Eurex Exchange's New Trading Architecture

The next generation in derivatives trading

Part 2 – Functional Aspects

August 2012

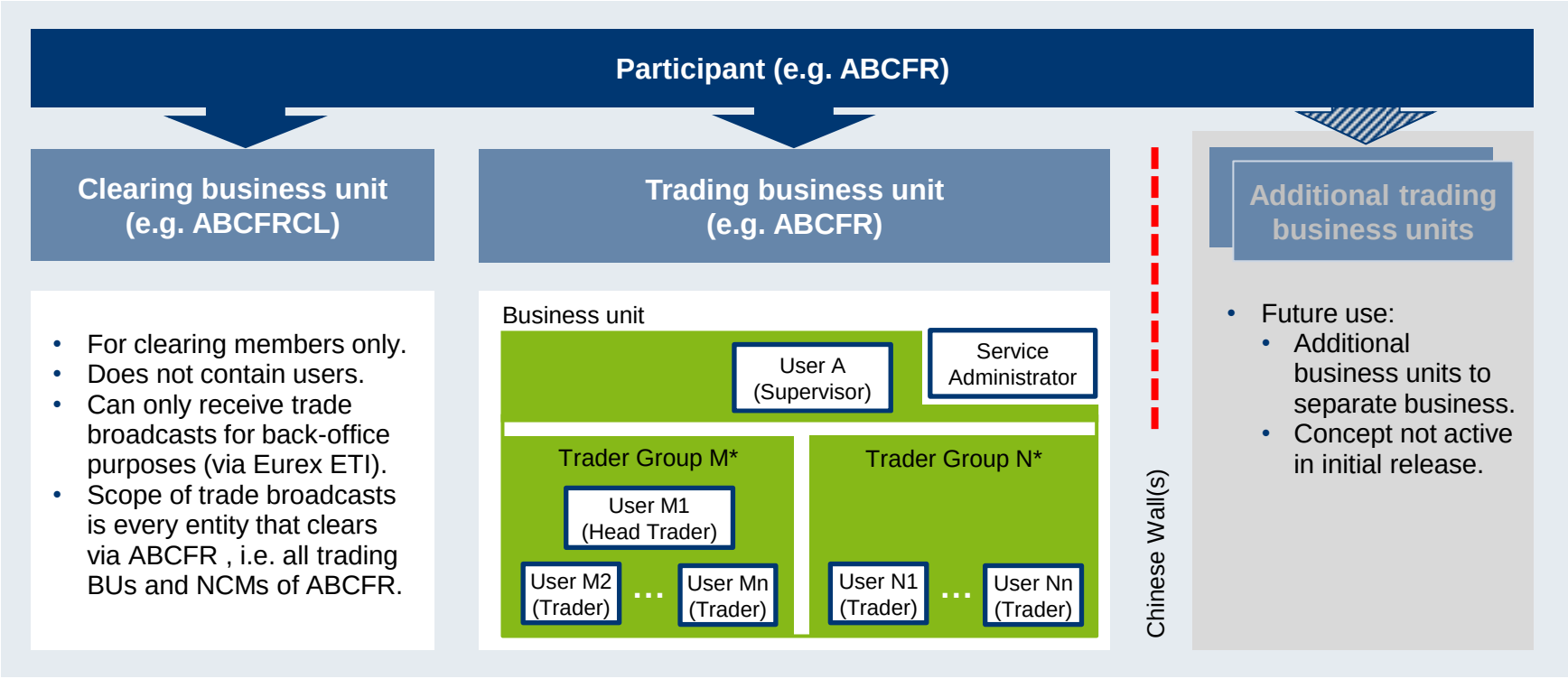
Agenda

- Entitlement
  - New participant structure
  - User hierarchy
  - Main limitations of today
  - Role concept
  - Assignment of roles
  - Transaction size limits
- Instrument concepts
- New functionality
- Matching
- Tracing of orders and trades
- Further information

Entitlement

New participant structure

- Entitlement on member / participant level as today.
- Entitlement on user level to be maintained by Service Administrator in the new system.
- Clear concept of "Chinese walls", rights & product assignments and user hierarchy.

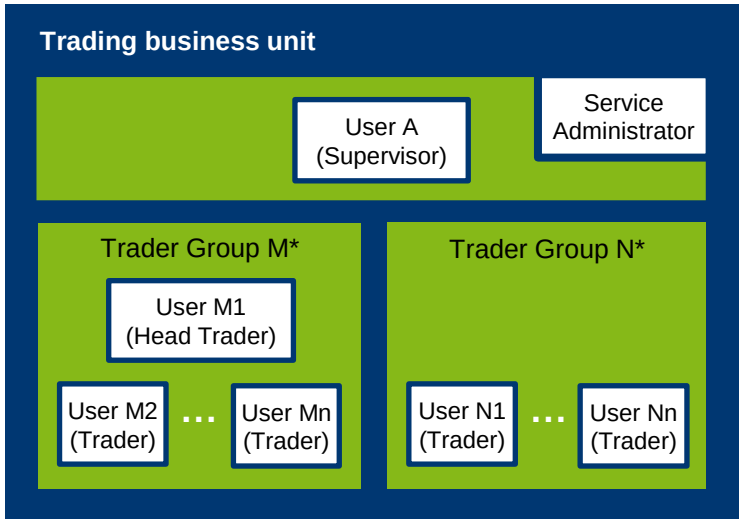


* The concept of trader groups will partially emulate the subgroup concept of the current Eurex® system.

