.3.1 T7 Cloud Simulation

Since 6 March 2017, separate instances of the T7 Cloud Simulation offer a Pre-Simulation T7 Release 5.0 environment. This T7 Cloud Simulation provides early access to the T7 Cash Market software, allowing software developers to adapt their inhouse applications to the T7 interfaces.

Features and benefits:

- The T7 Release 5.0 Cloud Simulation is available 24/7 via Internet[1], providing full market control and on-demand access to the T7 interfaces RDI, ETI, EMDI, MDI, EOBI and the FIX gateway.
- It offers the opportunity to test the T7 Participants' interfaces without any unintended interaction with other Trading Participants or vendors.
- Test scenarios can be created based on the needs of the Trading Participants.

For a detailed overview of the T7 Cloud Simulation features, benefits and connection options, please refer to the information provided on the Xetra website www.xetra.com under the following path:

Technology > T7 Trading Architecture > T7 Cloud Simulation

Interested Trading Participants or software vendors need to sign the "T7 Cloud Simulation Agreement" which can also be found under the aforementioned link.

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[1] T7 Cloud Simulation is planned to be available also via leased line in near future.

1.3.1 T7 Integrated Simulation

1.3.1.1 Objectives of the Integrated Simulation

The purpose of T7 Release 5.0 – Cash Market Integrated Simulation is mainly to provide an opportunity for Participants and independent software vendors (ISVs) to become familiar with the migration of the Xetra cash market onto the T7 architecture, new features and enhanced functional- and technical setup and to prepare for production.

The key objectives are:

Early issue identification on Participant and Deutsche Börse side
By providing a production-like setup where possible for Simulation and by encouraging early and frequent participation of the Participants, possible issues can be detected in advance of production.

Risk minimization
Production-like back end and front end conversion processes will be simulated, and Participants will be given the opportunity to test the migration strategy and gather experience in installation procedures.

Participant preparation focusing on new functionality
By granting access to the new functionality through Simulation, Participants are supported in practicing the skills required to handle the new and changed functionality. This Simulation is unguided

1.3.1.2 Integrated Simulation System Components

The following table gives an overview on the Simulation systems components in T7 Release 5.0 Cash Market – Integrated Simulation:
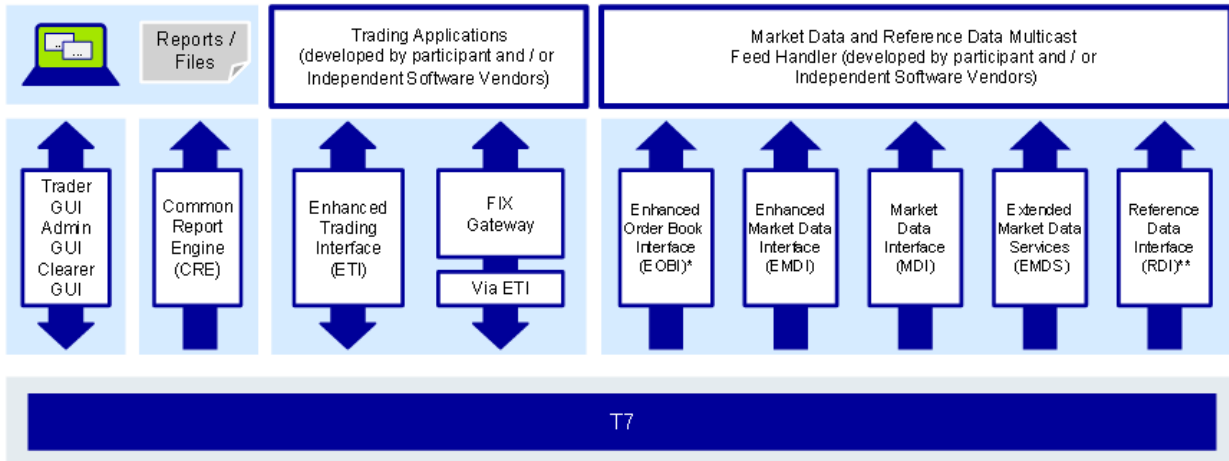
*available in co-locations only
**In addition to the multicast based solution there will also be a file based solution for reference data via the Common Report Engine (CRE) and an internet download

Table 1: Overview of the T7 Release 5.0 Cash Market – Integrated Simulation systems

1.3.1.3 Simulation Calendar

The detailed Simulation calendar with a day-by-day overview can be downloaded from the Xetra website xetra.com under the following path:

Member Section > Cash Market Member Section >

Cash Market Resources > Documentation > Xetra > Simulation

Included are focus days described in chapter 5.

The business days in T7 Simulation always correspond to the trading days providing an end-of-day batch processing. During Integrated Simulation, two batches per week are provided as a standard. To operate under production like conditions or for special test scenarios, deviations with three batches per week are planned.

Batch days alternate with online days on which the Simulation environment remains open for 24 hours. Additionally the Simulation environment is accessible on weekends to give Participants the opportunity to test long-lasting and complex Simulation scenarios outside of common working hours.

On batch days, the Simulation will close earlier than production in order to avoid any influences on end-of-day processing operations in production. Post-trading in Simulation is scheduled for 15:45.

1.3.1.4 Participating Systems

The following table gives an overview on the systems participating in T7 Release 5.0 Cash Market – Integrated Simulation:

System	Short Description	Participating time
CCP$_2$	Central Counterparty System (delivery management, cash management, report and data dissemination, Corporate Actions processing, provision of contract notes). CCP will run on the CCP Simulation environment.	09.05 – 19.06
CEF	DBAG Real Time Data Feed, used e.g. for Block-trade delay and data dissemination (e.g. trade prices). CEF will run on the CEF Simulation environment between Deutsche Börse and Market Data Vendors.	29.05 – 19.06
T7	Electronic cash market trading system.	18.04 – 19.06
Common Report Engine	Service which allows the centralized provision of reports.	18.04 – 19.06

Table 2: Overview of the T7 Release 5.0 Cash Market – Integrated Simulation systems

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[2] Clearing and settlement functionalities can be tested with following instruments instruments from 9 May, 2017 until June 7, 2017 and from June 16, 2017 onwards (See chapter 4.4)

1.3.1.5 Daily timetable for Simulation

Simulation days will be either batch days or non-batch days (online days). After batch processing, the online day starts at 10:00. Online processing ends at 16:00 on a batch day. On online days the system is permanently up and running. The business days correspond to the trading days, providing end-of-day processing.

