e u r e x *c i r c u l a r 1 5 / 9 9*

To: All Eurex members and vendors

Date: Frankfurt, 25th February 1999

Eurex Release 3.0 / New Front End Architecture

Dear Sir or Madam,

A number of Eurex circulars have already been distributed relating to the introduction of the new Eurex Release 3.0 front end and the use of the standard VALUES API interface. This circular is designed to give you a complete overview of the key information on Release 3.0 and the associated roll-out of the new front end.

1. Key dates for Eurex release 3.0

- **May '99**: Start of Technical and functional training for the new front end
- **June '99:** Delivery of Release 3.0 Member Manuals and Release 3.0 Simulation Guide
- **from 12.07.99:** Release 3.0 Simulation for User Devices and MISSs
- **23.08.98:** Start of Eurex Release 3.0 production for User Devices
- **06.09.99:** Start of Eurex Release 3.0 production for MISSs with the Graphical User Interface

2. New Functionality

The focus of Release 3.0 is the new Eurex front end with the open standardised interface (VALUES API). On the basis of this interface, Eurex is providing a modern graphical user interface (GUI) which, in this release, will support all trading functions. The attached document 'Functional Description of New Front End (GUI)' offers a comparison between the current user interface and the new one, and describes the implementation of the new trading interface. As the new front end covers the full range of Eurex functions, the current User Device can be replaced completely.

In a further step, on the basis of the new front end, the future integration of the cash market (Xetra) and derivatives market (Eurex) will become possible. With the VALUES API, Eurex Release 3.0 already provides an identical call interface to that of Xetra 3.1.

The attached 'Preliminary Release Notes' describe the new features of Release 3.0 related to the User Device interfaces. We ask you to take special note of these since they will be in effect for all members over the transition period between the start of Eurex 3.0 production on 23rd August until the start of support for the new front end on 6th September 1999. With respect to this, we would also draw your attention to the backward compatibility of the Back Office interfaces (see section 5, below).

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3. Supported Front-end Platforms

With Release 3.0, the new front end will be supported on the following platforms:

- IBM AIX 4.3.1
- Microsoft Windows NT (Intel) 4.0 Service Pack 3
- Sun Solaris 2.6
- Compaq AXP Open VMS 7.1-2

For details on the respective operating system patch levels, please refer to the attached 'Sizing Guidelines'.

In our circular 90/98 of 22nd December 1998 we announced that the decision to support the Compaq AXP platform required further investigations. In the meantime, these investigations have been carried out jointly with the Compaq company. As a result, Eurex has reached the decision to support Compaq AXP/Open VMS as a server (MISS) and as a workstation platform.

We would like to remind Eurex members who still have the old DEC-VAX hardware in use, that support for that platform will finally be withdrawn on 20th August 1999.

4. Technical Description of New Front End

The attached document 'Technical Overview' gives a comprehensive overview of the new front-end architecture, configuration variants, and network connections. The associated 'Sizing Guidelines' document allows system technical personnel to plan for the required future system capacity. Please note that the 'Sizing Guidelines' do not yet include figures for the Compaq AXP platform. We will, however, shortly issue you with an extrapolation (see below).

5. Migration from the User Device to MISS

From 6th September 1999, Eurex members will have the following configuration options:

- **Continuation with the current User Device Configuration**

  With this configuration it is possible to take the Back Office Interface in Eurex 3.0 format, or make use of the backward compatibility and continue to receive it in Eurex 2.0 format.

  Note: according to current planning, User Device configurations will be supported at least for Eurex Release 3.0. Depending on the progress on migration to the new architecture, User Devices may continue to be supported with Eurex Release 4.0.

- **Mixed configurations of User Devices and MISSs**

  Because of the advantages of the new graphical user interface it would be of benefit to make the new trading technology accessible quickly, and switch over the Back Office in a second step. In order to control the risks it is also possible for large trading installations to be migrated in multiple stages.

- **Complete Migration to MISS configurations**

  This option offers the possibility, particularly for small and middle-size installations, to adopt the advantages of the GUI immediately and avoid the simultaneous use of User Devices and MISSs.

Eurex is currently investigating cost-effective and risk-optimised migration procedures with the aim of giving you recommendations during calendar week 10 (week ending 12th March). At that time we also plan to publish the outstanding sizing parameters for the Compaq AXP hardware. The VALUES API Developer's Kit for this platform will also be delivered at the same time. With that, you will be in possession of all the documents for planning and preparation of the conversion to the new front end. Due to the reduced timescale, however, we are asking you to prepare your decision on the basis of the information contained in this circular. The following 'Migration Calendar' shows the necessary preparatory steps for members and the Exchange:

- from now: investigation of migration decision on the member's side
- Week 10: Eurex will make the following documents available:
  - Migration recommendations
  - Sizing Information for Compaq/Open VMS
  - 'Detailed Member Network Set-up'
  - Application form for User Device/MISS migration
  - VALUES API Developer's Kit for Compaq AXP/Open VMS
  - Information and application form for technical and functional training

- By 31.03.99: Members return application documents to Eurex
  (Eurex requires the applications by 31.03.99 in order to carry out the extensive preparation in the simulation and production environments. Applications arriving later may not be dealt with in the timescale

- By 30.04.99: Eurex confirms the classification of the members' proposed hardware configurations
- By 31.05.99: Members order the required hardware
- By 30.06.99: Members install the required hardware
- May/June '99: Participation in Eurex 3.0 technical and functional training
- By 30.06.99: Members and Eurex carry out joint connection tests with the new hardware
- From 12.07.99: Simulation of the new front-end configuration
- From 06.09.99: New front-end configuration taken over into production

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Finally, we would like to draw your attention to the fact that additional User Devices can only be accepted into production until 30th June 1999. For organisational reasons, the corresponding complete network request must be received by Eurex by 7th May 1999. Applications received later will be treated as for new front ends (MISS platform) and will be correspondingly put into service at a later date (see above).

We ask for your active support in the preparation of Eurex Release 3.0 and the new front end, and would like to thank you in advance for your co-operation.

The Eurex Member Readiness team can be reached on +49-(0)69-2101-1700 and will be pleased to help you with any questions you may have.

Yours sincerely,

Jürg Spillmann

Hartmut Klein

Attachments

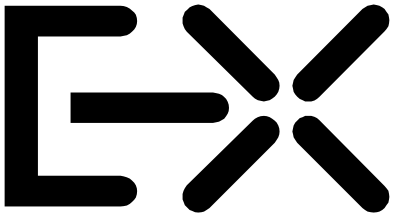
- Eurex Release 3.0 - Functional Description of new Front End (GUI)
- Eurex Release 3.0 - Technical Overview (MISS-based Front End)
- Eurex Release 3.0 - Sizing Guidelines
- Eurex Release 3.0 - Preliminary Release Notes

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X-pand into the **Future**



Eurex Release 3.0

Functional Description of the new Front-end (GUI)

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1 Introduction

The changes introduced with Eurex Release 3.0 are primarily associated with the new architecture and design of the member's front-end installation and the provision of a Graphical User Interface (GUI) to support the trading functions. The Graphical User Interface reflects the trading functionality provided with Eurex Release 2.0.

The document "Functional Description of new Front-end (GUI)" contains information on the functional layout of Eurex Release 3.0 and describes the functionality which will be made available to market participants with this release. In Release 3.0 the Graphical User Interface supports the trading activity. The exchange also provides an application on the new architecture that replicates the current Eurex 2.0 character-based User Interface (CUI) to the clearing functions.

For a description of the new front-end architecture introduced with Eurex Release 3.0, please refer to the document "Eurex 3.0 Technical Description – MISS-based Front End".

This functional description is mainly aimed at existing and potential Eurex users and the objective of the document is to provide an overview of the functional characteristics of Eurex Release 3.0.In particular, this includes the description of the menu structure, as well as the functionality of the Eurex Graphical User Interface.

The current character based user interface provided for the User Device technology will not change with Eurex Release 3.0. (This document might therefore be not immediately relevant for members who continue to use the current character based Front-end based on the User Device technology.)

Comments

All information and screen layouts presented in this document represent the current development intentions at the published date. Amended and/or new versions will be made available as they are published.

1.1 Document Structure

After a short functional description of the scope of the new interface, the document essentially follows the menu structure of the system. It includes illustrations of the main windows in each of the major groups of functions supported by the GUI.

Chapter 2 summarises the functional scope of the new front end and compares the new GUI with the current character-based user interface of the User Device.

Chapter 3 describes the design concept of the new front end, and shows the open system potential of the new application programming interface (API).

