

T7 Release 8.0

Final Release Notes for the Trading Venues Xetra and Börse Frankfurt

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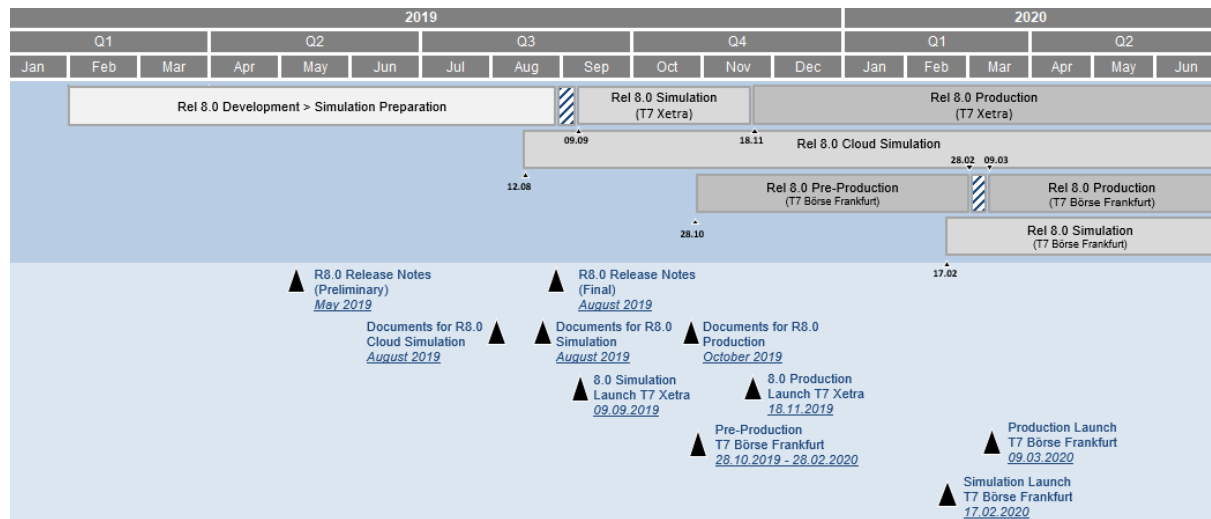
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1. Overview of T7 Release 8.0

Deutsche Börse AG is planning to launch T7 Release 8.0 on 18 November 2019. The T7 Börse Frankfurt including Börse Frankfurt Zertifikate migration is planned on 09 March 2020.

The following diagram gives an overview of the introduction schedule:



Deutsche Börse AG provides a dedicated release simulation environment in order to give trading participants the opportunity to perform comprehensive testing of their trading applications, independent from the T7 production environment. The simulation period for T7 Xetra (XETR) of the T7 Release 8.0 is planned to start on 09 September 2019. This simulation environment will also contain sample instruments in the trading model *Continuous Auction with Specialist* which will be delisted with the start of the T7 Börse Frankfurt pre-production environment (see below).

In addition and prior to the T7 release simulation, Deutsche Börse AG offers a T7 Release 8.0 Cloud Simulation to allow trading participants and Independent Software Vendors (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 started on 12 August 2019. Please note that the T7 Cloud Simulation includes both trading venues T7 Xetra (XETR) and T7 Börse Frankfurt (XFRA). In T7 Börse Frankfurt, sample instruments in the trading model Continuous Auction with Specialist are listed. However, the quoting respectively the Specialist functionality will only be available for the Specialist.

For more information on the T7 Cloud Simulation, please refer to <http://www.xetra.com/xetra-en/technology/t7/cloud-simulation>.

Migration of Börse Frankfurt and Börse Frankfurt Zertifikate (XFRA) to T7

In order to ease the big bang migration of the trading venue Börse Frankfurt (i.e. including Börse Frankfurt Zertifikate, XFRA) to T7 on 09 March 2020, the dedicated production environment will be made available to participants starting on 28 October 2019 as a pre-production environment. This will allow participants to set up and test their T7 Börse Frankfurt applications in a production-like way, i.e. in the same way they will use them in production later. The pre-production phase will continue until 28 February 2020 and with the migration in March 2020, the pre-production environment will become the production environment for T7 Börse Frankfurt. In order to offer participants the possibility to continue testing the T7 Börse Frankfurt applications, the dedicated simulation environment of T7 Börse Frankfurt will start on 17 February 2020. Prior to this date, sample instruments traded in the trading model Continuous Auction with Specialist will be listed in the T7 Xetra (XETR) simulation environment as well. However, these instruments will be delisted shortly after pre-production starts.

With the start of the T7 Börse Frankfurt pre-production environment, it is planned to increase the number of instruments steadily to allow participants to familiarize themselves with the new technology and ease production introduction. The instruments to be introduced will be the instruments currently traded in Börse Frankfurt on the Xetra trading system.

Separate circulars will provide more details about the pre-production environment, the simulation, member/user migration and the stepwise introduction of the products/instruments at a later point in time.

Regular trading on the Xetra trading system will be continued until the actual production migration to T7 on 09 March 2020. The Xetra trading system simulation environment will still be available as of today.

1.1 New Features and Enhancements Overview

The following new features and enhancements will be introduced with T7 Release 8.0:

- Trading Model Continuous Auction with Specialist (incl. Instrument Scope T7 Börse Frankfurt)
- Quote Request Solution in Continuous Auction with Specialist
- Bilateral Aggregation and Settlement Internalisation
- CCP and non-CCP Trading within one-market in Börse Frankfurt
- Split Snapshot Cycles in MDI

Note on Interfaces

T7 Release 8.0 is a mandatory release and will **not** be backwards compatible to version 7.1. All interface versions of 7.1 will no longer be supported with the production launch of T7 Release 8.0.

1.2 Further Reading

The existing documents have been or will be revised for T7 Release 8.0. The following table provides an overview of the final schedule for the publication:

T7 Release 8.0	Eurex	Xetra	Combined	Q2 2019			Q3 2019			Q4 2019			Q1 2020		
				Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
T7 Release 8.0 – Release Notes	x	x		◆				●							
T7 Functional Reference			x					●							
T7 Functional and Interface Overview			x					●							
T7 Participant Simulation Guide			x					●							
T7 Cross System Traceability			x					●							
T7 Incident Handling Guide			x					●							
T7 Participant and User Maintenance Manual	x	x						●							
Contract Notes Description		x							●						
T7 Known Limitations			x						■		●				

T7 Release 8.0	Eurex	Xetra	Combined	Q2 2019			Q3 2019			Q4 2019			Q1 2020		
				Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
T7 Trader, Admin and Clearer GUI – User Manual	x	x						■			●				
T7 Trader, Admin and Clearer GUI – Installation Manual			x					●							
T7 Enhanced Trading Interface – Manual incl. Repository and Header files			x					◆ ■			●				
T7 Enhanced Trading Interface – XML Representation			x					◆ ■			●				
T7 FIX Gateway – FIX 4.2 and 4.4 Manual incl. Fiximate and Repository			x					◆ ■			●				
T7 Market-, Enhanced Order Book- and Reference Data Interfaces, Manual incl. Fast Message Template, Repository & FIXML Schema Files			x					◆ ■			●				
T7 Extended Market Data Services – Manual incl. Fast Message Template and Underlying Ticker Data			x					■			●				
Cash Market Instrument Reference Data Guide		x						●							
T7 XML Report Reference Manual	x	x							■	●					
Common Report Engine User Guide			x					●							
N7 Network Access Guide			x					●							
Exchange Rules & Regulations		x							●						
Market Model Continuous Trading in connection with Auctions		x									●				
Market Model Continuous Auction		x									◆			●	

◆ Preliminary Version ■ Simulation Version ● Final Version

The documents will be available on the Xetra website www.xetra.com/technology under the link:

> Technology > T7 Trading Architecture > System documentation > Release 8.0

Please note that the outlined schedule is preliminary and subject to change.

1.3 Contacts

If you have any questions or require further information, please contact your Global Key Account Manager Trading. Alternatively, please contact your Technical Key Account Manager using your VIP number or via e-mail to: cts@deutsche-boerse.com.

1.4 Definitions and Abbreviations

Term/Abbreviation	Description
AOO	Auction Only Order
BBO	Best Bid, Best Offer
BOC	Book-or-Cancel
BU	Business Unit
CA	Continuous Auction
CEF	Consolidated Exchange Feed
CRE	Common Report Engine
DBAG	Deutsche Börse AG
DMA	Direct Market Access
EMDI	T7 Enhanced Market Data Interface
EMDS	T7 Extended Market Data Service
EOBI	T7 Enhanced Order Book Interface
ETF	Exchange Traded Fund
ETI	T7 Enhanced Trading Interface
ETP	Exchange Traded Product
FIX	Financial Information eXchange (portal)
FOK	Fill-or-Kill
GFD	Good-For-Day
GTC	Good-Till-Cancelled
GTD	Good-Till-Date
GUI	Graphical User Interface
HF	High Frequency
IOC	Immediate-or-Cancel
ISV	Independent Software Vendor
LF	Low Frequency
LIS	Large in Scale (TES Type for on-exchange off-book trading)
LS	Locked Stock
MDI	T7 Market Data Interface
MOV	Maximum Order Value
MOQ	Maximum Oder Quantity
OAQ	Opening Auction Only
OCO	One-Cancels-the-Other Order
PAG	Product Assignment Group
PS	Partition Specific Gateway
PWT	Price-Without-Turnover
QRS	Quote Request Solution
RDF	T7 Reference Data File
RDI	T7 Reference Data Interface

RfQ	Request for Quote
STP	Stop Order
T7	T7 is the trading architecture developed by Deutsche Börse Group
TES	T7 Entry Service
TSO	Trailing Stop Order
XETR	Market Identifier Code (MIC) of trading venue Xetra
XFRA	Market Identifier Code (MIC) of Börse Frankfurt including Börse Frankfurt Zertifikate

2. Trading Model Continuous Auction with Specialist

This chapter outlines the general functional concepts of the trading model Continuous Auction with Specialist on the T7 trading platform.

2.1 Functional Description

With T7 Release 8.0, the trading model Continuous Auction with Specialist (CA with Specialist) will be introduced in order to support the complete migration of Börse Frankfurt including Börse Frankfurt Zertifikate from the Xetra trading system onto the T7 trading platform. The functionality of the trading model Continuous Auction with Specialist on T7 is mainly derived from the functionality in the Xetra trading system. Some enhancements, which are outlined in these release notes, have been introduced. Further deviations are for harmonization and optimization reasons motivated by the creation of synergies, resulting in a consolidated platform with consistent interfaces for T7 Xetra and T7 Börse Frankfurt.

