

# Open Day – Deutsche Börse IT conference 2011

## Xetra<sup>®</sup> and Eurex<sup>®</sup> Enhanced Transaction Solution and Enhanced Broadcast Solution interfaces

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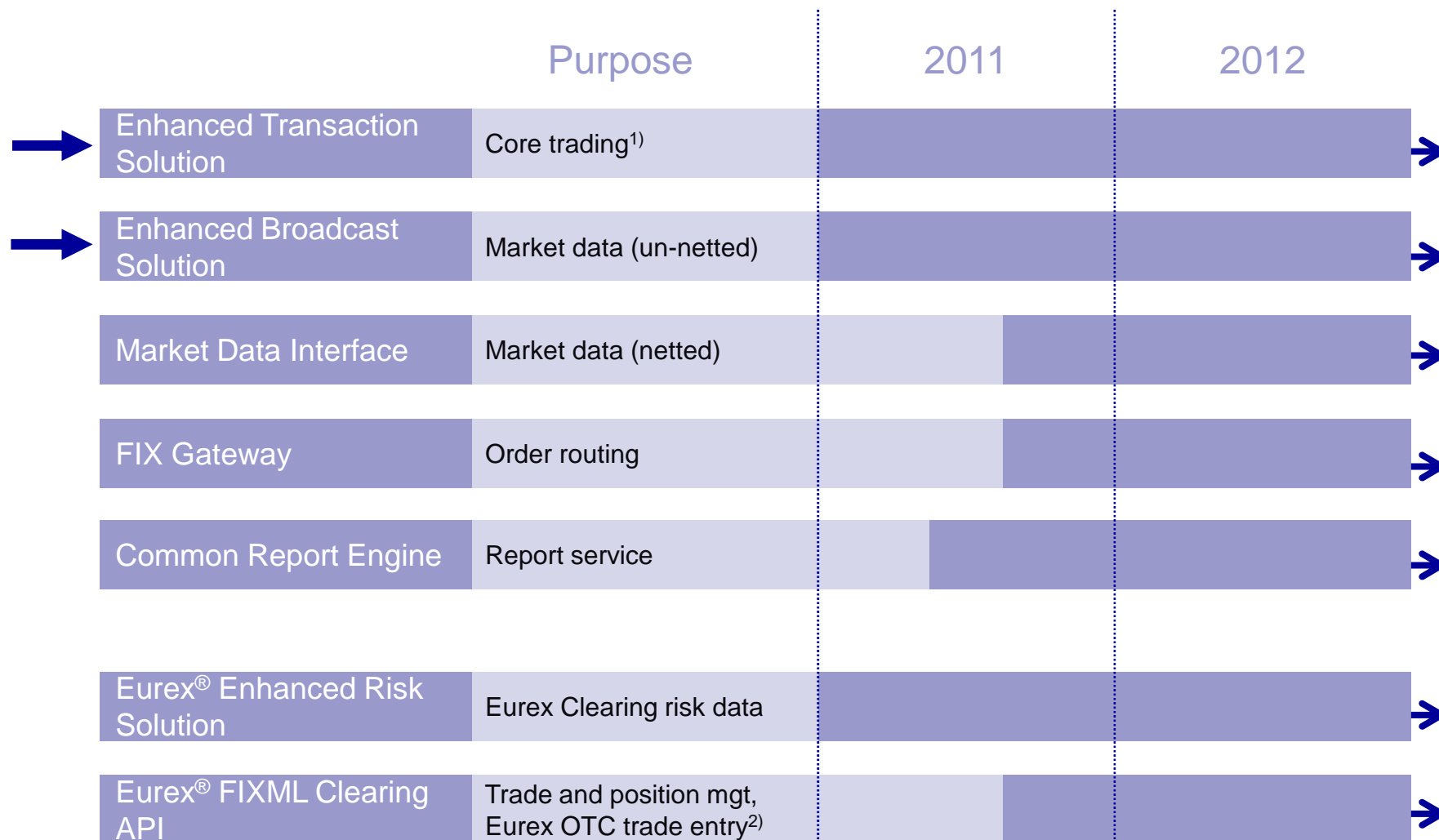
Eschborn, 5 October 2011



# Agenda

- n The need for socket-based interfaces
  
- n Deutsche Börse's high performance, low latency interfaces
  - n Enhanced Broadcast Solution: access to (un-netted) market data
  - n Enhanced Transaction Solution: core-trading functionality
  
- n Questions and answers

## From the list of the “new” interfaces, our focus is on:



1) Core trading does contain OTC trade entry for Xetra 12.0 but not for Eurex.

