



DEUTSCHE BÖRSE
GROUP

Enhanced Xetra
Connection Portfolio
Higher flexibility,
lower latency

The fastest trading.
Better order
book information.



Xetra: Strong Performance. At All Times.

Trading members who execute many transactions every day and in large volume, and who have to be able to react quickly to changes in the market need a reliable, high-performance trading system. This is exactly what Xetra® provides – with all the advantages of a seamless service chain for securities trading, clearing and settlement, along with efficient risk management. It is a unique product offering of over 380,000 tradable capital market instruments – with maximum liquidity and lowest transaction costs.

As Deutsche Börse's electronic trading platform, Xetra also provides the security and transparency of a regulated market. More than 260 banks and brokerage firms and more than 4,600 traders are reaping the benefits. Deutsche Börse's current expansion of the Xetra connection portfolio creates even better trading conditions for all trading members requiring not just high speed, but also even lower latency and even more market information in order to successfully implement their trading strategies.

In-Depth Market Information, Maximum Speed

Speed is increasingly a key success factor in securities trading – and not only in algorithmic trading. Even the slightest delay in order execution could mean sub-optimum results, thereby reducing the success of a trading strategy. The quality of the available market data is just as important an aspect as it forms the basis of every trading decision. By expanding its connection portfolio, Deutsche Börse is providing the market with innovative interface solutions, rendering key improvements in terms of trading speed and market data depth. The introduction of Xetra® Release 10.0 means that all Xetra members can use two separate high-speed interfaces in addition to VALUES API, one of which is exclusively for entering orders, and the other for receiving unnetted market data with increased order book depth. As the two new interfaces are low footprint solutions, they allow flexible and simple integration into the exchange member's technical infrastructure.

In order to guarantee Xetra members maximum flexibility and cost efficiency when implementing the two new interfaces into their existing connection structure, Deutsche Börse has developed a network connection consolidation concept: VALUES API and the new interfaces can be grouped on one physical high-speed line with 100 Mbit/s.

Enhanced Transaction Solution – setting orders and quotes faster

The new message-based interface focuses on the main trading functions and not only does it allow orders to be executed at an unprecedented speed, it also offers a range of features which considerably improve flexibility for the connected Xetra member. Unlike VALUES API, Enhanced Transaction Solution is an open interface which enables the member to use any combination of operating systems and hardware platforms, so the user has the comfort of using his own preferred systems.

Users have the choice of 2 Mbit/s¹⁾ or 10 Mbit/s bandwidth for their Xetra connection via Enhanced Transaction Solution. The shaped bandwidth concept means that Enhanced Transaction Solution connections provide the latency of the underlying physical lines irrespective of the chosen bandwidth. For example, if a 2 Mbit/s¹⁾ connection set up via a 100 Mbit/s line²⁾, Enhanced Transaction Solution provides the latency of a 100 Mbit/s bandwidth.

1) 2 Mbit/s Enhanced Transaction Solution is only available as part (channel) of a consolidated connection.

2) The range of high bandwidth physical lines depends on availability at the member's location.

Enhanced Broadcast Solution – market data with order book depth as required

This new interface is solely for the purpose of transferring unnetted market data with increased order book depth. The high-performance transfer mechanism guarantees low latency, which means Xetra members find out about market events faster than ever before. A subscription model enables them to select the market information they require, which effectively prevents any capacity bottleneck through transferring unnecessary data.

Like Enhanced Transaction Solution, Enhanced Broadcast Solution is also a low footprint solution which offers users easy integration into the existing infrastructure and maximum flexibility in selecting system components. By following current industry standards, the Enhanced Broadcast Solution's new high-speed protocol enables users to develop their own applications which correspond optimally with their individual trading strategies.

The main advantages of the two new interfaces

Enhanced Transaction Solution

- Ultra high speed access – optimized for order and quote management
- Open interface – possible to combine preferred hardware platforms and operating systems
- Low footprint solution – maximum flexibility due to low demand on investors' technical infrastructure
- Complete control at all times – even in the event of a failover
- Shaped bandwidth – flexible bandwidths with 2 Mbit/s and 10 Mbit/s

Enhanced Broadcast Solution

- High-performance transfer mechanism for unnetted market data – increased order book depth available
- Ultra-low latency – investors receive information on markets events even faster than before
- Subscription model – to subscribe to the individual instrument groups required
- Low footprint solution – maximum flexibility due to low demand on investors' technical infrastructure
- Oriented to industry standards – members can develop and apply their own applications flexibly
- Shaped bandwidth – flexible bandwidths from 10 Mbit/s to 50 Mbit/s

Technical Specifications of the New Interfaces

Enhanced Transaction Solution

Enhanced Transaction Solution is connected via TCP/IP, and is a message-based and session-oriented interface; the session is the most important context in its interaction with the Xetra® system. Enhanced Transaction Solution-based applications receive information for the orders and quotes entered within their own sessions. Several trader subgroups share one session, but each session can be instantiated once only. The individual layers of the interface are strictly separate in logical terms within Enhanced Transaction Solution (e.g. message flow, application messages and coding).