The following sections will highlight the main aspects of instruments, participants and functionality of T7 Börse Frankfurt. Overall, the concept and functionality applied in T7 can be found up in the “Functional Reference” document published on the Xetra website for T7 Release 8.0.

2.1.1 Market Concept

As general information: The market Börse Frankfurt includes both Börse Frankfurt and Börse Frankfurt Zertifikate, which will run on a separate instance of T7 referred to as T7 Börse Frankfurt. Therefore, the term “T7 Börse Frankfurt” is used in the subsequent sections for Börse Frankfurt and Börse Frankfurt Zertifikate if not explicitly differentiated.

In T7, each market has the following structure: “Product Assignment Groups” (PAGs), “Products” and “Instruments”. Instruments are tradable entities in pieces or percentage, i.e. an order always refers to buying or selling a specified quantity of a certain instrument. Every tradable instrument must belong to a product. Instruments of the same product allow for a simpler and less resource-intensive processing on a product level. All products will be grouped into PAGs. In contrast to the PAG usage in the continuous trading model, where the PAG serves as a means for the entitlement, e.g. for a user’s trading permission in relation to PAGs, the PAGs in CA with Specialist trading model do not govern entitlement, e.g. all users can trade all instruments of T7 Börse Frankfurt and T7 Börse Frankfurt Zertifikate, if the Cash Trader role assignment is granted. PAGs are only used for the logical grouping of products.

T7 Börse Frankfurt will follow the T7 concept of market hierarchy, PAGs, products, and instruments.

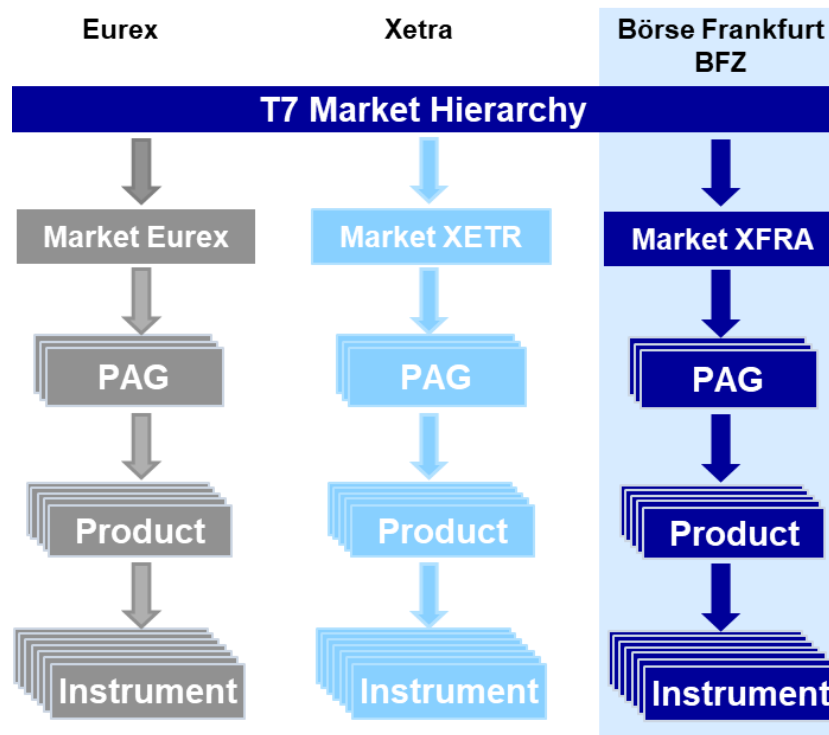


Figure 1: Market Structure in T7

Instrument Scope for Börse Frankfurt

The instrument scope for Börse Frankfurt will include equities, bonds, ETFs, ETPs, mutual funds and (company-issued) warrants. Bonds can have an interest rate calculation method independent from the unit of quotation which can be pieces or percentage.

Please note that with the migration of instruments of Börse Frankfurt to T7, the unit quoted bonds currently setup as equities in the Xetra trading system, will be listed as bonds in T7.

Instrument Scope for Börse Frankfurt Zertifikate

The instrument scope for Börse Frankfurt Zertifikate will include (bank-issued) certificates and warrants only. Certificates and warrants can have an interest rate calculation method.

Please note that with the migration of instruments of Börse Frankfurt Zertifikate to T7, the instruments listed as bonds on the Xetra trading system, will be listed as warrants in T7.

2.1.2 Participant & User concept

The member structure in T7 consists of three different levels: The participant which represents the legal firm, the Business Unit (BU) which always belongs to a participant and finally the user, always belonging to a dedicated BU. A BU may have several sessions, but there is no hierarchical relation of a user to a session.

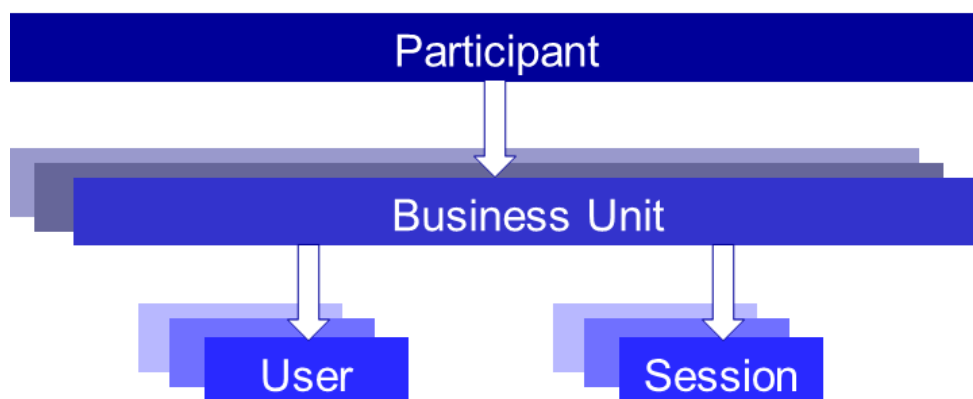


Figure 2: Participant Hierarchy in T7

Users belonging to a BU are assigned into user groups and each user is designated to have one (and only one) user level: trader, head trader or supervisor. A head trader of a user group is entitled to perform activities on behalf of other users in the same user group, while the supervisor can do such activities on behalf of the same BU.

Different pre-defined user roles simplify the administration by providing a set of resources for a logical user role (e.g. Cash Trader). A user may be assigned several roles at the same time. The trading BU may have different user roles provided than the clearing BU. For T7 Börse Frankfurt, the following roles will be available:

More details are available in the document "Participant and User Maintenance Manual¹".

T7 Börse Frankfurt Roles	Description	Applicable to
Cash Service Administrator	The Cash Service Administrator is allowed to set up new users, maintain their entitlement as well as delete users. The role is relevant for both the trading and the clearing BU.	Trading and Clearing BU
Cash Trader	The Cash Trader role allows the user to participate in trading, e.g. to enter orders.	Trading BU
Cash Specialist	This role is intended for the Specialist in the CA with Specialist trading model only. It enables the Specialist to do quote maintenance, and to enter, modify respectively delete orders for other business units user's on behalf.	Trading BU
Cash Liquidity Provider	The role is intended for the Issuer. For receiving the trades, this role does not have to be assigned to the Issuer. However, if the Issuer wants to make use of the knock-out functionality, then the assignment of this role is mandatory.	Trading BU

¹ See on the Xetra website under www.xetra.com under the link: > Technology > T7 Trading Architecture > System documentation > Release 8.0 > GUI Solutions.

T7 Börse Frankfurt Roles	Description	Applicable to
Cash User Data View	The Cash User Data View role allows the user to view its own user data information and of other users.	Trading BU and Clearing BU
Trading View	The Trading View role allows a user to view own trades and own orders.	Trading BU
TM Trade Overview	This new role will be introduced to provide the participants the possibility that users of a trading business unit can see only the trades, and no orders.	Trading BU
Trade Enrichment Rule	The Trade Enrichment Rule role enables a user to predefine texts that are filled in the respective free text fields of quotes.	Trading BU
Trade Enrichment Rule View	With the Trade Enrichment Rule View role a user is allowed to view predefined texts for quotes.	Trading BU
Emergency Mass Deletion	The Emergency Mass Deletion role allows a user to delete all open orders and quotes.	Trading BU
Emergency Trading Stop	The Emergency Trading Stop role allows a user to halt the entire trading participant in case of emergency. All open orders and quotes will be deleted and additionally it will not be possible to enter new orders and quotes.	Trading BU
Clearing Member Stop	The Clearing Member Stop role allows a user of a clearing member to stop one or many of his related trading participants.	Clearing BU
CM Backoffice View	The CM Backoffice View role allows a user to inquire the trades of all his related trading participants.	Clearing BU
TES Trader	<p>The TES Trader role enables the entry, modification, deletion and the approval of TES trades.</p> <p>This role is used if the entering user is directly participating in a TES trade, whereas the TES Broker role is used if the user is not a part of the TES trade. A user can have both roles assigned.</p>	Trading BU
TES Broker	<p>The TES Broker role enables the entry (as a broker), modification and deletion of TES trades.</p> <p>This role is used if the entering user is NOT directly participating in the TES trade, whereas the TES Trader role is used if the user is part of the TES trade. A user can have both roles assigned.</p>	Trading BU
TES View	The TES view role only applies to users of the Xetra Trader GUI and provides restricted display access to TES trading data in the TES View window. In T7 Börse Frankfurt, the TES view role is assigned on market level and is not required if a user is already assigned a TES trader or TES Broker role.	Trading BU

Table 1: T7 Börse Frankfurt Roles

Please note that the roles listed above will be applied to the entire market and not to PAGs.

2.1.3 Pre-Trade Safeguards

There will be three different pre-trade control mechanisms available for T7 Börse Frankfurt.

2.1.3.1 Price Reasonability Check

During continuous auction, the limit of an order will be validated against price ranges defined by the exchange. The participant will have the possibility to skip the check on the entry/modification of an order.

2.1.3.2 Maximum Order Value Check

The Maximum Order Value (*MOV*) check will determine the maximum value of an order that a trader is allowed to enter. The value of the order is calculated as quantity times price for buy limit orders and as quantity times last traded price for market orders and sell limit orders. The *MOV* is stored in exchange currency and in case of orders traded in foreign currency, the respective exchange rate will be taken into account.

2.1.3.3 Maximum Order Quantity Check

The Maximum Order Quantity (*MOQ*) check will determine the maximum quantity of an order that a trader is allowed to enter.

2.1.4 Product and Instrument States

T7 supports product states and instrument states. While product states give a structure to the business day and control general access to the system, the instrument states control order respectively quote maintenance, execution and also the availability of public market data. Generally, the instrument state is related to the product state. However, it may occur that an instrument can have a different state within one product state according to a special situation (e.g. suspension). For more details on product and instrument states, please refer to the Functional Reference².