Chapter 4 provides the menu structure of the new front end, identifying the categories of functions covered in the sections below

Section 4.1 deals with Login and Logout and shows the main menu providing access to the main functional groups below.

Section 4.2 deals with the group of windows concerned with Market Information.

Section 4.3 describes the Trading functions.

Section 4.4 shows the windows supporting the trader's own activity on the exchange.

Section 4.5 describes the window functions associated with trading support.

Section 4.6 contains windows for set-up of user specific configurations (colours, fonts, profiles). Further windows for the set-up of default values are described.

Section 4.7 describes the Help window.

2 Functional Scope

The new Eurex Front-end supports the following core functional areas:

- **Order Routing**

  Accepts orders from members' order routing system, forwards them to the back end system and receives the related responses

- **Order and Quote Administration**

  Pre-processing of order and quote transactions (e.g. deletion), forwarding the requests to the back end system and receiving the related responses

- **Matching & Trade Entry**

  Receipt of execution confirmation and supporting entry of OTC trades

- **Trade Enrichment**

  Receives trade confirmations from the back end system

2.1 Improved trading efficiency using GUI technology

The table below shows the main advantages of a GUI approach.

Character based User Interface (CUI)	Graphical User Interface (GUI)

Exclusively keyboard usage to enter orders, quotes, data and information display	Improved user friendliness by general GUI advantages such as individual configuration of window information
	• High speed and reaction time for trading activities via
	  • mouse usage
	  • short cuts and function keys
	  • fast entry facilities for changing market and own data display
	  • fast entry of data via quick entry menus
	  • entry of contract identification with short cuts (e.g. “Z8” equals DEC98)

2.2 Comparison of Eurex 2.0 and Eurex 3.0 Interfaces

The following table compares the character based user interface of the existing User Device and the graphical user interface available on the new front-end architecture.

Character based User Interface (CUI)	Graphical User Interface (GUI)
Market information only for single products at a time	Allows display of multiple products and contracts in one window
Execution Confirmation for orders being executed immediately after entry only includes quantity	Execution Confirmation always includes quantity as well as price of the executed order
Inquiry required to view update on own orders, own quotes and own trades	Automatic update of own orders, own quotes and own trades
No display of trader ID for own orders, own quotes and own trades	Display of trader ID for own orders, own quotes and own trades to easily identify the owner/initiator of a transaction
Fixed screen layout and information display	Individually configurable windows meeting all traders' requirements: • Agent, Proprietary and Market Maker business • Configuration of data display (content colour and size) • Multiple market windows containing different user defined information
Default values only available for quote quantity and individual text field configuration	Individual configuration of default and user defined values used for: • Order entry (default quantity per product) • Order/Quote limits • text field configuration incl. customer related information

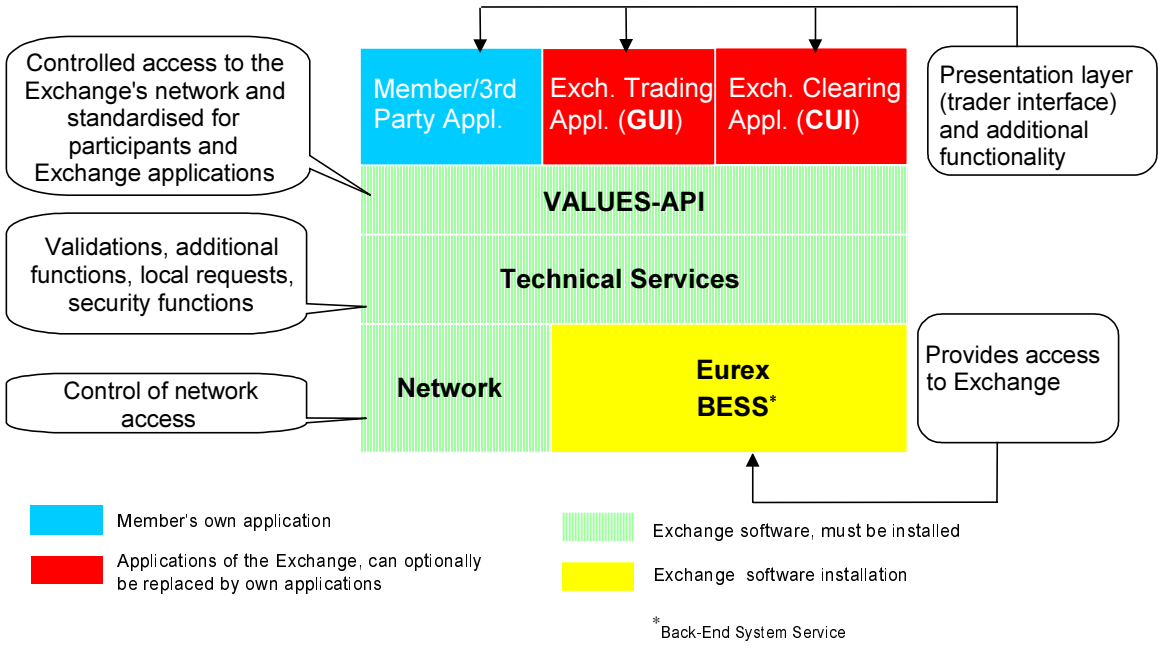
Character based User Interface (CUI)	Graphical User Interface (GUI)
Fixed order entry functionality available uniquely on every trading screen	Additional Order Entry window targeted at proprietary traders including: • Bid, Ask, Hit and Take function keys to react quickly on market movements • Display of inside market information of the selected contract (Best Bid/Ask, ...) • Display of net position of a trader's subgroup • Quick access to all own orders of the selected contract • Multiple order deletion functionality of all own orders in the selected contract • Quick access to the order book depth of the selected contract
No colours are provided	Colour usage to improve identification of price trends
Net position calculation on member and account level available after inquiry	Created additional intra-day net position calculation for selected contracts for a trader's subgroup displayed and updated automatically
Limited multiple order and quote deletion functionality	Selection and deletion of multiple orders or quotes simultaneously
Limited intra-day contract information displayed and updated automatically, i.e., inquiry required to display full intra-day contract statistics	Complete display and continuous update of intra-day contract statistics (Open, High, Low, Close, Acc. Volume, Last Price, Last Quantity)

3 Front End Concept

The front end offered to Eurex users by the Exchange, will include the standard Exchange applications and will offer the feasibility to integrate the member's applications. The Eurex Graphical User Interface (GUI) provides access to Eurex exchange trading system. This will be accessible from a standardised user interface and a standardised technical interface. This has been named **V**irtual **A**ccess **L**ink **U**sing **E**xchange **S**ervices – **A**pplication **P**rogramming **I**nterface (**VALUES-API**).

Participants can either use the Eurex Exchange applications, which belong to the Eurex Front-End, or extend or replace the software delivered by the Exchange with their own self-developed applications or third-party products (member applications). All applications, either provided by the exchange or developed by the participant himself, access the Eurex Back-End system exclusively via the VALUES interface.

In Eurex Release 3.0, the exchange also provides an application on the new architecture that replicates the current Eurex 2.0 Character based User Interface (CUI) to the clearing functions.



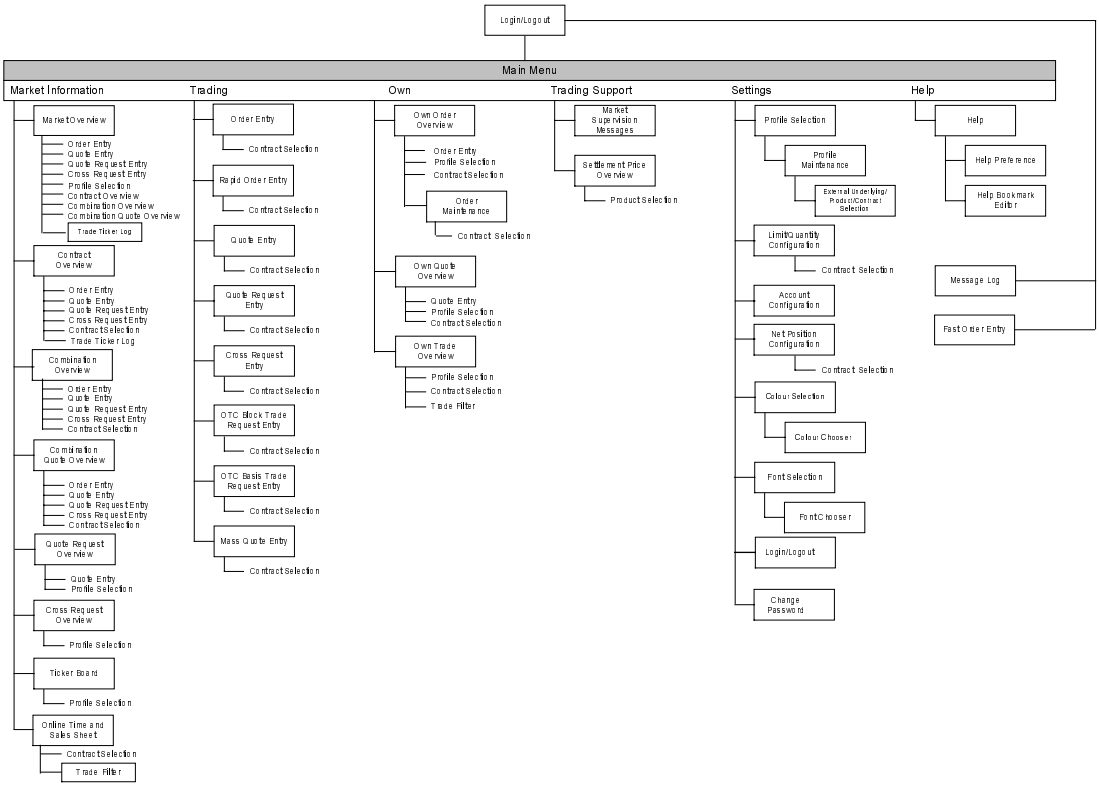
The standardised interface (VALUES API) as the sole access mechanism for all applications guarantees equal access for all participants.

