



DEUTSCHE BÖRSE  
GROUP

# Deutsche Börse Cash Market Migration of Trading Venue Börse Frankfurt (including Börse Frankfurt Zertifikate) (XFRA)

9 May 2019



# Agenda

Introduction & Cornerstones

Functional Aspects

Technical Aspects

Services, Support & Further Information

# 1

Migration of Börse Frankfurt

Introduction &  
Cornerstones



# Agenda


History

Simulation and Production Introduction Schedule

Simulation Approach

Product Migration

# A Brief History of the Architecture



<b>Börse Frankfurt on T7</b>	Migration of Börse Frankfurt to the T7 system. The migration includes instruments of both Börse Frankfurt and Börse Frankfurt Zertifikate. After the migration all legacy interfaces of the Xetra system including the MISS Infrastructure will be decommissioned.	<b>2020</b>
<b>Xetra on T7</b>	Introduction of T7 for the Cash Market - Xetra's new trading architecture as a next generation Cash Market trading system	<b>2017</b>
<b>Continued Xetra Interface Strategy</b>	Start decommissioning of legacy interfaces and MISS infrastructure	<b>2013</b>
<b>Launch of T7</b>	Introduction of T7 - Eurex Exchange's new trading architecture	<b>2012</b>
<b>Xetra Release 10.0</b>	Introduction of socket based interfaces <ul style="list-style-type: none"><li>- Enhanced Broadcast Solution</li><li>- Enhanced Transaction Solution</li></ul>	<b>2009</b>
<b>Launch of Xetra</b>	Launch of an electronic trading system for the Cash Market	<b>1997</b>

# Börse Frankfurt goes T7

**With the migration of Börse Frankfurt to T7 technology Deutsche Börse takes the next step to a common platform for the trading of securities and derivatives on a truly state-of-the-art multi exchange trading system.**



1

## **Multi exchange trading system**

Xetra®, Börse Frankfurt and Eurex® run on a common technology. Trading participants benefit from synergies resulting from the alignment and a harmonised interface landscape and releases.



2

## **Multiple asset classes**

Via T7 access to a large variety of asset classes like equities, ETFs, bonds, funds, structured products as well as futures and options is provided



3

## **State-of-the-art technology**

T7 is a powerful state-of-the-art trading platform. Cutting-edge technology delivers ultra-low latency, robustness and safe handling of very high throughput

# Scope of Migration

With the migration of Börse Frankfurt (MIC: XFRA) to the T7 system the continuous auction market model for equities, ETFs, ETPs, bonds, funds and structured products is migrated with the following scope:

## Instrument scope and market models

<b>Asset Classes</b>	~ 12,000 Equities, ~33,500 Bonds, ~1,600 ETFs & ETPs, ~ 3,100 Mutual Funds and ~ 1,6 mio. Structured Products
<b>Market Models</b>	Continuous Auction (Specialist Model)

## Order types, transparency, trading times and clearing & settlement

<b>Order Types and Quotes</b>	Market Orders, Limit Orders, Stop Limit Orders, Stop Market Orders, Trailing Stop Orders, One-Cancels-the-Other Orders, Specialist Quotes, Quote Requests
<b>Transparency</b>	Same level of transparency as today.
<b>Trading Times</b>	08:00 to 20:00 for Börse Frankfurt (Equities, ETFs, ETPs and Mutual Funds) 08:00 to 17:30 for Börse Frankfurt (Bonds) 08:00 to 22:00 for Börse Frankfurt Zertifikate
<b>Clearing &amp; Settlement</b>	Same offering for clearing & settlement as today (CCP or non-CCP with bilateral aggregation and settlement internalization)

## Connectivity, market data and execution reports

<b>Connectivity</b>	ETI (Enhanced Trading Interface), FIX and GUI
<b>Market Data Dissemination</b>	Netted market data, un-netted market data*, Instrument and market state changes
<b>Member Confirmation</b>	Order Confirmation, Order Execution Confirmation, Trade Confirmation

\* available in co-locations only

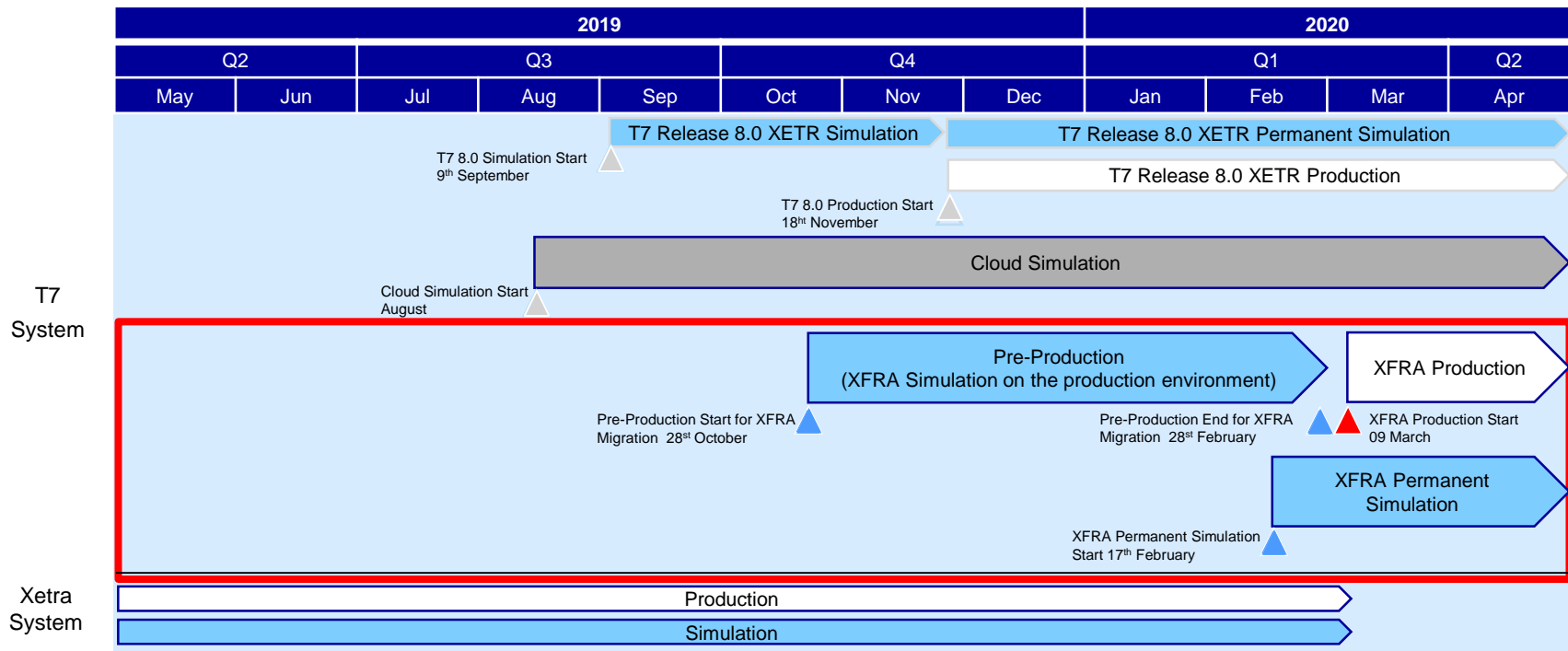
# Simulation and Production Introduction Schedule

Migration of the trading venue “Börse Frankfurt” (XFRA) will take place on 9 March 2020 based on the functionality implemented with T7 Release 8.0, which will be launched on 18 November 2019.

**Cloud Simulation** – scheduled to start in August 2019.

**Pre-Production** with an integrated environment – will start on the 28<sup>th</sup> October 2019 on the designated production environment.

**Product migration** – will be done on 9 March 2020 as ‘big bang’.





# Simulation Approach

The Simulation of the trading venue Börse Frankfurt/ Börse Frankfurt Zertifikate (XFRA) to the T7 system will be as production like as possible.

- **Several environments can be used with different focus:**

- Cloud Simulation: Adaption of interfaces to new T7 Release 8.0 software at an early stage. New market model will be available with MIC XETR.
- Existing Simulation Environment: testing of existing market models
- Pre-Production: Testing of new functionality on designated Production Environment
- New Simulation Environment for XFRA: As of the closing period of the Pre-Production the new established Simulation Environment can be used to test the new XFRA functionality. At production launch the environment will be used as permanent Simulation Environment

- **Instruments:**

- On the Pre-Production environment the number of instruments will be increased from the start in October until January/ February. There will be a period where the number of instruments on the Pre-Production is nearly identical to the number of instruments traded on XFRA production on the Xetra system.

**Optimal simulation infrastructure including the designated production environment in combination with the possibility to test the same number of instruments as in production are the fundament for a smooth migration with a big bang on 9 March 2020.**



# 2

Migration of Börse Frankfurt

Functional Aspects



# Agenda

Market Structure

Participant / Business Unit / User

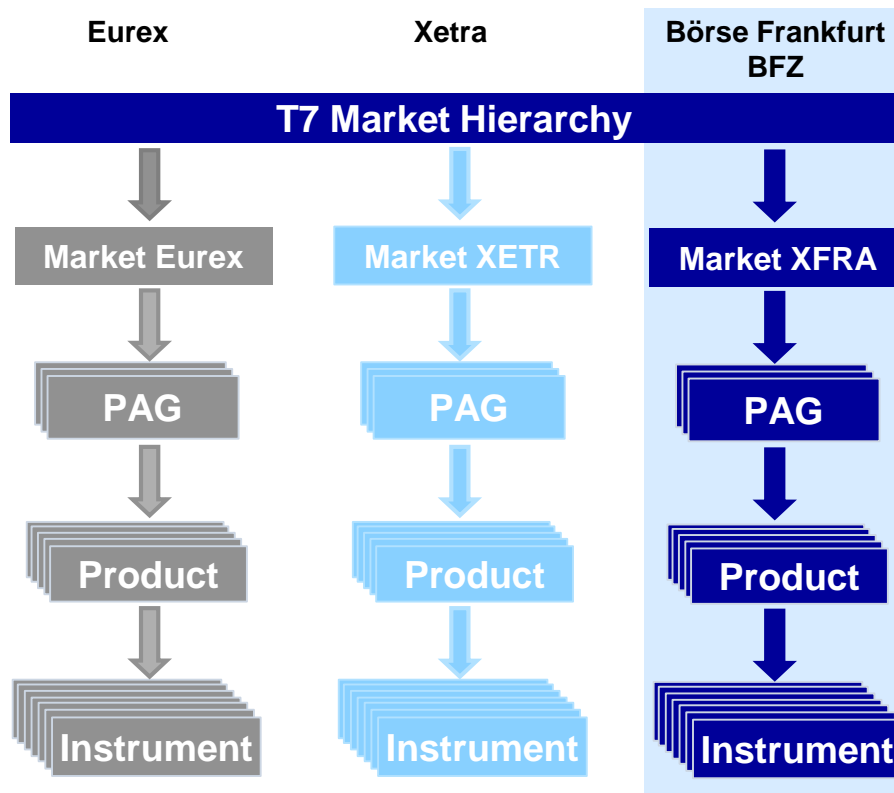
Entitlement Concept

Scope

Major Functional Changes

# Market Structure

- Both trading venues Xetra and Börse Frankfurt will be set up as different markets in separate environments
- Each market will be identified by a unique MIC



## Product Assignment Group (PAG)

- Products are grouped into PAGs
- PAGs govern entitlement in T7. In XFRA, all users will be entitled to trade all instruments.
- PAG hierarchy is maintained by the exchange

## Products

- Börse Frankfurt: Instruments are grouped per asset class
- Börse Frankfurt Zertifikate: Instruments are grouped per asset class and issuer
- Products of the same group are traded in the same way