For CA with Specialist trading model, the following instrument states in T7 will be supported:

² Please refer to [xetra.com](https://www.xetra.com) under the link > Technology > T7 Trading Architecture > System documentation > Release 8.0 > Overview and Functionality.

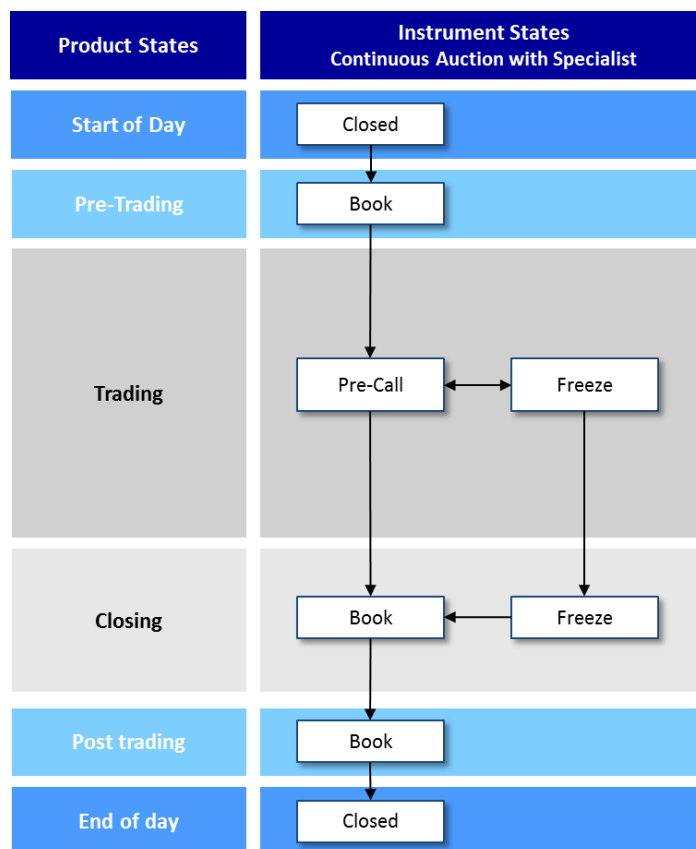


Figure 3: Product and Instrument States in CA with Specialist

Start of Day

The product state Start of Day represents the time before activity starts. Participants have no access to the order book and all instruments are in the state Closed. The Start of Day phase is followed by the Pre-Trading phase.

Pre-Trading

The product state Pre-Trading occurs before trading starts and all instruments are in the state Book. Order maintenance is possible but no matching occurs and no order book information is published except the Specialist's indicative quote. At the end of this phase, the Continuous Auction will be started.

Trading

The product state Trading represents the trading phase. All instruments belonging to a product will be automatically switched to Pre-Call, if they are in a tradable status (e.g. not suspended). Participants may add, modify, delete orders and according to the order book situation, the Specialist will initiate the Freeze phase to execute the orders. During Freeze, any order transactions by the participants will be kept in a locked stock condition and only be processed after the order book is unfrozen.

While the participants order transactions will be kept in a locked stock condition during the freeze phase, the Specialist will still be able to do any order/quote transactions which will be effective for the current price determination process. If required in this phase, the Specialist is also allowed to perform order transactions on behalf for other participants. An exception refers to TSO and OCO orders where on-behalf transactions are not possible at all, independent from the phase. After the order book is unfrozen, the instrument state will switch back to Pre-Call.

Closing

The product state Closing is an optional phase between Trading and Post-Trading and covers the time between the end of the continuous auction and the end of the closing state. If there are no instruments in a product in the state Freeze, then the product will be directly switched to Post-Trading.

If at least one instrument of a product is in the state Freeze, then the product state Closing will occur. The instruments which are in the state Pre-call will be switched automatically to the state Book while the instruments in the state Freeze will remain in Freeze until the Specialist terminates the Freeze state (i.e. via price determination or direct to unfreeze) or the timer for the freeze duration which is defined by the exchange terminates, or by the product state transition to End of Day.

Post-Trading

The product state Post-Trading terminates the trading session for a business day and is typically a time where traders can maintain their orders in preparation of the next trading day. No matching occurs in this phase and no market data is distributed. The instruments are in the state Book.

End of Day

The product state End of Day represents the time that is reserved for the end-of-day processing of the exchange. Participants have no access to the order book anymore and all instruments are in the state Closed. No market data will be published.

2.1.5 Orders

T7 Börse Frankfurt will take over the current T7 concept for orders. This section provides an overview which is relevant for T7 Börse Frankfurt only. For more details, please refer to the document "Functional Reference".

2.1.5.1 Order Maintenance

Orders can be entered, modified and deleted. Please note that a modification of the quantity will be supported, which was not possible before in the CA trading model.

2.1.5.2 Order Profile

There will be order profiles for the T7 Börse Frankfurt which are defined by the exchange and provided in the reference data on the Xetra website. An order profile includes the combination of order types, restrictions, price conditions and validities allowed which in turn is then assigned to products and their instruments. The final illustration of this chapter (2.1.5.7 **Error! Reference source not found.**, Figure 4) includes such an order profile for T7 Börse Frankfurt.

2.1.5.3 Technical Attributes

T7 provides persistent respectively non-persistent, standard and lean orders. However, in the CA with Specialist trading model, only **persistent standard orders** can be entered. Persistent orders will be reinstated at the start of the next business day depending on their order validity, or after a failure of the trading system. For standard orders, the complete order history for the current trading day can be recovered via retransmission requests. The order data is visible to all low frequency sessions belonging to the same business unit (including the Trader GUI) via subscription to the listener data broadcast (drop copy).

To enable tracing of the order, T7 provides the 20-digit exchange order ID³ (*OrderID*) which is unique per product and market and does not change over the entire lifecycle of the order.

³ The exchange order ID is based on the elapsed nanoseconds since Jan 1st, 1970.

Additionally, every order gets assigned a system order version number (*OrderIDSfx*, starting with 0) which increases in case of a user driven order modification with a priority change, i.e. in case of user driven priority changes such as:

- Change of limit
- Increasing the quantity
- Extending the validity

Order activation triggered by system functionality will **not** lead to a new *OrderIDSfx*, i.e.

- Triggering of a stop order (incl. One-Cancels-the-Other Order)
- Triggering of a trailing stop order

From a functional point of view, the latest status of an order can be derived from both the *OrderIDSfx* and the *OrderID*.

2.1.5.4 Order Types

The following order types will be supported for T7 Börse Frankfurt:

Order Types in CA with Specialist	
Limit Order	The limit order can be used by a trader to ensure that the order does not get executed at a price worse than the defined limit.
Market Order	The market order is an order without any limit. Market orders are matched against the best available order(s) in the order book.
Stop Order	<p>A stop order (STP) is an initially inactive market or limit order which is not available in the order book.</p> <p>As soon as the STP is triggered by the Specialists' matching quote, it is converted into an active market or limit order and if possible, matches according to the rules applied in CA with Specialist model (see below "Stop Order Handling in T7").</p>
One-Cancels-the-Other Order	<p>A One-Cancels-the-Other (OCO) order is an order that combines the behaviour of a limit order with that of a stop market order.</p> <p>An OCO order has both a limit price and a stop price. On entry, it behaves like a regular limit order and can match accordingly. Once the trigger condition is fulfilled, the OCO order behaves like a triggered stop market order, i.e. it is converted to an incoming market order and the limit price does not apply anymore.</p> <p>Though the name of "One-Cancels-the-Other" may suggest that two orders are linked, T7 treats an OCO order as one single order. This is reflected by the exchange order ID which does not change throughout its life time and specifically also not when it is triggered.</p> <p>An OCO order that already fulfils its trigger condition on entry is rejected by the system.</p> <p>Please see below for further information about OCO Handling in T7.</p>
Trailing Stop Order	Trailing Stop Orders (TSO) behave like STP orders but maintaining an absolute or relative distance between the stop limit and the indicative quote

Order Types in CA with Specialist

limit of the Specialist (trailing amount). TSOs can be entered only as "Market".

Please see below for further information about TSO Handling in T7.

Table 2: Order Types in CA with Specialist

Stop Order Handling in T7

The STP order can be entered directly into T7 via all trading interfaces. T7 will continue the monitoring. In the CA with Specialist's trading model, the STPs will be triggered by the matching quote according to the following rule:

- For Buy STP: Stop Limit \leq Ask limit of the Specialist's matching quote
- For Sell STP: Stop limit \geq Bid limit of the Specialist's matching quote.

If the STP is triggerable by the Specialist's matching quote, it will participate in the price determination.

The trigger rules described above will be applied to all kind of stop orders, i.e. STPs (Market/Limit), TSOs and OCOs.

One-Cancels-the-Other Order Handling in T7

The OCO order can be entered directly into T7 via all trading interfaces. T7 will continue the monitoring of the OCO order. OCO order triggering in the CA with Specialist trading model, will be performed by the Specialist's matching quote.

If the OCO order is triggerable by the matching quote, it will participate as a market order during price determination. Otherwise, it will participate with its regular limit.

"Price Collar Checks" as required by the MiFID II regulation will be applied on the (stop) limit against the last price.

The Specialist will not be able to modify an OCO order.

Trailing Stop Order Handling in T7

TSOs can be entered directly into T7 via all trading interfaces. The trailing stop limit (TSO limit) will be monitored and updated in T7.

Update based on the Specialist's indicative/matching quote:

- For Buy Trailing Stop Order:
 - If the ask quote limit + Trailing amount $<$ TSO limit
 \Rightarrow Update TSO limit = Ask quote limit + Trailing amount
- For Sell Trailing Stop Order:
 - If the bid quote limit – Trailing Amount $>$ TSO limit
 \Rightarrow Update TSO limit = Bid quote limit – Trailing amount

TSO limit updates will be provided to the client application in a defined netting interval. After a TSO limit update, there will be no further updates of the TSO limit published as long as the update occurs within the netting interval.

Triggering based on the Specialist's matching quote:

- A Sell (Buy) TSO is triggered when the bid (ask) limit of the Specialist's matching quote is equal or below (above) the trailing stop limit.

If a TSO is triggered by a matching quote, it will participate as a market order in the current price determination procedure.

The Specialist will not be able to modify a TSO order.

2.1.5.5 Trading Restriction

For particular instruments, the FWB management board may determine that one “Special Auction” has to be carried out on every trading day. Orders that should only be considered in such a special auction and not during other auctions, have to be marked with the trading restriction “Special Auction”.