Entitlement

User hierarchy

- The new system supports trader groups and a hierarchy of three user levels: Trader, Head Trader and Supervisor.
- User levels for trading users define a clear context for order maintenance:
  - Trader users maintain own orders only.
  - Head Trader users maintain own orders and can delete orders of traders in their trader group. Order modification is possible within same session context where the order was entered.
  - Supervisor users maintain own orders and can delete orders of all traders / trader groups. Order modification is possible for all trader groups within the same session context where the order was entered. It is also possible to modify standard orders via other low frequency sessions or the Eurex Trader GUI.

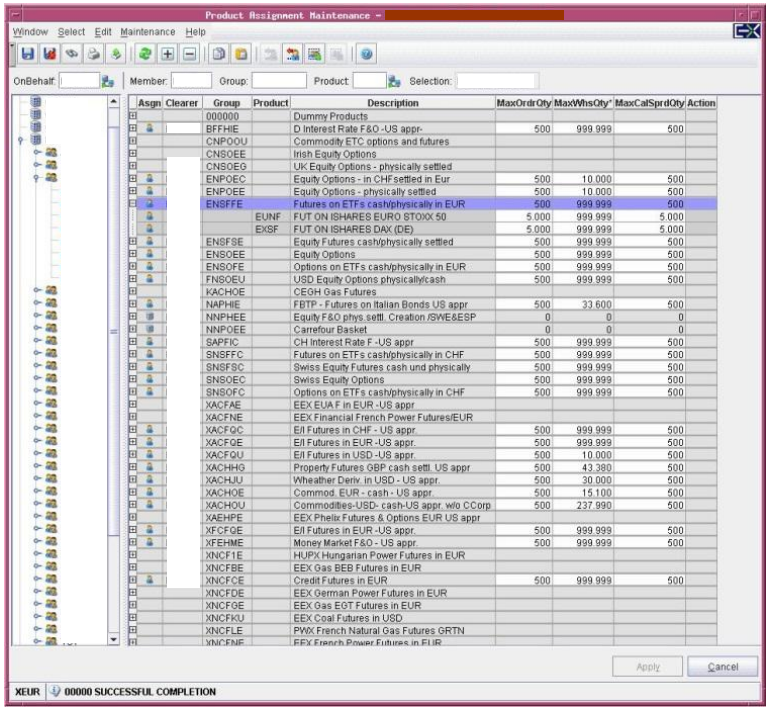


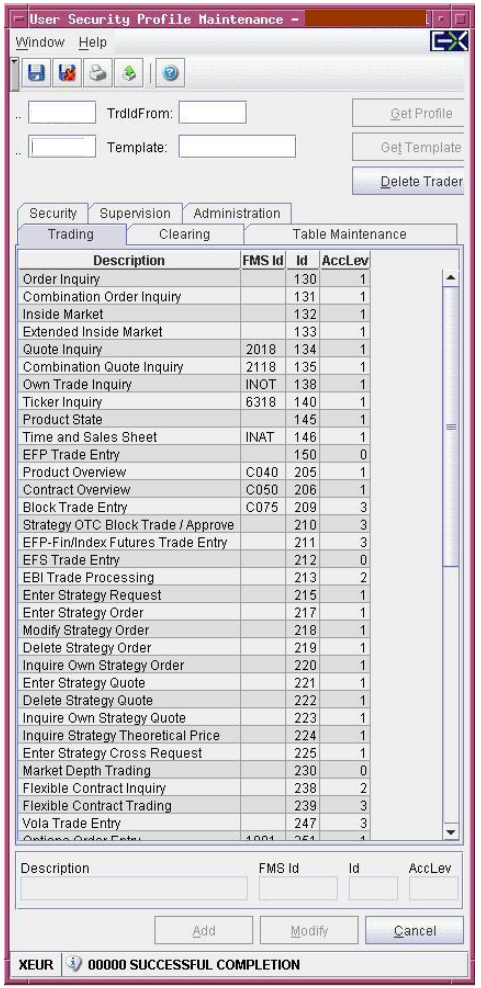
- Quotes can only be entered using Eurex ETI sessions, the context to modify or delete a quote is therefore defined by the session used to enter a quote.
- Emergency actions like „delete all" will be supported, but the scope of the action is determined by the user hierarchy.

Entitlement

Main limitations of today

- Business separation is done via different user IDs.
- Different combinations of functions and products not possible.
- Time consuming maintenance.