The following table shows an overview of the batch day schedule:

Phase	XETR
Pre-Trading*	10:00–10:15
Opening Auction*	10:15–10:30
Main-Trading	10:30*–15:30
Intraday Auction Call*	12:00–12:15 14:00–14:15
Closing Auction	15:30–15:45
Post-Trading	15:45–16:00
Ready for Batch	~16:00
Report Distribution	22:45 – 06:00

* In case the day before was a Batch Day.

 Table 4: Timetable T7 Release 5-0 – Cash Market

2   Participant Activities

2.1   Simulation Preparation

We recommend that all Participants use the entire preparation period to prepare for successful participation in the T7 Release 5.0 Cash Market – Integrated Simulation and to become familiar with the features and changes for interfaces in T7 trading platform. All Participants are recommended to use this time to adapt and develop in-house all exchange applications based on the T7 interfaces (T7 Enhanced Trading Interface, T7 FIX Gateway, T7 Market-, Enhanced Order Book- and Reference Data Interface, T7 Extended Market Data Service). The respective interface manuals can be found on the Xetra website www.xetra.com under the following path:

Technology > T7 trading architecture > System documentation

In order to participate in T7 Release 5.0 Cash Market – Integrated Simulation, specific Participants' tasks have been identified and are provided as a check list.

The check list can be found on the Xetra website www.xetra.com under the following path:

Technology > T7 trading architecture >
Checklist migration/contacts > Simulation preparation

In addition, the following activities have to be completed by Participants for participation in the Integrated Release Simulation:

- User IDs and passwords will be migrated and expired. They have to be changed immediately after the first login to T7 (otherwise contact Clearing Data Control, contact details see chapter 3.1).

  The user password requirements for T7 are:
  - o   minimum of 8 and a maximum of 16 characters
  - o   valid characters: [a-z, A-Z, 0-9] and special characters: ['+', '-', '@', '!', '_', '$', '%', '&', '/', '=','*','#']
  - o   minimum 1 uppercase letter and minimum 1 lowercase letter
  - o   minimum 1 special character
  - o   maximum number of repeated characters allowed is 6
  - o   a password history is maintained to prevent the last 10 passwords from being re-used.

- Resources for participation in Integrated Simulation on the days specified in the Simulation calendar are identified and confirmed.

- Participant internal issue management process and organization are established.

- Subscribe to broadcast streams, if streams are required.

- Clearing Participants have to ensure participation of their Non Clearing Participants in order to test clearing and settlement specific scenarios.

- Trading and back office sessions for FIX Gateway have been ordered and established, if required.

- GUI certificates to the member portal have been uploaded for Internet Connectivity
- Multicast addresses and gateways are configured in your in-house firewalls for receiving according broadcast streams.
- Connectivity and sessions (FIX and/or Xetra ETI sessions) for T7 have been ordered via the Member Section.
- Establish access to Common Report Engine.
- A connection to the Admin GUI / Trader GUI and for clearing business units to the Clearer GUI is required otherwise no passwords can be set.

2.2 Simulation Execution

Simulation is the final opportunity to attain functional and technical readiness for the migration of Xetra to T7 trading platform. Participants are free to choose their own focus for the Simulation period. They are encouraged to simulate the processes necessary for their company's individual situation, to acquire the knowledge and competence in working with the new functionality to be prepared for a seamless start into production.

The Simulation Participants can define and process their own Simulation scenarios. Participants can generally participate in the Simulation at any time, if the technical connection and login tests were executed successfully.

DBAG does not guide Participants during Simulation. Instead focus days are provided (see chapter 5) which are strongly recommended to be executed by Simulation Participants.

As the total number of orders / trades is restricted due to limited resources of the Simulation environment, Participants are requested to limit the number of orders and to use low volume orders. DBAG reserves the right to delete orders / trades or to suspend a trader or Participant in case the limitation is exceeded.

If more trades are needed, please contact Team Member/Vendor Services & Admission – Trading for support (contact details see chapter 3.1).

3   Simulation Support by DBAG

3.1 Helpdesks

Deutsche Börse provides dedicated support to the Participants to facilitate successful participation in the Simulation.

On exchange trading days, Participants can reach Deutsche Börse with their questions and comments regarding Simulation using the helpdesk numbers listed below:

Functional Helpdesk XETR

Tel. +49 (69) 211 - 1 14 00   Monday – Friday: 8.00 – 18.00
Fax +49 (69) 211 - 1 14 01

E-mail: xetrahelpdesk@deutsche-boerse.com

Clearing Data Control

Tel +49-(0) 69-211-1 24 53   Monday – Friday: 8.00 – 20.00
Fax +49-(0) 69-211-1 44 20

E-mail: clearingdata@deutsche-boerse.com

Group Client Key Account Manager

Tel. +49 (69) 211 – 1 16 40   Monday – Friday: 9.00 – 18.00
Fax +49 (69) 211 – 1 16 41

E-mail: memberservices@deutsche-boerse.com

Customer Technical Support

Please use your individual   Monday – Friday: 8.00 – 18.00
VIP Number

E-mail: CTS@deutsche-boerse.com

CBF Support

Tel. +49 (69) 211 – 1 11 88   Monday – Friday: 9.00 – 16.00
Fax +49 (69) 211 – 6 1 51 59

E-mail: cascade-testing@clearstream.com

4 Simulation Setup and Execution

4.1 Simulation Participant Data Setup

In order to ease customer migration from Xetra to T7, Participant data including passwords will be migrated from the Xetra Classic Simulation environment to T7 Release 5.0 Integrated Simulation environment.

T7 generally distinguishes trading and clearing business units per member firm. While all trading relevant rights can be assigned to trading business units the clearing business unit is restricted to back office activities only. Viewing of trades of all related Non-Clearing Members and Clearing Member Stop functionality are available for clearing business units. No trading activity is possible here.

With the migration the member data need to be transferred to the T7 system.

For every active member ID at least one business unit will be generated in T7 depending on their activity in the current Xetra environment. For every Non-Clearing Member a trading business unit will be setup where business unit IDs will be migrated one to one as they exist on Xetra today (e.g. ABCFR).

For members which are only offering clearing and/or settlement services a clearing business unit will be setup with an ID created from their Xetra member ID and adding "CL" as additional characters at the end.

Members acting as trading member and as clearing member or settlement institute will receive both types of business units.

The existing clearing relation between a trading member and its clearing member and settlement institute is migrated as well to T7. This also applies to the assignment of instrument groups.

The authorisation concept in T7 is slightly different than in Xetra today since it is not based on single rights but on the combination of rights into roles which are then assigned to the business unit by the exchange first.