While it is not possible to modify the exchange application provided, the open interface enables integration of existing in-house systems. This permits extension of the functionality of the Eurex exchange application through additional member specific applications as well as add on software by 3rd party providers

The VALUES API can be used by programs written in C and C++.

4 Menu structure of the Eurex 3.0 GUI

With Release 3.0, the graphical user interface of the Eurex front end provides Exchange members with access to the trading functions of Eurex. The menu structure of the windows (see diagram below) shows the functionalities provided by the graphical user interface in Eurex Release 3.0.



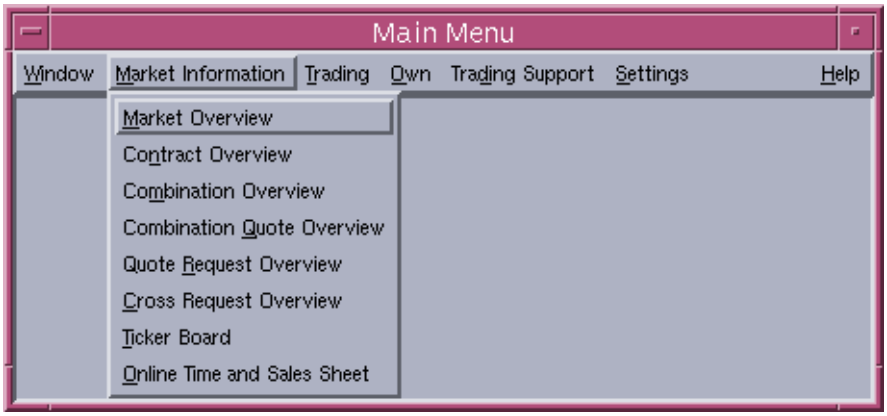
4.1 Login

- **Login/Logout**

The Login window allows the user to log in to the Eurex R3 Electronic Trading system back-end. The main menu of the Eurex front end can be accessed by entering the user identification and password. After successful login, the *Message Log* window and the *Fast Order Entry* window will open automatically.

- **Main Menu**

The *Main Menu* allows the user to access all main windows and the full trading functionality of the system.



Main Menu Window

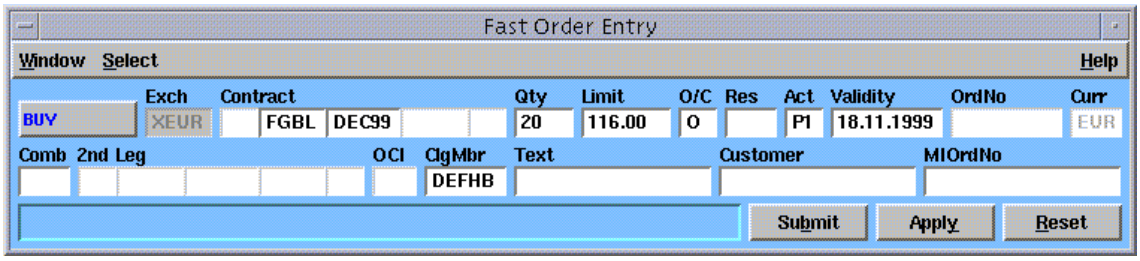
Function Menu	Description
Window	Enables the user to quit the Eurex Front-end application.
Market Information	Provides access to windows which display market information.
Trading	Provides access to windows to enter and delete orders and quotes.
Own	Provides access to windows to view own activities, i.e. orders, quotes, and trades, in the market.
Trading Support	Provides access to windows for general information.
Settings	Provides access to windows for the configuration of trader specific settings such as profiles, desktop set-up, colours, etc.
Help	Provides access to windows for online help.

- **Message Log**

The *Message Log* window displays certain system generated messages in chronological order, e.g. selected messages from market supervision. The window opens automatically after login and cannot be closed. All messages received since login can be reviewed.

- **Fast Order Entry (FOE)**

The *Fast Order Entry* window gives a trader the opportunity to quickly enter orders either after selecting respective limit(s) in the market windows or after entering the required order data via mouse or manually via keyboard.



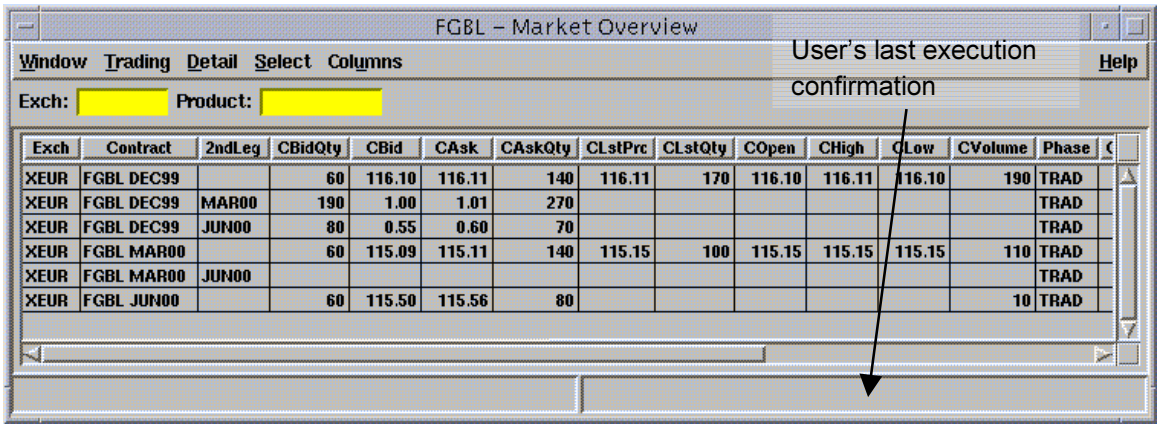
Fast Order Entry window

4.2 Market Information

This group consists of windows which display an overview of the Information in one or more securities. The following functions outline the specific contents of the market information sub-windows. The content of each display is influenced by the user's profile (see section 4.7).

- **Market Overview**

The *Market Overview* window displays market relevant information concerning the overall market. The window shows inside market information such as best Bid and best Ask including accumulated quantities, last traded price including quantity and contract trading state for a user defined number of contracts or products. Further the window contains intra-day statistical information, such as daily high and low, opening price, previous day's settlement price and daily accumulated quantity for the contracts displayed in the windows. The window content can be changed by entering a product in the *Product* quick entry field and after submitting the entry all contracts of the selected product are displayed. The message box on the right displays the user's last execution confirmation containing the following information: Buy/Sell, quantity, contract and price. Trading is possible by selecting a Bid or Ask limit which populates the *Fast Order Entry* window with the selected data and allows the user to enter an order.