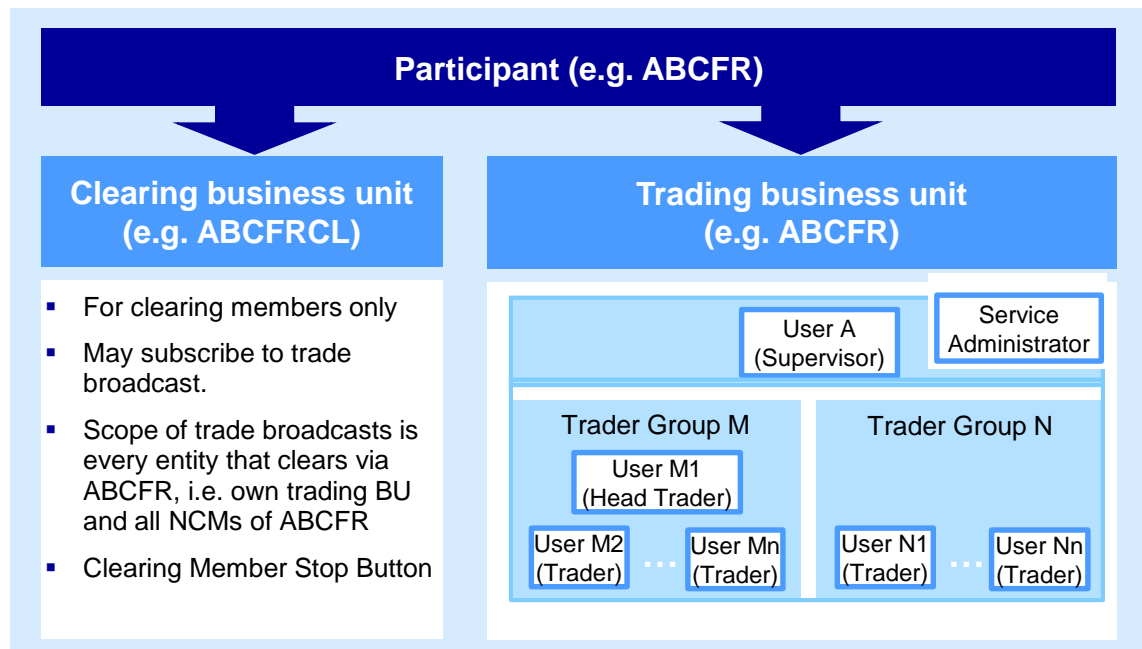
## Instrument

- Tradeable entities
- An order refers to buying/selling specified quantities of an instrument
- Instruments are set up by the exchange

# Participant, Business Unit, User – Three Level Hierarchy

Clear concept of rights & product assignments and user hierarchy:

- **Participant:** Trading participant, clearing member or service provider.
- **Business Unit:** By default, trading members will only get a trading BU; clearing members will only get a clearing BU; members both clearing & trading will get a trading BU and a clearing BU. The IDs of the participant and the business units are equal to the member ID in the Xetra system today.
- **User:** A Business Unit can have multiple users, which can be traders or service administrators. A user belongs to exactly one business unit.



- Entitlement on participant level is maintained by Market Operations.
- Entitlement on user level is maintained by service administrator(s) of the Participant.

# Participant, Business Unit, User – User Levels and User Roles

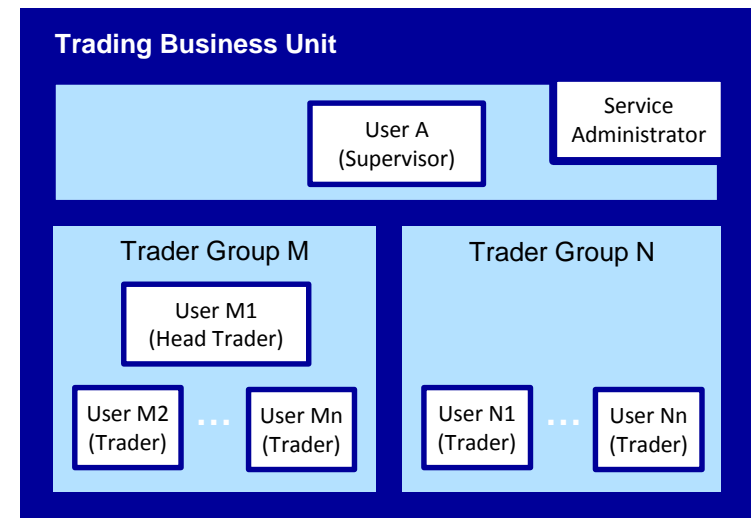
A user can be a person that interacts with the trading system (e.g. trader or administrator) or a machine (e.g. Order routing system)

The new system supports trader groups and a hierarchy of three user levels:

- **Traders** can maintain own orders only
- **Head Traders** can maintain own orders and can modify and delete the orders of traders in their trader group
- **Supervisors** can maintain own orders and can delete orders of all traders / trader groups. It is also possible to modify standard orders via other low frequency sessions or the Trader GUI

User functions depend on roles:

- Trader,
- Specialist,
- Service administrator,
- T7 entry service (TES) trader,
- TES broker,...



Quotes can only be entered using ETI sessions, the context to modify or delete a quote is therefore defined by the session used to enter a quote.

Emergency actions like „delete all“ are determined by the user level and user role.

# General Entitlement Concept – Responsibilities in Context of the Migration

Deutsche Börse AG	Participants
<ul style="list-style-type: none"><li>▪ Migration of the Xetra environment to the T7 platform</li><li>▪ Migration of reference data, including instruments as well as members</li><li>▪ Migration of the entitlement:<ul style="list-style-type: none"><li>▪ Assignment of all product groups to participants</li><li>▪ Assignment of roles to users in regard to their former RAL setup</li></ul></li></ul>	<ul style="list-style-type: none"><li>▪ Assessment and maintenance of the user and entitlement configuration</li><li>▪ Assignment of new roles to users</li><li>▪ Set-up of clearing business unit users</li></ul>

# General Entitlement Concept - Mapping of RALs to Roles

- Xetra: RALs entitle user to execute specific operations
- T7: the equivalent to RALs are resources. Resources are bundled in pre-defined roles.
- Users will be assigned pre-defined roles in T7 equivalent to their RAL entitlement in Xetra\*

In the first example the user is will be assigned the Cash Trader role since he is entitled to *Enter Orders*

The Trader role also includes other resources, e.g. display of orders and trades, statistics

Attributes		Authorizations
ResCode	ResName	Access
1	Xetra Inquire User List	<input checked="" type="checkbox"/>
2	Xetra Inquire User	<input checked="" type="checkbox"/>
3	Xetra Add User	<input checked="" type="checkbox"/>
4	Xetra Modify User	<input checked="" type="checkbox"/>
5	Xetra Delete User	<input checked="" type="checkbox"/>
6	Xetra Inquire Order	<input checked="" type="checkbox"/>
7	Xetra Enter Order	<input checked="" type="checkbox"/>
8	Xetra Modify Order	<input checked="" type="checkbox"/>
9	Xetra Delete Order	<input checked="" type="checkbox"/>
10	Xetra Inquire Quote	<input checked="" type="checkbox"/>
11	Xetra Enter Quote	<input checked="" type="checkbox"/>
12	Xetra Delete Quote	<input checked="" type="checkbox"/>

Cash Trader	
Role ID	Functions
102	Add Order
	Modify Order
	Delete Order
	Delete all orders
	Cross Trade
	Quote Request
	Add Short Order
	Modify Short Order
	Allow Cross Prevention

In the second example the user be assigned the *Cash Service Administrator* role since he is entitled to *Add Users*

The *Cash Service Administrator* role also includes the modification of users, maintenance of their entitlement, etc:

Attributes		Authorizations
ResCode	ResName	Access
1	Xetra Inquire User List	<input checked="" type="checkbox"/>
2	Xetra Inquire User	<input checked="" type="checkbox"/>
3	Xetra Add User	<input checked="" type="checkbox"/>
4	Xetra Modify User	<input checked="" type="checkbox"/>
5	Xetra Delete User	<input checked="" type="checkbox"/>
6	Xetra Inquire Order	<input checked="" type="checkbox"/>
7	Xetra Enter Order	<input checked="" type="checkbox"/>
8	Xetra Modify Order	<input checked="" type="checkbox"/>
9	Xetra Delete Order	<input checked="" type="checkbox"/>
10	Xetra Inquire Quote	<input checked="" type="checkbox"/>
11	Xetra Enter Quote	<input checked="" type="checkbox"/>
12	Xetra Delete Quote	<input checked="" type="checkbox"/>

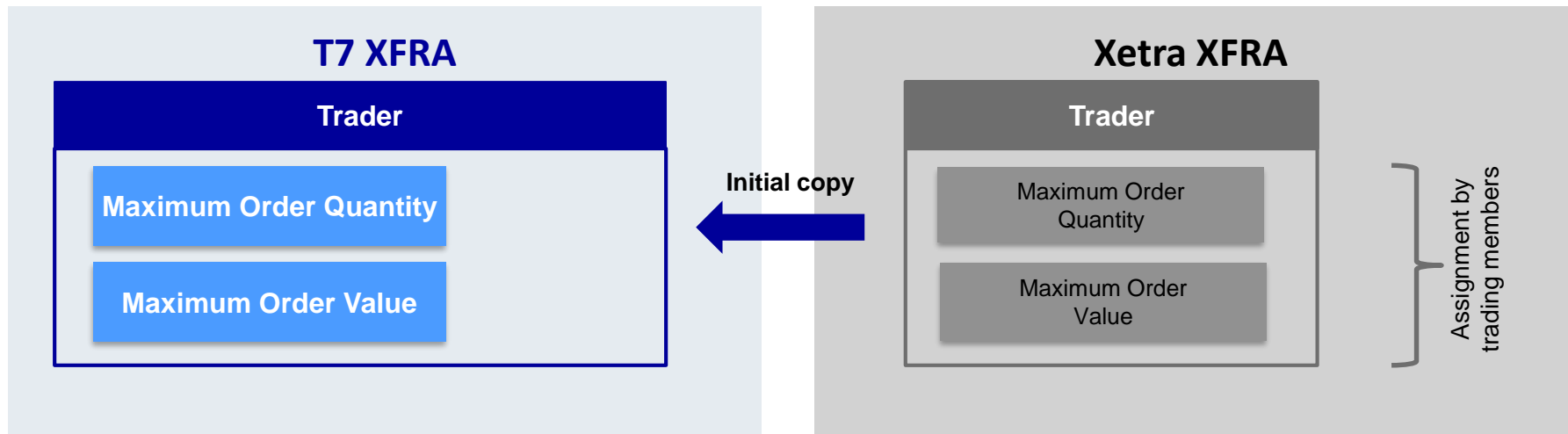
Cash Service Administrator	
Role ID	Functions
101	User Maintenance View
	STOP View
	Sessions View
	Bandwidth Monitor

\* More information is available in the *T7 Participant and User Maintenance Manual – Xetra*.



# General Entitlement Concept – Trading Limits

- Maximum Order Value and Maximum Order Quantity will be migrated from the Xetra system to T7 for all users of the trading venue XFRA
- Maintenance on user level in T7 is possible analogue to the Xetra system
- Maximum Order Values and Maximum Order Quantities will be applicable for all products of Börse Frankfurt and Börse Frankfurt Zertifikate



# Continuous Auction with Specialist

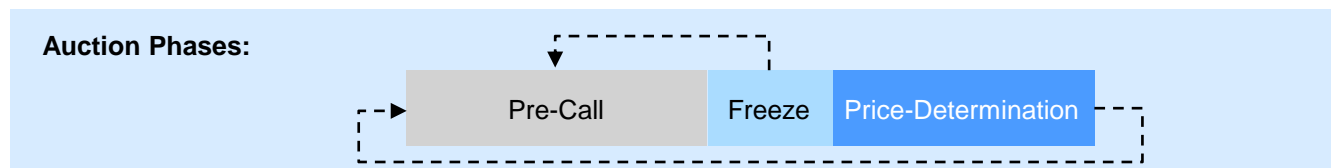
## Trading Day

- Continuous Auction with 1 to n auctions, where the number of auctions depends on trading activity in the respective instrument.
- Closed order book, solely Specialist's standard quote is published by trading system and via CEF (BFZ: only via CEF)



## Auctions

- During Pre-Call all trading participants can add, modify and delete orders.
- Order book freeze initiated by Specialist as soon as limit control system indicates an executable order book situation. Order submissions, modifications and deletions are entered in a locked stock during freeze and are processed after the order book is unfrozen (directly or after price determination).
- Specialist is able to add, modify and delete orders and quotes on own account or orders on behalf of other trading participants during freeze.
- Price determination according to modified principle of most executable volume which is triggered by a matching quote entered by the Specialist



\* The exact timing of the different trading phases depends on the specific asset classes. The schedule is planned to match the existing setup.

# Single and Special Auction

## Single Auction

- Only one price determination is allowed. An indicator on instrument level is available to identify these instruments.



- Specialist will take care of one price determination per business day



- Price distribution via market data interfaces as auction price.

## Special Auction

- For federal bonds and subscription rights\* a „Special Auction“ price determination is supported. Identification is possible on instrument level.
- For these instruments the new trading restriction „Special Auction“ can be entered.