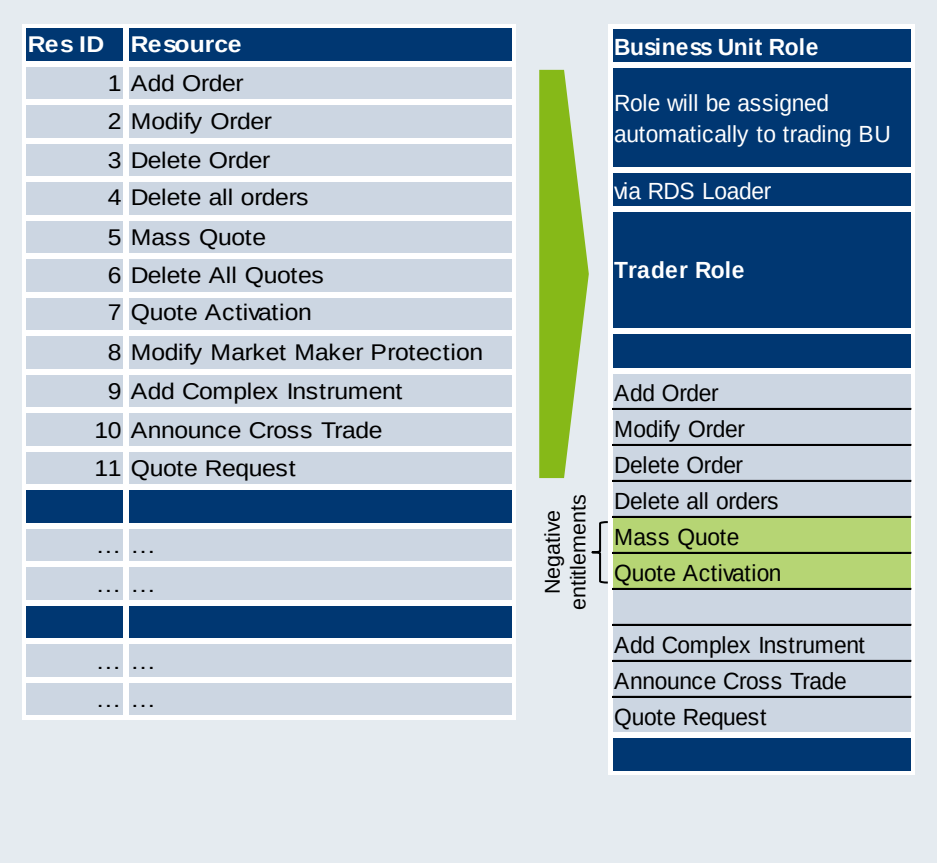




Entitlement

Role concept

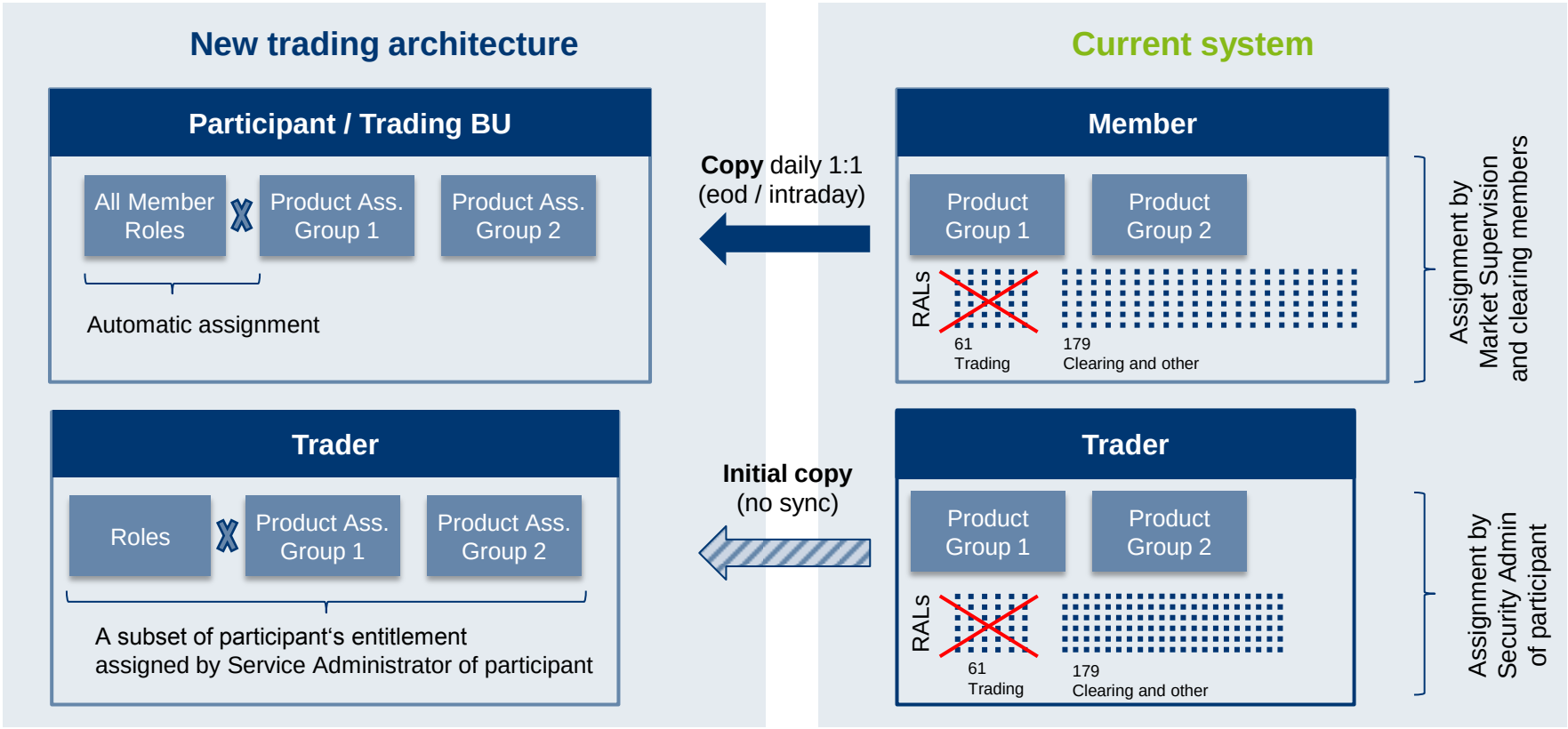
- Individual resources (e.g. add order) are grouped into roles.
- Entitlement consists of roles (e.g. Trader) that are assigned to product assignment groups (PAGs).
- Only few roles will be defined, reflecting the usage of Resource Access Levels (RALs) today:
  - Trader
  - Market Maker
  - „Emergency"
  - Administrator
- Product assignment groups are the same as today.



