X-pand into the Future

e u r e x *circular 143/09*

Date: Frankfurt, July 27, 2009
Recipients: All Trading Members of Eurex Deutschland and Eurex Zürich and Vendors
Authorized by: Thomas Lenz

1. Publication of "Last-Mile" Network / Matching Engine Roundtrip Times for Enhanced Transaction Solution Sessions
2. Message Latencies for Market Data disseminated via the Enhanced Broadcast Solution
3. Optimization of Enhanced Transaction Solution Roundtrip Times and Receipt of Market Data

Contact: Technical Account Manager, via VIP number or Eurex Customer Technical Support, tel. +49-69-211-1 12 00, e-mail: Eurex-help@deutsche-boerse.com

Content may be most important for:	**Attachments:**
Ü IT/System Administration	none

Summary:

Eurex currently provides members with roundtrip time information for their transactions submitted via the MISS and / or ETS sessions. The information provided includes the ranking of a member's MISS server(s) or ETS session(s) on the Communication Server / ETS Gateway.

In order to further increase the transparency of information concerning the individual components of round-trip times for ETS sessions and in addition provide information with respect to message latencies of market data disseminated via the Enhanced Broadcast Solution, Eurex will enhance its suite of web-based monitoring tools from **August 3, 2009** onwards.

Enhanced Transaction Solution: Publication of "Last-Mile" Network and Matching Engine Roundtrip Times

Eurex will provide network roundtrip statistics at a tcp-level from its measuring point located in close proximity to the Eurex gateways up to a member's application server. Eurex will measure the time taken for network packets being sent to these machines to be acknowledged. Information concerning the ranking of a member's ETS sessions will also be provided. In addition to these roundtrip times, Eurex will provide statistics with respect to the processing times of the matching engines.

Enhanced Broadcast Solution: Publication of Message Latency for Market Data

Eurex will provide latency statistics for market data messages in one minute time intervals for both the "A-Stream" and "B-Stream" over the entire business day. The measurements will be taken from the feed distribution data centre up to the Access Point location. In the first phase Eurex will provide this information for each of its proximity locations from **August 17, 2009** onwards. Information for the remaining Access Points will follow in the Q4/2009. Historical Information for up to five business days will be provided.

1. Publication of "Last-Mile" Network / Matching Engine Roundtrip Times for Enhanced Transaction Solution Sessions

2. Message Latencies for Market Data disseminated via the Enhanced Broadcast Solution

3. Optimization of Enhanced Transaction Solution Roundtrip Times and Receipt of Market Data

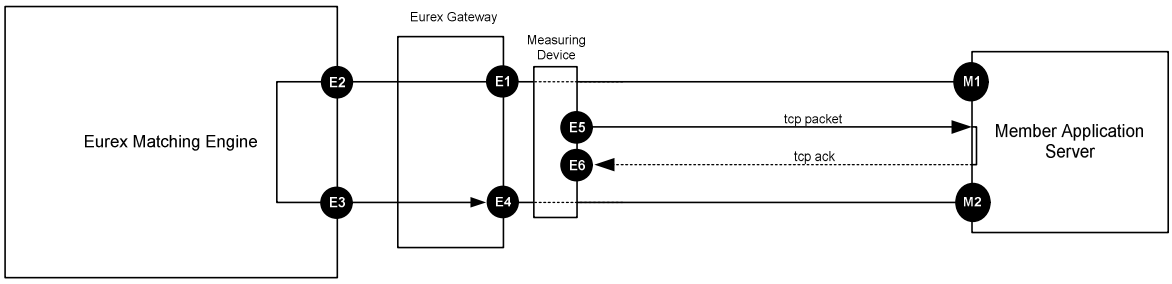
Eurex currently provides members with roundtrip time information for their transactions submitted via the MISS and / or ETS sessions. The information provided includes the ranking of a member's MISS server(s) or ETS session(s) on the Communication Server / ETS Gateway.

In order to further increase the transparency of information concerning the individual components of roundtrip times for ETS sessions and in addition provide information with respect to message latencies of market data disseminated via the Enhanced Broadcast Solution, Eurex will enhance its suite of web-based monitoring tools from **August 3, 2009** onwards.