2) Functionality will be made available in several steps

## Agenda item

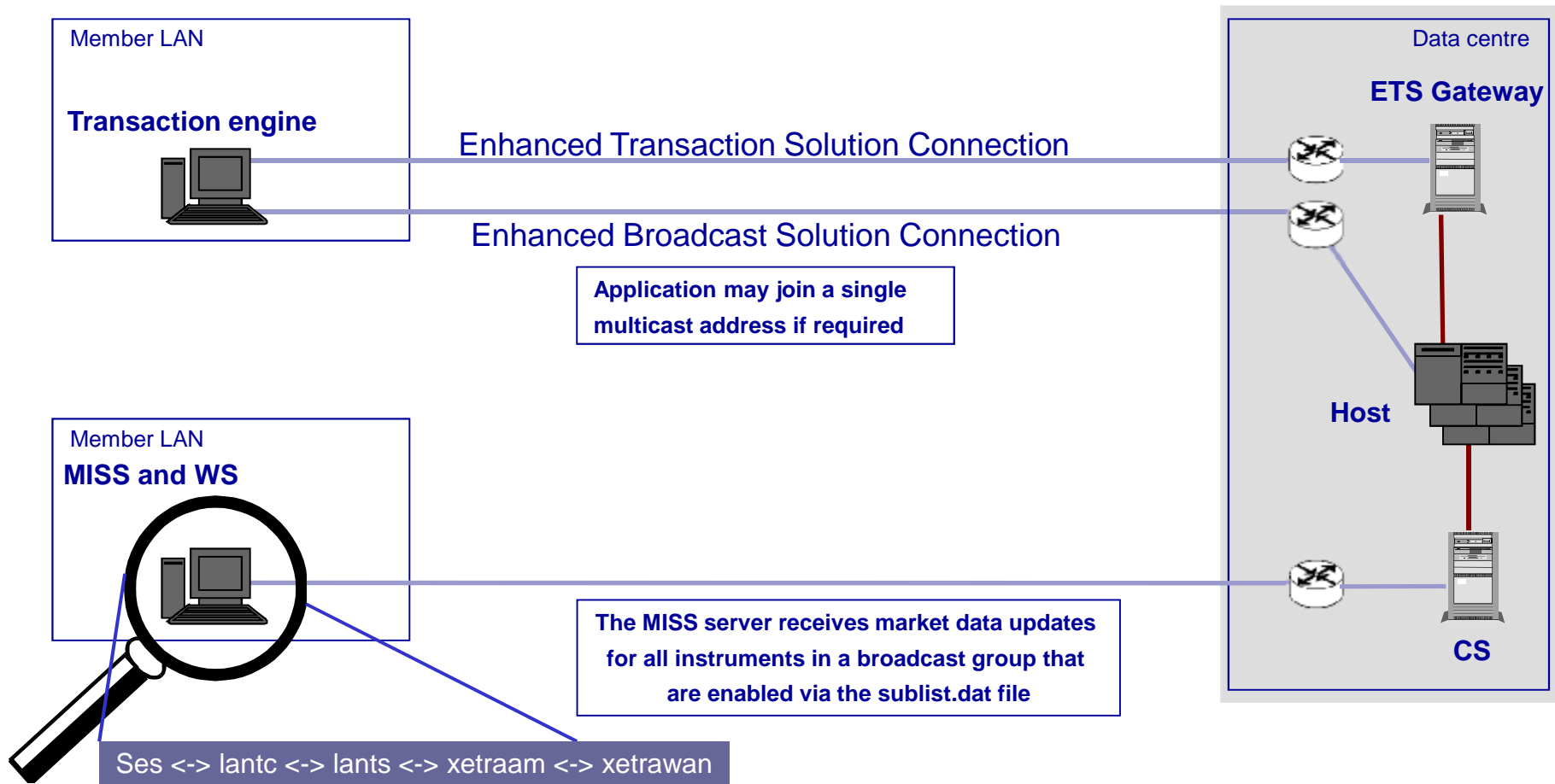
- n The need for socket-based interfaces