Entitlement

Assignment of roles

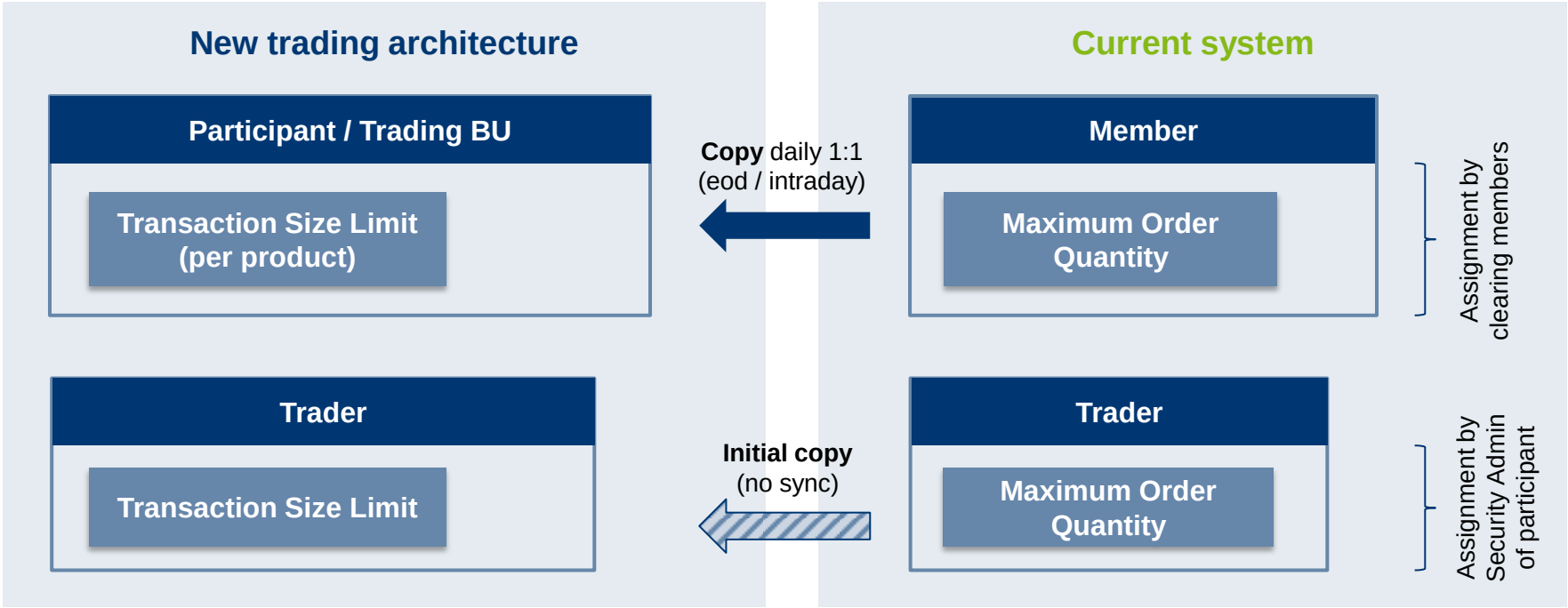
- On participant level, maintenance of product assignment remains as is.
- The participant's Service Administrator(s) will assign role / product group combinations to trading users.