1. Enhanced Transaction Solution: Publication of "Last-Mile" Network / Matching Engine Roundtrip Times

Eurex will provide network roundtrip statistics at a tcp-level from its measuring point located in close proximity to the Eurex gateways up to a member's application server. Eurex will measure the time taken for network packets being sent to these machines to be acknowledged. Information concerning the ranking of a member's ETS sessions will also be provided. In addition to these roundtrip times, Eurex will provide statistics with respect to the processing times of the matching engine.

The following diagram provides a simplified representation of a connection to the Eurex backend via the ETS interface and the various timestamps which can either be determined by members themselves (M1 & M2), which are already provided by Eurex (E1 & E4) or which will be provided by Eurex in the near future (E3-E2, E6-E5).



M1 / M2: represent the timestamps which can be taken by a member's application to determine the functional roundtrip time for a transaction (i.e.) the time taken from when a request is submitted to the time when a response is received from the Eurex backend.

E1 / E4: are currently provided by Eurex in two different forms:

1. Real-time in the response notifications (*GatewayReqInTimeStamp* and *GatewayRespOutTimeStamp* fields) from the Eurex® system back to the client application. These times can be used in conjunction with M1 and M2 to determine to what extent the gateway processing, host processing and network travel times between the gateway and the hosts contribute to the total roundtrip times.

2. The average difference between these two timestamps is also currently provided on a daily basis in the web-based monitoring tools on the member section of the Eurex website. The figures provided represent the performance statistics for the trading session for the whole business day. Further statistical (e.g,) fastest/slowest transaction processing times and ranking information is also provided. The ranking information will also be enhanced to include the total number of sessions which were used in the ranking calculation (i.e.) 10 / 213

E2 / E3: These timestamps are taken in order to calculate the average processing times for the related transactions on the matching engines. The average difference between these two timestamps for the whole trading day will also be provided on a daily basis in the web-based monitoring tools on the member section of the Eurex website from **August 3, 2009** onwards.

The changes which will be made in the existing web-based monitoring tools on the member section of the Eurex website are depicted below (shaded columns)

Date and time			Own values																						Comparative values per GW			
2009-07-02 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]
ABCFR	1000	- FRA	112012	2.4	1	5	15	40	1	62.3	0	24/213	1.9	379	2	1	7	15	24	0	24.7	1	2/117	1.5	1.5	26.9	1.6	207.3
ABCFR	1001	- FRA	106601	2.3	1	5	13	37	1	47.2	0	13/213	1.8	11380	4.6	1	20	50	105	0	92.8	1	17/117	3.9	1.5	26.9	1.6	207.3
ABCFR	1002	- FRA	99980	2.3	1	5	13	38	1	49.7	0	19/213	1.9	11159	3.6	2	10	15	34	0	52.9	1	10/117	3	1.5	26.9	1.6	207.3

HD ave time [ms] = Average Round Trip Time of futures/options related transactions on the matching engine [Backend] in milliseconds

E5 / E6: The figures to be provided will represent the average tcp ack times (i.e.) the time taken between a tcp data packet being sent from Eurex to a member's application server to the time which the tcp ack is received on Eurex's measuring device.

The average difference between these two timestamps together with further statistical information (e.g,) maximum, minimum values times and ranking information for the whole trading day will also be provided on a daily basis in the web-based monitoring tools on the member section of the Eurex website from **September 21, 2009** onwards in the following form.

Report Date and Time: 21.07.2009 - 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 [ms]
ABCFR	1000	PRO	117784	0,213	0,225	0,312	0,356	0,174	1,432	5 / 197	0,171
ABCFR	1001	PRO	118231	0,217	0,231	0,321	0,365	0,168	1,431	6 / 197	0,171
ABCFR	1002	PRO	117921	0,232	0,243	0,355	0,417	0,175	5,504	9 / 197	0,171

The "overall ranking field" provides the rank for the given trading session amongst all trading sessions in the market where the TCP/IP packet count was larger than 30.000 packets

Please Note:
It is **essential** that members disable the "delayed ack" on their in application machines in order to be able to make use of these statistics.

2. Enhanced Broadcast Solution: Publication of Message Latency for Market Data

Eurex will provide latency statistics for market data messages in one minute time intervals for both the "A-Stream" and "B-Stream" over the entire business day. The measurements will be taken from the feed distribution data centre up to the Access Point location. In the first phase Eurex will provide this information for each of its proximity locations from **August 17, 2009** onwards. Information for the remaining Access Points will follow in the Q4/2009. Historical Information for up to five business days will be provided.