The available predefined roles are assigned automatically with the migration to trading and clearing business units, partially in general[3] and partially based on the authorisation available in the current Xetra environment. The "Cash Trader" role will be assigned to every trading business unit if the respective member setup in Xetra included the Resource Access Level (RAL) 7 "Enter Order", "Cash Market Maker" will be derived from RAL 11 "Enter Quote". For clearing business units the "Clearing Member Stop" role will be given if the RAL 102 "Modify CM Stop/Release" is enabled.

Below the business unit a service administrator can set up users of different kinds in T7 and group them into user groups. Users in a user group can exist on three levels with regards to their rights for order maintenance, i.e.:

- Traders are only allowed to maintain their own orders.
- Head traders[4] can maintain their own orders and orders of all users within their group.
- Supervisors finally may maintain orders of all traders of the trading business unit.

For clearing business units such a hierarchy is possible in general as well but does not make any sense since no order activity is possible within clearing business units at all. Users can be defined on any level.

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[3] Further details regarding roles which are assigned automatically with the migration in general for trading & clearing business will be included in the document "Participant and User Maintenance Manual". The document will be published in April 2017 on the Xetra website www.xetra.com under the following path:
Technology > T7 trading architecture > System documentation > Overview and Functionality
[4] Please note that head traders are set up based on the Xetra senior trader concept.

Within the migration every user which has logged in since the introduction of Xetra Release 12.0 in 2011 will be migrated to T7 automatically.

Because in the Xetra environment all users are setup with the same member ID while in T7 up to two business units will be generated, the following rule applies for the migration:

For members that are set up on Xetra only as trading or as clearing member , i.e. where only one business unit needs to be setup, all users in scope of the migration will be automatically migrated to the respective business unit.

In case both the trading and the clearing business units will be setup for a member, still all users in scope will be migrated to the trading business unit. However, for the clearing business unit the only initially active user will be "CLGSPV" with the cash service administrator which is setup for all clearing business units automatically.

Within a trading business unit all users having the "Senior" flag in Xetra will be setup as "Head Traders". Other users will be migrated to the "Trader" level. No user will receive the "Supervisor" level automatically but this can be assigned later, if required, manually by the Service Administrator of the business unit.

For clearing business units on the other hand all users that are migrated or setup automatically will get the "Supervisor" level since they anyway act always for the whole member.

The available trading accounts or trading capacities in T7 are Agency, Proprietary and Market Making. The trading accounts assigned to a user in Xetra today will be migrated as they are and mapped to the respective trading capacity in T7.

Also the Maximum Order Value will be migrated from the Xetra environment to T7 with its current value. Values higher than the possible maximum value in T7, which is 9,999,999,999.99999999, will be set to the T7 maximum automatically.

The role assigned to a user during the migration will be based on the Resource Access Levels (RAL) of the user in the current Xetra environment. For trading business units as an example the user gets the role Cash Market Maker assigned if the RAL 11 "Enter Quote" was assigned in the Xetra environment and the Cash Service Administrator role is given if the user was allowed to "Add Users" by RAL 3 in Xetra. Roles where no corresponding RAL is available will not be assigned to users automatically but can be given by the Service Administrator. These roles are "Emergency Trading Stop", "Trade Enrichment Rule" and "Trade Enrichment Rule View".

For pure clearing members, where only a clearing business unit is set up and the users are migrated to this clearing business unit, the Cash Service Administrator role is derived as well from RAL 3 "Add User" and the Clearing Member Stop role from Xetra RAL 102 "Modify Member Stop".

The CM Backoffice View role is given to all users since having the possibility to view the trades of all assigned Non-Clearing Members is the main reason for the existence of the clearing business unit.

The automatically generated user "CLGSPV" for the clearing business unit will have the Cash Service Administrator role and the CM Backoffice View role assigned automatically and the password will be provided by the exchange.

If the Clearing Member Stop functionality is planned to be used by a Clearing Member, at least two users need to have this role assigned because the stop request needs to be approved by a second user.

In the existing Xetra environment, the Resource Access Levels can be assigned independent of Instrument Groups. In T7 roles are always assigned to users in combination with a Product Assignment Group.

The due date when the participant data to be converted to T7 is taken from Xetra will be a few days before Production or Integrated Simulation start.

For Integrated Simulation the data from March 23rd 2017 end-of-business will be used. The members and users will be available in the T7 Simulation starting April 18th 2017.

Any change to user data done after the respective date in Simulation can not be considered for the migration and has to be performed again after the migration to the T7 system.

Further details will be included in the document "Participant and User Maintenance Manual[5]".

4.2   Instrument migration and activation

Migrated instruments will not be activated directly for trading on T7 7 Release 5.0 Cash Market – Integrated Simulation nor will all instruments be activated at once.

From 21. April reference data for all instruments will be distributed via Reference Data Interface (RDI), Common Report Engine (CRE), Cash Market member section and on the Xetra website www.xetra.com (see chapter 0).

The next step will be the activation of all ETCs with 26th April 2017 as first trading day. Starting from this day they will no longer be tradable in the Xetra simulation environment.

On 28th April all remaining CCP-eligible equities and ETPs will be activated and tradable the first time on T7 Release 5.0 Cash Market – Integrated Simulation. Trading in the market XETR in the Xetra simulation system will then be discontinued completely. To operate under production like conditions, trading for the following non CCP-eligible instruments will be discontinued on 25th April 2017 in the market XETR in the Xetra simulation system as well:

AU000000PVA7   PSIVIDA CORP. CDIS

BMG1368B1028   BRILL. CHINA AUT. DL-,01

CA0679011084   BARRICK GOLD CORP.

CA4969024047   KINROSS GOLD CORP.

DE0005167902   3U TELECOM AG

ES0130670112   ENDESA   PS 200

FR0000125486   VINCI S.A. INH.

GB0005405286   HSBC HLDGS PLC   DL-,50

IL0010837248   ADVANCED VISION T. IS 2

NO0005052605   NORSK HYDRO ASA NK 1,098

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[5] The document will be published in April 2017 on the Xetra website www.xetra.com under the following path:
Technology > T7 trading architecture > System documentation > Overview and Functionality

During the migration period, members that are connected both to Xetra and T7 simulation, are supported with identification of instruments being tradable in the respective environment by reference data settings. Within the reference data published by T7 via Reference Data Interface (RDI), Reference Data File (RDF) on the Common Report Engine (CRE) as well as the file in the member section, the field Market Segment Status (Tag 2542) needs to be evaluated.

Until the instruments become active in T7 Release 5.0 Cash Market – Integrated Simulation, the respective field has the value "10 (Published)" for all instruments. This indicates that the data is only published but no instrument is yet activated for trading.

Starting on 26th April for ETCs the field will have the value "1 (Active)" and all instruments in the Xetra simulation system with a Market Segment Supplement "ETC" or "DEZ", depending on the source of the reference data in use, are set to trading phase "HALT".