Although Enhanced Transaction Solution does not include mechanisms for a possible failover, the user is in complete control at all times. Therefore, functions such as heartbeats are provided, which allow technical problems between client applications (trading sessions) and the Xetra system to be identified. Thus, members can develop individual failover concepts for their applications.

Client applications are connected to the Xetra system by Deutsche Börse via “application gateways”. Each session has a unique session ID. The connection between the member router and the exchange router in the network is encrypted (IPSec protocol). The encryption can be deactivated at the member’s request for connections in proximity locations, in order to further reduce latency.

To avoid excessively high transaction frequencies in individual client sessions, which may also impair stock exchange operation, there is a limit to the number of order transactions which can be sent to the Xetra system per second in each session. The “throttle” is set in the same way as the architecture throttle for the existing MISS architecture.

Enhanced Broadcast Solution

Enhanced Broadcast Solution is offered as an optional service for the transfer of unnetted market data. Enhanced Broadcast Solution will initially be introduced parallel to “Un-Netted Inside Market Broadcast” via VALUES to facilitate migration to the new interface for Xetra members also over a longer period of time. From January 2010, unnetted market data will be transferred exclusively via Enhanced Broadcast Solution. Netted price information (Public Inside Market Broadcast) continues to be provided via the existing MISS architecture using the VALUES API application. Transaction data and specific client data (Private Broadcast) will continue to be transferred via the existing connection or via the new Enhanced Transaction Solution. The considerable changes in concept design mean that members’ existing applications will have to be adapted to the new interface.

Transferring market data in line with the subscription model principle

The Enhanced Broadcast Solution’s transfer mechanism is based on the subscription model principle, whereby a reference data feed transfers the relevant information to all instruments, including assignment of instruments to order book depth and the appropriate multicast address. Xetra members’ applications can automatically process this information on a daily basis; in the event of changes, no manual reconfiguration is necessary.

The market data subscribed to is sent at regular intervals in the form of complete order book information feeds, known as snapshot broadcasts. In the event of changes in the order book situation between the snapshot broadcasts, delta broadcasts are disseminated in a parallel data feed. The complete sequence of all Xetra transactions is transferred in a third stream (“All Trade Price”). The synchronization of the broadcast transfers in the individual feeds representing the complete order book must be done by the receiver application.

Every broadcast transfer is sent to two different multicast addresses in order to minimize the risk of package loss (live-live principle) and in the event of communications/line problems with the member application, to allow a very fast and smooth failover. Deutsche Börse therefore urgently recommends members to order two separate connections for Enhanced Broadcast Solution in order to be able to implement this concept. Snapshot and delta broadcasts are sent to separate multicast addresses.

Snapshot Broadcasts

- Complete order book information for a defined instrument at a defined time
- Broadcasts sent at regular intervals in addition to the Delta broadcasts
- Reference for the Delta broadcasts
- Information about those Delta broadcasts have been included in the snapshot

Delta Broadcasts

- Absolute values which are always sent when an event occurs which affects the market (such as an order or a transaction). Only changes in the market (Delta) are broadcast.
- Sequence number to check whether a previous broadcast was lost, perhaps as a result of system failure or extreme volume peaks.

All Trade Prices

- Price and volume of all Xetra® transactions

Further information on technical specifications and connection requirements for the two new interfaces are available in Deutsche Börse circular 167/08 and at www.deutsche-boerse.com.