\* Last trading day



- If orders with „SA“ are available, the Specialist can initiate a special auction price determination by entering a matching quote with trading restriction „SA“.
- All orders with and without trading restriction „SA“ are included in Special Auction price determination.



- Price distribution via market data interfaces as auction price and indicator „Special Auction“.

# Orders - Attributes

- For the trading venue 'Börse Frankfurt' orders can only be entered as persistent standard orders.
- No entry of non-persistent standard orders or lean orders is possible.
- Only quotes will be handled like non-persistent lean orders.

## Standard

- The complete order history can be recovered via retransmission requests. This order data is visible to all low frequency sessions belonging to the same business unit (via subscription to the listener data broadcast).
- Should be used for low frequency sessions



## 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

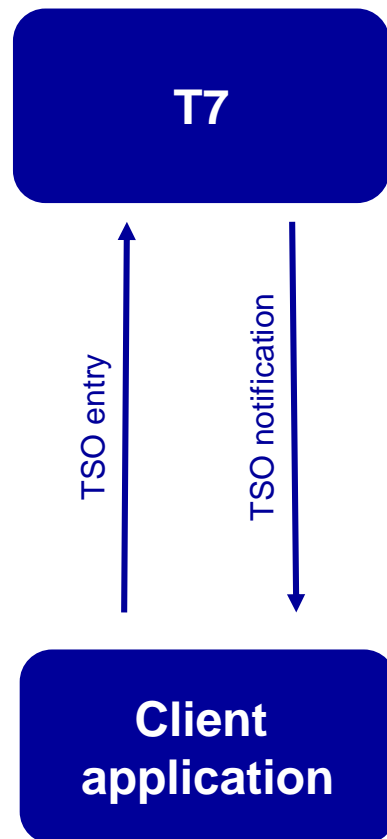
# Orders - Profiles

For the trading venues 'Börse Frankfurt' and 'Börse Frankfurt Zertifikate' the following order types are supported:

Order Profile	Order Profile Attributes															
	Internal Order Types & Restrictions										Allowed Price Condition		Allowed Order Validity			
	Regular	Stop	Iceberg	TSO	OCO	AOO	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		✓		✓								✓			✓	✓

# Major Functional Changes - Trailing Stop Order Handling in T7

- Trailing stop orders will be monitored directly in T7 & specialist systems
- Triggering of trailing stop orders will be based on matching quotes as for regular stop orders
- Trailing stop price updates will be broadcast to entering business unit and Specialist (push instead of pull)

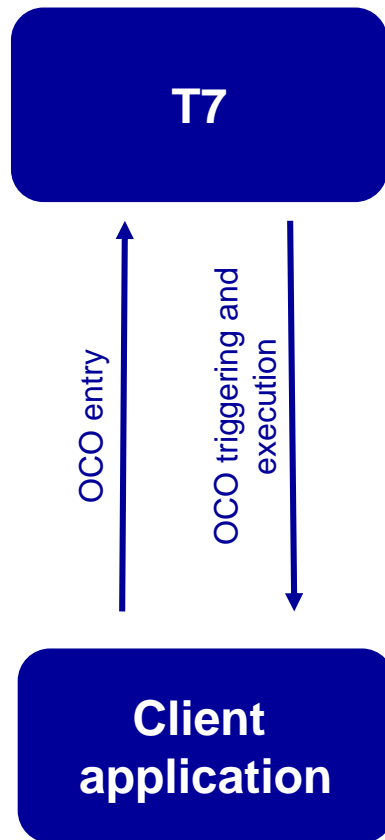


## TSO updates and trigger handling

- TSO updates are performed based on Specialist's standard quote and matching quote:
  - For buy TSO, if ask quote price + delta < trailing stop limit, then update is applied as trailing stop limit = ask quote price + delta
  - For sell TSO, if buy quote price – delta > trailing stop limit, then update is applied as trailing stop limit = bid quote price – delta
- TSO updates will be provided to client applications and Specialist in defined netting intervals.
- After a stop limit update was broadcast, further stop limit updates for the same TSO within the netting interval will not be published directly.
- Additionally, Specialist will receive TSO updates
  - When the Auction phase is switched to Freeze
  - When the TSO is triggerable by the Specialist's standard quote
- TSO will participate in price determination as a market order when its current trigger limit is triggerable by Specialist's matching quote.
- TSO is not modifiable by the Specialist.

# Major Functional Changes - One-Cancels-Other Order Handling in T7

- One-cancels-Other orders will be monitored directly in T7 & specialist systems
- Triggering of stop orders uniformly based on matching quotes

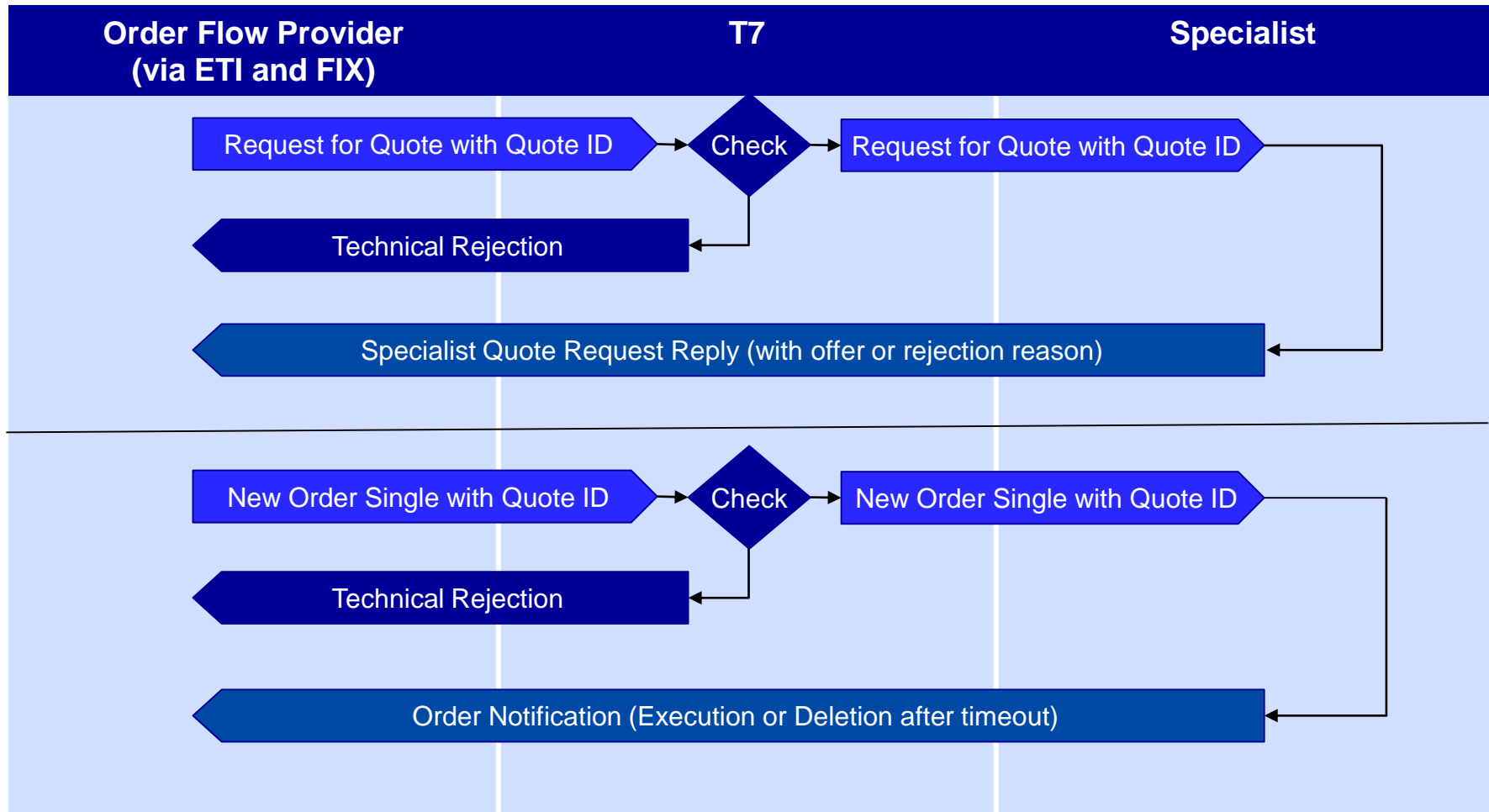


## OCO Order handling in T7

- OCO order will be triggered by Specialist's matching quote
- Upon price determination after freeze phase
  - If the stop limit of the OCO order is triggerable against the matching quote, it will participate as a market order during price determination / price calculation,
  - Otherwise it will participate with its limit part.
- Price collar checks will apply on the limit and stop price against the last price
- OCO order is not modifiable by the Specialist

# Major Functional Changes - Quote Request Solution (QRS)

- Quote request functionality for retail customers will be extended to all asset classes
- The QRS Workflow resembles the workflow currently implemented in Xetra.



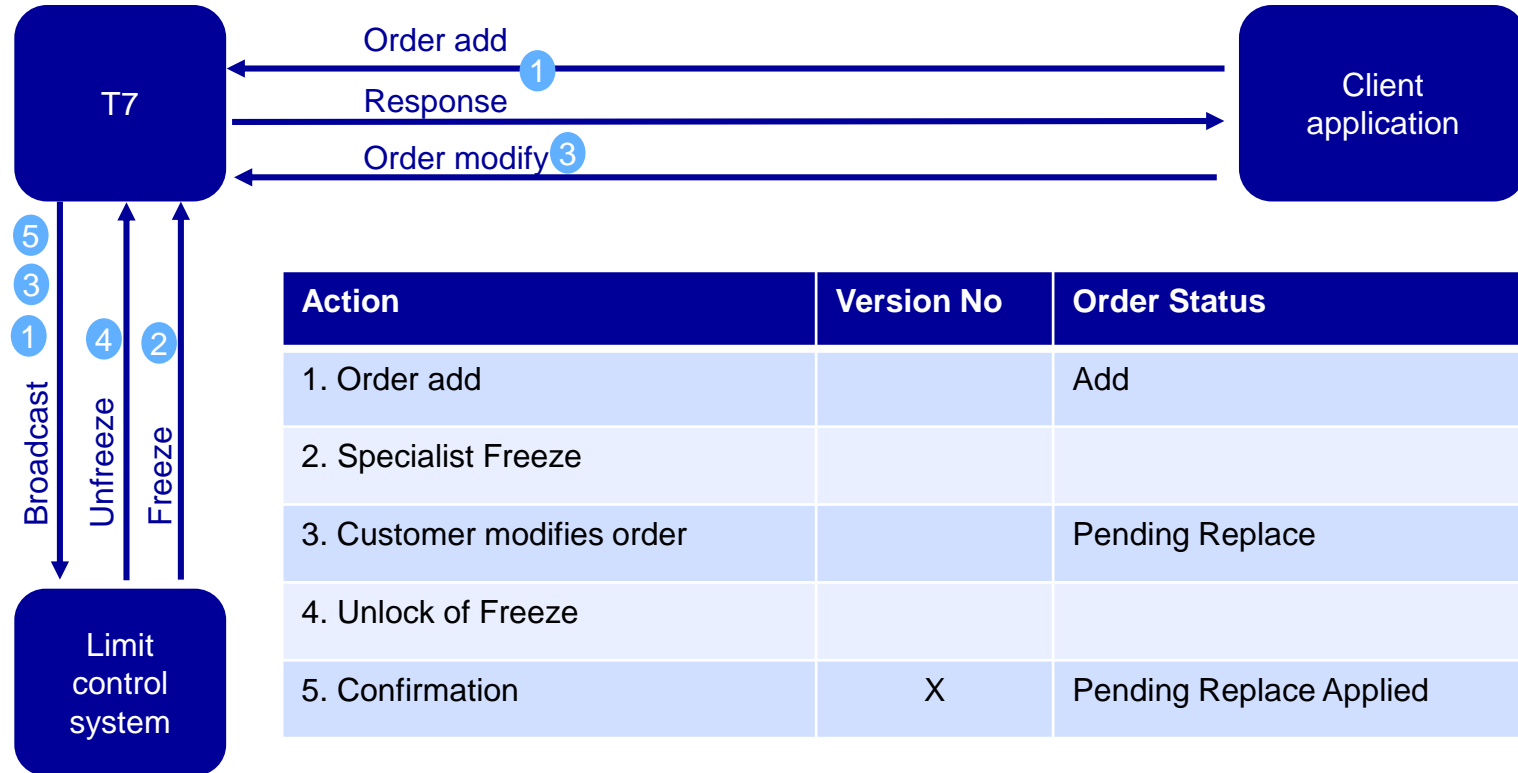


# Major Functional Changes - Locked Stock (LS) Scenarios – Xetra Trading System vs. T7

Action	Xetra trading system	T7
<b>1. Orderbook freeze by Specialist</b>	<ul style="list-style-type: none"> <li>Order transactions are buffered in locked stock and marked as 'pending'</li> <li>Provision of a new order number for each pending transaction.</li> <li>Pending transactions are netted resulting in only one overall pending order action</li> </ul>	<ul style="list-style-type: none"> <li>Order transactions are buffered in locked stock and marked as 'pending'</li> <li>No new order number will be provided for pending txns. A pendingSequenceNumber will be used for proper ordering</li> <li>1-n pending transactions are stored individually.</li> </ul>
<b>2. Execution</b>	<ul style="list-style-type: none"> <li>Partial/full execution applies on the active order</li> </ul>	<ul style="list-style-type: none"> <li>Partial/full execution applies on the active order</li> </ul>
<b>3. LS resolution after Freeze if order still exist (pending transactions can be applied)</b>	<ul style="list-style-type: none"> <li>One broadcast for the netted pending transaction</li> <li>Linkage via OrderNoLinked</li> </ul>	<ul style="list-style-type: none"> <li>One broadcast for each pending transaction</li> <li>Order number will remain unchanged</li> <li>Order version number will be increased in case priority has been changed by applied pending modify</li> </ul>
<b>4. LS resolution after Freeze if orders was matched/ deleted (pending transactions cannot be applied)</b>	<ul style="list-style-type: none"> <li>Final cancellation message for the netted pending transaction</li> </ul>	<ul style="list-style-type: none"> <li>Last broadcast message (from 2 or 3) will contain „pencdingsCancelled“ to indicate that pending transaction(s) have been cancelled</li> </ul>