Finally on 28th April 2017 all migrated instruments are set to "Active" in the T7 reference data and trading will be possible. In the Xetra system all instruments are set to trading phase "HALT".

In the Xetra end of day processing prior to the activation of trading of instruments in T7 Release 5.0 Cash Market – Integrated Simulation, all open orders in the respective instruments are deleted by a special processing, if they are not deleted anyway e.g. due to expiry or corporate action. All deletions done in the Xetra system because of the migration will have time stamp 23:59:58 and the deletion reason suspend in the order confirmation and in report TC540.

Following Exchange Traded Commodities (ETCs) will be available on 21st April 2017 and activated on 26th April 2017:

Name	ISIN
LYXOR G.BUL.SEC.04/UND DZ	DE000A0LP781
ETFS MET.SEC.DZ07/UN.XAU	DE000A0N62G0
DT.BOERSE COM. XETRA-GOLD	DE000A0S9GB0
DB ETC PLC P GOLD EUR 60	DE000A1E0HR8

Following instruments will be available on 21st April 2017and activated on 28th April 2017:

Name	ISIN
ANDRITZ AG	AT0000730007
SANOCHEM. PHARMAZEUT.	AT0000776307
FABASOFT AG	AT0000785407
NOVARTIS NAM. SF 0,50	CH0012005267
ROCHE HLDG AG GEN.	CH0012032048
CRED.SUISSE GRP NA SF 1	CH0012138530
HOLCIM LTD. NAM. SF 2	CH0012214059
ABB LTD. NA SF 2,50	CH0012221716
SWATCH GRP AG NAM.SF 0,45	CH0012255144
SWISS LIFE HLDG SF 5,10	CH0014852781

Name	ISIN
UBS NAM. SF -,10	CH0244767585
UTD.INTERNET AG NA	DE0005089031
BASLER AG O.N.	DE0005102008
ADVA AG OPT.NETW.O.N.	DE0005103006
ATOSS SOFTWARE AG	DE0005104400
SYZYGY AG O.N.	DE0005104806
AC-SERVICE AG NA O.N.	DE0005110001
TELEGATE AG O.N.	DE0005118806
FJH AG O.N.	DE0005130108
QSC AG NA O.N.	DE0005137004
DEUTSCHE BANK AG NA O.N.	DE0005140008
SINNERSCHRADER O.N.	DE0005141907
DR. HOENLE AG O.N.	DE0005157101
BECHTLE AG O.N.	DE0005158703
SOFTING AG O.N.	DE0005178008
BAY.MOTOREN WERKE AG ST	DE0005190003
BAY.MOTOREN WERKE VZO	DE0005190037
BEIERSDORF AG O.N.	DE0005200000
ADCAPITAL AG	DE0005214506
NEXUS AG O.N.	DE0005220909
ORBIS AG O.N.	DE0005228779
BERTRANDT AG O.N.	DE0005232805
CARL-ZEISS MEDITEC AG	DE0005313704
CENIT AG SYSTEMH.O.N.	DE0005407100
CENTROTEC HOCHL.KUNS.O.N.	DE0005407506
LEONI AG	DE0005408884
CANCOM IT SYSTEME AG	DE0005419105
COMDIRECT BANK AG	DE0005428007
CONTINENTAL AG O.N.	DE0005439004
CTS EVENTIM AG	DE0005470306
LANXESS AG	DE0005470405
ALPHAFORM O.N.	DE0005487953
ISRA VISION O.N.	DE0005488100
UNITED LABELS O.N.	DE0005489561
CURASAN AG	DE0005494538
TOMORROW FOCUS AG	DE0005495329

Name	ISIN
DRILLISCH AB	DE0005545503
DRAEGERWERK VORZ.A.O.N.	DE0005550636
DEUTSCHE POST AG NA O.N.	DE0005552004
DT.TELEKOM AG NA	DE0005557508
PARAGON AG	DE0005558696
DUERR AG O.N.	DE0005565204
ECKERT+ZIEGLER AG O.N.	DE0005659700
EVOTEC OAI AG O.N.	DE0005664809
FIELMANN AG O.N.	DE0005772206
FRAPORT AG FFM.AIRPORT	DE0005773303
FRESENIUS AG O.N. ST	DE0005785604
FRESEN.MED.CARE AG O.N.	DE0005785802
GFT TECHNOLOGIES AG	DE0005800601
DEUTSCHE BOERSE NA O.N.	DE0005810055
GFK AG O.N.	DE0005875306
BILFINGER BERGER AG	DE0005909006
ETF DAX	DE0005933931
ETF STOXX 50	DE0005933949
ETF EUROSTOXX50	DE0005933956
OHB TECHNOLOGY O.N.	DE0005936124
MAN AG ST O.N.	DE0005937007
MAN AG VZO O.N.	DE0005937031
HEIDELBERGCEMENT ST O.N.	DE0006047004
HENKEL KGAA ST O.N.	DE0006048408
HENKEL KGAA VZO O.N.	DE0006048432
KONTRON AG O.N.	DE0006053952
HOCHTIEF AG	DE0006070006
INDUS HOLDING AG	DE0006200108
SALZGITTER AG O.N.	DE0006202005
IWKA AG O.N.	DE0006204407
MUELLER-DIE LILA LOGISTIK	DE0006214687
JUNGHEINRICH AG O.N.VZO	DE0006219934
INTERTAINMENT O.N.	DE0006223605
JENOPTIK AG O.N.	DE0006229107
INFINEON TECH.AG NA O.N.	DE0006231004
EB.REXX GOVERNMENT	DE0006289499

Name	ISIN
DEUTZ AG O.N.	DE0006305006
KRONES AG O.N.	DE0006335003
LPKF LASER+ELECTRON.	DE0006450000
NEMETSCHEK AG O.N.	DE0006452907
LINDE AG O.N.	DE0006483001
MLP AG	DE0006569908
MERCK KGAA O.N.	DE0006599905
MG TECHNOLOGIES AG	DE0006602006
MEDION AG O.N.	DE0006605009
MUEHLBAUER HOLD.O.N.	DE0006627201
MORPHOSYS AG O.N.	DE0006632003
NORDDT.AFFINERIE O.N.	DE0006766504
PFEIFFER VACUUM TECH.O.N.	DE0006916604
PRO DV SOFTWARE AG O.N.	DE0006967805
PUMA AG	DE0006969603
PUBLITY AG NA O.N.	DE0006972508
REALTECH AG O.N.	DE0007008906
RHEINMETALL AG	DE0007030009
RWE AG ST O.N.	DE0007037129
RWE AG VZO O.N.	DE0007037145
RHOEN-KLINIKUM O.N.	DE0007042301
DAIMLER	DE0007100000
SAP AG ST O.N.	DE0007164600
KOENIG + BAUER AG ST O.N.	DE0007193500
SIXT AG ST O.N.	DE0007231326
SIXT AG VZO O.N.	DE0007231334
SGL CARBON AG O.N.	DE0007235301
SIEMENS AG NA	DE0007236101
STADA ARZNEIMITT.VNA O.N.	DE0007251803
METRO AG ST O.N.	DE0007257503
METRO AG VZO O.N.	DE0007257537
SUEDZUCKER MA./OCHS. O.N.	DE0007297004
HEIDELBERG.DRUCKMA.O.N.	DE0007314007
IVU TRAFFIC TECHN.AG O.N.	DE0007448508
WIRECARD AG	DE0007472060
THYSSENKRUPP AG O.N.	DE0007500001