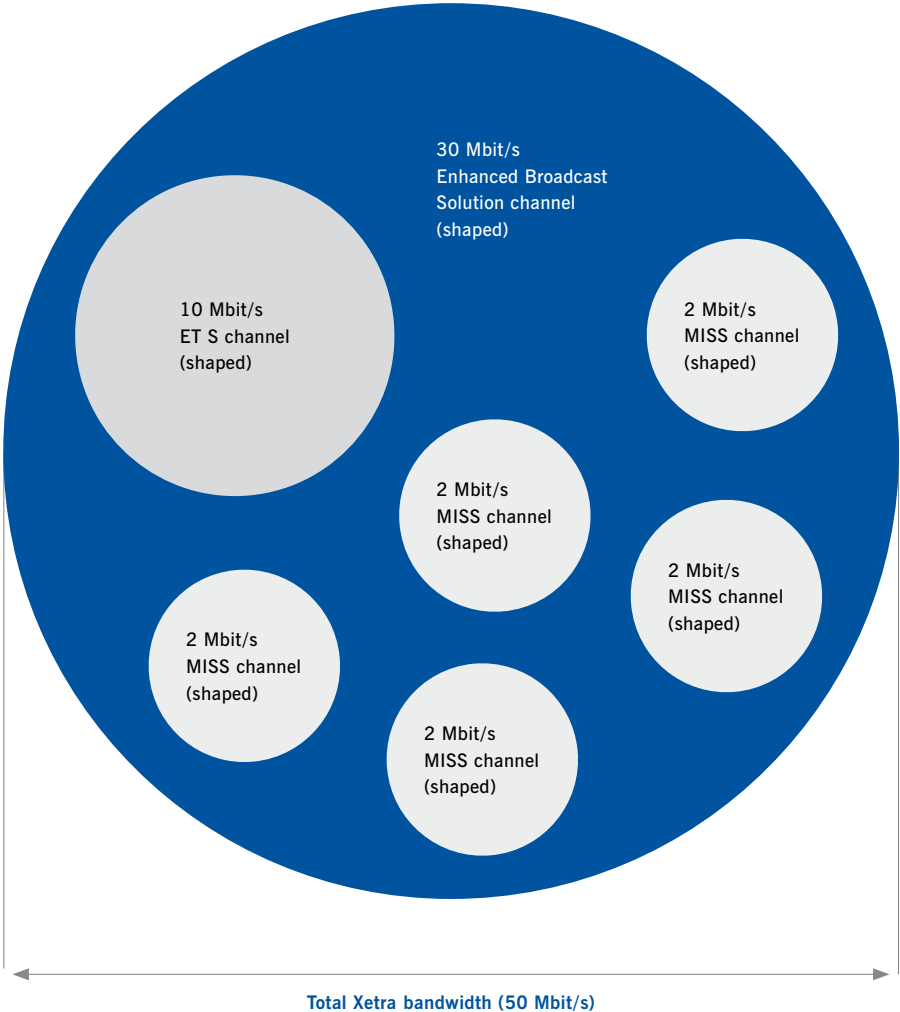


Simple and Cost-Efficient Connection

To facilitate easy and efficient integration in the Xetra® member's existing connection, Deutsche Börse offers consolidation of VALUES API, Enhanced Broadcast Solution and Enhanced Transaction Solution connections to Xetra in one physical line. This does not only make it easier to implement the new interfaces, it also facilitates increased efficiency, as some existing VALUES API connections can be replaced.

Xetra members can break down the bandwidth selected for the Enhanced Broadcast Solution connection into different logical "channels", and realize Enhanced Broadcast Solution connections, MISS and Enhanced Transaction Solution connections on this line. Irrespective of the individual capacity of the channels, each channel shows the serialization time of the physical line base (shaped bandwidths).

Consolidation of all Xetra connection types on one physical line
An example of this type of configuration



Price Overview

The existing price model for technical connection to Xetra® has been extended due to the introduction of Enhanced Transaction Solution and the increase in connection alternatives. However, existing prices for connection services will remain unchanged.

Enhanced Connectivity Service Fee

The connection fees for the new connection alternatives Enhanced Transaction Solution and Enhanced Broadcast Solution comprise a fee for the provision of bandwidths and an Enhanced Connectivity Service Fee. The Enhanced Connectivity Service Fee is charged for the provision of backbone and gateway capacity for the new interfaces and is payable both for connection to the new interfaces via individual lines (stand-alone lines) and for consolidated connections. The monthly fee per line amounts to €1,500.

Enhanced Broadcast Solution and consolidated connections

The following table shows the fees for using Enhanced Broadcast Solution via individual and consolidated connections with various bandwidths and depending on the location of the member installation.

Xetra connection fees for Enhanced Broadcast Solution and consolidated Xetra connections

Level	10 MB	20 MB	30 MB	40 MB	50 MB	Location
0	n/a	n/a	n/a	n/a	€500	Proximity
1	€1,500	€2,000	€2,300	€2,500	€2,700	Amsterdam, Dublin, Frankfurt, London, Paris, Zurich
2	€4,500	€6,000	€7,000	€7,500	€8,000	Germany, UK, Switzerland
3	upon request	upon request	upon request	upon request	upon request	other locations

The prices include bandwidth provision for Enhanced Broadcast Solution and are charged per connection. The charge for provision of a redundant line is equivalent to two connections. Additional fees are charged for Enhanced Transaction Solution and VALUES/MISS channels in consolidated connections (see page 14).