There is no fixed time determined when the special auction takes place. The Specialist will trigger it with a corresponding matching quote. The price which occurs out of the special auction will be marked specifically.

Trading Restriction for CA with Specialist	
Special Auction	<p>Special auction orders can be entered for instruments which are available for Special Auction (defined by exchange).</p> <p>Modifications to a restriction will not be supported in general. If a trader wants to change this trading restriction, it is necessary to delete and re-enter the order.</p>

Table 3: Trading Restriction for CA with Specialist

2.1.5.6 Validity

T7 will support the following validities for the Börse Frankfurt:

Validity for CA with Specialist	
Good-for-Day	Orders entered “Good-for-Day” (GFD) will be deleted at the end of the trading day they were entered on.
Good-till-Date	A certain date can be defined until which the order is valid. The order is then deleted automatically during the end of day processing of their last validity day.
Good-till-Cancelled	Orders can be defined to be available in the system until they are deleted by the user. For this purpose, the validity “Good-till-Cancelled” (GTC) is used.

Table 4: Validity for CA with Specialist

Orders of instruments traded in Continuous Auction with Specialist submitted with a validity greater than the current business day will not be deleted in case of a change of price step during start-of-day processing nor Intraday Recovery.

2.1.5.7 Order Profile

The order profile below reflects the combinations of order types, restrictions, price conditions, and validity constraints for T7 Börse Frankfurt. It will be assigned to products of T7 Börse Frankfurt specifically. The assigned order profiles can be found up in the reference data provided by the exchange.

Order Profile	Order Profile Attributes															
	Internal Order Types & Restrictions										Allowed Price Condition		Allowed Order Validity			
	Regular	Stop	Iceberg	TSO	OCO	ADO	OAO	CAO	SA*	BOC	Limit	Market	IOC	FOK	Day	GTD/ GTC
Limit Order	✓								✓		✓				✓	✓
Market Order	✓								✓			✓			✓	✓
Auction Only Order																
Opening Auction Order																
Closing Auction Order																
Book-Or-Cancel Order																
Stop Order		✓									✓	✓			✓	✓
One-Cancels-the-Other Order					✓						✓				✓	✓
Iceberg Order																
Trailing Stop Order		✓		✓								✓			✓	✓

* Please note that an order profile usually relates to product level, and therefore attributes on instrument level, such as "Special Auction" (SA), will not be part of it.

Figure 4: Order Profile for CA with Specialist

2.1.6 Order Book Restatement

T7 Börse Frankfurt participants may consider that order status inquiries are not supported by T7's Enhanced Trading Interface (ETI). Participants must maintain the state of orders based on the execution report messages.

During the start of day phase and after a market reset event, all active orders of a session will be transmitted to the market participant via the respective session and via the listener broadcast.

At first, a Trading Session Status Event message is sent to all the participants' sessions indicating the start of a day or of an event per partition, optionally followed by an Extended Order Information message for each restated order to corresponding sessions and finally a Trading Session Event message again to all sessions, indicating the end of the restatement per instrument. Extended Order Information messages and Trading Session Event messages will only be visible to low frequency sessions.

It is not possible to unsubscribe the order book restatement.

2.1.7 Locked Stock Procedure

Locked Stock (LS) 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 LS. After unfreeze, the processing of these order transactions will be performed (if applicable).

The following table aims to provide an overview of the general concept of LS handling in T7 compared to the Xetra trading system:

Action	T7	Xetra Trading System
Orderbook freeze by Specialist	<ul style="list-style-type: none"> Order transactions are buffered in locked stock and marked as <i>Pending</i> No new order number will be provided for pending transactions. Proper sequencing will be guaranteed by T7 1-n pending transactions are stored individually 	<ul style="list-style-type: none"> Order transactions are buffered in locked stock and marked as <i>Pending</i> Provision of a new order number for each pending transaction Pending transactions are netted resulting in only one overall pending order action
Execution	<ul style="list-style-type: none"> Partial/full execution applies on the active order 	<ul style="list-style-type: none"> Partial/full execution applies on the active order

Action	T7	Xetra Trading System
LS resolution after Freeze if order still exist (pendings can be applied)	<ul style="list-style-type: none"> One broadcast for each pending transaction Order number will remain unchanged Order version number will be increased in case the priority has been changed by applied pending modify 	<ul style="list-style-type: none"> One broadcast for the netted pending transaction
LS resolution after Freeze if orders were matched/deleted (pendings cannot be applied)	<ul style="list-style-type: none"> Last broadcast message (from execution or LS resolution) will contain status of pending cancelled to indicate that pending transaction(s) have been cancelled⁴ 	<ul style="list-style-type: none"> Final cancellation message for the netted pending transaction

Table 5: LS Procedure in T7 vs. Xetra Trading System

2.1.8 TES Functionality

T7 Börse Frankfurt will support reporting of off-exchange trades which is referred to as T7 Entry Service.

From the existing T7 functionality, TES Type *OTC* will be supported which is similar to as of today bilateral off-exchange trading in simple instruments - that is entered in order to forward such a transaction to settlement. Neither price/quantity validations nor publication of the TES trades will be performed for this TES type.

TES trades can be approved automatically if the respective data is pre-defined by the TES user and the auto approval functionality is allowed in the TES profile.

TES trade approval, independent whether it is approved manually or by the auto approval functionality, is only possible when it is not a crossed TES trade, i.e. if at least one counter user who belongs to the same business unit has the trading capacity of "Agent".

Please refer to the "Functional Reference" document for more details about the TES functionality on T7.

2.1.9 Quoting Periods

Quoting periods define the timeframe when quote transactions are possible in the order book. When defined, no quote transactions and hence no price determinations are possible outside of these periods. Quoting periods are defined by the exchange on an instrument level and the information is distributed in the reference data (see chapter 2.2.4). Please note that the exchange may update them intraday with immediate effect.

Please note that instruments that are marked for single auction shall have their one and only price determination within fixed quoting periods (11 a.m. - 1 p.m.) per business day.

For instruments of T7 Börse Frankfurt Zertifikate, the following will apply:

- Quoting period for premium-instruments:
 - Start quoting period: 8:00 a.m. or 9:00 a.m.
 - End quoting period: 8:00 p.m. or 10:00 p.m.

⁴ LS resolution after Freeze if orders were matched/deleted will be treated differently via the FIX trading sessions. For every request, there will be always a preliminary pending response and, after the order book is unlocked, a final response with the result. Please refer for more details to the T7 FIX Gateway Manual on the Xetra web pages.

- Quoting period for non-premium-instruments:
 - The quotation period can be chosen freely between 8 a.m. and 10 p.m.

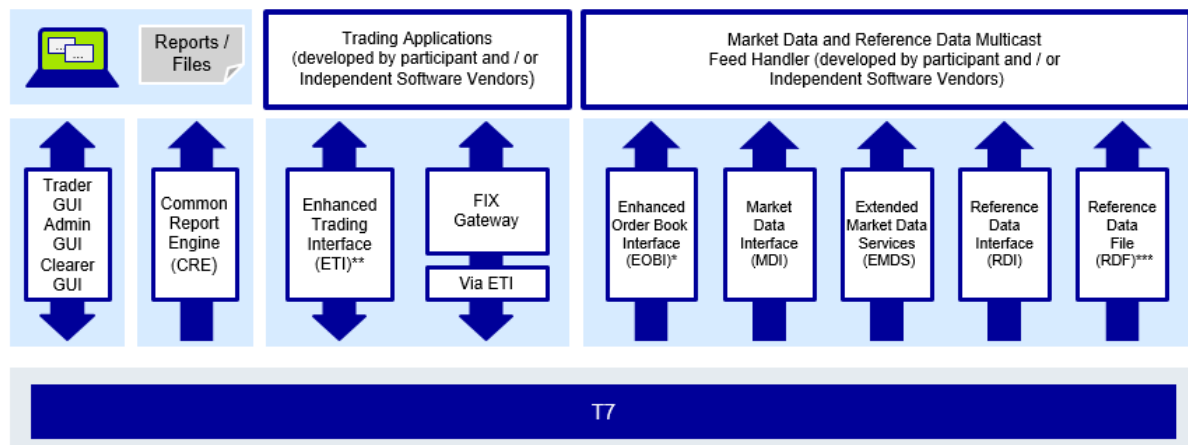
When no quoting periods are defined, no restrictions apply for the submission of quotes.

2.2 Interface Landscape T7 Börse Frankfurt

This chapter outlines the interface landscape of T7 Börse Frankfurt. The following interfaces will be available:

- **T7 Enhanced Trading Interface (ETI) and Financial Information eXchange (FIX) Gateway**
The T7 ETI and T7 FIX interface (via ETI) support all trading activities of the participants. Only low frequency sessions will be supported. The Specialist's functionality will only be available via ETI and not via the FIX Gateway.
- **T7 Market Data Interfaces (MDI/EOBI) and Reference Data (RDI/RDF)**
The new market data interfaces support the distribution of netted (MDI) and un-netted (EOBI) market data. The new reference data interface (RDI) and the reference data file (RDF) distribute all the relevant reference data for trading. In contrast to T7 Xetra, the Enhanced Market Data Interface (EMDI) will not be available in T7 Börse Frankfurt.
- **T7 Graphical User Interfaces (GUIs)**
T7 provides three kinds of GUIs (Trader, Admin, Clearer) which are used for all Deutsche Börse cash markets. For T7 Xetra and for T7 Börse Frankfurt separate logins will be required.
- **T7 Common Report Engine (CRE)**
The T7 CRE is the component where reports are provided to the participants.
For T7 Börse Frankfurt, the CRE will also be used to provide reference data in file format (i.e. as RDF).
For participants with established CRE access, the existing CRE path for T7 Börse Frankfurt will be re-used.

The figure below provides an overview of the T7 interface landscape for T7 Börse Frankfurt:



• available in co-locations only

** including Specialist functionality

*** in addition there will also be an internet download

Figure 5: T7 Börse Frankfurt Interface Landscape

The table below depicts a high-level summary of supported functionality across all interfaces:

	Interfaces	Exchange GUIs			Market Data Interfaces			Reference Data			Trading Interfaces	
Functionality		Admin	Trader	Clearer	EOBI	MDI	EMDS	RDI	Web Page	CRE	ETI	FIX
		GUI	GUI	GUI								
Order Transactions			✓								✓	✓
Quote Transactions											✓	
Private Order/ Execution Information			✓								✓	✓
Private Trade Information			✓	✓							✓	✓
TES Functionality (TES Type OTC)			✓								✓	✓
Market Data			✓		✓	✓	✓					
					(un-netted)	(netted)	(Trades)					
Ticker Information			✓				✓					
User Administration		✓		✓								
Instrument and Product Reference Data								✓	✓	✓		
Reports										✓		
Clearing Member Stop/Release NCM				✓								
Specialist Functionality											✓	

Table 6 Supported Functionality of T7 Interfaces

2.2.1 Enhanced Trading Interface

The ETI interface is an asynchronous, message based interface using TCP/IP sessions. No special hardware, operating system, programming language or compiler version is required on customer side and no exchange delivered software needs to be installed.