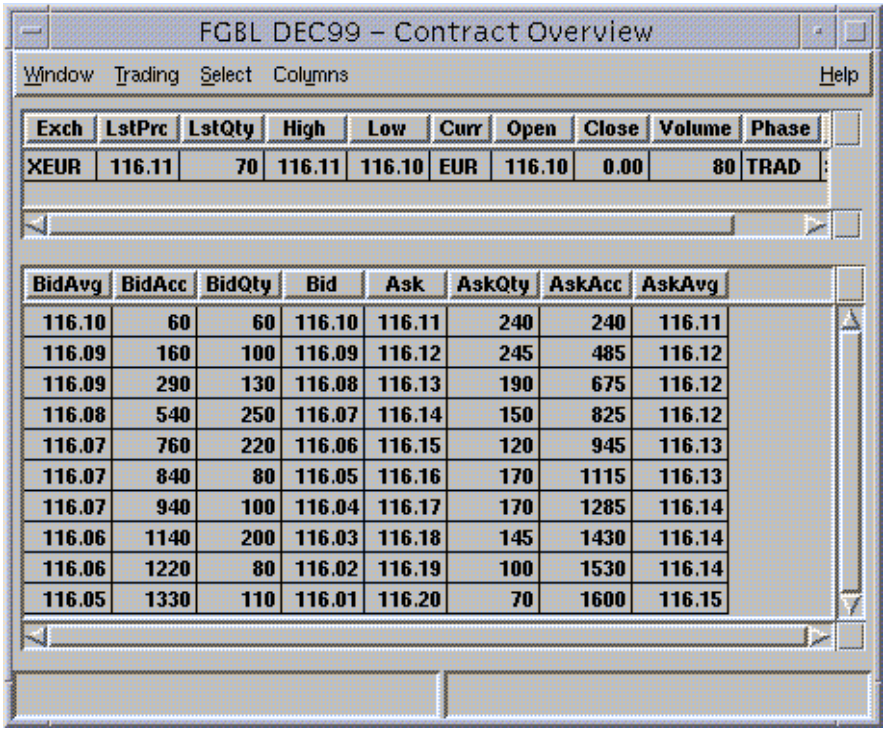
Market Overview window

- **Trade Ticker Log**

The *Trade Ticker Log* window displays the user's most recent execution confirmations in chronological order.

- **Contract Overview**

The *Contract Overview* window displays detailed order book information for a single contract to a depth of ten. The window is divided into a history line and an order inside market listbox. The inside market listbox includes information about the accumulated order quantity per limit for the ten best Bid and Ask limits. The history line contains various intra-day contract information such as last price, last traded quantity, daily high and low price, opening price, settlement price of the previous trading day, accumulated daily traded volume, etc. Trading is possible by one or multiple Bid or Ask limit(s) which populate the *Fast Order Entry* window with the selected data and allows the user to enter an order.



Contract Overview window

- **Combination Overview**

The *Combination Overview* window displays detailed order book information, bid/ask and accumulated order quantity for a combination. The window lists future combinations (Time Spread) to a depth of ten whereas for option combinations (e.g. Bull, Bear, etc.) the best Bid and Ask limit is displayed. If the trader wants to submit an order, a single click on a corresponding order in the listbox opens the *Fast Order Entry* window. Contract description, limit and buy/sell attributes are pre-filled in the *Fast Order Entry* window with the listbox values and allows the user to enter an order.

- **Combination Quote Overview**

The *Combination Quote Overview* window displays detailed quote book information for a selected option combination. The Best Bid and Best Ask are shown. *Combination Quote Overview* is only available for option combinations.

- **Quote Request Overview**

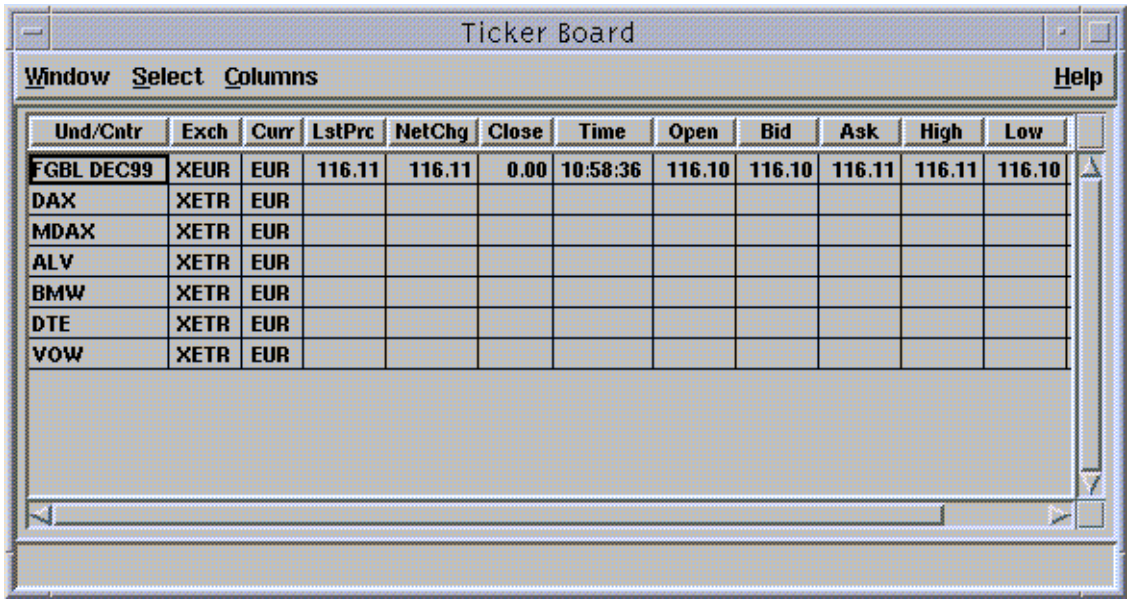
The *Quote Request Overview* window provides quote request information for a single contract or contracts of a selected user-defined trading profile. Quote requests are listed in chronological order with the latest requests appearing at the top.

- **Cross Request Overview**

The *Cross Request Overview* window provides information on cross requests for contracts of a selected user-defined trading profile.

- **Ticker Board**

The *Ticker Board* window displays real-time trade price information of external underlyings and internal option and future contracts based on the user-defined ticker profiles. It includes information such as Best Bid and Ask, last traded price, closing price, opening price and daily high price of the underlying or index.



Ticker Board window

- **Online Time and Sales Sheet**

The *Online Time and Sales Sheet* window gives the user an overview of all trades executed for a particular contract for specified date and time boundaries, set through the *Trade Filter* window. Data is available for the last four business days.

- **Trade Filter**

The *Trade Filter* window allows the user to select a contract or profile and to set a time frame to be used in the *Online Time and Sales Sheet* window or in the *Own Trade Overview* window.

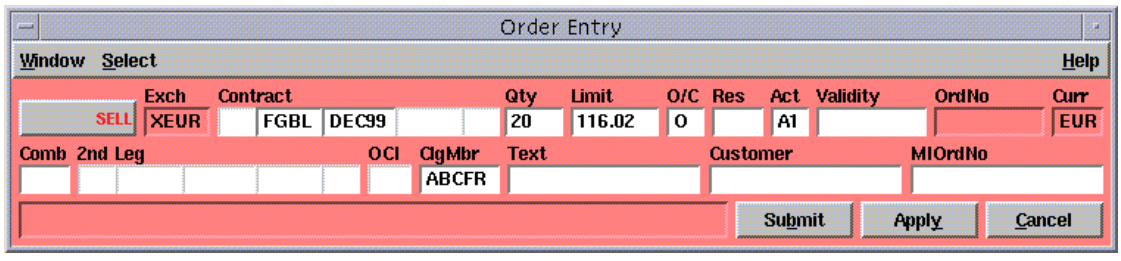
4.3 Trading

This group contains windows for the detailed entry of orders and quotes as well as the function to enter off-exchange trades in Eurex or request information on OTC transactions. The following selections describe the facilities available in the trading functionality.

- **Order Entry**

The *Order Entry* window allows the user to enter an order. The window supports futures, options, and combination orders. The Order Entry window is accessed from the Trading Menu of the “Main Window” or from the following windows:

- *Market Overview*,
- *Contract Overview*,
- *Combination Overview*,
- *Combination Quote Overview*,
- *Own Order Overview* and
- *Cross Request Overview*.