Connection to Xetra via Enhanced Transaction Solution

Members have the choice of bandwidths of 2 Mbit/s or 10 Mbit/s for access to Xetra® via Enhanced Transaction Solution. The connection can be realized either via dedicated lines (10 Mbit/s only) or by setting up logical channels in a consolidated connection (2 Mbit/s or 10 Mbit/s). The fee for bandwidth provision is based on the bandwidth selected and for individual connections on the member's location. The following monthly fees apply for the different connection types:

- Per 10 Mbit/s individual line see prices for Enhanced Broadcast Solution connection with 10 Mbit/s
- Per 2 Mbit/s channel (in a consolidated connection): €800
- Per 10 Mbit/s channel (in a consolidated connection): €1,400

Because Enhanced Transaction Solution is a session-based interface, every member receives two sessions free of charge. Additional sessions are charged at the following monthly rates:

- Per session (from session 3): €500
- Per session (from session 11): €900

Fees for additional sessions are only charged once per member, also for redundant Enhanced Trading Solution connections. The sessions in the simulation environment are free of charge. A maximum of ten sessions are provided in the Permanent Simulation category and a maximum of five in the Advanced Simulation category.

Connection via VALUES/MISS

The prices of standard connections for the MISS architecture (512 kbit/s, 2 Mbit/s and 1 Gbit/s) remain unchanged. Furthermore, existing or new standard connections can be realized within a consolidated connection if logical channels are set up. The following monthly fees apply for setting up a VALUES/MISS channel via a consolidated connection:

- Per 512 kbit/s channel: €600
- Per 2 Mbit/s channel: €800

If you choose a consolidated connection, you can select as many VALUES/MISS channels as you wish (up to the capacity limit of the selected bandwidth).

Fee Examples

Example 1

A member orders an Enhanced Broadcast Solution connection with 10 Mbit/s bandwidth for a location within London.

Bandwidth distribution	
Enhanced Broadcast Solution	10 Mbit/s
Fee charged	
Enhanced Connectivity Service Fee	€1,500
+ Enhanced Broadcast Solution 10 Mbit/s	+ €1,500
= Total per connection (monthly)	= €3,000

Example 2

A member orders a consolidated connection with 40 Mbit/s bandwidth for a location in Frankfurt/Main. The member wishes to use an Enhanced Transaction Solution channel with 10 Mbit/s in this consolidated connection and migrates two 512 kbit/s MISS connections into it.

Bandwidth distribution	
Consolidated connection	40 Mbit/s
– Enhanced Transaction Solution	– 10 Mbit/s
– 2 × MISS channel 512 kbit/s	– 1 Mbit/s
= remainder (i.e. available for Enhanced Broadcast Solution)	= 29 Mbit/s
Fee charged (monthly)	
Enhanced connectivity service fee	€1,500
+ Consolidated connection 40 Mbit/s in Frankfurt/Main (including Enhanced Broadcast Solution)	+ €2,500
+ Enhanced Transaction Solution 10 Mbit/s	+ €1,400
+ 2 × MISS channel 512 kbit/s	+ €1,200
= Total per connection (monthly)	= €6,600

In this case the member can cancel two 512 kbit/s MISS connections:
saving 2 × MISS connections at €1,500 each €3,000

The appropriate fee is doubled for provision of a redundant line. If more than the two free sessions are required for trading via Enhanced Transaction Solution, the additional session fees must be paid.

Important Information on Ordering the New Interfaces

The following advice is vital for selecting suitable bandwidth:

- One physical line can only contain one logical Enhanced Transaction Solution channel for Xetra®.
- A maximum of two Enhanced Transaction Solution channels can be connected to each IP subnetwork.
- One physical line can only contain one Enhanced Broadcast Solution channel for Xetra.
- An Enhanced Broadcast Solution channel must have bandwidth of at least 10 Mbit/s (maximum 50 Mbit/s).
- MISS channels can have bandwidth of 512 kbit/s or 2 Mbit/s.
- Enhanced Transaction Solution channels can optionally be selected with 2 Mbit/s or 10 Mbit/s bandwidth.
- To ensure failover, consolidated connections for trading locations must always be ordered redundant and with identical configuration.
- Because of the sheer number of different member locations, and consequently different telecommunications providers, the provision of network connections for the new Enhanced Broadcast Solution and Enhanced Transaction Solution interfaces and of the new consolidated connection portfolio may take some time. This should be taken into consideration in the scheduling.

Published by

Deutsche Börse AG
60485 Frankfurt/Main
www.deutsche-boerse.com

December 2008
Order number: 1110-2770

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