ETI is a high performance interface designed for participants and for the Specialist who require the highest throughput and the lowest latency for their transactions. A proprietary session layer and flat binary encoding is used in order to provide the best performance.

All application messages between the client and the ETI gateway follow FIX V5.0 SP2 semantics, including all officially approved extension packs.

A dedicated request scope to address the cash market functionality will be available. Although all information in ETI is session oriented, a subscription mechanism to receive broadcast streams across sessions is provided.

Please note that the Specialist functionality will be available via ETI only. Please refer to section 2.3 Impact on Interfaces.

Further details on ETI can be found in the "Xetra Enhanced Trading Interface - An Introduction" document already available or in the "T7 Enhanced Trading Interface – Manual" (preliminary version in August 2019 and final version to be published in November 2019).

2.2.1.1 Session Concept

ETI is a session-oriented interface whereby the session is the basic scope of the interaction with the T7 architecture. Several users may share a single session, but every session may only be instantiated once. Each TCP/IP connection may only support one session instance. The receiver of the direct response to a request sent to the gateway is always the submitting session. Additionally, the session is informed about system events and all unsolicited messages referring to status changes of orders and quotes belonging to that session.

ETI supports three session types: low frequency sessions for regular trading, low frequency session for back office, and high frequency session. T7 Börse Frankfurt will offer low frequency sessions only.

Low Frequency Session (LF) – Regular Trading

This session type supports the complete ETI functionality and is especially aimed at participant applications that rely on the complete order history to be recoverable. Orders of T7 Börse Frankfurt will always be persistent standard orders.

A LF session may also be used to subscribe broadcast streams, for example: Listener broadcast, trade notifications.

Low Frequency Session (LF) – Back Office

This session type supports only a subset of the regular trading LF sessions. In particular, it does not support order management functions. Please refer to the table below for the details.

2.2.1.2 Functional Scope

The ETI interface provides a dedicated request scope for the T7 Börse Frankfurt functionality which is depicted as follows:

Functionality	LF Session - Regular Trading	LF Session - Back Office
Standard Order	✓	
Persistent Order	✓	
Order Book Restatement/ Listener Broadcast	✓	✓
Short Order Message Layouts	✓	
Quotes	✓	
Maintaining orders of another session	✓	
Delete all quotes of another session	✓	
Trade Broadcast	✓	✓
Mass Deletion	✓	
News Broadcast	✓	✓
Risk control broadcast	✓	✓
Service Availability Broadcast	✓	✓
Session List Inquire	✓	✓
User List Inquire	✓	

Table 7: Functionality per Session Type

2.2.2 FIX Gateway

The FIX Gateway is intended for participants that require a standard FIX connection to the exchange and is a point-to-point service based on the technology and industry standards TCP/IP, FIX and FIX Session. The T7 FIX Gateway supports version 4.2 and version 4.4 of the FIX protocol.

Participants can use the FIX gateway for regular on-exchange and TES trading, but not for quoting functionality, market data nor instrument reference data.

For further information please refer to existing document "Xetra FIX Gateway – An Introduction" or to the document "T7 FIX Gateway - FIX 4.2 and 4.4 Manual" (preliminary version in August 2019, final version to be published in November 2019).

2.2.2.1 Main Concepts

The FIX Gateway uses the ETI interface to connect to the exchange. In general, the previously mentioned concepts valid in ETI are also reflected in FIX Gateway.

From a session concept perspective, FIX uses only low frequency session connections. To access to T7 Börse Frankfurt, additional sessions will be required as there will be no common FIX gateway for T7 Xetra (XETR) and T7 Börse Frankfurt (XFRA). Thereby, different sessions for trading and back office will be needed as well.

The additional FIX sessions can be requested via the Xetra Member Section.

2.2.2.2 Functional Scope

The FIX Gateway offers the complete functional scope of ETI except for Quote handling. While it is possible to send a quote request, the FIX Gateway does not provide the functionality to send or maintain quotes.

The FIX Gateway provides the following functions for T7 via a respective trading session:

- Order management incl. execution notifications
- Quote Request Solution
- TES Functionality for TES Type *OTC*⁵
- Risk control events

Additionally, the FIX Gateway enables participants to subscribe to private trading data in broadcast form via a back office session:

- (TES) Trade notifications at a business unit level
- Drop Copy for standard (not lean) orders at business unit level

2.2.3 Market Data Interfaces

The Market Data Interfaces for T7 Börse Frankfurt are:

- **T7 Market Data Interface (MDI):** This interface provides netted price level aggregated market data, i.e. in T7 Börse Frankfurt, the best bid, best ask (BBO) based on the indicative quote, if configured and state change information.
- **T7 Enhanced Order Book Interface (EOBI):** This interface provides, if configured, the best bid and best ask (BBO) information based on the indicative quote.
- **T7 Extended Market Data Services (EMDS):** This interface provides real time and replay dissemination of all on-exchange trade prices and ticker information about indices.

⁵ Please refer to the "Functional Reference" document for more details about the TES functionality on T7.

All interfaces distribute information via UDP multicast; following FIX 5.0 SP2 semantics and are FAST 1.2 encoded (except EOBI). If any message is lost, complete recovery is possible because every message is published on two identical services (A and B) with different multicast addresses (live-live principle). In the unlikely case of a message-loss on both services, participants can take advantage of the respective snapshot message and rebuild the order book.

Please note that the order book transparency configurations for T7 Börse Frankfurt will be equal to as of today:

T7 Börse Frankfurt Order Book Transparency		
	Order Book Transparency	BBO Visibility Based on Indicative Quote
Börse Frankfurt	Closed	MDI EOBI
Börse Frankfurt Zertifikate	Closed	CEF

Table 8: T7 Börse Frankfurt Order Book Transparency

The table below describes the main differences between the EOBI, MDI and EMDS:

Characteristic	EOBI	MDI	EMDS
Netting interval / market depth	<ul style="list-style-type: none"> Un-netted, entire visible order book information for all instruments * 	<ul style="list-style-type: none"> Netted market data 	<ul style="list-style-type: none"> Un-netted, entire on-exchange trades for all instruments
Snapshot processing	<ul style="list-style-type: none"> Snapshot messages required for recovery only Snapshot and incremental messages must be synchronized during recovery 	<ul style="list-style-type: none"> Snapshot messages must be processed continuously (In-band protocol) Snapshot and incremental messages must be synchronized during recovery 	<ul style="list-style-type: none"> N/A
Snapshot / incremental sequence numbers	<ul style="list-style-type: none"> Individual sequence number range for incremental and snapshot (Off-band) 	<ul style="list-style-type: none"> One sequence number range for incremental and snapshot (In-band) 	<ul style="list-style-type: none"> No snapshots, but individual sequence number range per instrument
Trade volume reporting	<ul style="list-style-type: none"> It can be calculated by using incrementals. Snapshot messages contain trade statistics / volume information for recovery 	<ul style="list-style-type: none"> Statistical information (daily high / low and total traded quantity) and last trade per netting interval information only * 	<ul style="list-style-type: none"> Each on-exchange trade reported separately
Packet header	<ul style="list-style-type: none"> No explicit performance indicator. It can be calculated by using PS Gateway-In and packet header timestamp 	<ul style="list-style-type: none"> No performance indicator 	<ul style="list-style-type: none"> No performance indicator
Functional heartbeat	<ul style="list-style-type: none"> Functional heartbeat message on a product level + the last valid <i>MsgSeqNum</i> 	<ul style="list-style-type: none"> Snapshot messages act as functional heartbeat messages 	<ul style="list-style-type: none"> Functional heartbeat contains + the last valid <i>MsgSeqNum</i>
Technical heartbeat	<ul style="list-style-type: none"> Technical heartbeats (FAST reset messages) sent periodically on all multicast/port combinations to verify technical connection 		

Table 9: Differences between the Market Data Interfaces

* Dependent on order book transparency settings

More details about the market data interfaces will be provided in the existing document "Xetra Enhanced Market Data Feed Interface, Market Data Feed Interface, Reference Data Interface – An Introduction", as well as in "T7 Market-, Enhanced Order Book- and Reference Data Interfaces Manual", "Reference Data File – FIXML Schema

Files” and “T7 Extended Market Data Services – Manual” which will be published as preliminary versions in August 2019 and in November 2019 as final versions.

2.2.3.1 MDI

In T7 Börse Frankfurt, the indicative quote of instruments of Börse Frankfurt will be displayed in MDI as best bid, best ask. Indicative quotes of instruments of Börse Frankfurt Zertifikate are not displayed in MDI. Otherwise, the order book is closed. Updates of the order book are sent at regular intervals; they are not provided for every order book change and are sent significantly less frequently than for EOBi.

Along with the order book updates, the following market data is disseminated via this interface:

- Product state and instrument state information
- Trades

Trades are not reported individually, but statistical information (daily high/low price, last trade price and quantity) is provided instead.

The Market Data Interface consists of incremental messages (event driven) and snapshots (periodic generated) which will be delivered via one channel (in-band).

2.2.3.2 EOBi

The EOBi is a market data interface which provides un-netted Order-by-order public market data. In T7 Börse Frankfurt, this corresponds to the indicative quote of instruments of Börse Frankfurt being displayed as best bid, best ask. Indicative quotes of instruments of Börse Frankfurt Zertifikate are not displayed in EOBi. The EOBi interface provides fixed-length binary messages with no data compression with the following information:

- Indicative quote of the instruments of Börse Frankfurt being displayed as best bid, best ask
- Trade prices and traded quantity for each executed on-exchange trade
- Product state and Instrument state information

Please note: For Börse Frankfurt Zertifikate, the indicative quote is only provided via CEF.

2.2.3.3 EMDS

EMDS is an additional market data interface providing a real time and replay dissemination of all on-exchange trade prices. The replay service allows participants to recover from any data loss for on-exchange trades.

EMDS also includes ticker information about the indices calculated and disseminated by Deutsche Börse AG.

2.2.4 Reference Data

Depending on the content, the reference data is provided via the

- Reference Data Interface (RDI),
- Common Report Engine (CRE),
- Member Section (RDF) and
- public web page (e.g. “All tradeable instruments” CSV-file)

The Reference Data Interface (RDI) distributes instrument reference data over a number of IP multicast addresses via high bandwidth connections. All feeds follow FIX 5.0 SP2 semantics and are sent with FAST encoding.