Entitlement

Transaction size limits

- No change to today: Maximum Order Quantities will be maintained on product level, separately for simple instruments and futures spreads. Maximum quantities for option strategies will be derived from the simple instrument limits, as today.
- Maintenance in current system on member level with automatic synchronization.
- Maintenance on user level in Eurex Exchange's new trading architecture.



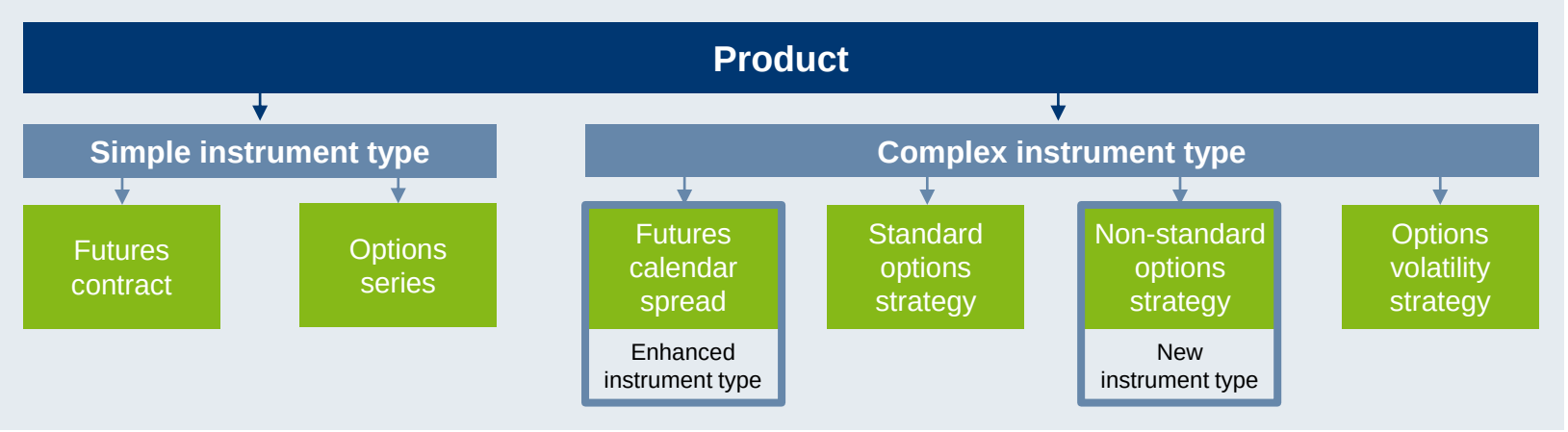
Agenda

- Entitlement
- Instrument concept
  - Overview of instrument types
  - Instrument type details and defaults
  - Instrument states
- New functionality
- Matching
- Tracing of orders and trades
- Further information

Instrument concept

Overview of instrument types

- Rigid **product** concept is replaced by a more flexible **instrument** concept.
  - An instrument constitutes the tradable unit of a derivative product and is referenced by a unique instrument ID for trading throughout the new trading architecture.
  - While simple instruments are taken over from the clearing system, complex instruments are supported independently from any other systems and, usually, are requested by the trader.
  - In addition to the already existing complex instrument types, the new trading architecture supports:
    - Non-standard options strategies enabling any kind of combinations of options series without using strategy templates (which are required for standard options strategies).
    - All calendar spread contracts available for a futures product.
  - Additional complex instrument types can be introduced without major efforts in the future.