# Major Functional Changes - Locked Stock Scenario in XFRA

## T7 - Example



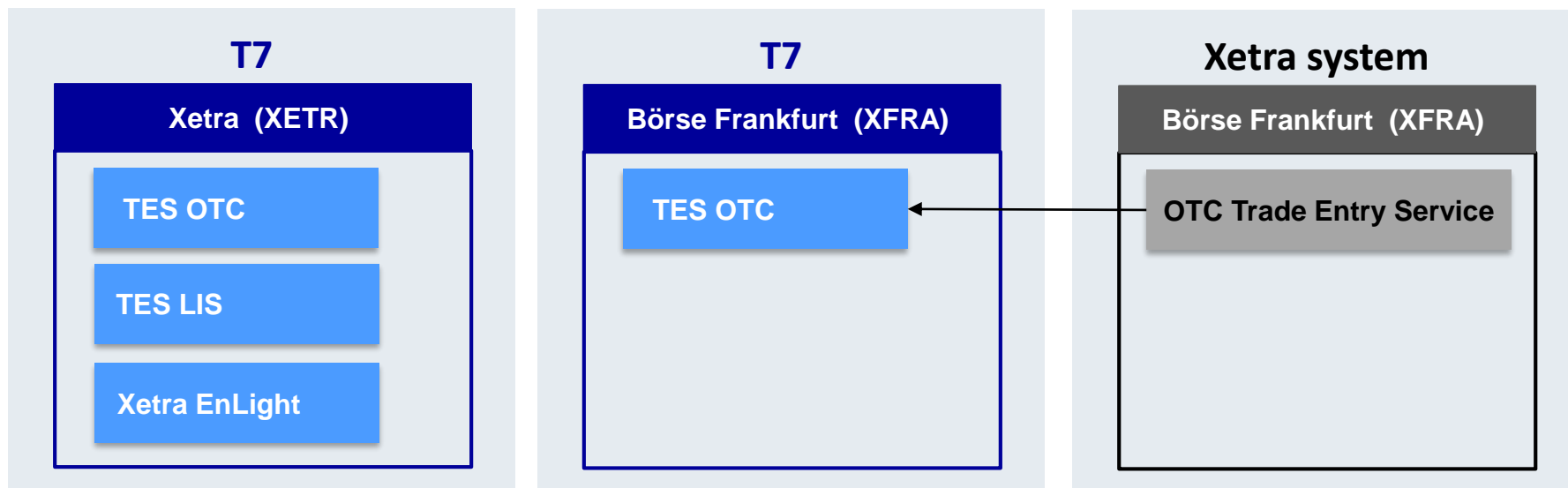
- Pending message will be sent to customer and Specialist.
- After unfreeze pending replace request will be resolved with an increased version number. Respective message will be sent to customer and Specialist.

## Major Functional Changes - Quoting Periods

- Quoting Periods define the periods in which a quote can be submitted in T7.
- A Starting and an Ending Time are set on instrument level in case Quoting Periods are defined for an instrument.
- In case quotes are submitted outside of defined Quoting Periods, the entry is rejected.
- Quoting Periods are included in RDF.
- All Single Auction instruments will have a Quoting Period from 11 a.m. to 1 p.m. during which one price determination either via matching quote or PWT is allowed.
- Börse Frankfurt Zertifikate: Issuer defined Quoting Periods in eListing are inserted into T7.

## Major Functional Changes - OTC and T7 Entry Service (TES)

- Currently on Börse Frankfurt (XFRA) the OTC Trade Entry Service is offered. Trades that are bilaterally agreed outside the trading system can be entered for settlement.
- With the migration of Börse Frankfurt to T7 the TES OTC functionality is offered, which allows members to enter bilaterally agreed trades that have been agreed outside the trading system.
- In addition to the TES OTC functionality the TES type TES LIS is offered on the trading venue Xetra (XETR) on T7. With TES LIS a functionality for on-exchange off-order book transactions for large in scale sizes is provided. It is currently under discussion whether TES LIS will also be provided for Börse Frankfurt.
- On T7 Xetra EnLight is offered for the trading venue Xetra. With this functionality on-exchange off-order book transaction for large in scale sizes can be conducted on T7. It is currently under discussion whether Xetra EnLight will also be offered for the trading venue Börse Frankfurt.



# Major Functional Changes - TVTIC Generation

## TVTIC - Trading Venue Transaction Identification Code

The TVTIC availability and generation in T7 differ from Xetra:

- In ETI, *RegulatoryTradeID* (Tag 1903) contains TVTIC information in Trade Notification and TES Trade Broadcast.
- In Report TC810 T7 Daily Trade Confirmation, tvtic contains the TVTIC information.

TVTIC Creation Rule:

➔ Envir\_Flag (1) + SecurityID (20) + MDEntryTime (20) + DealType (1) + MatchStepID (10)

### Envir Flag (1):

To be set to 1 for transactions in T7 system.

### SecurityID (20):

Field length is fix 20 digits. The part on the leading zeros needs to be provided to reach the fixed length

- RDF, MDI, ETI: SecurityID (Tag 48)
- FGW: SecurityAltID (Tag 455)

### TranTime (20):

Field length is fix 20 digits. The part on the leading zeros needs to be provided to reach the fixed length.

- ETI: Trade Notification TransactTime Stamp (Tag 60)
- MDI: MDEntryTime (Tag 273)
- FGW in Execution and Trade Capture Report UTransactTime (Tag 30060)

### DealType (1):

- Valid Value "0" for on-book
- Valid Value "1" for off-book

### MatchStepID (10):

Field length is 10.

For on-book:

- ETI: TradeMatchID (tag 880)
- MDI: MDEntryID (tag 278)
- FGW: TradeMatchID (tag 880)

For off-book:

- ETI and FGW: packageID (tag 2489)
- MDI: MDEntryID (tag 278)

# Further Functional Changes Compared to XFRA on Xetra

## Order Quantity Modification

- Order quantity can be modified after order entry.
- Increasing quantity will change the order version number (priority change).
- Order quantity modification in Continuous Auction will be allowed for non-Specialist traders as well.
- TSO/OCO are not modifiable by the Specialist.

## Instrument Reference Data

- **Warrants** can be listed with Unit of Quotation *Unit* or *Percent*.
- Percentage-listed structured instruments will be grouped under 'WAR' instead of 'BON' (currently ~ 120.000 instruments).
- Warrants listed in percent will always have an interest rate calculation method.
- Warrants listed in pieces will never have an interest rate calculation method.
- **Bonds** can be listed with Unit of Quotation *Unit* or *Percent*.
- Bonds always have an interest rate calculation method defined.
- Unit quoted bonds will be grouped under 'BON' instead of 'EQU'.

## Settlement

- Settlement internalization and bilateral aggregation are possible on settlement account level .



# 3

## Migration of Börse Frankfurt

### Technical aspects



# Agenda

Technical Characteristics

Member Interfaces

GUI

ETI

FIX

MDI

EOBI

Reference Data

Reports and Files

Major Technical Changes



# Overview of T7 – Technical Characteristics

Common system for all DBAG cash and derivatives markets

Trading platform based on Linux with various system components; no VMS-system

- Partitions concept for better scalability, throughput and separation of failure domains
- Direct messaging concept for high throughput (no message broker)

New external interfaces for exchange participants

- New message based interfaces for trading and market/reference data
- New GUIs for trading and administration
- No MISS / VALUES API

Reports provided exclusively via the CRE

Multi market capability

- Used for Eurex Exchange, Cash Market and partner exchanges and European Energy Exchange (EEX)

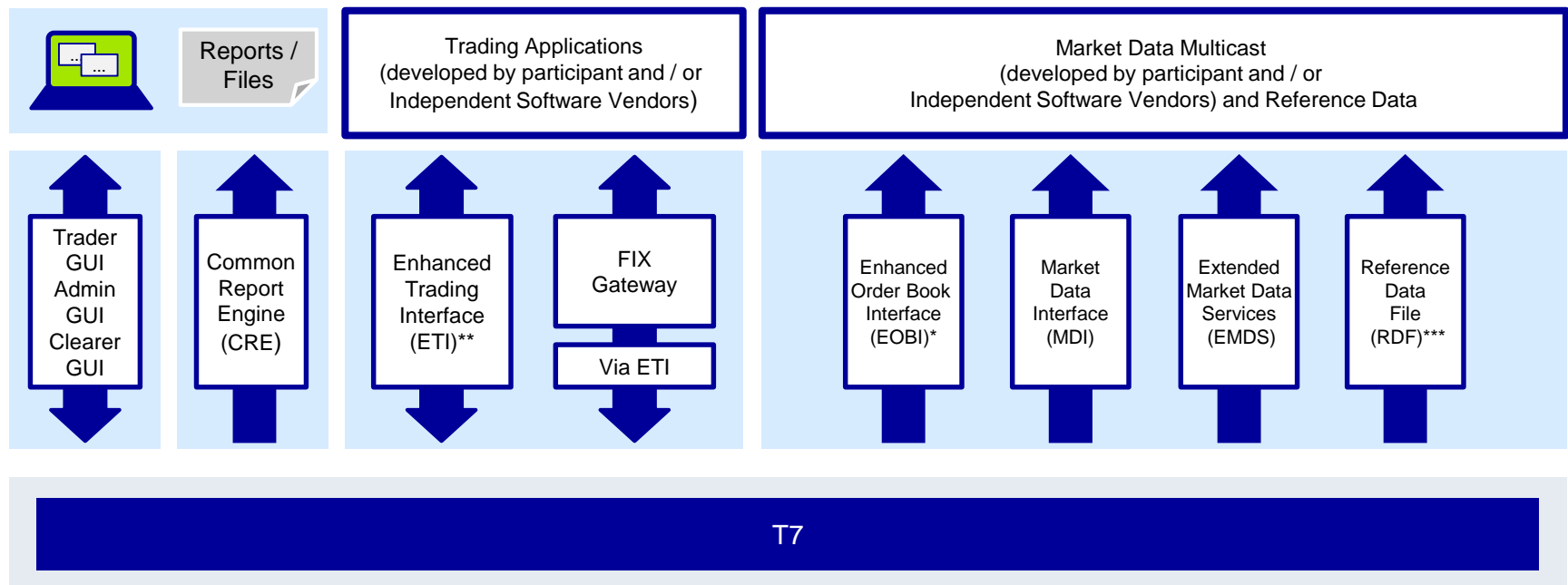
Platform inherent functional changes\*

- New hierarchy of participants and business units and the addition of the Supervisor role
- New entitlement concept with pre-defined roles replacing the current concept of RALs