Information is provided as regular snapshots containing reference data as of the beginning of the day. For intra-day recovery purposes the snapshots are repeated during the day. It uses the same technical means as the market data interfaces.

Please note that the instrument reference data remains constant throughout the business day.

The reference data provided via the CRE, RDI, member section and public web pages will include only instrument related information. In addition to those files, the information about trading schedules, order profiles, and descriptions of market segment and market segment supplements will be provided in a compressed zipped file on the public web pages. These static files will only change rarely. Any changes will be communicated in advance with sufficient lead time.

The following table shows the availability of reference data:

Reference Data	Availability		
	CRE Public Area	Member Section	Xetra Website
Static Files (common for BF and BFZ)	X	X	X
RDF listing all instruments	X	X	
All Tradeable Instruments File listing all instruments	X		X
RDF listing only instruments of Börse Frankfurt	X	X	
All Tradeable Instruments File listing only instruments of Börse Frankfurt	X		X
RDF listing only instruments of BFZ	X	X	
All Tradeable Instruments File listing only instruments of BFZ	X		X
RDF listing only instruments of BFZ assigned to Specialist BALFR	X		
All Tradeable Instruments File listing only instruments of BFZ assigned to Specialist BALFR	X		
RDF listing only instruments of BFZ assigned to Specialist ICFFR	X		
All Tradeable Instruments File listing only instruments of BFZ assigned to Specialist ICFFR	X		

Table 10: Availability of Reference Data in T7 Börse Frankfurt

More details about the distribution of reference data can be found in the same sources as depicted for market data interfaces above.

2.2.5 GUIs

T7 offers a java-based GUI solution. To start and automatically receive updates of the T7 GUIs, Deutsche Börse offers a customized seamless solution named "T7 GUI Launcher" which is independent from the Oracle's Java SE Java Web Start mechanism. Please see chapter "T7 GUI Launch Mechanism" (chapter 7.12) or visit the Xetra website for more details:

www.xetra.com > Technology > T7 Trading Architecture > T7 GUI Launcher.

In comparison to the Xetra trading system, no MISS infrastructure is necessary, i.e. participants will directly connect to Deutsche Börse server. Consequently, bandwidth requirements increase with the number of open screens.

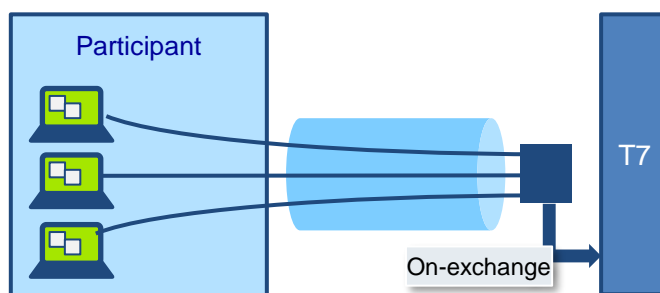


Figure 6: GUI Connection Scheme

T7 provides different GUIs subject to the activities and operations a user wants to execute: an Admin GUI, a Trader GUI, and a Clearer GUI.

Each of the different GUIs supports different operations and functionality, which can be taken from the overview table below:

	T7 GUIs		
	Trader GUI	Admin GUI	Clearer GUI
Order Transactions	✓		
Private Order / execution info	✓		
Private Trade info	✓		✓
Market Data	✓		
User Administration		✓	✓
Clearing Member Stop/Release			✓

Table 11: Supported Functionality per GUI

More details about the GUIs will be provided in the “Trader, Clearer and Admin GUI – Manual” which will be published in August 2019.

Please refer also to chapter 7.12 for “T7 GUI Launch Mechanism”.

2.3 Impact on Interfaces

The following chapter outlines the changes to the ETI interface, FIX interface, Market and Reference Data, GUIs, and reports, especially for those participants who are already using the T7 trading architecture. The changes are described in a general fashion to provide an indication of upcoming changes. For detailed changes, please refer to the interface manuals once they are published, and to the *Online Help* in the GUIs.

Please note that in contrast to T7 Xetra, ETI high frequency sessions and EMDI will **not** be offered for T7 Börse Frankfurt.

2.3.1 ETI

The ETI interface will be enhanced to support the CA with Specialist's trading model for T7 Börse Frankfurt as follows:

- Order and quote related messages will include the information of Trading Capacity *Issuer/Liquidity Provider* (only quote), Special Auction, and order status which Broker is relevant in Locked Stock scenarios.
- Order messages will be enhanced to include the business unit and the trader login name which will be used to support trading on-behalf.
- Introduction of a new message *Single Quote* to support Specialist's entry of Member Internal Number and text fields to map trade notification in their subsystems (*FreeText1*, *FreeText2*, *FreeText4*).
- *Account* in Trade Notifications will be enhanced by the Issuer Account 'I' in case of the Issuer being the counter party of a trade.
- Introduction of Specialist specific messages.
 - Specialist Data Stream (RefApplId 11 (Specialist Data) and Subscription Scope Specialist Data) includes:
 - Order Mass Cancellation Notification (Specialist Data)
 - Extended Order Information (Specialist Data)
 - Cancel Order Notification (Specialist Data)
 - Mass Cancellation Event (Specialist Data)
 - Trading Session Event (Specialist Data)
 - Specialist Specific Information (Specialist Data)
 - Order Book Information for Specialist (Specialist Data)
 - Specialist Specific Instrument Information
Reception of state change information
 - Specialist Security State Change Request
This request is used by the Specialist to freeze or unfreeze the order book for instruments that are serviced by that Specialist.
 - Specialist Security State Change Response
This synchronous response is the answer to the Specialist Security State Change Request.

Please note that existing message *Issuer Security State Change Request* can be used by the Liquidity Provider for the Knock-out functionality if the instrument is activated by the exchange.

2.3.2 FIX

All order, request for quote, trade and status related messages will be enhanced in the FIX Gateway to support the CA with Specialist trading model as the ETI interface, with exception of quoting related transactions. Especially, the FIX interface will include a new logic to capture the scenarios in Locked Stock when the order transactions were in the state *Pending*. With regard to the Knock-out functionality, the request *Security Status Definition Request* will be introduced for the Liquidity Provider to submit knock-out information for an activated instrument. The response of this request can be received in the *Security Status*.

2.3.3 Market and Reference Data

The following applies for market and reference data:

- The new instrument state *Freeze* will be introduced.
- Trades resulting from Special Auction price determination will be marked specifically as 'SA' in *TradeCondition*
- The MDI and the EOBI interfaces will distribute the Price-Without-Turnover (PWT) prices.
- A new paging mechanism using *LastFregment* (782) in the *MassInstrumentStateChange* message will be introduced

- New fields will be introduced in the *MassInstrumentStateChange* message:
 - *SecurityMassStatus*(30965)
 - *MassSoldOutIndicator*(35155)
 - *TESecurityMassStatus*(35045)
- In EOBI, a new message *MassInstrumentStateChange* will be introduced.
- RDI, the RDF and the “All Tradeable Instruments” file (published via the Xetra website) will be enhanced to include the following information:
 - the Specialist information, the Specialist User Group and Liquidity Provider User Group information
 - Auction Type (e.g. Single Auction, Special Auction)
 - Warrant Type (e.g. Certificate)
 - Quoting Periods
- Additionally, the All Tradeable Instrument file will include the new fields
 - Price Currency
 - First Trading Date
 - Last Trading Date
 - Deposit Type.

The Liquidity Provider's information will be distributed via the current fields *Market Maker* and *Market Maker ID*

- For participants with established CRE access, the existing CRE path for T7 Börse Frankfurt will be re-used.

2.3.4 GUI

The following enhancements in the T7 Trader GUI will be applied to support the migration of Börse Frankfurt:

- Introduction of the new Account “I” to denote the trade notifications for the Liquidity Provider.
- Introduction of the new trading restriction “Special Auction” in all order entry and modification windows as well as in Orders and Full Order Book window.
- Trades resulting from Special Auction price determination will be marked specifically.

Please note that quote maintenance will not be supported via the Trader GUI but via ETI only.

2.3.5 Reports

The following enhancements will apply to reports:

- Several fee reports that relate to the Specialist only will be adapted for Börse Frankfurt.
- The report TC810 - Trade Confirmation will include the Liquidity Provider of the Specialist and the report TC540 - Daily Order Maintenance will reflect the new trading restriction “SA” for Special Auction.
- The report “SC001 WSS Instrument Import” for the trading venue Börse Frankfurt (based on Xetra technology) will not be provided any more. The structured product instruments listed on T7 Börse Frankfurt will be part of T7 reference data.

The following new reports will be introduced based on the versions of the Xetra Trading System:

- CB142 Fee Per Executed Order T7 Boerse Frankfurt
- CB150 Fee Overall Summary T7 Boerse Frankfurt
- CB160 Fee Statement T7 Boerse Frankfurt
- CB162 Monthly Specialist Refund
- CB242 Specialist Service Fee Per Executed Order
- CB243 Specialist Service Fee XFS Per Executed Order
- CB250 Specialist Service Fee Overall Summary
- CB253 Specialist Service Fee XFS Overall Summary

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- CB260 Specialist Service Fee Statement
- CB263 Specialist Service Fee XFS Statement

3. Quote Request Solution in Continuous Auction with Specialist

This chapter provides the Quote Request Solution (QRS) for the CA with Specialist trading model provided on T7 Börse Frankfurt with the production launch of T7 Release 8.0.

3.1 Functional Description

The Quote Request Solution (QRS) offers market participants the opportunity to request a prompt and full execution of an order at a defined or better price.

During the main trading phase in continuous auction, the following will apply for the QRS:

- Market participants can ask the Specialist for an indicative private quote submitting the ISIN, the quantity they would like to trade and optionally the side (buy or sell) they intend to trade.
- The request is answered by the Specialist either with a quote response containing an adequate bid/ask with the available quantity or with an error message in case no current and adequate quote e.g. in terms of quantity is available. In case the Specialist does not answer, the market participant will also receive an error message indicating that the time period for a response is exceeded.
- Having received an adequate answer from the Specialist, the participant may submit an order based on the quote request response, referred to as QRS order.
- All the messages, i.e. the quote request, the quote response, and the order upon a quote response refer to each other via a unique *Quote ID* that will be set by the participant and which has to be unique per business unit and instrument during the business day.
It is important to notice that the *Quote ID* initially submitted in the QRS workflow in a Request for Quote (RFQ) differs in validation and uniqueness from the *Quote ID* submitted as (mass) quote identifier by a Specialist/Market Maker for which no validation is done in T7. As such, the field used is the same however, the associated functionality differs.
- The QRS order can either be fully executed according to the matching rules of the market model or not at all. In case, the Specialist's matching quote would result in a partial execution of the QRS order, the quote will be rejected by T7.
- If not executed, the QRS order will be deleted from the order book after the respective time period elapsed. This deletion is performed even if the order book is currently frozen.
- Any modification to the QRS order will be rejected and only deletions are allowed.
- The exchange will define a maximum number of QRS quote requests which can be sent per BU in a product during the trading day.
- The quote request, the quote request response, and the QRS order will be marked with a timestamp and outdated after a certain time period.
- In case of unsupported ISINs (e.g. instruments in subscription, instruments with a single auction only), QRS quote requests may be rejected and returned with a respective error message.