Instrument concept

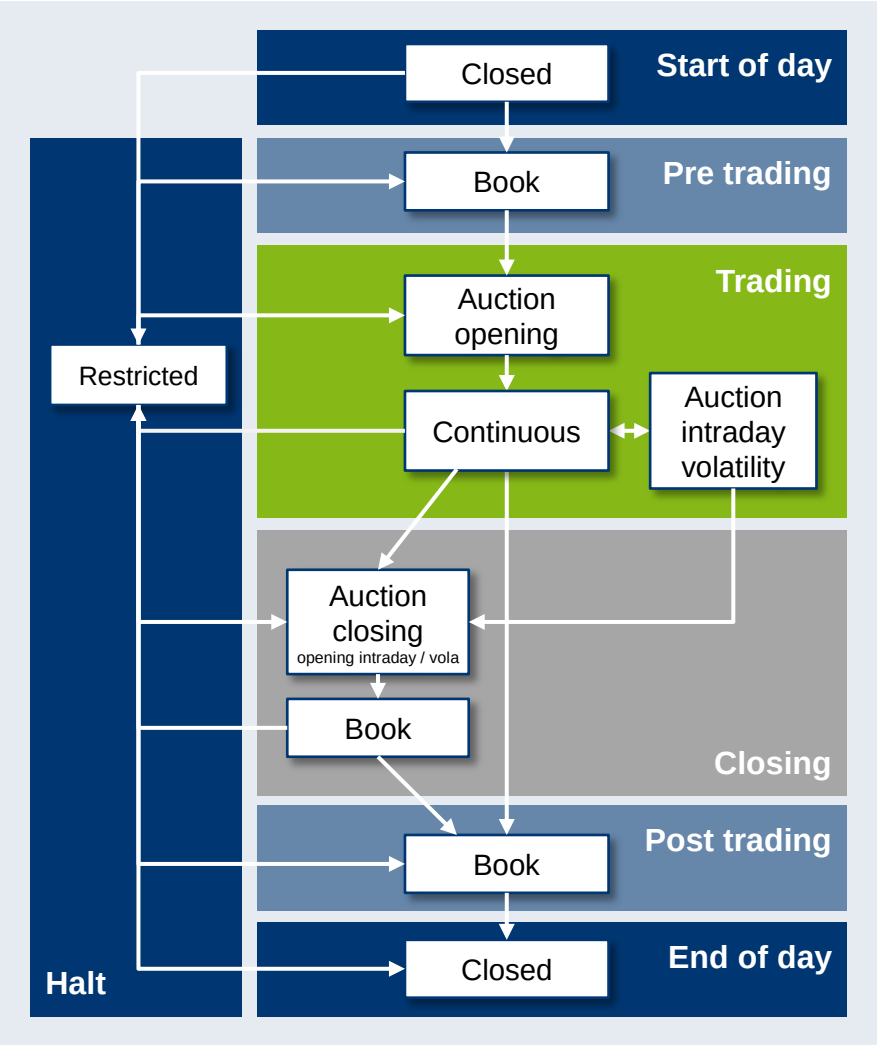
Instrument type details and defaults

- Default handling of complex instruments
  - Complex instruments have to be manually requested by a trader.
  - Order books of complex instruments being empty at the end of the business day are automatically deleted.
- Standard options strategies (including new types): BUL, BER, STD, STG, etc.
- Options volatility strategies (including new types): Call – U, Put + U, BUL – U, etc.
- Non-standard options strategies (new)
  - Higher flexibility by allowing any combination of simple instruments up to 5 legs and a maximum ratio of 99.
  - No strategy template (also denoted as "complex instrument subtype") as for standard options strategies.
  - The decomposition of a non-standard options strategy trade into its leg instruments may result to more than one trade prices per leg (in contrast to standard options strategies where there is only one trade price per leg).
  - Requesting and handling of non-standard options strategies is similar as for standard options strategies.
- Futures calendar spreads
  - Creation method: indicates whether a futures spread has to be manually requested intra-day by a trader or whether it is automatically provided by the trading system.
  - Matching method: indicates whether a futures spread is exclusively matched in its own order book ("direct matching") or whether a futures spread is considered for implied-in and implied-out matching ("synthetic matching").

Instrument concept

Instrument states

- Each instrument has its own instrument state which is independent from other instruments of the same product. Instrument states are: Restricted, Closed, Book, Auction, Continuous.
- Trading activities and visibility of public market information are controlled by instrument states.
- Scheduling of a business day is primarily based on product states which are superordinate to instrument states.
- Usually, product state changes drive instrument state changes but instrument state changes can also be triggered without a product state change (e.g. volatility interruption).
- Product state "Fast" of the current system is replaced by a product state indicator "Fast" which can be set independently.
- The instrument state of a complex instrument is completely deduced from the instrument states of its legs.



Agenda

- Entitlement
- Instrument concept
- New functionality
  - New order functionality
  - Enhanced market maker functionality
  - Enhanced price reasonability check
- Matching
- Tracing of orders and trades
- Further information

New functionality

New order functionality (I/II)

- New order attributes:
  - Persistent versus non-persistent:
    - Persistent orders will remain in the order book. A order book replay will happen at start of day and after a market reset.
    - Non-persistent orders will be deleted end of day (as they are "Good for Day") and in case of market resets, volatility interruptions and state changes to halt. Only a summary deletion information is sent to sessions that supplied non-persistent orders (and quotes).
  - Lean versus standard:
    - Lean orders will allow a higher throughput and reduce latency. All lean orders are non-persistent. Only executions and foreign events related to lean orders are recoverable and lean orders will only generate response messages to the entering session (no drop copy of the order history is available).
    - Only standard orders will be visible to other sessions: Drop copies are available for the order history (listener broadcast) and the order is displayed in the new Eurex Trader GUI, if entered by another session.

New functionality

New order functionality (II/II)

- New order types:
  - Stop Limit orders
  - Book or Cancel orders
  - Good-till-date (GTC) and Good-till-cancelled (GTC) for all complex instruments

- Flexible mapping between order type and market model allows the provision or restriction of different order types.

- New market order matching concept. Currently, market orders are processed differently for options and futures. In the future, matching of market order is applied to options and futures in the same way.
  - Incoming market orders can only immediately match in case the difference between best bid and best ask price is equal to or less than a pre-defined range ("market order matching range").
  - In case an incoming market order triggers a matching cascade which widens the difference between best bid and best ask price to an extend larger than the market order matching range, the matching of the incoming market order is aborted in order to protect the incoming market order.
  - Market orders resting in the order book can only match in case an incoming order results to a crossed order book situation; in this case, market orders always have priority over limit orders.