# Why did we develop socket-based interfaces?

- n Speed
- n Freedom to choose
  - Operating system / HW / Programming language
- n Flexibility
- n Simplicity

# Demonstrating speed, simplicity and flexibility

## Enhanced Broadcast / Transaction Solution vs. VALUES API (MISS architecture)



# Demonstrating message compactness, speed and simplicity

## Market order in VALUES API vs. Enhanced Transaction Solution

### VALUES API – Example of a Market Order

#### Request Structure → outbound to the Exchange

```

exchAppId          "XEUR"
prodLine           "F"
membExchIdCodOboMs "#####"
buyCod             "B"
  prodId           "FESX"
  cntrExpMthDat    "03"
  cntrExpYrDat     "2012"
  partSubGrpCod    "###"
  partNo           "###"
  ordrQty          "1"
  ordrExePrc       "+00000000000000"
  ordrTrgPrc       "+00000000000000"
  ordrResCod       "#"
  ordrExpDat       "00000000"
  opnClsCod        "O"
  acctTypCod       "A"
  acctTypNo        "1"
  cust             "#####"
  userOrdrNum      "#####"
  text             "#####"
  membClgIdCod     "#####"
  prcRsbIChkInd    "N"
  ordrPersInd      "#"
  userOrdrRef      "#####"
  etsSesId         "###"
  
```

### Enhanced Transaction Solution – Example of a Market Order

#### Request Structure → outbound to the Exchange

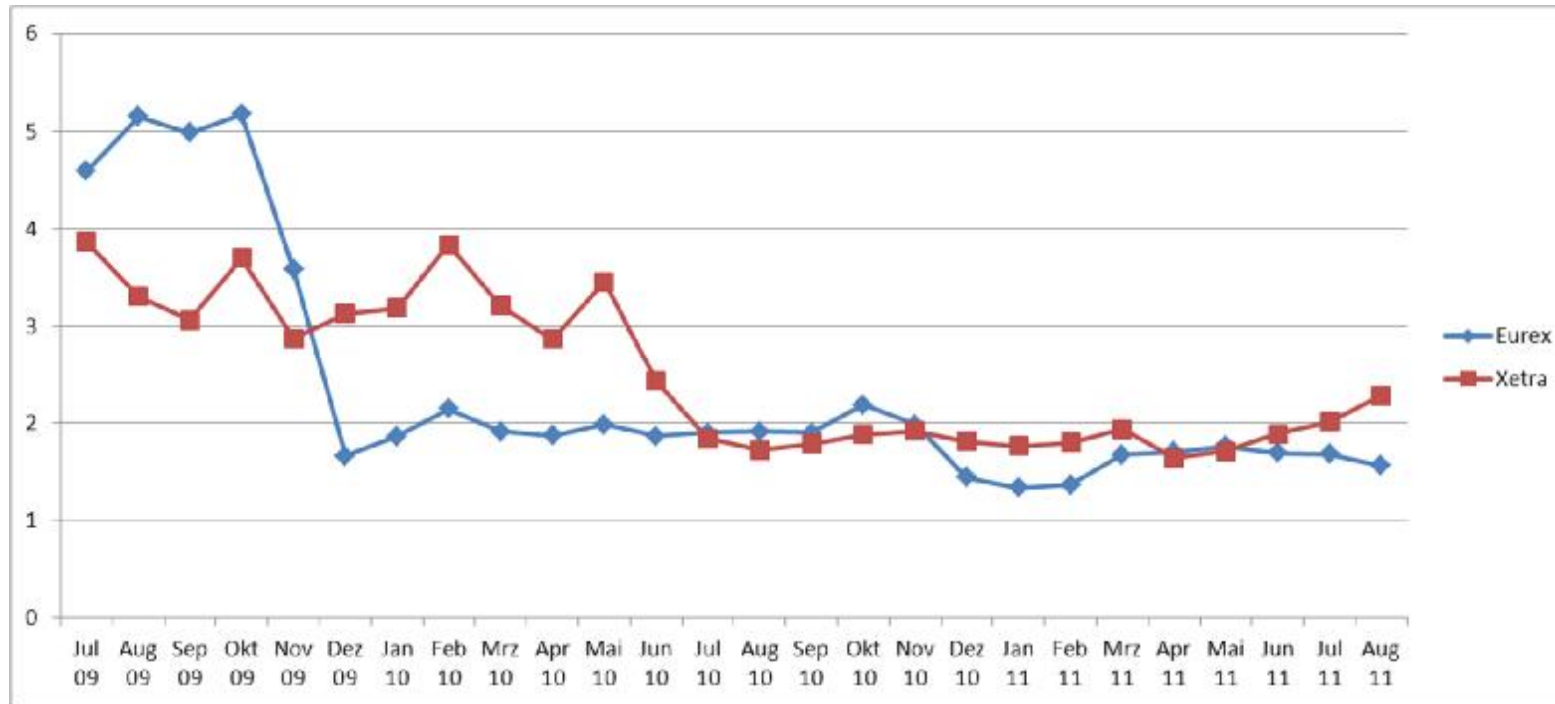
```

account            "A1"
buySellCode        "B"
clientOrderId      "Gdbxx7215400"
SingleLegIdGrp    contractId  "12"
                  productId    "102"
openCloseCode      "O"
orderTypeCode      "M"
timeInForceCode    "0"
totalQty           "1"
  