The QRS will be provided via ETI and FIX interface only.

3.2 Impact on Interfaces

The following chapter outlines the changes to the ETI interface, FIX interface, and reports. The changes are described in a general fashion to provide an indication of upcoming changes. For detailed changes, please refer to the interface manuals once they are published.

3.2.1 ETI

The ETI interface will be enhanced to support the QRS for T7 Börse Frankfurt.

The field *QuoteID* will be added to the following messages:

Request	Quote ID in ETI	
	Quote ID referring to QRS workflow	Quote ID provided as (mass) quote identifier
New Order Single	x	
Order Book Information for Specialist	x	
Cancel Order Notification	x	
Extended Deletion Report	x	
Quote Request Reject Notification	x	
Request for Quote Notification	x	
Request-for-Quote reject request for Specialist	x	
Notification for Specialist's reply to a Request-For-Quote request	x	
Single Quote Request		x
Mass Quote Response		x
Quote Request	x	

Table 12: Quote ID in ETI

Please note that the existing *Quote ID* in all other not changed requests and notifications relates to the (mass) quote identifier provided by the Market Maker/Specialist.

The following messages will be introduced for the QRS workflow for participants:

- **Quote Request Reject Notification**
This notification is sent when either the Specialist directly rejects the Request for Quote or the timeout is triggered in T7.

The following messages will be introduced for the QRS workflow for Specialists:

- **Request for Quote Notification**
Notification for the Specialist when a member enters a Request for Quote
- **Specialist's reply to a Request-For-Quote request**
This request is used by the Specialist to send a private quote to the dedicated member.
- **Response to a Specialist's reply to a Request-For-Quote request**
This synchronous response is the answer to the Specialist after submitting the Specialist's reply to a Request-For-Quote request
- **Notification for Specialist's reply to a Request-For-Quote request**
This notification is received by the Specialist after sending the Specialist's reply to a Request-For-Quote request
- **Request-For-Quote reject request for Specialist**
This request is used by the Specialist to reject a Request for Quote

3.2.2 FIX

The FIX interfaces will correspond with the changes in the ETI interface.

- New message flows via messages QuoteRequest (R), Quote (S) and NewOrderSingle (D)
- Field PrivateQuote (1171) will be added to the message QuoteRequest (R)
- Field QuoteID (117) will be added to the message NewOrderSingle (D)
- Fields RefOrderID (1080) and RefOrderIDSource(1081) will be added to the message ExecutionReport (8)
- New messages Quote (S) and User/QuoteRequestReject (UAG/AG)

3.2.3 Reports

The TC540 – Daily Order Maintenance will be enhanced including the Quote ID and showing the expiries for the QRS order.

4. CCP and non-CCP Trading in One Market

With T7 Release 8.0, it will be possible to perform CCP and non-CCP trading in one market. Each instrument will be flagged by the exchange whether it is CCP eligible or not. The information is available in the reference data interface, in the Reference Data File, and in the All Tradeable Instruments File:

- RDI/RDF: Identification via *PostTradeAnonymity*
 - CCP instruments can be identified by *Central Counterparty (2)*
 - Non-CCP instruments are those where the *PostTradeAnonymity* is not equal to *Central Counterparty (2)*
- All Tradeable Instrument File: Identification via *CCP eligible Code (10)*.
 - Y defines instrument as CCP eligible
 - N defines instrument as not CCP eligible

As part of the migration of Börse Frankfurt, the T7 trade notifications will be enhanced to include the counterparty information of non-CCP trades.

5. Bilateral Aggregation and Settlement Internalisation

The functionality of bilateral aggregation and settlement internalisation will be introduced with T7 Release 8.0 for non-CCP instruments.

Participants currently using bilateral aggregation and settlement internalisation in the Xetra trading system will be setup accordingly in T7. Participants who want to start using bilateral aggregation and/or settlement internalisation have to submit an application to be setup accordingly.

5.1 Functional Description

5.1.1 Settlement Internalisation

Participants can opt for settlement internalisation on Trading Capacity A and/or P per settlement account. Market Operations will apply the participant settings accordingly.

Once a trade is generated, T7 will check whether both trade sides belong to the same business unit. If so, T7 will then check the settlement internalisation settings of the settlement accounts. In case settlement internalisation is selected for the settlement account of each trade side, the trade will be marked for settlement internalisation. If not, the checks for bilateral aggregation are performed.

In case settlement internalisation is applied, contract notes will be generated, but delivery instructions will not be generated by DBAG.

5.1.2 Bilateral Aggregation

Participants can opt for bilateral aggregation on Trading Capacity A and/or P per settlement account. Market Operations will apply the Participant settings accordingly.

Once a trade is generated, T7 will check the participant's settlement account settings of the business units of the trade and in case bilateral aggregation is selected for each settlement account of the trade side, the trade will be marked for bilateral aggregation.

In case bilateral aggregation is applied to a trade, the trade will be aggregated by the clearing system. Contract notes and delivery instructions will then be generated for the aggregated trades.

5.2 Impact on Interfaces

The following chapter outlines the changes to the ETI interface, FIX interface, GUIs, and reports. The changes are described in a general fashion to provide an indication of upcoming changes. For detailed changes, please refer to the interface manuals once they are published, and to the *Online Help* in the GUIs.

5.2.1 ETI

The information of the settlement internalisation or bilateral aggregation settings of a trade (*ClearingInstruction*) will be included in the ETI Trade Notification and TES Trade Broadcast:

- *ClearingInstruction* 13 (self clearing) for trades marked for settlement internalisation
- *ClearingInstruction* 2 (Bilateral netting only) for trades marked for bilateral aggregation

5.2.2 FIX

The information of the settlement internalisation or bilateral aggregation settings of a trade will be included in the Trade Capture Report.

5.2.3 GUI

The information whether a trade is bilaterally aggregated or internalised will be displayed in the Trade View.

5.2.4 Reports

The clearing instruction will be included in the report TC810 - T7 Daily Trade Confirmation.

6. Split Snapshot Cycles in MDI

Currently incremental messages are not sent during a snapshot cycle of a given product. For products with many instruments, this means that no incremental messages are sent for a longer period of time in a MDI stream.

Snapshot Cycle Subset: With T7 Release 8.0, this behaviour will change. A snapshot cycle will no longer be sent contiguously for all instruments, but in a disjunct subset of instruments of a specific product. This may result in the situation that a snapshot cycle subset may only contain one instrument. Incremental messages received any time in between snapshot cycles subsets may still belong to instruments of either previous snapshot cycle subsets or subsequent snapshot cycle subsets.

When receiving snapshots and incremental messages, the participant's applications will have to ensure the proper mapping of incremental messages to the correct snapshot to build an initial baseline using the message sequence number. Incremental messages have to be processed immediately *before reception of further* snapshot messages of a product. Multiple snapshots can be packaged together.

This means that a joining application which has just received snapshot messages for instruments 1,2,3, and 4 of product XYZ should process only the instructions of incremental messages for instruments 1,2,3, and 4 while discarding all included instructions for instruments 5 and 6 sent in the incremental message of product XYZ. The subsequent snapshot message for instrument 5 and 6 will already include the incremental messages which have been discarded before.

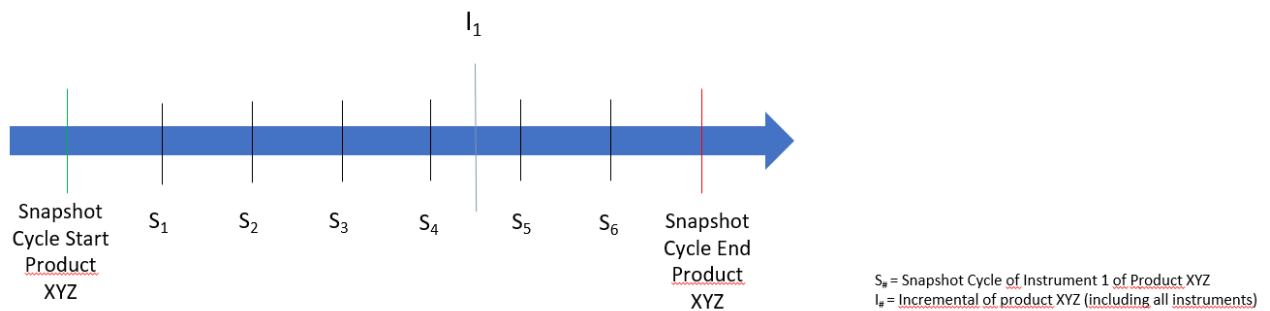


Figure 7: Snapshots and Incremental Processing

The following description illustrates the changes in more technical detail.

Current Behavior - Contiguous Snapshot Cycle before T7 Release 8.0

Definitions:

A product P has n instruments,

$S_{i,r}$ is the snapshot for instrument $i, i = 1, \dots, n$

whereby $lastMsgSeqNumProcessed = r$.

As the incremental message I_{r+1} with $msgSeqNum = r + 1$ has product scope P , all n instrument snapshots $S_{1,r}, S_{2,r}, \dots, S_{n,r}$ from product P with all its instruments may be collected by the participant's application, *before* applying any incremental messages to that initial baseline.

Up to T7 Release 8.0, MDI sends a snapshot cycle for product P without interruption by any incremental message I as in the following sample:

$$\dots, I_r, S_{1,r}, S_{2,r}, \dots, S_{n,r}, I_{r+1}, \dots$$

Because of the *in-band* nature of T7 MDI, snapshots do not carry a *lastMsgSeqNumProcessed* explicitly, but essentially all snapshots from the sequence above were *implicitly* based on same last received incremental message sequence number I_r , so $S_{1,r}, S_{2,r}, \dots, S_{n,r}$ was essentially equivalent to

$$S_{1,r}, S_{2,r}, \dots, S_{n,r}.$$

Please note that any of those snapshots still might be flagged as a *mandatory refresh*, but while building an initial baseline any *newly* received snapshot is implicitly a mandatory refresh for a joining application.