Name	ISIN
VOLKSWAGEN AG ST O.N.	DE0007664005
VOLKSWAGEN AG VZO O.N.	DE0007664039
VOSSLOH AG O.N.	DE0007667107
LUFTHANSA AG VNA O.N.	DE0008232125
HANN.RUECKVER.AG NA O.N.	DE0008402215
ALLIANZ AG VNA O.N.	DE0008404005
MUENCH.RUECKVERS.VNA O.N.	DE0008430026
EM.TV+MERCHANDI.O.N.	DE0009147207
MTU AERO ENGINES NA O.N.	DE000A0D9PT0
DATAGROUP AG O.N.	DE000A0JC8S7
ISH.EB.REXX.MON.MARK.(DE)	DE000A0Q4RZ9
ETFS-S-NET ITG GL.AG.B.DZ	DE000A0Q8NA2
ETFS-RUSSELL 2000 FD DZ	DE000A0Q8NE4
HAMBURGER HAFEN	DE000A0S8488
HSBC ETFS-S+P 500 ETF DZ	DE000A1C22M3
ADIDAS AG NA O.N.	DE000A1EWWW0
DEUTSCHE BOERSE Z.UMT.	DE000A2AA253
BASF SE NA O.N.	DE000BASF111
BAYER AG NA	DE000BAY0017
COMMERZBANK AG	DE000CBK1001
E.ON AG NA	DE000ENAG999
ETFLAB DAX	DE000ETFL011
K+S AG NA O.N.	DE000KSAG888
PORSCHE AUTOM.HLDG VZO	DE000PAH0038
TUI AG NA	DE000TUAG000
WACKER CHEMIE	DE000WCH8881
BCO BIL. VIZ. NOM. PS 90	ES0113211835
BCO SANTANDER NOM.PS. 115	ES0113900J37
ACS,ACT.CO.SER.INH.EO-,50	ES0167050915
REPSOL SA	ES0173516115
TELEFONICA	ES0178430E18
NOKIA CORP. EO-,06	FI0009000681
OUTOKUMPU OY A	FI0009002422
AIR LIQUIDE INH. EO 11	FR0000120073
CARREFOUR S.A. INH.EO 2,5	FR0000120172
TOTAL FINA ELF SA B EO 10	FR0000120271

Name	ISIN
OREAL (L') INH. EO 0,2	FR0000120321
ACCOR SA INH. EO 3	FR0000120404
BOUYGUES SA INH. EO 1	FR0000120503
SANOFI-SYNTHELABO INH.EO2	FR0000120578
AXA S.A. INH. EO 2,29	FR0000120628
GROUPE DANONE EO 1	FR0000120644
LVMH EO 0,3	FR0000121014
SCHNEIDER S.A. FF 50	FR0000121972
VEOLIA ENVIRONNE. EO 5	FR0000124141
ST GOBAIN EO 4	FR0000125007
VIVENDI UNIVERS.INH.EO5,5	FR0000127771
STE GENERALE INH. EO 1,25	FR0000130809
BNP PARIBAS INH. EO 2	FR0000131104
FRANCE TELECOM INH. EO 4	FR0000133308
LYXOR ETF EO ST.50 IN.D	FR0007054358
AMUNDI ETF CAC 40 C	FR0007080973
BHP BILLITON DL-,50	GB0000566504
BAE SYSTEMS PLC LS-,025	GB0002634946
IMP. TOBACCO GRP	GB0004544929
PEARSON PLC LS-,25	GB0006776081
RIO TINTO PLC	GB0007188757
BP PLC DL-,25	GB0007980591
LLOYDS TSB GRP LS-,25	GB0008706128
TESCO PLC LS-,05	GB0008847096
GLAXOSMITHKLINE LS-,25	GB0009252882
ASTRAZENECA PLC DL-,25	GB0009895292
BT GROUP PLC LS 0.05	GB0030913577
BARCLAYS PLC LS 0,25	GB0031348658
DIALOG SEMICOND. LS-,10	GB0059822006
ROYAL DUTCH SHELL B EO-07	GB00B03MM408
NATIONAL GRID PLC NEW	GB00B08SNH34
RECKITT BENCK.GRP	GB00B24CGK77
CO.CCBI RQFII MON.MK.A CH	GB00BVJF7G73
BK OF IRELD CAP.ST.EO-,10	IE0030606259
PS GL.F.I.-POWERSHRS EQQQ	IE0032077012
XMTCH (IE)-MSCI UK L.C.	IE00B3VWKZ07

Name	ISIN
XMTCH (IE)-MSCI UK S.C.	IE00B3VWLG82
XMTCH (IE)-IB.USD G. 1-3	IE00B3VWN179
XMTCH (IE)-IB.USD G. 3-7	IE00B3VWN393
XMTCH (IE)-IB.USD G. 7-10	IE00B3VWN518
ICS-INSTIT. USD LIQ. PREM. ACC	IE00B4KZ8V93
ISHSVII-MSCI EM AS.UC.ETF	IE00B5L8K969
SOURCE-DJST600 OPT.BKS A	IE00B5MTWD60
SOURCE-DJSTX600 OPT.B.R.A.	IE00B5MTWY73
SOURCE-DJSTX600 OPT.INS.A	IE00B5MTXJ97
SOURCE MKTS-DJ E.S.50 S.A.	IE00B60SWX25
ICS-INSTIT. EUR ASSET LIQ. ACC	IE00B8C1FB24
UBS I.ETF-M.U.100P.H EOAA	IE00BD4TYG73
ISHSII-MSCI USA DIV.IQ U.	IE00BKM4H312
GENERALI EO 1	IT0000062072
BCA INTESA EO 0,52	IT0000072618
MEDIASET S.P.A. EO 0,52	IT0001063210
ENEL S.P.A. EO 1	IT0003128367
ENI S.P.A. EO 1	IT0003132476
TELECOM ITALIA EO 0,55	IT0003497168
TELECOM ITALIA RNC EO0,55	IT0003497176
FRESCO-F.EO ST.50 INH.A	LU0136234068
EASYETF EPRA EUROZONE	LU0192223062
LYXOR ETF LEVDAX	LU0252634307
RBS MKT ACC.-RICI MET.IN.	LU0259320728
DB X-TR.MSCI WLD TRN I.1C	LU0274208692
DB X-TRACK STOXX 50	LU0274211217
DB X-TRACK DAX	LU0274211480
DB X-TR.II-IB.EO S.E.T.1C	LU0290355717
DB X-TR.II-IB.GL.IN.-L.1C	LU0290357929
DB X-TR.II-ITR.EU.5YR.1C	LU0290358653
DB X-TR.EU.ST.SE.DI.30 1D	LU0292095535
DB X-TRACK SH DAILY 1	LU0292106241
DB X-TR.II-EONIA T.R. 1D	LU0335044896
COMSTAGE ETF DJ EURO STOXX 50	LU0378434079
CS.-SX.E.600AP NR U.ETF I	LU0378435043
CS-S.E.600 BANK.N.U.ETF	LU0378435399