\*More details in the forthcoming Functional and Technical release notes

# Overview of T7- Interface Landscape

- One Trader GUI, Admin & Clearer GUI for all Deutsche Börse cash markets (XETR and XFRA). Separate login required for XETR and XFRA
- Distribution of reports via Common Report Engine
- New trading interfaces - Enhanced Trading Interface and FIX Gateway (via ETI)
- New market data interfaces for netted and un-netted\* market data and new reference data interface



• available in co-locations only

\*\* including Specialist functionality

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

# Member Interfaces – High Level Summary

	Exchange GUIs			Market Data			Reference Data		Trading Interfaces	
				Interfaces						
	Admin	Trader	Clearer	EOBI	MDI	EMDS	RDF	CRE	ETI	FIX
GUI	GUI	GUI								
Order Transactions		✓							✓	✓
Quote Transactions									✓	
Private Order / Execution Information		✓							✓	✓
Private Trade Information		✓	✓						✓	✓
Market Data		✓		✓	✓	✓				
				(un-netted)	(netted)	(Trades)				
User Administration	✓		✓							
Instrument Referenced Data							✓	✓		
Reports								✓		
Clearing Member Stop/Release NCM			✓							
Specialist Functionality									✓	

## Exchange GUIs

- One for core trading and one to maintain user master data

## Enhanced Order Book Interface (EOBI)

- Provides order-by-order public market data

## Market Data Interface (MDI)

- Provides netted price level aggregated public market data for low-bandwidth connected customers

## EMDS (Extended Market Data Services)

- Provides a real time and replay dissemination of all on-exchange trade prices

## Common Report Engine (CRE)

- Provides public reference data as a file download (RDF)
- Provides reports and files

## Enhanced Trading Interface (ETI)

- Performs order routing via TCP/IP socket interface
- Native interface which uses FIX 5.0 syntax but partly varying semantics
- Contains relevant functionality for Specialists

## FIX Gateway

- Provides order routing and order trade info access for FIX 4.2 and FIX 4.4 customers order routing devices  
i.e. it can host trading and/or back office sessions

# Member GUIs

## Trader GUI

For on-exchange trading:

- Latest and statistical Market information (e.g. Market prices with Market depth, Time & Sales data)
- Trading Support (e.g. Order add/modify/delete)
- Private trading information for orders (including Order History for the current business day) and trades
- T7 Entry Service
- News Board
- Highly customisable (e.g. configurable views, instrument profiles, alert notifications, filtering)
- All views automatically updated
- Modern look and easy to use
- No software installation required
- Internet or leased line connection

Limitations:

- Entry and display of quotes not supported
- QRS functionality not supported

## Admin GUI

For administrative functions:

- User setup and maintenance
- Assignment of user entitlements
- Maximum order value and quantity
- Basic risk protection services ("Stop Button")
- Sessions view and bandwidth monitor

## Clearer GUI

For back office and clearing risk functions:

- Backoffice Trades
- Clearing Member: Stop/Release NCM
- Clearing user setup

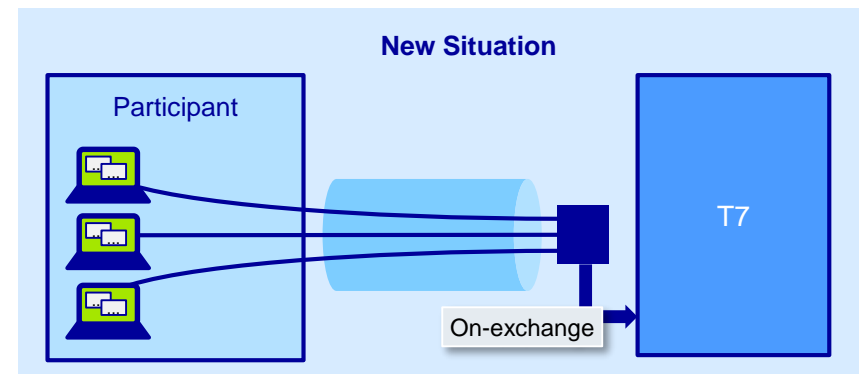
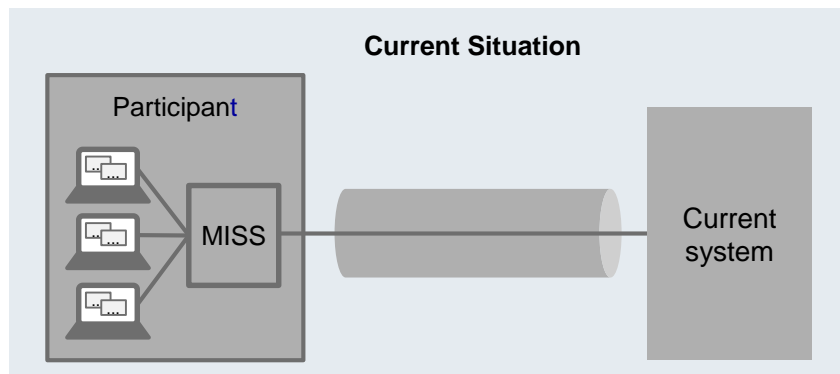
# Member GUIs – Technical Aspects

New Java-based GUI solution:

- No need for installation of front-end GUI
- GUI frontend updated by Xetra as latest version will be downloaded automatically
- Only internet connections require a certificate for client authentication – similar to Common Report Engine and Eurex Clearing FIXML Interface

Connectivity:

- No MISS used as concentrator for market data provided to the GUIs, thus bandwidth requirements increase with the number of open screens
- Access via leased lines and internet possible



# Enhanced Trading Interface (ETI) – Technical Features

## Message based

T7 ETI is an asynchronous, message-based interface. Connection between participant and T7 backend established via TCP/IP session.

- Low footprint: no special hardware required; no exchange software to be installed; free choice of operating system, programming language and compiler versions
- Adoption of standards: messages follow semantics of FIX standard V5.0 SP2 (including officially approved extension packs)
- Performance oriented: proprietary session layer and flat binary encoding (defined order of fixed-length fields and arrays of fixed-length elements)

## Session oriented

T7 ETI based applications receive information on orders/quotes and their executions which were entered in their own session

## Subscription mechanism

T7 ETI provides information across sessions via a subscription mechanism for broadcast streams (including new specialist stream)

## Throughput limits / throttle

The number of transaction requests transmitted to T7 per time interval by each participant session is limited

## Full control in case of a failover

Participant applications will be required to take full control of failover. Heartbeats can be used to support detection of malfunctions between the client application (trading session) and the gateway

# Enhanced Trading Interface (ETI) – High Level Concepts

## General concepts

- Order/Quote/Execution messages do not completely echo the data of the original order
- No state recovery (inquiry) is supported
- All order events are recoverable for standard (non-lean) orders
- Execution notifications and unsolicited events are recoverable
- A listener broadcast contains order events for standard (non-lean) orders

## Session oriented interface

- Responds to each request on the same session after the request was submitted
- Sends unsolicited messages when changes / executions to any order / quote received

## Ownership of orders & quotes

- Orders are owned by the user within a session
- Quotes are owned by the session

## Enables subscription to trading in broadcast form

- Drop copy of order events
- Trade confirmation at a business unit level

## Provides all the trading functions

- Order handling
- Quote handling
- Quote Request Solution
- Execution notifications
- TES OTC
- Specialist functionality

## Provides trading support information

- News messages from market supervision
- Private risk control messages

# Enhanced Trading Interface (ETI) – Session Concept

Two session types are supported for Börse Frankfurt:

## Low Frequency (LF):

- Intended for participant applications that rely on the complete recoverable order history
- May also be used for the receipt of broadcasts

## Back Office (LF):

- Intended for settlement and clearing business units plus back office departments of trading members
- Drop copy functionality available as part of risk processing

Functionality	Low Frequency Session	Back Office Session
Standard Order (non-lean)	Yes	No
Persistent Order	Yes	No
Quotes (non-persistent)	Yes	No
<u>Update</u> : Modification “on behalf” functionality*	Yes (for standard orders)	No
Delete “on behalf” functionality*	Yes	No
Listener Broadcast (order history)	Yes	Yes
Trade Broadcast	Yes	Yes
News Broadcast	Yes	Yes
Service Availability Broadcast	Yes	Yes
Order Validity Types	GTD, GTC, GFD	n/a

\* Please note, “On-behalf” means on behalf of another session. “Delete” includes also the de-activation and re-activation functions for quotes.



# Enhanced Trading Interface (ETI) – Order / Quote Response

Order / quote response information (execution report) is sent out immediately after the order or quote has been processed by the T7 matcher.

## Order / quote response information is preliminary

- Order / quote response execution information is always preliminary. Only the corresponding Trade Capture Report (sent via Trades broadcast) is legally binding.
- Market data is based on order execution information.\* Market data interfaces provide trade price messages on the basis of preliminary information.

## Limited order and quote response

- Order / quote responses are only sent within the initiating session
- Execution reports do not contain all data of an order / quote (e.g. no quantity, price, etc.). Participants' applications are required to maintain the state of orders / quotes
- Listener broadcast contains all order parameters (different layout compared to direct response)

\* Dependent on order book transparency

# Enhanced Trading Interface (ETI) – Order Book Restatement

## No order status inquiries

- Order status inquiries are not supported by the ETI
- Participants must maintain the state of orders based on the Execution reports
- For lost order information, participants must rely on retransmission recovery and the order book restatement

## Order book restatement

- Sent at start-of-day and in case of an exchange system failure, i.e. a market reset
- Order book restatement messages provide execution reports for each restated order
- Restatement messages are only sent for persistent orders. There is no restatement for quotes and lean orders, as no quotes and lean orders exist at start-of-day or they are deleted in case of a market reset
- Order book restatement messages are also sent on the listener broadcast
- Order book restatement is available in the Specialist Specific information

## Retransmission request of restatement messages

- Order book restatement messages are recoverable\*
- The owning session can request a retransmission if it was not logged on at the time

\* Retransmission requests are also supported for broadcasts (Listener, Trades, News and Risk Control).

# Enhanced Trading Interface (ETI) – Failover Concepts

Two groups of ETI gateways.

- Both groups of gateways are built redundantly
- Two lines highly recommended to ensure access in case of a line failure

Network failover.

- ETI sessions will be disconnected from the gateway
- No automatic session failover if a connection to the gateway is lost
- Application requires failover mechanism to re-establish an ETI session connection to an alternative gateway

Application failover.

- Active sessions will be disconnected upon gateway failure
- Application can re-establish ETI session connection to one gateway

# FIX Gateway – Interface Characteristics and FIX Sessions

## Characteristics

Standard session-based FIX interface supporting FIX versions 4.2 and 4.4.

Provides trading functionality for on-exchange trading and TES on T7 Cash.

- Does not support quoting functionality
- Does not provide market / reference data
- Provides enhanced information on mass cancellation events (e.g. in case of a market reset)

## FIX session concept

FIX sessions are identified by SenderCompID and password.

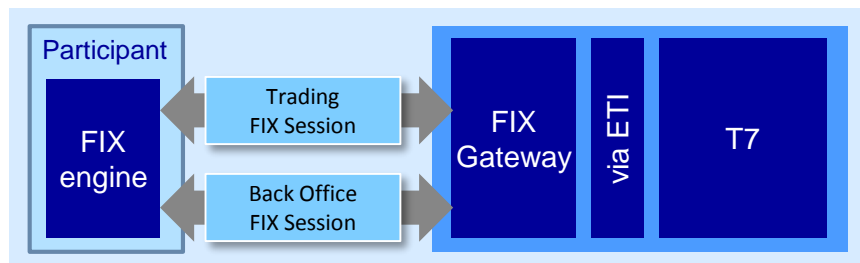
For XFRA, dedicated sessions are required.

Trading FIX session:

- Used for order management
- A session only receives information for all of its own orders and their executions\*
- One session can be shared by several traders

Back Office session:

- Used for trade capture at a business unit level
- Optional drop-copy functionality for standard orders



\*All responses are optimistic. Only trade capture reports are legally binding.