```

In VALUES API, fixed message structures have to be put on the wire also with white spaces and initialised fields (white space is illustrated with '#').

In ETS, only mandatory fields are put on the wire.

## Xetra<sup>®</sup> and Eurex<sup>®</sup> order round-trip times



The diagram shows monthly averages (in ms) of the Enhanced Transaction Solution round trip times of futures order add transactions (Eurex) and all order/quote transactions (Xetra).

Futures order add latency in Eurex and order / quote processing time in Xetra have been significantly reduced over the last years. In particular during periods with high trading activity the processing times have been stable.

# Eurex<sup>®</sup> – increased use of the Enhanced Transaction Solution

Enhanced Transaction Solution – transactions entered



Today, more than 80 percent of options and 90 percent of futures order and quote transactions are entered using the Enhanced Transaction Solution.

# Agenda item

n Enhanced Broadcast Solution

# Enhanced Broadcast Solution – scope

## In scope



- n un-netted public, “market” data
  - à Everyone may listen.
- n Clients can only listen to the market data.
- n Inquiries are not possible.

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## Out of scope



- n back office / clearing and settlement
  - n give-up / take-up processing
  - n trade inquiry, position and trade management
- n trading: order and quote maintenance

# Enhanced Broadcast Solution – support

## What we provide



- n documentation
  - n live-live concept to compensate for possible data loss
  - n multicast addresses
  - n data analysis tool
  - n support in application development issues/queries
- 