New functionality

Enhanced market maker functionality

- Quoting functionality is exclusively provided via Eurex ETI sessions, as quotes always belong to a session.

- In addition to the already existing mass deletion request, all quotes of an Eurex ETI session can be de-activated or re-activated by setting the respective attributes for the session. In addition to the Eurex ETI, this is also possible via the Eurex Trader GUI.

- In addition to options products, all market making functionality including market maker protection is now also available for futures products.

- Mass quote layout is valid for all products; no separate single quote layout anymore.

- Market Maker Protection can:
  - be applied to all simple and complex instrument types independently supplementing the already existing protection on product level,
  - be maintained separately via Eurex Trader GUI and Eurex ETI,
  - use an additional percentage limit supplementing the already existing volume, delta and vega limits.

New functionality

Enhanced price reasonability check

- When entering an order / mass quote, the trader can chose one of the following alternatives:
  - Skip price reasonability check.
  - Optional price reasonability check (changed):
    Based on the order book situation and / or on the availability of an additional reference price, a price reasonability check is performed.
    However, if no price reasonability check can be performed by the exchange because of missing price information, the incoming order / quote is accepted without performing a price validation and without additional notification.
  - Mandatory price reasonability check (new):
    Based on the order book situation and on the availability of an additional reference price, a price reasonability check is performed.
    However, if no price reasonability check can be performed by the Exchange because of missing price information, the incoming order / quote is rejected with a specific notification to the entering trader.

- In case the price reasonability check is skipped, an extended price range check will be applied by the exchange under specific conditions to protect markets from obviously mispriced orders / quotes (already existing).

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- Matching
  - New time-pro-rata allocation
  - Flexible, synthetically linked spread matrix
  - New Match Step ID
- Tracing of orders and trades
- Further information

Matching

New time-pro-rata allocation

- In case there is more than one book order available for matching, the incoming order quantity needs to be distributed to the price-best book orders in accordance with an order allocation scheme defined by the exchange ("Order Allocation").
- The following order allocation schemes are envisaged:
  - Time allocation: the oldest order (i.e. the order with the oldest order priority time) is allocated first; if incoming quantity is still available for matching, the next oldest order is allocated until the incoming quantity is completely matched or all price-best orders in the order book are allocated.
  - Pro-rata allocation: the allocation of an individual order is directly based on its order size; in that way, all price-best orders are considered for the allocation provided the incoming order quantity is sufficient.
  - Time-pro-rata allocation (new): the allocation of an individual order is based on order size as well as on the order priority time, combining aspects of the pro-rata as well as time allocation; the oldest order receive a higher matched quantity compared to the pure pro-rata allocation at the expense of the last entered order.
- Example: An incoming order with 150 lots is matched against 5 book orders with equal quantity of 100.

Rank	Orders Size	Order Allocation for Q(inc) = 150		
		Time	Time-Pro-Rata	Pro-Rata
1	100	100	54	30
2	100	50	42	30
3	100	0	30	30
4	100	0	18	30
5	100	0	6	30
Sum	500	150	150	150

Matching

Flexible, synthetically linked spread matrix

- Synthetic matching functionality can be configured for futures products.
  - It is configurable by the exchange (futures spread attribute "matching method") which calendar spreads of a futures product are considered for synthetic matching; a synthetically linked full spread matrix is achieved by considering all calendar spreads of a futures product.
  - The following products are envisaged to be equipped with a synthetically linked full spread matrix: EURO STOXX 50® Index Dividend Futures (FEXD), VSTOXX® Mini Futures (FVS) and Three-Month EURIBOR Futures (FEU3).

- Independent of the number of spread instruments allowed for synthetic matching, the length of synthetic orders is restricted to focus on functionally meaningful synthetic combinations and to cope with performance requirements.
  - Only synthetic orders of length 2 (i.e. synthetic orders of a specific order book side generated by orders from 2 different order books sides) are published in the inside market.
  - Only synthetic orders up to length 3 (i.e. synthetic orders of a specific order book side generated by orders from up to 3 different order books sides) are considered for internal matching.
  - Distinction between synthetic orders published to the outside world and synthetic orders considered for internal matching is required in order to prevent the display of crossed order book situations.

Matching

New Match Step ID

- By introducing a Match Step ID in the trade volume reporting, synthetic matching can be easily identified.
  - Assume an incoming sell order is matched against a synthetic buy order in FESX Jun12 which is generated by one buy order in FESX Mar12 and by one sell spread order in FESX Mar12 / Jun12, then the trade volume reporting contains the following 3 records.