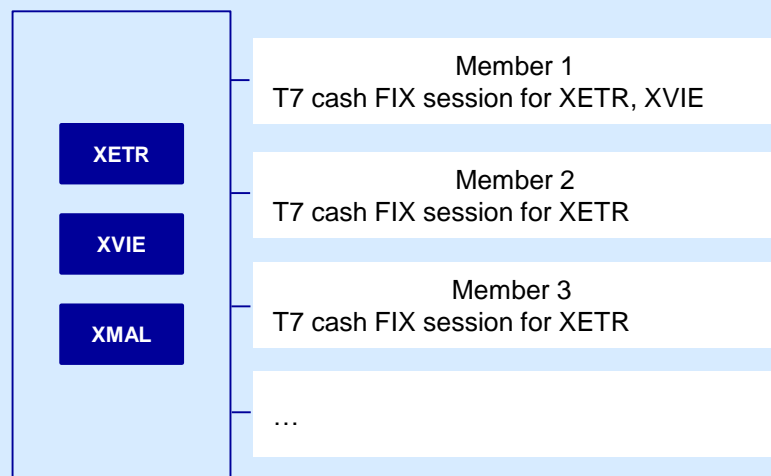
# FIX Gateway - Xetra FIX Gateway vs T7 Cash FIX Gateway

	Xetra FIX-Gateway	T7 FIX-Gateway for Cash
FIX Message flows and message formats	Message Flows based on ETS interface	Message flows similar to Xetra FIX-Gateway. Messages formats will be different, adapted to the ETI interface and the T7 functionality.
Supported FIX-Versions	FIX 4.2 and FIX 4.4	FIX 4.2 and FIX 4.4
Instrument Identification	ISIN, Isix	ISIN, SecurityID
Back Office Session functionality	Functionality on Member Level <ul style="list-style-type: none"> <li>• Trade Confirmations</li> <li>• Drop-copy for persistent orders (optional - activation via Xetra Member Section)</li> </ul>	Functionality on Business Unit Level <ul style="list-style-type: none"> <li>• Trade Confirmations</li> <li>• Drop-copy for standard orders (optional - activation via Xetra Member Section)</li> </ul>
Trading Session functionality	<ul style="list-style-type: none"> <li>• Order Handling</li> <li>• Quote Request Solution</li> <li>• OTC Trading functionality (Xetra Trade Entry)</li> </ul>	<ul style="list-style-type: none"> <li>• Order Handling</li> <li>• Quote Request Solution</li> <li>• TES OTC</li> <li>• Risk Control Events</li> </ul>
Initial order transfer / order book replay	Optional Can be deactivated via Xetra Member Section	Mandatory Cannot be deactivated
Supported Order Attributes	Persistent, Non-persistent	Only Standard orders (no support for lean orders) Persistent, Non-persistent (Not for XFRA)
Support for all Order Types, Price Conditions, Validity- and Execution-Restrictions implemented in Backend	✓	✓

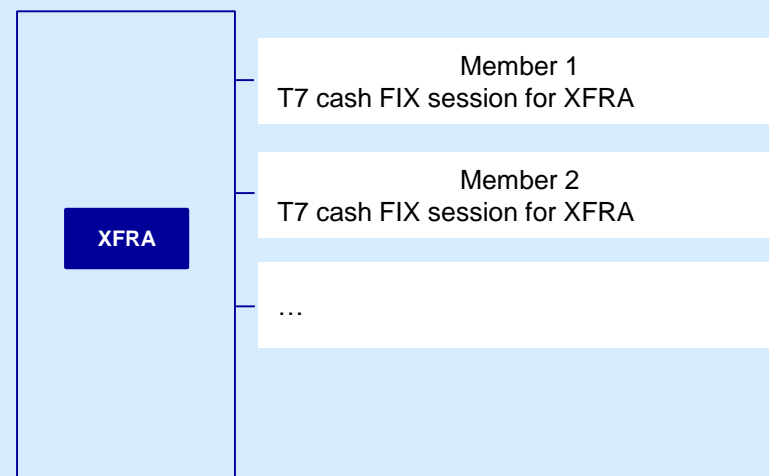
## FIX Gateway – Separate Gateways for XETR and XFRA

- New T7<sup>®</sup> FIX Gateway for cash markets will replace the existing Xetra<sup>®</sup> FIX Gateway for the trading venue Xetra (XFRA) after migration. The existing Xetra FIX Gateway will be switched off.
- No common FIX sessions for the T7 FIX Gateway for Xetra on T7 (XETR) and Börse Frankfurt including BFZ on T7 (XFRA)
- Additional FIX sessions will be required for accessing XFRA. These can be ordered via the Xetra Member Section.

### T7 FIX Gateway for XETR



### T7 FIX Gateway for XFRA



**Configuration after migration**

# New Market Data Interfaces for XFRA – Introduction

Multicast-based public market data interfaces.

## Market Data Interface (MDI)

- Provides, netted, price level aggregated market data on-exchange market data\*
- Order book depth of 10\*
- Snapshots and incremental market data messages delivered via one channel (in-band)

## Enhanced Order Book Interface (EOBI)

- Provides un-netted, order by order (including quotes)\*
- No depth limitation\*
- The side, price, priority timestamp and displayed quantity of each visible order and quote\*
- Trade prices and traded quantity for each executed on-exchange trade
- Product state and Instrument state information
- Full order book depth \*

## Extended Market Data Services (EMDS)

- Provides a real time and replay dissemination of all on-exchange trade prices
- Provides a replay service which allows users to recover from data loss for on-exchange trades

\* Dependent on order book transparency settings

# Market Data Interfaces - Characteristics

Comprise all services that provide public information

- Public order book information – netted and un-netted
- Market statistics and state
- Order book depth – either price level aggregated, order-by-order, or nothing (dependent on order book transparency settings)
- Trade information
- Instrument state

	Market Data Interface (MDI)	Enhanced Order Book Interface (EOBI)	Extended Market Data Interface (EMDS)
Data Type	Netted	Un-netted	Un-netted
Connection Type	Low bandwidth	High bandwidth (only in co-location)	Low bandwidth
Encoding	FAST encoded FAST compression	Fixed length binary no data compression	FAST encoded FAST compression
Recovery	In-band	Out-of-band	Replay Service



# Market Data Interfaces – Major Differences

Characteristic	T7 EOB1	T7 MDI	T7 EMDS
<b>Netting interval / market depth</b>	<ul style="list-style-type: none"> <li>Provides un-netted, entire visible order book information for all instruments *</li> </ul>	<ul style="list-style-type: none"> <li>Configurable netting interval in milliseconds</li> </ul>	<ul style="list-style-type: none"> <li>Provides un-netted ,entire on-exchange trades for all instruments</li> </ul>
<b>Snapshot processing</b>	<ul style="list-style-type: none"> <li>Snapshot messages required for recovery only</li> <li>Snapshot and incremental messages must be synchronized during recovery</li> </ul>	<ul style="list-style-type: none"> <li>No synchronisation of messages required as in-band delivery is used but snapshot messages must be processed.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Snapshot / incremental sequence numbers</b>	<ul style="list-style-type: none"> <li>Individual sequence number range per instrument</li> </ul>	<ul style="list-style-type: none"> <li>One sequence number range per instrument</li> </ul>	<ul style="list-style-type: none"> <li>No snapshots, but individual sequence number range per instrument</li> </ul>
<b>Trade volume reporting</b>	<ul style="list-style-type: none"> <li>It can be calculated by using incrementals.</li> <li>Snapshot messages contain trade statistics / volume information for recovery</li> </ul>	<ul style="list-style-type: none"> <li>Statistical information (daily high / low and total traded quantity) and last trade per netting interval information only *</li> </ul>	<ul style="list-style-type: none"> <li>Each on-exchange trade reported separately</li> </ul>
<b>Packet header</b>	<ul style="list-style-type: none"> <li>No explicit performance indicator. It can be calculated by using Matching Engine-In and packet header timestamp</li> </ul>	<ul style="list-style-type: none"> <li>No performance indicator</li> </ul>	<ul style="list-style-type: none"> <li>No performance indicator</li> </ul>
<b>Functional heartbeat</b>	<ul style="list-style-type: none"> <li>Functional heartbeat message on a product / instrument level + the last valid MsgSeqNum</li> </ul>	<ul style="list-style-type: none"> <li>Snapshot messages act as functional heartbeat messages</li> </ul>	<ul style="list-style-type: none"> <li>Functional heartbeat contains + the last valid MsgSeqNum</li> </ul>
<b>Technical heartbeat</b>	<ul style="list-style-type: none"> <li>Technical heartbeats (FAST reset messages) sent periodically on all multicast / port combinations to verify technical connection</li> </ul>		

\* Dependent on order book transparency settings

# Reference Data Interface

## Reference Data File (RDF)

### File based solution

- Available via the Common Report Engine at the start of day
- Reference data will also be provided in the form of a start-of-day file
- Files are in compressed FIXML format

## Internet Download

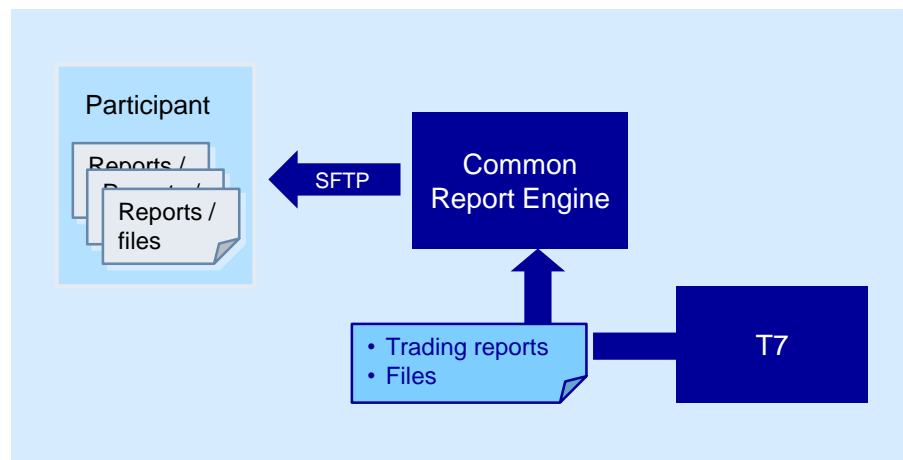
- Downloads via both the public (partial information) and member (full information) sections

# Reports and Files - Common Report Engine

The Common Report Engine (CRE) and internet downloads via both the public and member sections are the sources of reports and files from T7.

Reports on T7 are provided by the Common Report Engine analogue to the reports of the Xetra system:

- Enhanced structure of report provision
- Reports produced in XML but the layouts will change
- Trading reports for instruments traded on Börse Frankfurt (XFRA) by T7
- Clearing reports for products on new and current system from the clearing system
- Both T7 & Xetra system deliver mostly the same reports, but key will change (format as for XETR)



## T7: Trade- vs. Deal-Logic

### Trade-Logic (current Xetra)

- In Xetra **trades** can be generated in CCP eligible instruments as well as non-CCP eligible instruments.
- In non-CCP eligible instruments, participants need to receive all executions and the according counterparty information.

### Deal-Logic (current T7)

- In T7 all match steps on **one price level** will be combined under one **deal**.
- All orders that are executed in this match step will be included in this deal.
- Technically the orders are netted on price level, i.e. the originator of the incoming order does not see how many executions he has. He only sees that his order is fully executed. He does not need to know the amount of executions nor the real counterparties since all trades will be executed against the CCP.

- In CCP instruments, so-called deal logic is applied. In deal logic, exactly one trade broadcast correlates to one order execution broadcast, independent on the number of counter orders / counterparties.
- In non-CCP instruments the so-called trade logic will be applied. In trade logic, the number of trade broadcasts for each individual order confirmation correspond to the number of counterparties, as for each counterparty individual trade broadcast pairs will be generated (existing logic on Xetra Classic).