Name	ISIN
CS-S.EU.600B.R.NRB U.ETF.1	LU0378435472
COMS.-S.E.600UT.N.U.ETF I	LU0378435555
COMS.-S.E.600CM N.U.ETF I	LU0378435639
CS.-S.E.600 FS NR U.ETF I	LU0378435712
COMS.-S.E.600UT.N.U.ETF I	LU0378435803
COMS.-ST.E.600HC N.U.E. I	LU0378435985
COMS.-S.E.600UT.N.U.ETF I	LU0378436017
COMS.-S.EU.600I.N.U.ETF I	LU0378436108
COMS.-S.E.600UT.N.U.ETF I	LU0378436363
COMS.-S.E.600UT.N.U.ETF I	LU0378436447
COMS.-S.E.600UT.N.U.ETF I	LU0378436520
COMS.-S.E.600UT.N.U.ETF I	LU0378436793
COMS.-S.E.600UT.N.U.ETF I	LU0378436876
COMS.-S.E.600UT.N.U.ETF I	LU0378437098
CS-S.EU.600B.R.NRB U.ETF.1	LU0378437171
COMS.-S.E.600UT.N.U.ETF I	LU0378437254
COMS.-S.E.600UT.N.U.ETF I	LU0378437338
COMSTAGE ETF DAX TR	LU0378438732
DB X-TR.II GL.S.EO H.I.1C	LU0378818131
DB X-TRACK STOXX 50 1	LU0380865021
COMSTAGE ETF-MSCI PAC.T.I	LU0392495023
COMSTAGE ETF-EM EAST.EU.I	LU0392495379
COMSTAGE ETF-MSCI TAIW. I	LU0392495619
COMSTAGE ETF-MSCI USA I	LU0392495700
COMSTAGE ETF-TOPIX I	LU0392496773
DB X-TR.QUI.WE.MAN.T.R.1C	LU0397221945
COMST.-FR DAX UCITS ETF I	LU0488317024
DB X-TRACKERS S+P500 1CDL	LU0490618542
OSS.-O.ETF IST.EUR.M.V.1C	LU0599612842
DB X-TR.HAR.CSI300 UC. 1D	LU0875160326
UBS-E.-M.EMU H.T.DL ADDL	LU0937835576
BOCI CBK-S.S.EX.50A I.AYD	LU1306625283
KON. KPN NV EO-24	NL0000009082
HEINEKEN	NL0000009165
KON. PHILIPS ELECTRONICS N.V.	NL0000009538
AD PEPPER MEDIA EO 0,10	NL0000238145

Name	ISIN
AEGON NV (DEMAT.) EO-12	NL0000303709
HENNES + MAURITZ B SK-125	SE0000106270
Ericsson B (FRIA) SK 2,50	SE0000108656
BOLIDEN AB SK 2	SE0000869646
AMAZON.COM INC. DL-,01	US0231351067
AMER. EXPRESS DL -,20	US0258161092
ANGLO AMERICAN SP.ADR 1/2	US03485P3001
APPLE COMPUTER INC.	US0378331005
BCO BIL.BIZ.ARG.EO,-52ADR	US05946K1016
BANK AMERICA DL 2,50	US0605051046
BOEING CO. DL 5	US0970231058
CISCO SYSTEMS	US17275R1023
COCA-COLA CO. DL-,25	US1912161007
COLGATE-PALMOLIVE DL 1	US1941621039
DEUTSCHE TELEKOM ADR DM 5	US2515661054
DEUTSCHE POST SPONS.ADR	US25157Y2028
EBAY INC. DL-,001	US2786421030
ERICSSON B SK 10 ADR/10	US2948216088
INTEL CORP. DL-,001	US4581401001
KON. PHILIPS EL. ADR	US5004723038
MCDONALDS CORP.	US5801351017
MICROSOFT CORP. DL -,001	US5949181045
MORGAN STANLEY DL-,01	US6174464486
NOKIA CORP. A ADR EO 0,06	US6549022043
ORACLE CORP. DL-,01	US68389X1054
PEPSICO INC. DL-,0166	US7134481081
PFIZER INC. DL-,05	US7170811035
PROCTER GAMBLE	US7427181091
RWE AG DM 5 ADR/1/10	US74975E3036
TELEFONICA S.A. EO 1 ADR3	US8793822086

4.3 Supported Simulation Instruments

Liquidity (bid/ask prices) will be provided on each trading day throughout T7 Release 5.0 Integrated Simulation in the following products:

- Foreign currency instruments, for which DBAG provides liquidity
  LU0937835576, LU1306625283
- Instruments for which DBAG provides buy orders to test Iceberg Order
  AT0000730007, DE0005200000
- Script support for Liquidity / provision of market depth for EMDI, MDI and ETI
  DE000A1E0HR8, DE0005140008

4.4 Instruments for settlement end-to-end tests

Clearing and settlement functionalities can be tested with following instruments instruments from 9 May, 2017 until June 7, 2017 and from June 16, 2017 onwards in the T7 5.0 Integrated Simulation:

Name	ISIN
ANDRITZ AG	AT0000730007
UBS NAM. SF -,10	CH0244767585
ADVA AG OPT.NETW.O.N.	DE0005103006
TELEGATE AG O.N.	DE0005118806
BEIERSDORF AG O.N.	DE0005200000
CONTINENTAL AG O.N.	DE0005439004
DRILLISCH AB	DE0005545503
DT.TELEKOM AG NA	DE0005557508
FRESEN.MED.CARE AG O.N.	DE0005785802
BILFINGER BERGER AG	DE0005909006
LYXOR G.BUL.SEC.04/UND DZ	DE000A0LP781
ETFS MET.SEC.DZ07/UN.XAU	DE000A0N62G0
DT.BOERSE COM. XETRA-GOLD	DE000A0S9GB0
DB ETC PLC P GOLD EUR 60	DE000A1E0HR8

4.5 Reports

Reports are provided after every batch day on the Common Report Engine. Participants that wish to receive their reports via the Common Report Engine need to setup a user on the DBAG business portal. Details on accessing the Common Report Engine are described in the Common Report Engine User Guide. T7 report distribution will be done exclusively via the Common Report Engine. This is valid for production and Simulation. This is a change for Xetra Participants who are currently receiving reports via their MISS infrastructure. Hence, all Xetra (XETR) Participants require a setup on the Common Report Engine for the market Xetra and the environment "Simulation" (and later "Production").

The distribution of (new) reports via the Common Report Engine will start with the T7 Simulation on 18 April.

The distribution of the reports CB042, CB142, CB242, CB243 CB062 and CB080 will start on 1 June.

4.6 Reference Data Simulation

Customers will receive the instrument reference data in Integrated Simulation via

- **Reference Data Interface (RDI)**

  This interface provides reference data which is available for products and instruments traded on T7. For more information, please refer to T7 Market & Reference Data Interfaces on the Xetra website www.xetra.com under the following path:

  Technology > T7 trading architecture > T7 System documentation > Simulation

- **RDF / Common Report Engine (CRE)**
  On the Common Report Engine the Reference Data File (T7 RDF) is available containing all tradable instruments for the current Business Day.

- **Member section**
  In the Cash Market member section the instrument Reference Data File (T7 RDF) will be available on the following path:

  www.xetra.com > Member Section > Cash Market Member Section >

  Cash Market Resources > Simulation

- **Xetra public reference data**

  As of April 21, 2017 a sample file for Participants will be available on the Xetra website www.xetra.com under the following path:

  Technology > T7 trading architecture > T7 System documentation > Simulation

  As of May 5, 2017 the Xetra public reference data file will be generated with every batch run and be transferred to the public Xetra website under the following path:

  Technology > T7 trading architecture > T7 System documentation > Simulation

Further details regarding Reference Data can be found in the document "Xetra Instrument Reference Data Guide". The document can be found on the Xetra website www.xetra.com under the following path:

Technology > T7 trading architecture > T7 System documentation >
Market and Reference Data Interfaces

5   Focus Days

Focus days are explicitly marked in the Simulation calendar. In the overview below, all focus days offered during the Integrated Simulation are listed and described. Please note: There are no exchange triggered focus days in the T7 Cloud Simulation.

Technical Focus Days – Cash & Derivatives: Triggered by DBAG:

- Fix Gateway Failover
- Matching Engine Failover and Failure, EOBI Failure
- Market Data Services Failure
- 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 DBAG Market Operation

- Corporate Actions
- Product Halt
- Instrument Suspend
- Volatility Interruption & Extended Volatility Interruption
- IPO

Functional Focus Days – Cash: Executed by Exchange Participants

- Instrument / product state changes
- Quote Handling
- Self-Match Prevention
- Stop/Release User / Risk Controls view

5.1 Technical Focus Days – Cash & Derivatives: Triggered by DBAG

5.1.1 Focus Day 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: 90.152.253.42 becomes unavailable)
*   15:15 CEST: Restart of FIX Gateway
                              (IP address: 90.152.253.42available again)
*   15:30 CEST: Application Failover FIX Gateway
                              (IP address: 90.153.253.42becomes unavailable)

*   15:45 CEST: Restart of FIX Gateway
                              (IP address: 90.153.253.42 available again)

These tests are recommended for all T7 Participants (Members/Vendors) using the T7 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, Participants 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 Participant.

The Participants 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 Participants during the resend series for application messages. Application messages should always be re-transmitted since the T7 FIX Gateway requires all missing application messages for the purpose of reconciliation with the 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.

5.1.2 Focus Day 2: Matching Engine Failover and Failure, EOBI 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 failover and a failure of a matching engine will be simulated.

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 or 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 triggers automatically an EOBI failure.

Matching Engine Failure

For the execution of a matching engine failure both matcher processes will be crashed for a partition in Simulation. The test case will have an impact on all products available on this partition in permanent Simulation. 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.

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 triggers automatically an EOBI failure as well.

T7 Enhanced Order Book Interface (EOBI) Failure

Prior to the focus day, Participants should check whether they are able to receive market data from the T7 Enhanced Order Book Interface (EOBI) in advance, i.e. they should try to send some orders on instruments which are available in the T7 Integrated Simulation (see chapter 4.2). Public market data information from T7 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 continuous per *MarketSegmentID*.

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

An EOBI Failure is triggered together with a matching engine failover or failure. 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. Whenever a Participant application detects a restart of the *MsgSeqNum* as well, it must rebuild all order books for this *MarketSegmentID* again from the T7 EOBI snapshot channel.

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.

➔ Matching Engine and EOBI Failover / Failure scenario will be offered between 15:00-16:00 CET.

5.1.3 Focus Day 3: Market Data Services Failure

Prior to the focus day Participants should check whether they receive market data from 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* (continuous per *SenderCompID* multicast address and port combination) and a *MarketSegmentID*. The *SenderCompID* always remains constant for a product during the whole business day, if there is no failover.

When the market data failure is initiated by DBAG, 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.

5.1.4 Focus Day 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 to, 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 because 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 document "Exchange and Settlement Network Access" which is available Xetra website www.xetra.com under the following path:

Technology > T7 trading architecture > System documentation > Network Access

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.

5.1.5 Focus Day 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 sessions with MassActionReason set to (111) Product_temporarily_not_tradable.
- OrderMassActionReport (UBZ) messages will be sent to all FIX sessions.
- 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 DE0006599905 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 the Xetra website www.xetra.com under Member Section > Cash Market Member Section > Cash Market Resources > Documentation > Xetra > Simulation for the days on which this focus day will be provided.

5.1.6 Focus Day 7: GUI (forced user log out)

The GUI Focus Day scenario is provided to first of all make Participants aware of a function within T7 whereby in an emergency/exceptional situation Xetra 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.
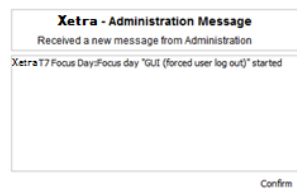
This window can be closed by pressing the Confirm button.