## What we do not provide



- n trading GUI
- n “Front End application” components
- n FAST decoder

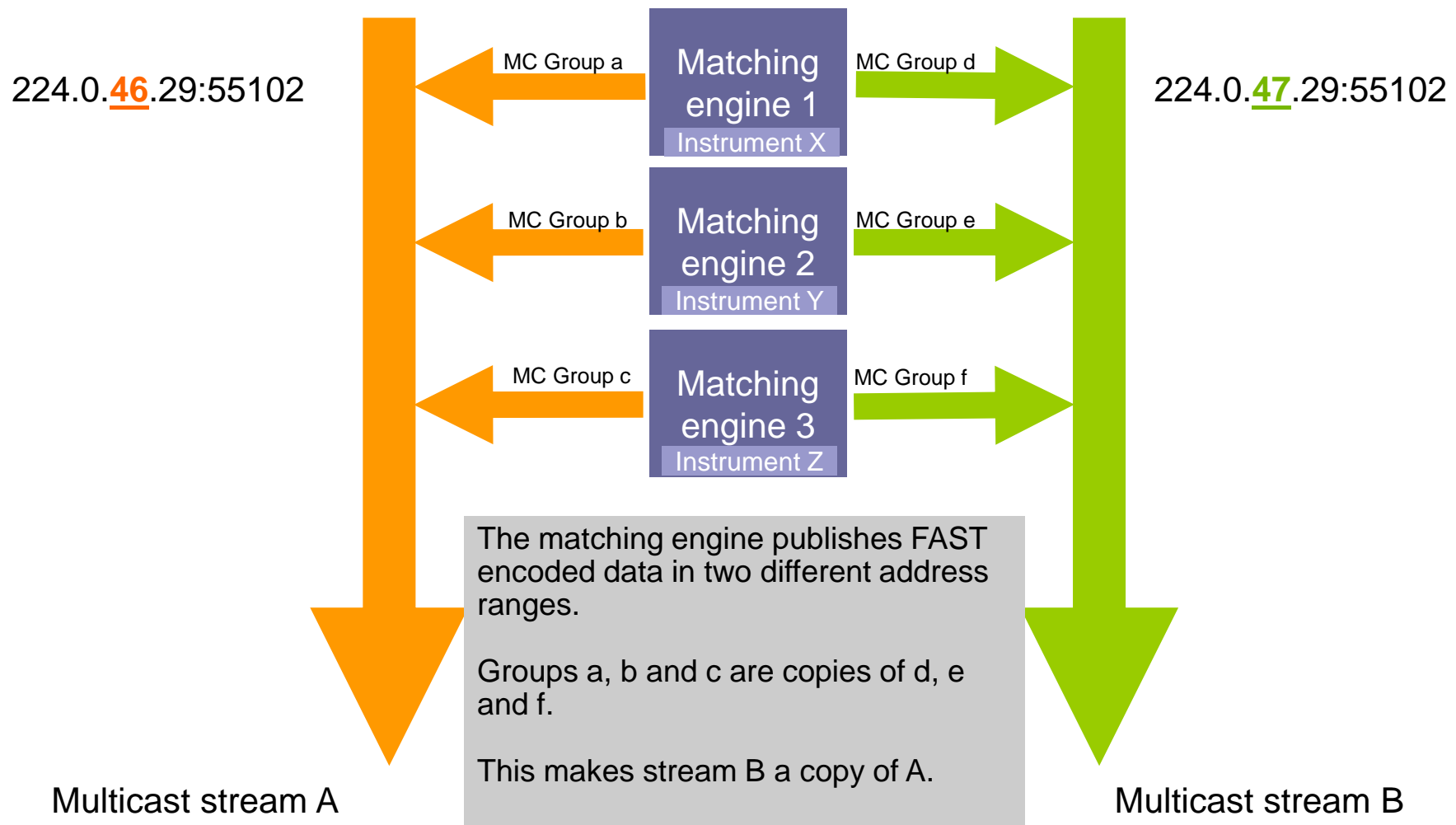
## Enhanced Broadcast Solution – the protocol

1. Messages are encoded with the FAST protocol:

[www.fixprotocol.org/fastspec](http://www.fixprotocol.org/fastspec)

2. Data packets are distributed via UDP multicast.
3. Live-live concept helps to compensate for data loss and failover.

# Enhanced Broadcast Solution – live-live concept (simplified)



# Enhanced Broadcast Solution – data dissemination concept

Data is distributed via various streams:

§ Reference data

§ Snapshot

§ Delta / incremental

§ All traded prices (Xetra<sup>®</sup> only)

§ State changes (Xetra only)