## T7: Trade- vs. Deal-Logic

### Example 2: Handling of half trades in Auctions

#### Handling of half-trades – Auction Example 1

Buy Orders

(B) 30@17,00

(C) 50@17,00

(D) 20@16,50

Sell Orders

(A) 100@16,50

Match: 100@16,50

#### Trade-Logic

##### 3 Trades & 6 Half Trades

30 @ 16,50€

A sell 30

B buy 30

50 @ 16,50€

A sell 50

C buy 50

20 @ 16,50€

A sell 20

D buy 20

##### 4 Order Execution Reports / 6 Trade Capture Reports\*

Member A 1 OER (100) / 3 TCR – 30/50/20@16,50 ⚠

Member B 1 OER / 1 TCR – 30@16,50

Member C 1 OER / 1 TCR – 50@16,50

Member D 1 OER / 1 TCR – 20@16,50

#### Deal-Logic

##### 1 Trade & 4 Half Trades

100 @ 16,50€

A sell 100

B buy 30

C buy 50

D buy 20

##### 4 Order Execution Reports / 4 Trade Capture Reports

Member A 1 OER / 1 TCR – 100@16,50 ⚠

Member B 1 OER / 1 TCR – 30@16,50

Member C 1 OER / 1 TCR – 50@16,50

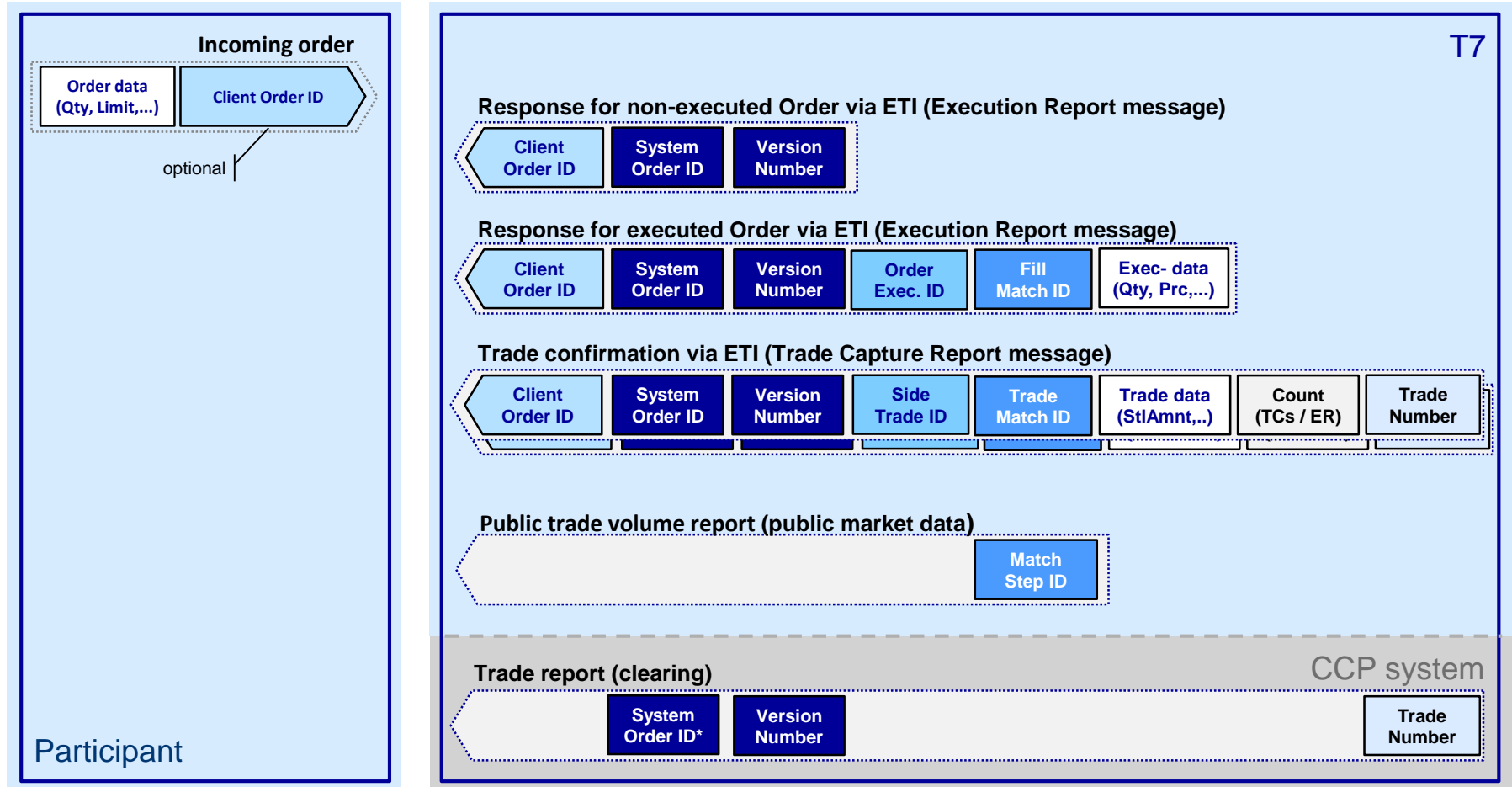
Member D 1 OER / 1 TCR – 20@16,50

- Independent from the Trade- or Deal-logic, the number of Order Execution Reports stays the same
- In general Deal-logic is more efficient regarding generation of Trade Capture Reports due to **aggregation by time and price**

\* Order level netting is not considered since it is not supported on T7

TCR = Trade Capture Report; OER = Order Execution Report

# Major Technical Changes -Tracing of Orders and Trades



\*Same content information reflected by the same colour and position of the respective boxes

Comparison of order execution ID in private order broadcast to Side Trade ID in private trade broadcast allows mapping of related order and trade broadcast information.

# Major Technical Changes - System Order ID & Trade Number

## System Order IDs

CCP or Customer system	T 7
<p>System Order Number (as Xetra)</p> <ul style="list-style-type: none"><li>▪ Max 13 digits</li></ul>	<p>System Order ID</p> <ul style="list-style-type: none"><li>▪ Assigned by the trading system<ul style="list-style-type: none"><li>▪ Based on elapsed time (nsec) since 1/1/1970</li></ul></li><li>▪ The order ID is unique per exchange (MIC) and product.</li><li>▪ An order consists of the order number plus version number. The order number of an order will stay the same during the entire lifetime of the order, the version number is changed each time the order gets a new time priority.</li><li>▪ Length greater than System Order Number (Xetra today)</li><li>▪ Max 20 digits (8 byte integer)</li></ul>

Transformation calculation required between the 2 systems

## Trade Numbers

T7 uses Trade number as unique identifier of a trade

- The Trade number is unique in the context of the exchange (MIC) plus the product per day
- The format of the Trade number is 7 digits what is identical to Xetra
- T7 (XFRA) Trade number could equal a Trade number issued by T7 (XETR) for the same ISIN



# 4

## Migration of Börse Frankfurt

Services, support and further  
information





# Agenda

Implementation and communication schedule

Further information

Support contacts

Version history

# Implementation and Communication Schedule

T7 Release 8.0	Eurex	Xetra	Combined	Q2 2019			Q3 2019			Q4 2019		
				Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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 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. Fixmate 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					■			●	
Xetra Instrument Reference Data Guide		x						●				
T7 XML Reports – Reference Manual	x	x							■	●		
Common Report Engine User Guide			x					●				
N7 Network Access Guide			x					●				
Xetra Rules & Regulations		x							●			
Market Model		x									●	

- ◆ preliminary versions
- simulation versions
- final versions

# Implementation and Migration – High Level Checklist (1/2)

## All Trading Participants

HIGH LEVEL CHECKLIST FOR IMPLEMENTATION AND MIGRATION	
<b>Modification of software applications for trading</b>	<ul style="list-style-type: none"> <li>- Decide on applications/files to be used: <ul style="list-style-type: none"> <li>* (new) trading interfaces (ETI and FIX Gateway),</li> <li>* (new) market data interfaces (MDI for netted data and EOBI for unnetted data, but only in co-location 2.0)</li> <li>* (new) Reference Data File (RDF) on Common Report Engine or public website/member section,</li> <li>* (new) Instrument Reference Data on public website</li> </ul> </li> <li>- Verify with your Independent Software Provider (ISV), if applicable</li> <li>- Coordinate software rollout and implementation timeline with your software provider ISV, if applicable</li> <li>- Disable / migrate TSO-Limit-Interface (from pull to push)</li> </ul>
<b>Connectivity</b>	<ul style="list-style-type: none"> <li>- Order connectivity and sessions (FIX Gateway and/or ETI sessions) for T7 <ul style="list-style-type: none"> <li>* sessions for Pre-Prod - ETI and FIX</li> <li>* sessions for Simu</li> </ul> </li> </ul>
<b>Pre-Production preparation</b>	<ul style="list-style-type: none"> <li>- Ensure access to the new T7 Admin GUI - necessary for user maintenance</li> <li>- Establish connection to T7 Cloud Simulation for early development</li> <li>- Test your applications using the new interface in Simu (Pre-Production) environment</li> <li>- Validate the processing of reports and reference data from the Common Report Engine</li> <li>- Test product migration / rollout behaviour</li> <li>- Test handling of changed locked stock messaging</li> <li>- Settlement internalisation and bilaterale aggregation</li> <li>- Test handling of deal-logic (CCP) instruments and trade-logic (Non-CCP)</li> <li>- Confirm successful migration of user accounts</li> </ul>
<b>Production launch preparation</b>	<ul style="list-style-type: none"> <li>- Enter orders in Pre-Prod alternatively Simulation - via ETI, FIX, GUI</li> <li>- Review and modify (if necessary) converted production user data during Pre-Production</li> <li>- Prepare for the product migration / rollout period</li> </ul>
<b>Readiness check</b>	Assess your readiness & send Readiness Statement

# Implementation and Migration – High Level Checklist (2/2)

## Specialists and Issuers

### Specialists

ADDITIONAL CHECKLIST FOR SPECIALISTS	
Modification of software applications for trading	<ul style="list-style-type: none"> <li>- Decide whether to use (F)XML reflat file or CSV file</li> <li>- Decide whether to load all tradable instruments or just the own subset (for structured products)</li> </ul>
Connectivity	ETI mandatory for Specialists
Pre-Production preparation	<ul style="list-style-type: none"> <li>- Implement and test intensively new RFQ for all asset classes</li> <li>- Special focus on limit control in specialist's LCS for TSO and OCO</li> <li>- Settlement internalisation and bilateral aggregation</li> </ul>

### Issuers

ADDITIONAL CHECKLIST FOR ISSUERS (STRUCTURED PRODUCTS)	
Connectivity	Decide whether to indicate knock-out-events via email/eListing or via FIX (new)
Pre-Production preparation	<ul style="list-style-type: none"> <li>- Ensure Quote-Provider-ID (QPR) setup is correct</li> <li>- Ensure trader linked to QPR id is admitted to the same BU and has sufficient rights &amp; limits</li> <li>- Ensure that issuer can provide MIFID II shortcodes to specialist and takes care of the shortcode- / longcode-mapping</li> <li>- Check if all quoting periods in T7 reflat are correct</li> </ul>

## Further Information - The Xetra Website

For information on T7 visit the Xetra website at:

<http://www.xetra.com/xetra-en/technology/t7>

The system documentation will be available at:

<http://www.xetra.com/xetra-en/technology/t7/system-documentation/release8>

To ensure an efficient communication, Trading Participants, Clearing Members, Service Providers and ISVs are kindly asked to verify their registered Xetra release contacts, that are stored in the members only area:

<https://member.deutsche-boerse.com/irj/portal>

If you require help to do this, please contact our Member Section Team via telephone

+49.69.211.17888 or email: [member.section@deutsche-boerse.com](mailto:member.section@deutsche-boerse.com)

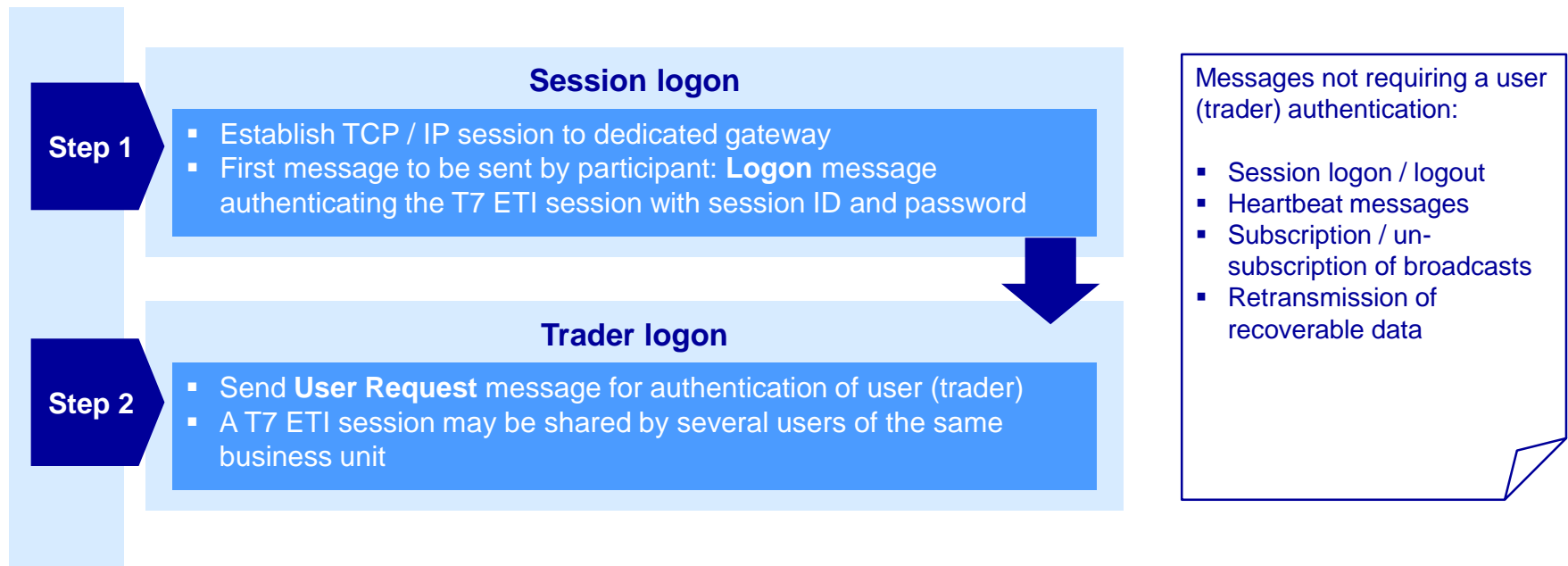
# Support contacts

Your Key Account Manager	Please contact your dedicated key account manager directly. If you need the contact details, please ask via <a href="mailto:client.services@deutsche-boerse.com">client.services@deutsche-boerse.com</a>
Technical Support	<a href="mailto:cts@deutsche-boerse.com">cts@deutsche-boerse.com</a> or your dedicated Technical Account Manager
ISV Relations	Steven Will, <a href="mailto:steven.will@deutsche-boerse.com">steven.will@deutsche-boerse.com</a> ; 069.211 14130
Simulation support	Market Operations <a href="mailto:Xetra-Simulation@deutsche-boerse.com">Xetra-Simulation@deutsche-boerse.com</a> 069.211.11050