MatchStepID	Instrument	AggrSide	#BuyOrd	#SellOrd	Qty	Price	AccQty
StepID-01	FESX Mar12	---	1	---	50	2559.0	+50
StepID-01	FESX Jun12	S	---	1	50	2539.0	+50
StepID-01	FESX Mar12/Jun12	---	---	1	50	20.0	---

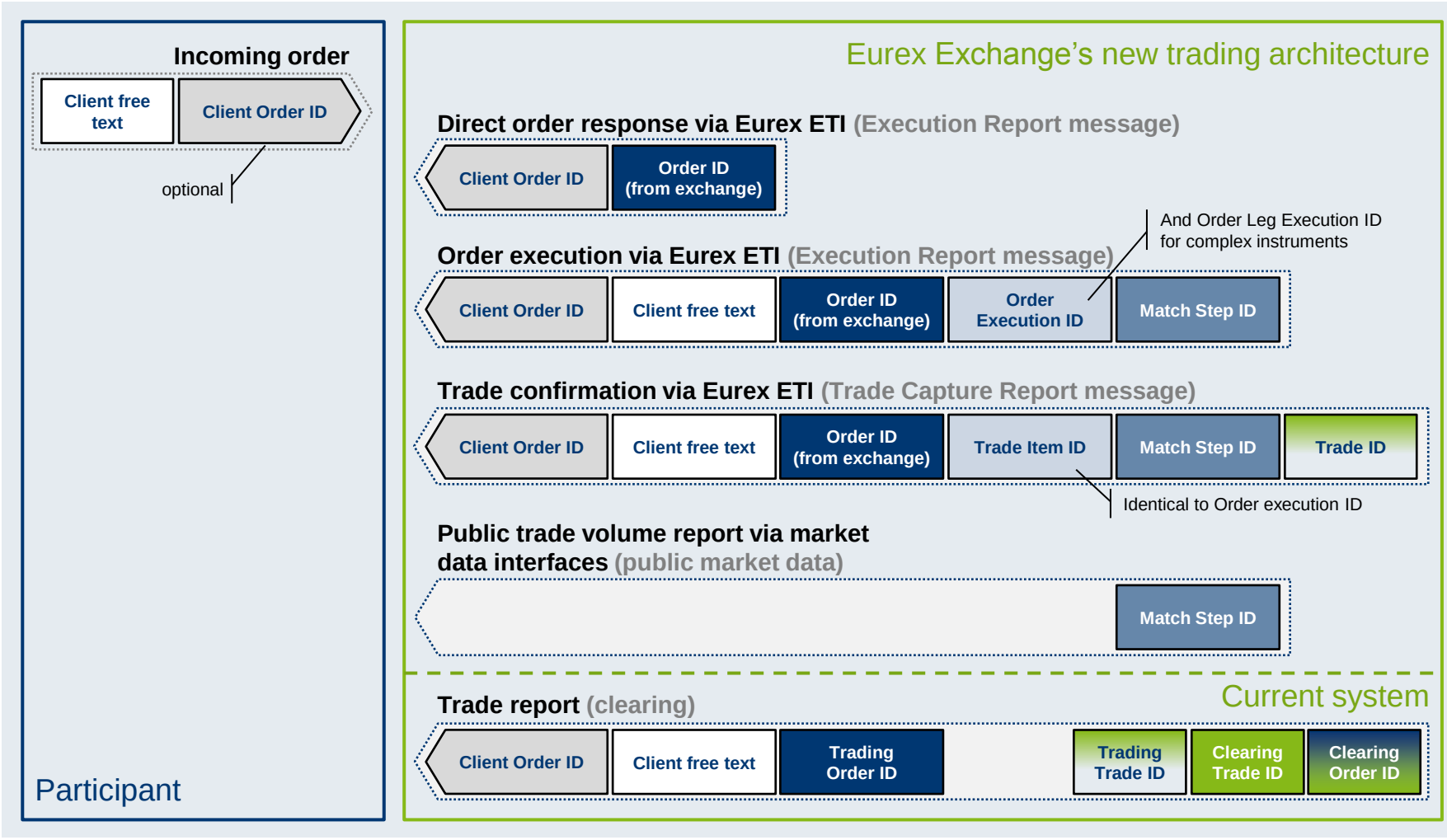
  - For a synthetic match, there is more than one trade volume record of the same Match Step ID.
  - Match Step ID supplements the trade ID in the current Eurex concept.

Match Step ID	Trade ID	Instrument	Buy Side Qty	Sell Side Qty	Price	Acc Deal Qty
StepID-01	TradeID-01	FESX Mar12	50	50	2559.0	+50
StepID-01	TradeID-02	FESX Jun12	50	50	2539.0	+50

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Tracing of orders and trades – use case



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Further information

Information on Eurex website

- For information on Eurex Exchange's new trading architecture visit the Eurex Exchange website at:
  www.eurexchange.com > Technology > New Trading Architecture.

- Documents for the new trading architecture and the new interfaces are available in the member section of the Eurex website (a log-in is required to access the documents):
  www.eurexchange.com > Members Section > New Trading Architecture.

- Visit our newsroom at www.eurexgroup.com, if you are looking for the latest news on Eurex Group's products and services.

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