The contents of the information to be provided includes: Minimum, average and maximum latency (in µs), as well as 90 percent and 99,5 percent latency percentiles.

Members can use this information to determine if Eurex has incurred any delays in the dissemination of market data to its access points or if the reason for potential latency of market data maybe located elsewhere (i.e.) a member's in-house network infrastructure.

The web-based monitoring tools can accessed from the Eurex website under:

www.eurexchange.com > Member Section > Service Point > Technical Services > Monitoring

Optimization of Enhanced Transaction Solution Roundtrip Times and Receipt of Market Data

The Eurex matching engines are distributed across two separate data centres, with each matching engine being responsible for single or a group of products. In order to provide members with transparency concerning the location of the individual products together with the appropriate gateway which should be used to achieve optimal performance when trading them, Eurex provides the optimal gateway location (*OptiGatewayLocID*) for each product in the product reference data distributed via the Enhanced Transaction Solution. The *OptiGatewayLocID* contains either the value "0" or "1" which corresponds to the IP address of the optimal gateway for trading the product as follows.

Eurex Enhanced Transaction Solution connections **encrypted** or **simulation**

"0" Optimal Gateway Location: Gateway IPs are in the range 193.29.94.0/25 (less 127)

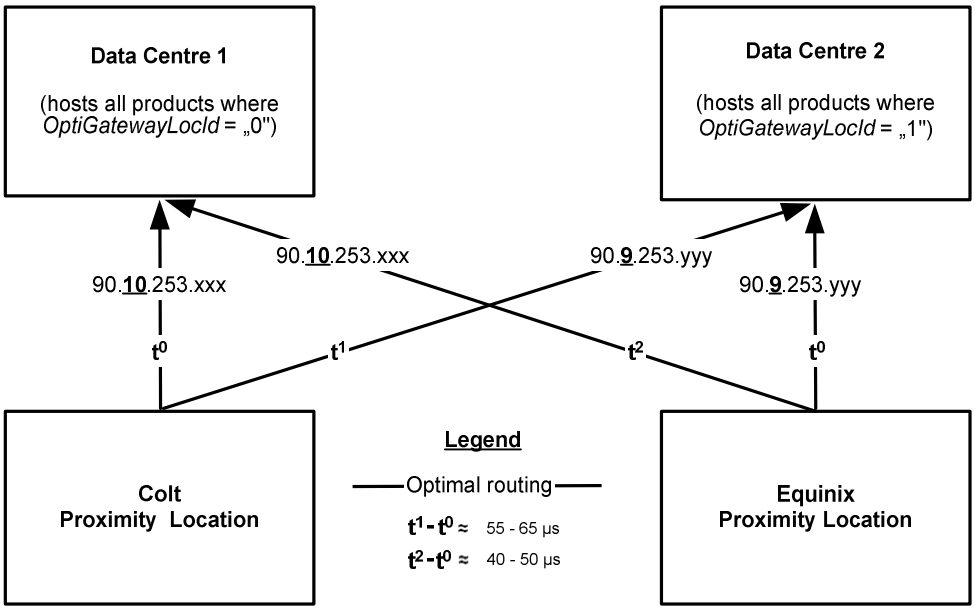
"1" Optimal Gateway Location: Gateway IPs are in the range 193.29.94.128/25 (greater than 128)

Eurex Enhanced Transaction Solution **non-encrypted production (proximity) environment only**

"0" Optimal Gateway Location: Gateway IPs are in the range 90.10.253.0/24

"1" Optimal Gateway Location: Gateway IPs are in the range 90.09.253.0/24

The following diagram represents the **optimal** gateway configuration which should be used from each of the Eurex proximity locations in order to access the individual products.