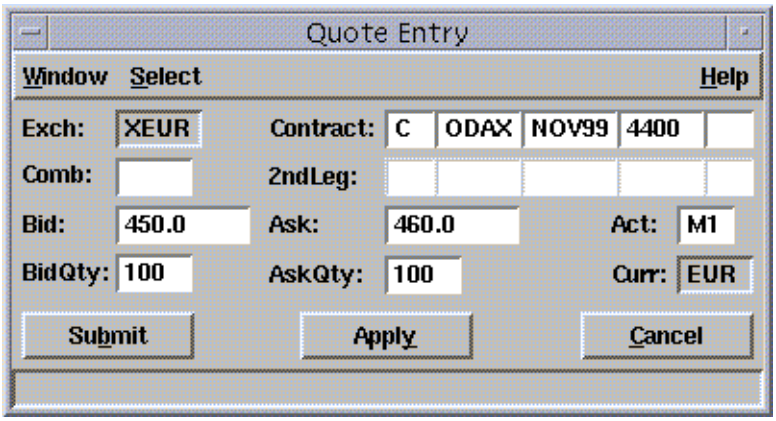
Order Entry Window

- **Rapid Order Entry**

The Rapid Order Entry window allows the user to enter an order. This window is a contract-specific window, i.e. the user can only enter orders for the contract which is applied to this window. In addition to the Order Entry window, the Rapid Order Entry window contains inside market information of the selected contract such as best Bid and Ask limit including accumulated quantities and last traded price.

- **Quote Entry**

The *Quote Entry* window allows the Market Maker to enter single leg and double leg quotes for futures and options.



Quote Entry window

- **Quote Request Entry**

The *Quote Request Entry* window allows the user to enter a quote request into the trading system.



Quote Request Entry window

- **Cross Request Entry**

The *Cross Request Entry* window allows the user to enter a Cross Request into the trading system.

- **OTC Block Trade Entry**

The *OTC Block Trade Entry* window allows authorised users to enter an off-exchange trade for option products in the trading system. The trade must have a minimum quantity which is defined by the exchange at the product level.

- **OTC Basis Trade Entry**

The *OTC Basis Trade Entry* window allows authorised users to enter a Basis Trade in the trading system.

- **Mass Quote Entry**

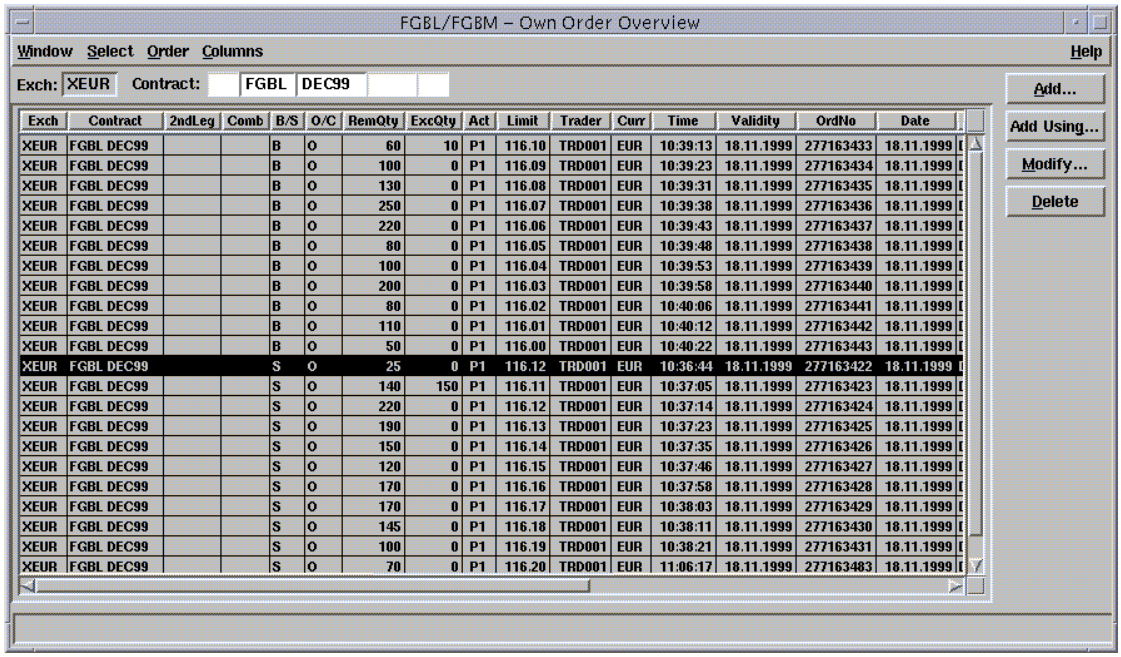
Mass Quote Entry window allows the user to enter and edit multiple quotes. Quotes under processing can be submitted to the trading system one-by-one or simultaneously.

4.4 Own

This group contains windows which supply an overview of own orders, quotes and trades as well as appropriate request mechanisms.

- **Own Order Overview**

The *Own Order Overview* window dynamically shows an overview of all open orders for a particular trader's subgroup. Orders displayed in the listbox are sorted by contract as listed in the user defined profile. By entering a contract in the *Fast Entry Line* all open orders of the selected contract will be displayed. Users may enter new orders by using the *Add* or *Add Using* buttons, which open the *Order Entry* window. Modification of orders can be performed using the *Modify* button which opens the *Order Maintenance* window. Orders are removed from the window as soon as they have been fully matched or if they are deleted.



Own Order Overview window

- **Order Maintenance window**

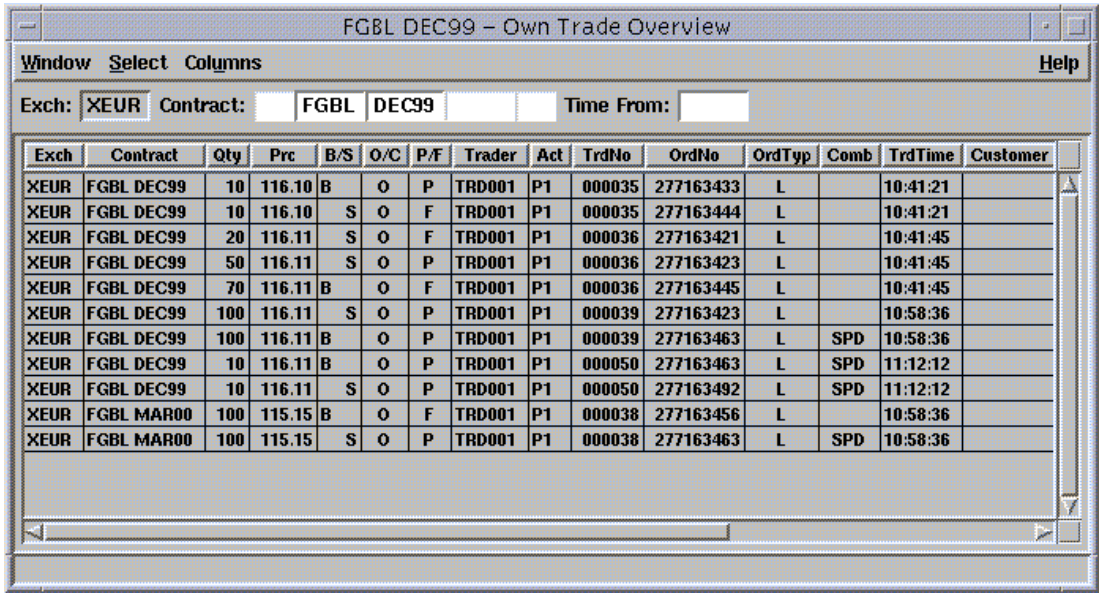
The *Order Maintenance* window allows the user to modify an existing order previously selected in the *Own Order Overview* window. All order attributes can be changed except buy/sell indicator and contract.

- **Own Quote Overview**

The *Own Quote Overview* window lists all own quotes according to the selection criteria. Own entries can either be deleted or new quotes entered. Further own quotes can be held and released via this window.

- **Own Trade Overview**

The *Own Trade Overview* window displays the user's own trades of the current business day for a specified profile or contract starting at a selected point of time.