## Enhanced Broadcast Solution – typical daily operation

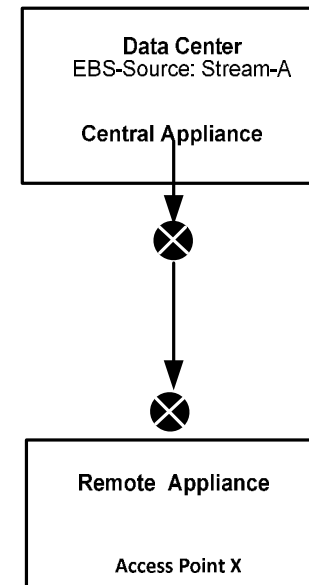
1. Join Reference Data Stream<sup>1)</sup> to get information about available products and their multicast addresses
2. Join Snapshot Stream for desired products to build initial order book
3. Join Delta Stream for desired products to get market updates and maintain order book
4. Perform recovery from “problem situations” as described in the interface specification

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1) Refer to the document “Network Access to Exchanges” for the reference data multicast addresses

# Enhanced Broadcast Solution – measuring latency using Corvil<sup>®</sup>

- n A central appliance is located in the Frankfurt-based data centres.
- n Several remote appliances are deployed in all access points.
- n Measurements do not include any matching engine / application processing times – only network latency is measured.
- n Statistics are available on the Internet.



# Agenda item

n Enhanced Transaction Solution

# Enhanced Transaction Solution – scope

## In scope



- n core trading functionality
  - n order maintenance
  - n quote maintenance
  - n product and contract static master data (inquire)
  - n market-maker quote limits (modify, inquire)
  - n cross requests: with Eurex<sup>®</sup> Release 14 & Xetra<sup>®</sup> Release 12
  - n OTC Information & Trade Reporting: with Xetra<sup>®</sup> Release 12
- 

## Out of scope



- n market data
- n member setup and maintenance
- n back office, clearing and settlement
- n Eurex: OTC trades
- n system state data

# Enhanced Transaction Solution – support

## What we provide



- n documentation
  - n connectivity information
  - n support in Application Development issues/queries
  - n “trading sessions”
- 

## What we do not provide



- n No “front end application” components / GUI

# Enhanced Transaction Solution – the protocol

1. binary interface – uses length type, value en- / decoding
2. compact messages – you only need to send the mandatory/optional fields required by your application
3. “private”-session based concept and view. For a member level view, use the Eurex<sup>®</sup> Enhanced Confirmation Solution (ECS) or Xetra<sup>®</sup> Trade Notifications with Release 12
4. documentation: Enhanced Transaction Solution specification

# Enhanced Transaction Solution – typical daily operations procedure

1. session logon
2. trader id login(s)
3. inquire product/instrument reference data and store locally
4. trade (and make money)
5. If necessary, use the retransmission request to recover event notification messages.

# Enhanced Transaction Solution – round-trip statistics and latency monitoring (available online)

n For “transactions”

Date and time			Own values																			Comparative values per GW							
2010-07-27 8:00-22:00			Futures messages											Options messages								Futures average time		Options average time					
Member	Session	GW	TS count	TS ave time[ms]	TS median [ms]	TS 95% [ms]	TS 99% [ms]	TS 99.9% [ms]	TS fastest [ms]	TS slowest [ms]	TS # slow	Rank over all	HD ave time[ms]	TS count	TS ave time[ms]	TS median [ms]	TS 95% [ms]	TS 99% [ms]	TS 99.9% [ms]	TS fastest [ms]	TS slowest [ms]	TS # slow	Rank over all	HD ave time[ms]	TS best [ms]	TS worst [ms]	TS best [ms]	TS worst [ms]	
INTXX			Unknown member																										
BEST+WORST																									0.6	57.7	1.1	178.2	

n And for TCP/IP data packets

## TCP/IP Roundtrip Statistics Eurex Enhanced Transaction Solution

Member ID:  Date (yyyymmdd):