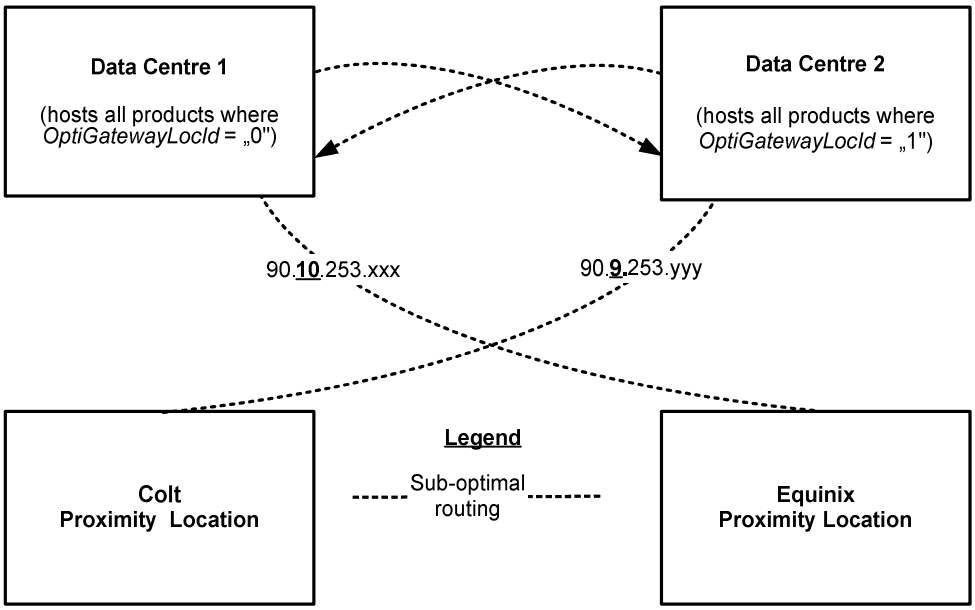


Example:

A customer located in the Equinix Proximity Location wishing to trade a product with whose *OptiGatewayLocID* = 1, should use a gateway address of 90.9.253.yyy.

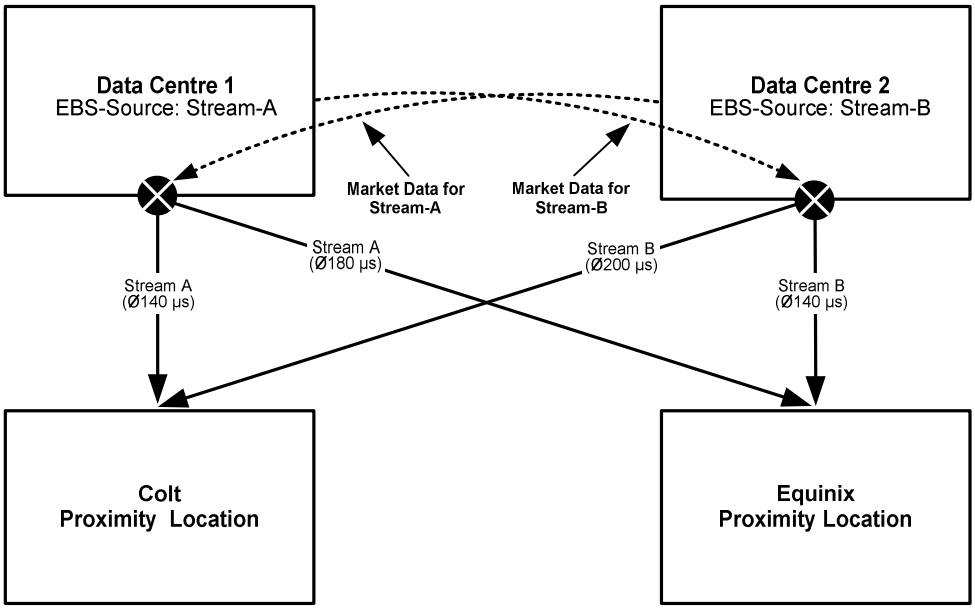
The same customer wishing to trade a product whose *OptiGatewayLocID* = 0, should use a gateway address of 90.10.253.xxx.

In contrast, the following diagram represents a **sub-optimal** configuration which would lead to additional latency and poorer roundtrip times.



The Enhanced Broadcast Solution Stream A originates from the Eurex Data Center 1 where the products with OptiGatewayLocID = “0” are hosted. Stream B originates from the Eurex Data Center 2 where products with OptiGatewayLocID = “1” are hosted.

The following diagram depicts the mechanism of data dissemination from each of the Eurex Data Centers together with the average latency for Market Data in each of the proximity locations.



Members are advised to take this information into consideration when subscribing to Market Data.

If you have any questions or require further information regarding this circular, please contact your Technical Account Manager using your VIP number, the Eurex Customer Technical Support, tel. +49-69-211-1 12 00 or via e-mail: eurex-help@deutsche-boerse.com.

Frankfurt, July 27, 2009