Exch	Contract	Qty	Prc	B/S	O/C	P/F	Trader	Act	TrdNo	OrdNo	OrdTyp	Comb	TrdTime	Customer
XEUR	FGBL DEC99	10	116.10	B	O	P	TRD001	P1	000035	277163433	L		10:41:21	
XEUR	FGBL DEC99	10	116.10	S	O	F	TRD001	P1	000035	277163444	L		10:41:21	
XEUR	FGBL DEC99	20	116.11	S	O	F	TRD001	P1	000036	277163421	L		10:41:45	
XEUR	FGBL DEC99	50	116.11	S	O	P	TRD001	P1	000036	277163423	L		10:41:45	
XEUR	FGBL DEC99	70	116.11	B	O	F	TRD001	P1	000036	277163445	L		10:41:45	
XEUR	FGBL DEC99	100	116.11	S	O	P	TRD001	P1	000039	277163423	L		10:58:36	
XEUR	FGBL DEC99	100	116.11	B	O	P	TRD001	P1	000039	277163463	L	SPD	10:58:36	
XEUR	FGBL DEC99	10	116.11	B	O	P	TRD001	P1	000050	277163463	L	SPD	11:12:12	
XEUR	FGBL DEC99	10	116.11	S	O	P	TRD001	P1	000050	277163492	L	SPD	11:12:12	
XEUR	FGBL MAR00	100	115.15	B	O	F	TRD001	P1	000038	277163456	L		10:58:36	
XEUR	FGBL MAR00	100	115.15	S	O	P	TRD001	P1	000038	277163463	L	SPD	10:58:36	

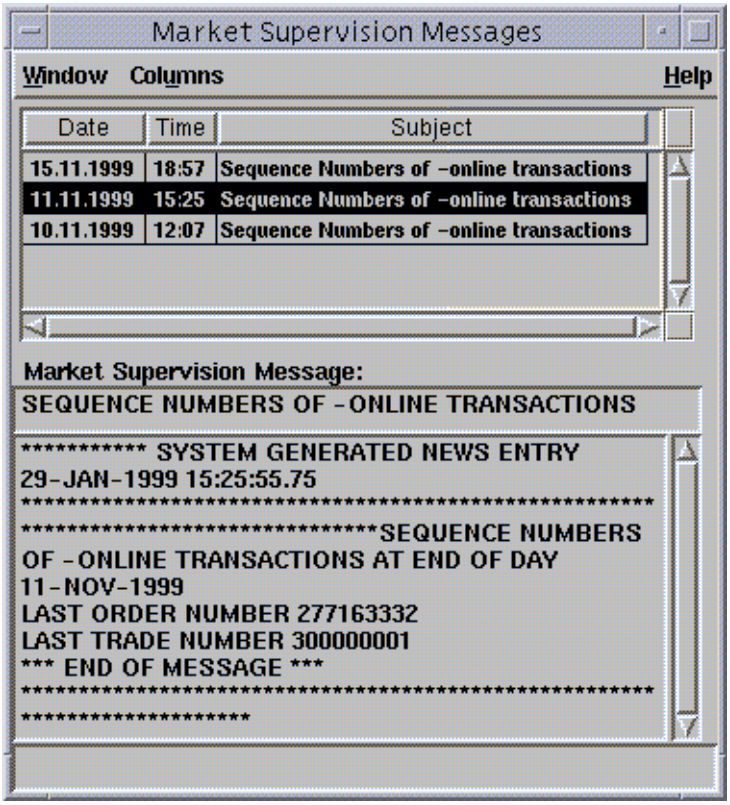
Own Trade Overview Window

4.5 Trading Support

This group contains windows providing market supervision news messages and daily settlement price information.

- **Market Supervision Messages**

This window allows the exchange to publish trading system specific market supervision messages for the market (e.g., new products, etc.).



Market Supervision Messages window

- **Settlement Price Overview**

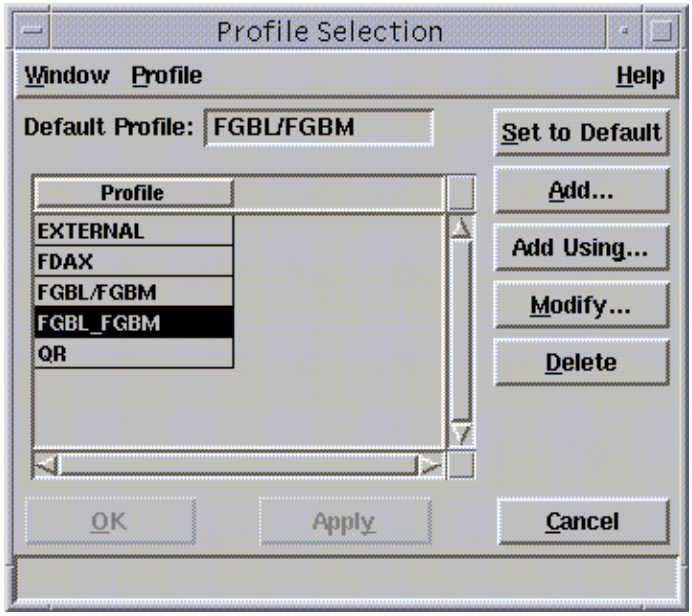
The *Settlement Price Overview* window allows the user to view the settlement prices of the current trading day for specific contracts or contracts/products contained in a user defined profile.

4.6 Settings

These windows allow the trader to create individual configurations (colour, fonts, instrument profiles). A context sensitive help function is also included. The following sections outline the submenus of the settings group.

- **Profile Selection**

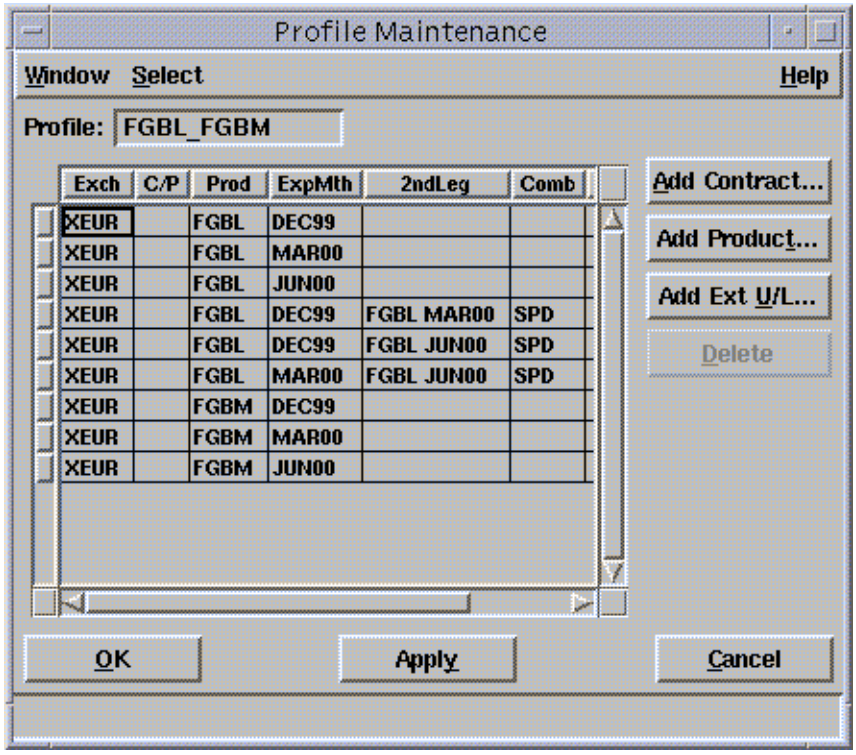
The *Profile Selection* window allows the user to select a profile to determine which information is displayed in various *Market Information* and *Own* windows. The user also has the possibility to modify or delete an existing profile as well as to create a new profile.



Profile Selection window

- Profile Maintenance

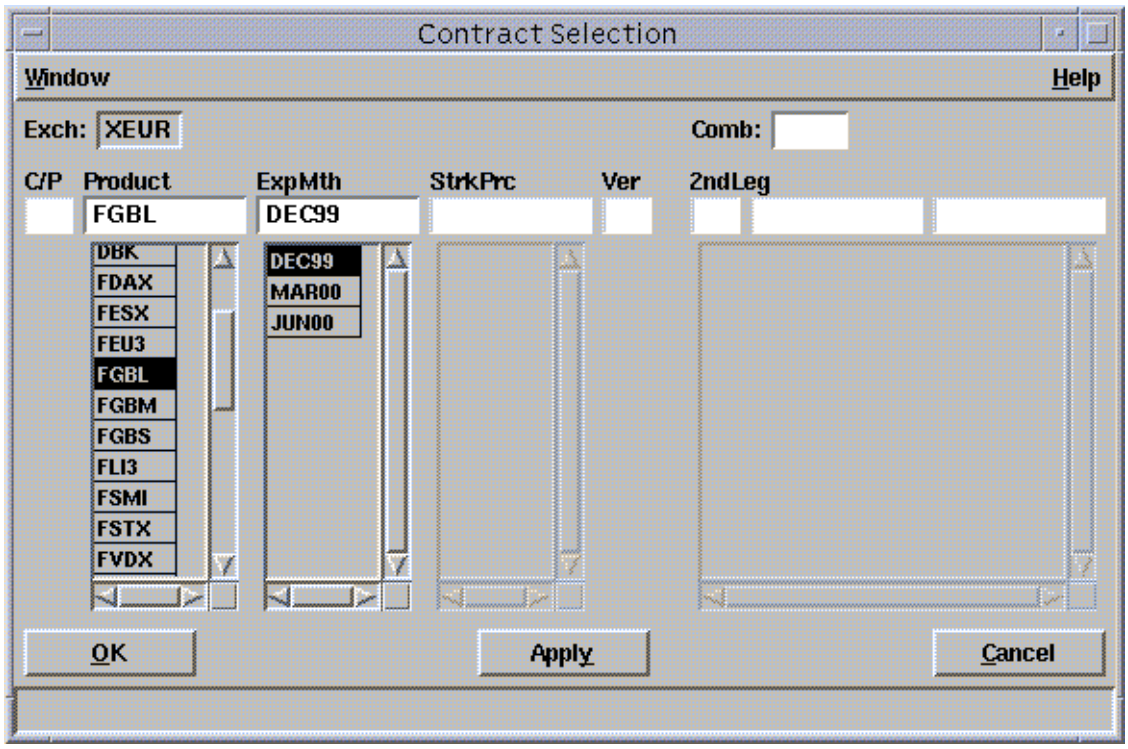
The *Profile Maintenance* window allows the user to define or modify a profile containing a number of contracts or products.