Admin Message + Forced Trader GUI Shutdown

After this first message the following message will be send 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 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.

5.1.7 Focus Day 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 affected products 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. Please be aware that persistent orders will be moved to the other partition too and are part of the orderbook restatement. The PartitionID in the reference data, product snapshot and packet header for EMDI and EOBI for the affected product(s) will change. When the 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:

US0231351067, US0258161092, US0378331005, US0605051046, US0970231058, US17275R1023, US1912161007, US1941621039, US2786421030, US2948216088, US4581401001, US5801351017, US5949181045, US6174464486, US68389X1054, US7134481081, US7170811035, US7427181091

➔ 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.

5.2 Functional Focus Days- Triggered by DBAG Market Operation

5.2.1 Corporate Actions

DBAG will trigger a corporate action in dedicated instrument. The approach will be as following:

One business day prior to the Focus Day DBAG will maintain the Cum indicator, the Ex date and the dividend amount for the respective instrument. On the Focus Day, the Participants will see the Cum-Indicator. The Participants then should have open orders in POSTR. These orders will be deleted during the following batch run. Furthermore, the deletion messages including the order deletion reasons will be sent. On the next business day, (Ex-day) the Participants see the Ex indicator and the reference price is reduced accordingly by the dividend amount.

The exact dates and products are displayed in the Simulation calendar.

5.2.2 Product Halt

As a possibility to reflect a product halt in T7, DBAG has planned product halts on a predefined focus day for six products. 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 products. As a result, 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.

The exact dates and instruments of the Product Halt scenario are displayed in the Simulation calendar.

5.2.3 Instrument Suspend

As a possibility to reflect a product halt in T7, DBAG has planned one Instrument Suspend 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 Instrument Suspend 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 T7. In this scenario all orders (persistent and all non-persistent) and all quotes will be deleted immediately and Participants must re-enter them. Additionally the following message occurs:

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

The exact dates and products are displayed in the Simulation calendar.

5.2.4 Volatility Interruption & Extended Volatility Interruption

During continuous trading and auction call phases, the potential trade price is validated against the fixed and floating volatility boundaries. If a potential trade price lies outside the fixed or floating volatility boundaries then a Volatility Interruption is triggered and the volatility indicator is published. Please note that in auction call phases, the Volatility Interruption is only triggered at the end of an auction call phase.

If, at the end of a Volatility Interruption, the potential price lies outside the extended range, which is broader than the floating price range, the Volatility Interruption will be extended until it is terminated manually. This extension of the volatility auction call phase will be marked with a special indicator. This indicator is published by the exchange to inform the market about an Extended Volatility Interruption.

For this focus day the Volatility Interruption will be repeatedly triggered for the respective products by DBAG between 14:30 and 15:00.
The Extended Volatility Interruption will be triggered by DBAG between 15:00 and 15:15.

Test scenario and expected result

I.   Prior to the planned volatility interruption participants are recommended to enter persistent and non persistent orders in the respective product. As a result of this test scenario all persistent and non persistent orders are still in the book after the volatility interruption started.

II.   During the freeze of an Extended Volatility Interruption, instrument's trading phase does not allow deletion of orders. In such a situation the respective orders cannot be deleted directly but the deletion is pending until the respective phase gets released. Participants are recommended to execute a Mass Cancellation by the respective trader or contact the Functional Helpdesk XETR (contact details see chapter 3.1) and request the execution of a Mass Delete. Within the mass cancellation (/ deletion) message the member is informed about all orders with "Pending Deletion" by enumeration of the system order numbers. When the Extended Vola Freeze is resolved an order marked for pending deletion might get executed or (the remaining quantity) is deleted before the next incoming order book transaction is processed. For this final deletion a single order message is formatted.

The exact dates and products of the Volatility Interruption scenario will be displayed in the Simulation calendar.

5.2.5 IPO

An IPO auction is used for the inclusion of an instrument in the secondary market and is a special version of an auction. Like in an auction, orders and quotes can be entered, modified and deleted.

In contrast to the standard auction Market Supervision is able to enter a matching range on behalf of the lead bank during the IPO auction call phase. The price determination is restricted to this price range.

Market Participants will only be informed about the price range. Market data will not be published at any time of the IPO auction phase.

Before the IPO auction is manually terminated, Market Supervision is setting the instrument state from Auction to Freeze in order to control the order book situation.

During this state, any activity that changes the order book is not possible.

After the IPO auction is terminated by Market Supervision the auction price determination takes place. The IPO auction is directly followed by an intraday auction call phase.

This focus day will allow the Participants to practice the interaction of their activities regarding the first price determination after an initial public offering (IPO). The focus will encompass the common trading and processing features in initial public offering.

The actions will be focused on equities.

The exact dates and products are displayed in the Simulation calendar.

5.3 Functional Focus Days- Cash: Executed by Participants

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

5.3.1 Instrument / product state changes

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.

5.3.2 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 equities.

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 is past last trading day.

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.

5.3.3 Self-Match Prevention

Self-match prevention is an optional functionality that allows a business unit to prevent that certain own orders of the same instrument match against each other.

SMP is offered via all trading interfaces (ETI, FIX Gateway) including the Trader GUI. It is supported for all order types (except iceberg orders and orders with order validity "FOK") and quotes.

On the Focus Day "Self Match Prevention", Participants are requested to test the new functionality by entering orders, which are executable against each other with the same numeric SMP-ID. The SMP-ID will be checked on a business unit level. Its setup and usage lies within a business unit's responsibility.

In report TC 812 "Daily Prevented Self-Matches" Participants can see all order deletions, cancellations, and modification due to selfmatch prevention.

5.3.4 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
- 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 "T7 Trader, Admin and Clearing GUI Manual".

6   Appendix

6.1   XML and Text Reports

All reports provided by T7 Release 5.0 Cash Market for Participants, together with their frequency of creation, and whether they are available as text reports can be found in the document "XML Reports - Reference Manual". The document can be found on the Xetra website www.xetra.com under the following path:

> Technology > T7 trading architecture > T7 System documentation > Simulation

Reports are only provided on batch days.

6.2   Related Documentation

Documentation for Participants is available in English and partially in German on the Xetra website www.xetra.com under the following path:

> Technology > T7 trading architecture > T7 System documentation

7   Change Log

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

No	Date	Chapter	Change
1.0	31 March 2017	All	Initial version
1.1	12 April 2017	4.2	Bullet "Member Section" has been amended.
		1.3.1.4	CCP Participating Time has been updated.
		4.4	Schedule has been updated.
		5.1.7	Updated products.
1.2	17 May 2017	5.2.4	Focus Day 'Volatility Interruption & Extended Volatility Interruption' has been amended.