A straight forward member application had the chance to build a full and complete product baseline from $S_{1,r}, S_{2,r}, \dots, S_{n,r}$, *before* it had to apply any following incremental message I_{r+1} .

So, the following sequence of message might be a valid scenario for T7 MDI up to Release 8.0:

$$\dots, S_{1,r}, S_{2,r}, \dots, S_{n,r}, I_{r+1}, I_{r+2}, \dots, I_{r+k}, S_{1,r+k}, S_{2,r+k}, \dots, S_{n,r+k}, I_{r+k+1}, \dots, K > 1.$$

Future Behavior – Split Snapshot cycle with T7 Release 8.0

Definitions are the same as defined in the previous paragraph (i.e. Product P with n Instruments, $S_{i,r}$ denotes the snapshot message). With T7 Release 8.0, MDI will not guarantee anymore that the product cycle for snapshots S_1, \dots, S_n is sent *without* interruption by any incremental message I . So, the following sample sequence might be a totally valid scenario

$$\dots, S_{1,r}, I_{r+1}, \dots, I_{r+k_1}, S_{2,r+k_1}, I_{r+k_1+1}, \dots, I_{r+k_1+k_2}, S_{3,r+k_1+k_2}, \dots, S_{n,r+k_1+\dots+k_{n-1}}, \dots, K_1, \dots, K_{n-1} > 1.$$

Please note that each optional incremental message $I_{r+1}, \dots, I_{r+k_1}$ may carry instructions for all n instruments $1, \dots, n$ of product P . This means, that a joining application, which so far has just received snapshot $S_{1,r}$, needs to apply all instructions from $I_{r+1}, \dots, I_{r+k_1}$ for instrument 1 to snapshot $S_{1,r}$, *but* it *must* ignore all instructions for snapshots $S_{2,r+k_1}, \dots, S_{n,r+k_1}$, as all following snapshots will already have $I_{r+1}, \dots, I_{r+k_1}$ incorporated.

7. Further Functional Enhancements

The following enhancements relate both to T7 Xetra and T7 Börse Frankfurt.

7.1 Direct Market Access Flagging for Orders

T7 Xetra will be enhanced with a new flag for participants to flag Direct Market Access (DMA) orders. In order to be able to flag DMA orders on T7 Xetra, participants are required to register for DMA trading. Once registered, participants must use the newly introduced flag *OrderOrigination* in conjunction with either the Trading Capacity “Customer (Agency) or “Riskless Principle”.

Participants who are currently using the DMA trader ID for the flagging of DMA orders may continue to do so for an extended period of time however must inform DBAG of their intent to do so.

Additional DMA related information will be provided in a separate circular.

The flag *OrderOrigination* will be included in the following ETI messages:

- Order Mass Cancellation Request
- Cancel Order Single
- Replace Order Single
- Replace Order Single (short layout)
- New Order Single
- New Order Single (short layout)
- Book Order Execution
- Trade Notification

The FIX interface will be enhanced accordingly in all affected FIX order- and trade-messages to include the *OrderOrigination*:

- NewOrderSingle (D)
- NewOrderMultileg (UAB/AB)
- OrderCancelReplaceRequest (G)
- User/MultilegOrderCancelReplaceRequest (UAC/AC)
- OrderCancelRequest (F)
- UserOrderMassActionRequest (UCA)
- User/TradeCaptureReport (UAE/AE)

The *dmaFlg* will be added to the following reports:

- TC540 - Daily Order Maintenance
- TC550 - Open Order Detail
- TC810 - T7 Daily Trade Confirmation

7.2 Enhancements of Quote Deletion Context

Xetra can define whether single-sided quotes or double-sided quotes are allowed at a product level. For this reason, the parameter *QuoteSideIndicator* with three valid values (*NotSSQAllowed*, *SSQOnEntryAllowed*, *SSQSupported*) was introduced with T7 Release 7.0. Currently, *SSQOnEntryAllowed* is set for all cash markets implying that single sided quote entry is supported but quote deletions (e.g. because of failed price non-reasonability check) affect both quote sides (i.e. double-sided quote deletion context).

After the launch of T7 Release 8.0, Xetra has the option to switch to the configuration *SSQSupported* which means that the single-sided quote will be supported as well and a rejection of one quote side of a double-sided quote may lead to a situation that only the other quote side remains in the book. To properly communicate this one-sided quote deletion context via the ETI interface, the quote status respectively quote rejection responses to

the sessions will be enhanced. Please note that the change of the quote status and quote rejection response also contributes to the non-backward compatibility to T7 Release 7.1. The members will be informed about the configuration change in sufficient time.

The settings of the *QuoteSideIndicator* will be published on the Xetra web page and via CRE in the RDF.

7.3 Resting Hidden Quantity in Execution Summary message

The Execution Summary message via the Enhanced Order Book Interface (EOBI) is published whenever an incoming order is executed. In contrast to current behaviour, with T7 release 8.0 this message will populate the resting hidden quantity (*RestingHiddenQty*) of iceberg orders that have been involved in the match.

7.4 New Role to View Trades only

A new role "TM Trade Overview" will be introduced to provide participants the possibility that users of a trading business unit can see only the trades and no orders. The role is applied for an entire market and includes only three views:

- Market View
- Trade View
- Online Times and Sales Sheet View

7.5 TES Trading with Riskless Principal

The TES (Auto) Approval functionality will be enhanced allowing now the TES (Auto) approval by users who belong to the same business unit and use trading capacity "Riskless Principal" for both sides of the TES trade at the same time.

7.6 Auto Approval Indicator in Report TC545

The report TC545 - Daily TES Maintenance will include a new valid value for the *tesActivity* (*AUT*) to indicate that the TES approval has not been manually but auto approved. The manual approval is marked as before with "APP".

7.7 Delivery Type in TES Trade Broadcast

With the release introduction, the delivery type (28890) will be integrated into the TES Trade Broadcast/TES Trade Capture Reports aligning the behaviour as implemented for on-exchange trades.

7.8 New Security Types

Two new security types will be added to *SecurityType* (167) in the reference data:

- *Subscription Right* (*SR*)
- *Investment Funds* (*FUN*)

7.9 Topology Changes of Low Frequency Gateways

The partition specific (PS) gateway is the single low-latency order entry point. The low-frequency gateways (LF) are usually slower than the PS gateways. However, the PS gateway queues requests during high loads. When this happens, requests sent to LF gateways may overtake PS gateway requests.

With T7 Release 8.0, preparatory steps will be taken to remove this overtaking possibility in T7 Xetra. After activation of the new routing, all traffic requests entered via LF gateway will be routed through the PS gateway to fix the above-mentioned situation.

To keep the additional latency as low as possible, the network access to the LF gateways will be changed before the new routing will be activated. The LF gateways will be directly connected to the distribution switch of the Co-Location network and thus the access to the LF gateways will be the same as for the PS gateways. There will be an additional delay of approximately 50 µs between LF and PS gateway if the route between LF and PS gateway involves a change of rooms, e.g. requests sent to an odd LF gateway target on an even partition.

Note that the feature will not be activated with release start but is scheduled for early 2020. An appropriate communication about the activation of the new routing and the change in network access will be provided well in advance. For markets without PS gateways (e.g. Vienna, Malta) the routing via PS gateways will not be enabled.

The below diagram illustrates the planned changes.

Topology as of now



Move of LF gateway



Rerouting of LF gateway requests



Figure 8: Topology of PS and LF Gateways

The PS gateway entry timestamp will be available in the following protocols:

- The *RequestTime* field in the ETI responses will be filled with the *PS Gateway In* timestamp once routing is activated
- In EMDI and EOBI, all fields referencing the *Matching Engine In* timestamp will be referencing the *PS Gateway In* timestamp instead, with the exception of the *AggressorTime* in the EOBI *Execution Summary* message. The number of existing LF gateways and the network access to the LF and PS gateways will remain unchanged.

For markets without PS gateways the *RequestTime* of the LF gateway will be used instead.

Please refer to the *ETI manual* and *Incident Handling Guide* for changes to the protocol.

Aspects of latency changes will be covered in an update of the *Insights into trading system dynamics* presentation available on xetra.com.

Special note for LF gateways customers: The incident handling for LF gateways will change because of the routing through PS gateways. Please be aware of the changes. DBAG will offer dedicated focus days in simulation T7 Xetra for customers to familiarize themselves with PS gateway specific failover scenarios. Please refer to the participant simulation guide and simulation calendar for more details of the dedicated focus days.

7.10 New Depository Type for NCSC-T Instruments

A new depository type *AKT* will be introduced to mark Non-Collective Safe Custody instruments settled on T2S (*NCSC-T*) as part of Clearstream (CBF) services. This depository type will be included in the *DeliveryType* in the ETI Trade Notifications, ETI TES Broadcasts, and FIX (TES) Trade Capture Reports, as well as in the report TC810 T7 Daily Trade Confirmation.

7.11 Aggressive/Passive Information in TC540

The TC540 - Daily Order Maintenance report will incorporate a new field *sideLiquidityInd* to indicate whether an order was passively or aggressively executed.

7.12 T7 GUI Launch Mechanism

Deutsche Börse offers a customized seamless solution to start and automatically receive updates of the T7 GUIs named "T7 GUI Launcher" independently of Oracle's Java SE Java Web Start mechanism for Windows. Additionally, Deutsche Börse will offer a Java SE 8 Runtime Environment without additional Java license charges to be used exclusively with the T7 GUI applications. Initially, both T7 GUI launch mechanisms, the existing Java WebStart and the new T7 GUI Launch mechanism, will be offered in parallel. The new T7 GUI Launcher and the Java SE 8 Runtime Environment are provided to participants via the member section.

For additional information, please visit the Xetra website www.xetra.com > Technology > T7 Trading Architecture > T7 GUI Launcher.

7.13 Possibility to Allow Non-CCP Trading on User Level

Cash Service Administrators will be able to define whether a user is allowed to trade non-CCP instruments on-exchange in the User Maintenance view of the T7 Admin GUI. The activation of the feature will be communicated separately.

The new flag *allowNonCCPTrading* will be introduced on user level, which will be set to true with the initial conversion. The flag will be evaluated during each order entry of a non-CCP instrument. In case it is set to false, no order entry or modification will be possible.

The flag is changeable intraday. Deletions of orders are performed after the restart of T7. The settings will be tracked in the reports *RD110 User Profile Maintenance* and *RD115 User Profile Status*. In case the flag is removed, orders of that user will be deleted when T7 is restarted.