Profile Maintenance Window

- External Underlying/Product/Contract Selection

The *External Underlying/Product/Contract Selection* window allows the user to select either an external underlying, a product or a contract. These windows are used for the creation of profiles and for the selection of external underlyings, products or contracts to be displayed in various *Market Information*, *Trading*, *Own* and *Trading Support* windows.



Contract Selection window

- **Limit/Quantity Configuration**

The *Limit/Quantity Configuration* window allows the user to predefine, at the product level, increments for the limit and quantity context menus. The window also allows a default quantity to be predefined, which is used in the *Fast Order Entry*, *Order Entry* and *Rapid Order Entry* window.

- **Account Configuration**

The *Account Configuration* window allows the user to predefine *Text* field entries and data that is linked to it, which are *Act* (Account Type) and *ClgMbr* (Clearing Member).

- **Net Position Configuration**

The *Net Position Configuration* window allows the user to maintain a list of contracts for which net position information should be calculated. The net position of the selected contracts are displayed on the *Rapid Order Entry* window.

- **Colour Selection**

The *Colour Selection* window allows the user to set up application colours for background, foreground, price trend indicators, and for highlighting changed display items.

- **Colour Chooser**

The *Colour Chooser* window allows the user to select a colour using one of four different colour models. It is only accessible from the Colour Selection window which is used to set application colours for foreground, background, etc.

- **Font Selection**

The *Font Selection* window provides the user with the ability to configure the font used in the list boxes of all windows.

- **Font Chooser**

The *Font Chooser* window provides the user with the ability to choose one of supported fonts, face, and size that can be selected by the *Font Selection* window. The *Font Chooser* window is only accessible from the *Font Selection* window.

- **Change Password**

The *Change Password* window is used to change the trader login password. Only one trading system password can be changed at any one time

4.7 Help

- **Help Window**

The *Help* window displays entries from a help document for a window.

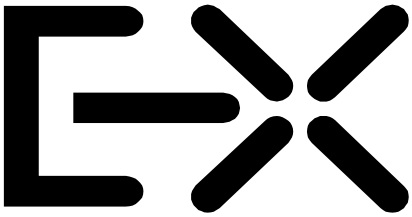
- **Help - Preferences**

The *Help-Preferences* window allows the user to customize the online help user interface.

- **Help - Bookmark Editor**

In the online help, a bookmark marks an entry of a help document so it can be accessed quickly.

X-pand into the **Future**



Eurex Release 3.0

Technical Overview

(MISS-based Front End)

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1. Introduction

1.1 Overview

The Technical Overview of the new MISS-based front end introduced with Eurex Release 3.0 primarily addresses the members' network and system administrators. The objective of the document is to give this target group an overview of the technical structure of the new front end design of Eurex. This includes a description of hardware and software components as well as the requirements that have to be met by the network configuration. An overview of the installation and administration of the new Eurex front end is also included.

Existing User Devices are still supported with Release 3.0, and the Eurex 2.0 technical description is still applicable to member configurations with those platforms. Recommendations for migration from User Devices to MISS-based front end installations will be covered in a separate document.

1.2 Contents

Chapter 2 – Front End Architecture Overview - describes the technical concept of the Eurex front-end configurations. The client/server principle of the Eurex design and the software structure of the new front end are described. The important concept of VALUES API broadcasts for data distribution in Eurex is also covered.

Chapter 3 – Recommended Platforms and Classification – defines the platforms supported by Eurex, as well as the possible homogeneous and heterogeneous configurations.

Chapter 4 – The Eurex Network - describes the network structure and the limits of Eurex and member address spaces. Network security is also discussed.

Chapter 5 – Member Front End Installations - describes the various topologies that may be considered in configuring a member installation according to different needs for availability or autonomy. Possible alternatives for segmentation, the connection of remote workstations and an overview of the failover and/or high-availability mechanisms are also described.

Chapter 6 – Multi Member Support - covers the possibilities for a joint Eurex front-end installation with "basic multi-member support" or "extended multi-member support" for several Eurex members.

Chapter 7 - Installation and Administration - contains an overview of the most important steps in the front end installation procedure for members. An outline of the configuration classification procedure required for member admission to Eurex is given, and the chapter contains a brief description of the normal software release process. The split between member and exchange responsibilities for administration of the front end installation are also presented.

2. Front End Architecture Overview

2.1 Advantages

Eurex is a distributed system based on the client/server principle, where some of the functionality is decentralised on member installations (Eurex front ends) and other parts are centralised on the Eurex back end of the Exchange (see section 2.2). The member's front-end installation can also be structured according to the client/server principle (MISS[1] = server, and trader workstations = client). By using a programmable interface (VALUES-API[2], see section 2.3), the Eurex front end has become an open system to which members can attach their own applications.

The Eurex architecture takes into account certain requirements concerning fairness, differentiation, integration and cost efficiency in terms of access to the electronic trading system:

Fairness:
- The VALUES-API provides all members with equal and secure access to the exchange's back end.
- The Eurex Exchange Application lowers access barriers and provides an efficient basic service for all members.

Integration:
- The standard interface permits the integration of member's applications (e.g. position keeping and order management systems) and of additional software (e.g. front office and back office systems).
- The support of standard platforms used for the operating systems of front ends guarantees an efficient integration of Eurex into the member's systems.

Differentiation:
- Members can be distinct from others by implementing additional applications to enhance the functionality of the Eurex Exchange Application or replace the Eurex Exchange Application completely.
- Members can decide to configure the front end to be fault-tolerant, so that trading by the member will not be interrupted even in the event of hardware or software disruptions.

Cost efficiency:
- Members can avoid unnecessary development of functions with little potential for differentiation; these are provided with the Eurex Exchange Application.
- The Eurex Exchange front-end client/server architecture guarantees easy scalability, making front end configurations of different sizes more efficient.

[1] **M**ember **I**ntegration **S**ystem **S**erver
[2] **V**irtual **A**ccess **L**ink **U**sing **E**xchange **S**ervices-**A**pplication **P**rogramming **I**nterface

2.2 Back End and Front End Trading System

The technical environment of the member's front end is based on the client/server principle. The terms client, workstation and trader station are used synonymously in this and the following chapters. Due to de-coupling the member's installation from the Exchange, market participants can make changes at the front end without these having any effect on the Exchange's back end. The de-coupling also ensures that modifications can be made at the Exchange's back end while minimising the effects on the front end.

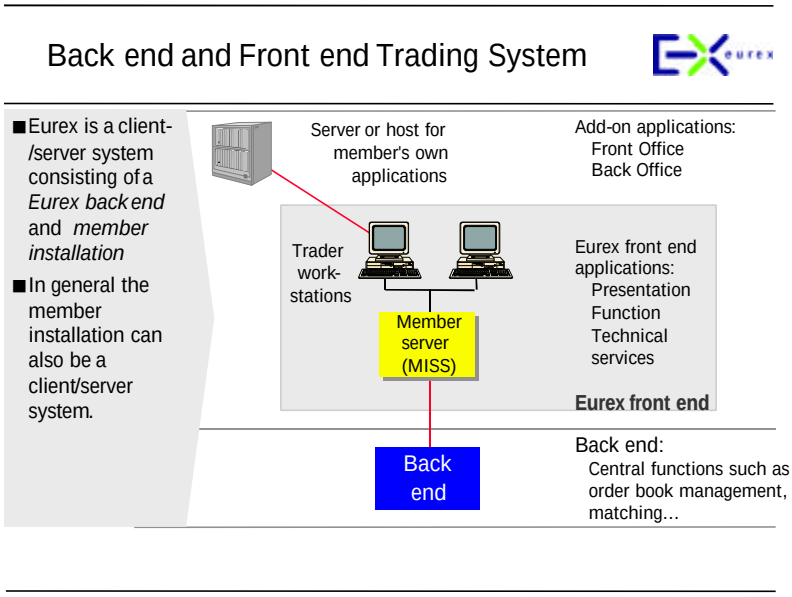


Diagram 2.2

In general, a member installation consists of one or more member servers (MISSs) and workstations which can be connected locally or remotely. In its minimum configuration it is possible to configure the MISS and workstation software on the same physical hardware system.