Back up

# Enhanced Trading Interface (ETI) – Session Concept

## Two step logon procedure

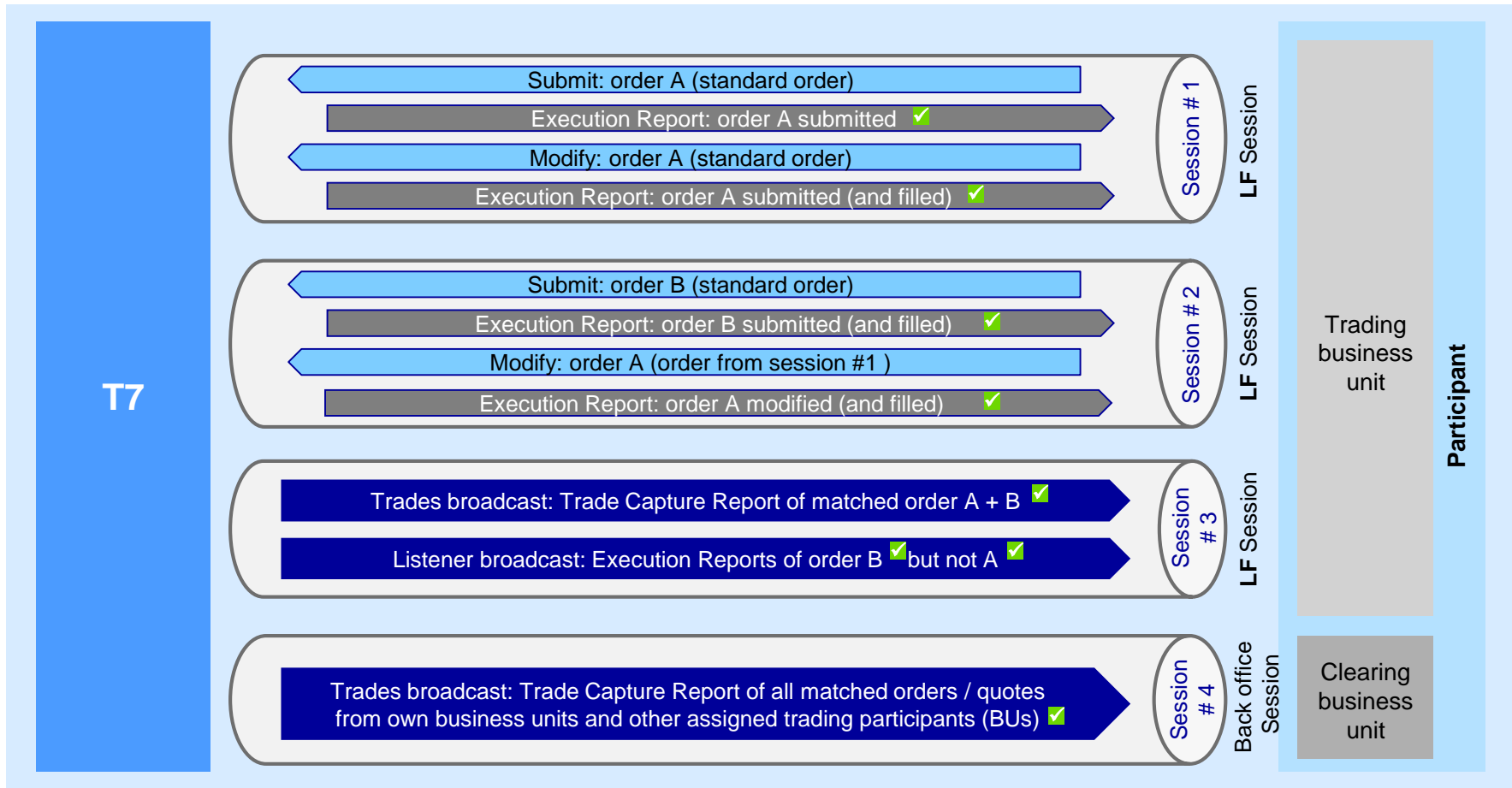


Note: There are separate technical infrastructures for T7 gateways with different IP address ranges / ports compared to the current Enhanced Transaction Solution infrastructure.

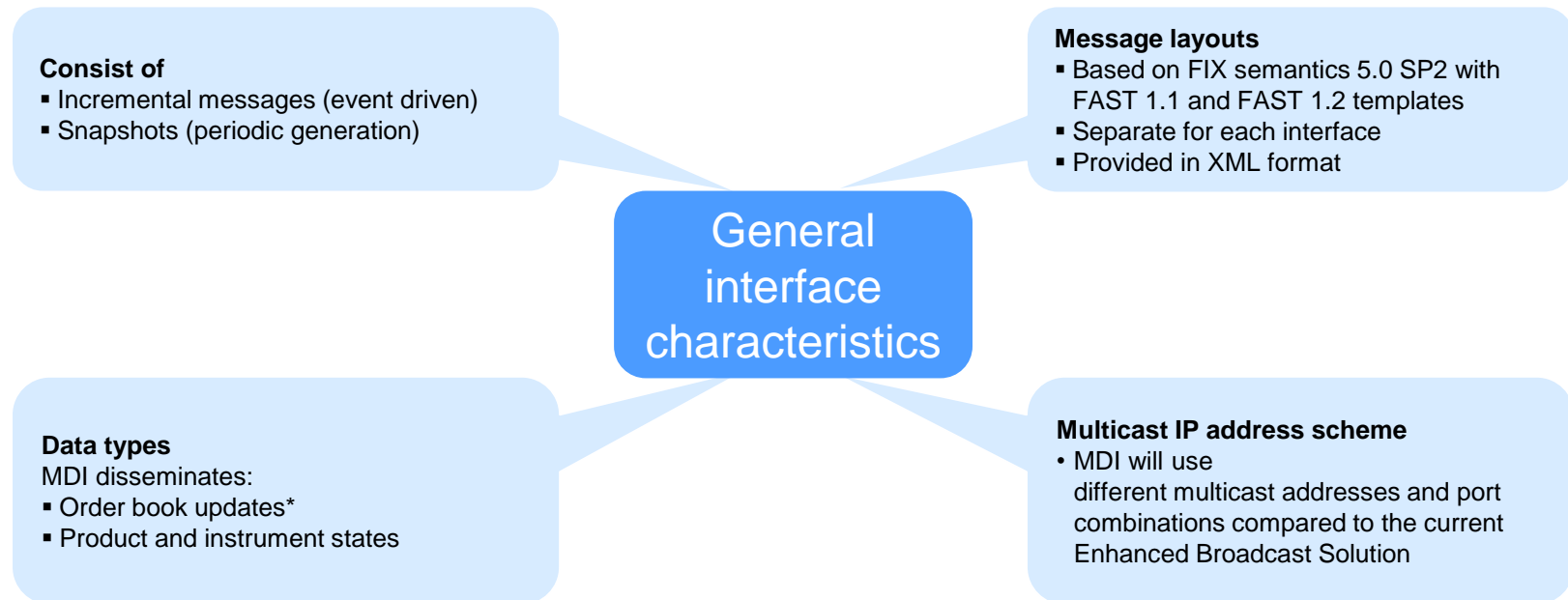


# Enhanced Trading Interface (ETI) – Session Concept

## Example for Usage of Standard Order Types



# MDI - Market Data Interface

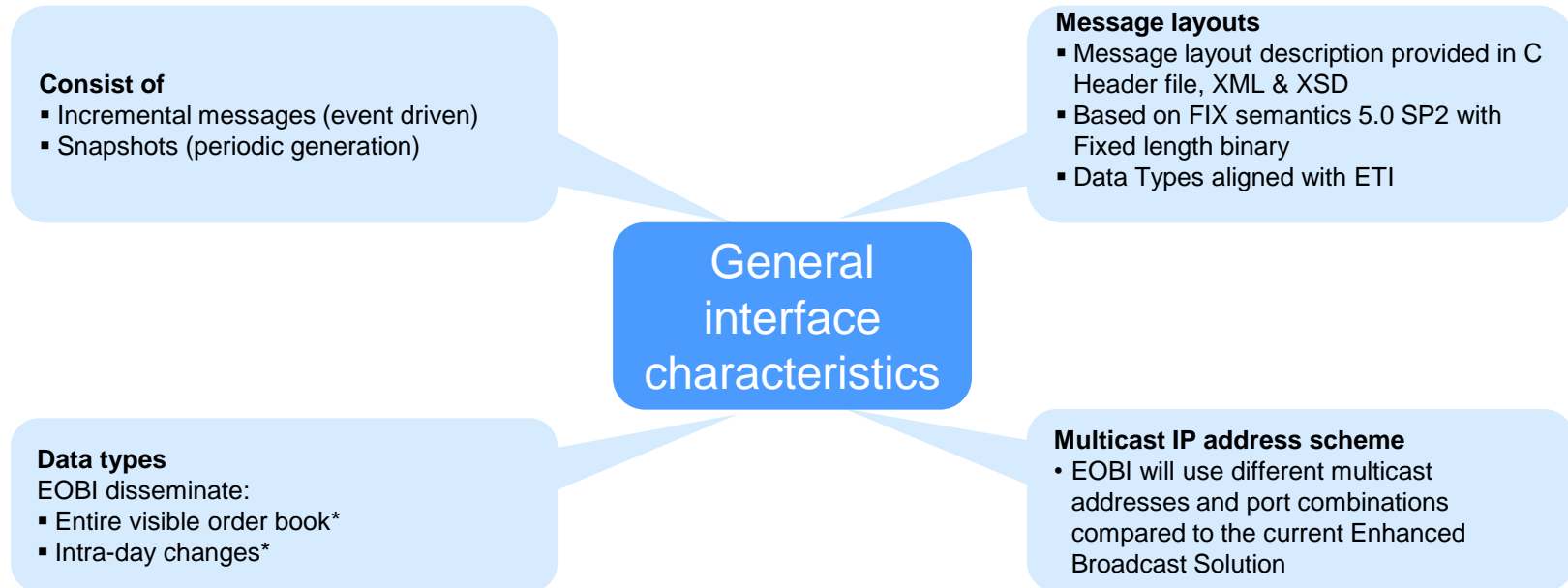


## A and B Stream

- All feeds sent on two multicast addresses via different channels, so called service A and B; both services identical in terms of packet contents, sequence numbers and package sequence
- Depending on the partition, market data will either originate first either on the A-Stream (even partitions) or the B-Stream (odd partitions), therefore both streams should be subscribed simultaneously
- Packet Header contains a sender ID, which together with a sequence number, is unique (for a given multicast address and port combination) allowing detection of duplicates and missing packets

\* Dependent on order book transparency settings

# EOBI - Order By Order Market Data Interfaces



## A and B Stream

- All feeds sent on two multicast addresses via different channels, so called service A and B; both services identical in terms of packet contents, sequence numbers and package sequence
- In-band and out-of-band approaches to synchronise incrementals and snapshots:
  - In-band: packet sequence number is incremented for both.
  - Out-of-band: packet sequence number is incremented individually.

\* Dependent on order book transparency settings



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