Report Date and Time: 23.07.2010 - 08:00 - 22:00			Own values per session								Comparative values per session	
Member	Session	Location	TCP/IP Packets	TCP/IP RTT Avg. Latency [ms]	TCP/IP RTT Median Latency [ms]	TCP/IP RTT Latency 99% [ms]	TCP/IP RTT Latency 99.9% [ms]	TCP/IP RTT Fastest [ms]	TCP/IP RTT Slowest [ms]	Overall Ranking	TCP/IP RTT Fastest avg. (location) [ms]	TCP/IP RTT Fastest avg. (overall) [ms]
GDBXX	1598	FRA	84	1.63	1.497	1.958	1.958	1.405	1.958	N/A	0.67	0.176

# Agenda item

n Markets and network connectivity

# Enhanced Broadcast Solution/Enhanced Transaction Solution – available for following markets

- n Eurex®

- n Eurex® Vienna with Eurex Release 14

- n Eurex® Bonds

- n Irish Stock Exchange (Xetra®)

- n Vienna Stock Exchange (Xetra® Vienna)

- n Xetra® Frankfurt (FFM)

- n Xetra® Frankfurt 2 (Scoach) with Xetra® Release 12

- n Xetra® International Market

## Enhanced Transaction Solution – connectivity

Feature & market	Xetra <sup>®</sup>	Eurex <sup>®</sup>
Bandwidth	2.10 Mbit/s 10 Gbit/s unshaped	1.10 Mbit/s 10 Gbit/s unshaped
Sessions	up to 40 sessions per member	up to 25 sessions per member
Protocol	TCP/IP	

## Enhanced Broadcast Solution – connectivity

Feature & market	Xetra <sup>®</sup>	Eurex <sup>®</sup>
Bandwidth	10, 20, 30, 40, 50 Mbit/s 1 Gbit/s unshaped (Colt/Equinix) 10 Gbit/s unshaped (as of Dec 2011, Equinix)	10, 20, 30, 50, 60, 70, 120, 600 Mbps 1 Gbit/s unshaped (Colt/Equinix) 10 Gbit/s unshaped (Dec 2011, Equinix)
Protocol	IP Multicast	

n For details on available bandwidths:

- Eurex Circular 213/11
- Xetra Circular 89/11

Thank you for your attention!



# Contact

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Backup slides



# New features planned with Eurex<sup>®</sup> Release 14

## Enhanced Transaction Solution

- n support for cross requests
- n implementation of a subscription mechanism
- n additional field in the (user) inquire products request
- n introduction of a new session type with lower throttle setting: 50 transactions per second

## Enhanced Broadcast Solution

- n enhancement of the version information message (packet header)
- n additional fields in the static reference data
- n implementation of a ticker feed

## Enhanced Confirmation Solution

- n generic subscription
- n trade notification enhancement

# New features planned with Xetra<sup>®</sup> Release 12 (1/2)

## Enhanced Transaction Solution

- n trade notifications at a member level
- n OTC trading and trade reporting
- n support for Continuous Auction and Xetra BEST<sup>®</sup>
- n support for cross requests
- n clearing member stop button notification
- n member status notifications
- n order inquiry on session level allowing to filter for a trader subgroup
- n support order deletion via GUI
- n client order ID added to trade notification
- n text fields (text1 and text2) added to order status notification

# New features planned with Xetra<sup>®</sup> Release 12 (2/2)

## Enhanced Broadcast Solution

- n redesign of the version information message (packet header)
- n full instrument reference data
- n cross requests
- n technical market reset information
- n instrument suspend / unsuspend, knock out / revoke information

## Enhanced Broadcast Solution – features compared to VALUES API (MISS architecture) and Market Data Interface

Feature	MISS - VALUES API	Enhanced Broadcast Solution	Market Data Interface
Reference Data	Available	Available	Not available
Data granularity: Eurex® & Xetra®	Netted	Un-netted	Netted
Market Depth - Eurex	Automatic updates available only for selected Futures contracts (up to level 10).	Automatic updates available for all contracts (futures: up to level 20; options: 3 or 5)	Automatic updates available only for selected Futures contracts (up to level 10).
Market Depth - Xetra	Automatic updates up to level 10.	Automatic updates for full depth.	Automatic updates up to level 10.