Two MISSs installed on the same LAN can be configured as a MISS Group, providing back-up for each other for higher availability.

Workstations can be connected remotely to a front-end installation. Several MISS groups can be concentrated in one infrastructure. Additionally, members can share parts of the front-end infrastructure in a so-called Multi-member configuration.

2.3 Front-End Software Components

The Eurex front-end applications consist of architecture software and the Eurex Exchange Applications. The architecture software is installed on the MISS and Workstation and provides functional and technical services as well as the interfaces "upward" and "downward".

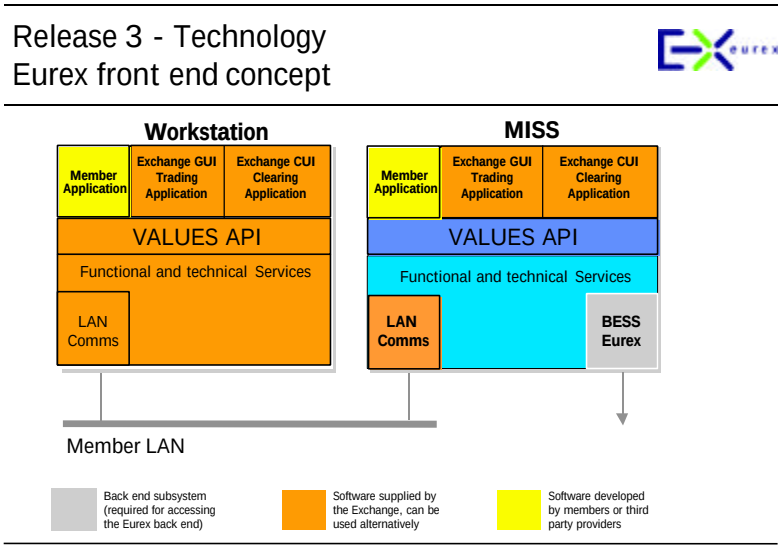


Diagram 2.3

The connection of the architecture software "upward" is defined by a uniform interface (VALUES-API). This can be used to connect the Eurex Exchange Applications or member applications (e.g.: back office, tools for position keeping and risk management).

The Eurex Trading Application in Release 3.0 provides a new graphical user interface for the trading functionality as a standard exchange application. In Release 3.0 the exchange also provides an application to run on the new architecture that covers the current Eurex 2.0 character-based interface to the clearing and advanced trader support functions. Thus, the complete functionality of Eurex has moved forward to the new Release 3.0 front end.

Members can supplement or replace (but not modify) the standard Exchange applications with proprietary or third-party applications. Member applications can be connected directly to the VALUES-API if they run on the supported platforms. Applications on other platforms can be connected to the VALUES-API via custom-made interface adapters.

C and C++ are supported as programming languages for the VALUES-API. For each release, detailed information on the programming, functions and parameters of the interface can be found in the VALUES-API documentation.

The 'downward' interface shields the member from direct access to the Eurex network and the back end. The objective is to keep the technical framework of the VALUES-API largely stable through the Eurex Releases, so that modifications on each side of the interface (member application/Exchange back end) cause minimum adjustment effort due to added or enhanced functionality.

The MISS system software, the VALUES-API, the functional and technical services and the communication to the workstation (LAN Comms.) are software components delivered by the Exchange and installed on a mandatory basis. The back end specific subsystem (BESS[3] Eurex) is delivered by the Exchange and is necessary for accessing the Eurex back end. Architecturally, further BESS modules (e.g. Xetra) can be installed on the same MISS in order to simultaneously support access to these services.

MISS and workstation communicate via architectural components (LAN Comms.) which are installed on the MISS and the workstation.

The structure of the workstation's software elements (client software) is similar to that of the software on the MISS, with the exception of the BESS, which is not configured on the workstation.

2.4 General Concept of Broadcasts in VALUES API

In addition to the request/response type processing (e.g. Enter Order, Inquire Own Order) the new front end architecture provides information dissemination through broadcasts. Subscription to broadcasts is the most effective way for members to gain access most current member private or public information..

Broadcasts are asynchronous messages, sent within a broadcast stream, from the Eurex back end system to the member's front end. Eurex supports public and private broadcast streams.

Public broadcasts contain information that is identical for all members. They are therefore identically available for all members and contain, for example:

- best bid/best ask prices and quantities
- last trade prices
- order book depth
- margining parameters
- Eurex supervision messages/news

[3] **B**ack **E**nd **S**pecific **S**ubsystem

Private broadcasts are for information that is distinct for each individual member. This kind of information is:

- order confirmations (recoverable)
- order execution confirmations (unreliable)
- quote execution confirmations (unreliable)
- trade confirmations (recoverable)

Broadcast streams have one of the following two characteristics:

Public broadcast streams are generally disseminated unreliably, which means that messages that have been lost cannot be re-requested by the member. However, the network protocols used by Eurex ensure that under normal operations no messages will be lost.

The quality of the private streams (unreliable or recoverable) is adjusted to suit the member's performance and recoverability requirements. Recoverable means that each broadcast message contains a unique sequence number allowing applications to track received messages, to detect missed messages, and to re-request missed messages from the Eurex back end system using a special VALUES API application request. Each recoverable stream has its own sequence numbering.

Only one MISS per MISS group can subscribe to the broadcast streams at the same time. In case of a failover, the subscription will be transferred to the alternate MISS. In addition to members' subscriptions to public and private streams, clearing members may subscribe to the private recoverable trade confirmation stream for each member for whom they clear trades.

A configuration file on the MISS defines which broadcast data streams shall be subscribed from the Eurex back end system. This configuration file is maintained by the member according to member data needs.

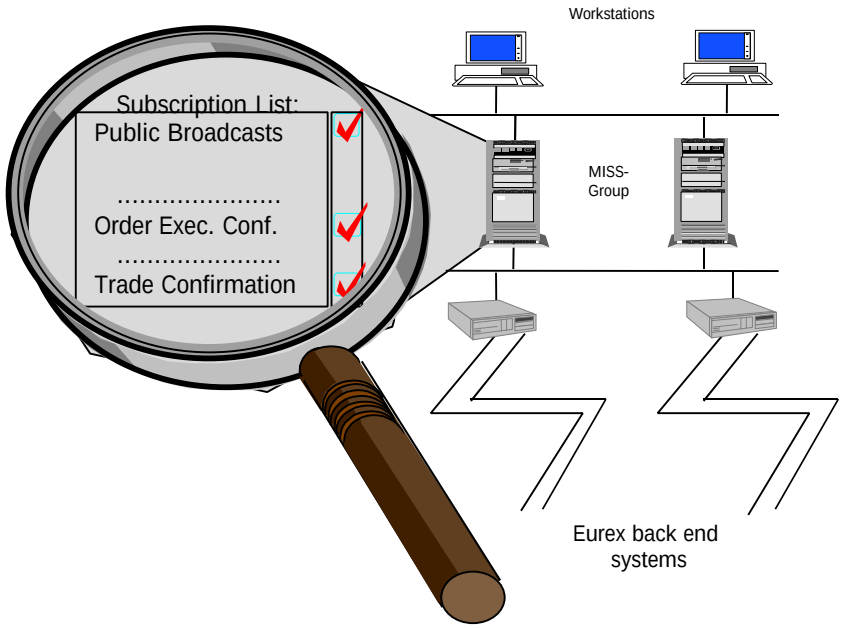


Diagram 2.4-1

The process of broadcast subscription and dissemination in a high availability front end installation with one MISS group is summarised as follows:

- During start-up one of the two MISSs in the MISS group automatically becomes the active broadcast MISS.
- The active broadcast MISS subscribes to the broadcast data streams as defined in the configuration file.
- The broadcast MISS disseminates the received broadcast information to the workstations and the alternate broadcast MISS.
- If the active broadcast MISS fails, the remaining MISS of this MISS group automatically becomes the active broadcast MISS.

Transfer of broadcasts from the Eurex back end system to the broadcast MISS is carried out via TCP/IP. For the distribution of broadcasts to the workstations and the alternate MISS, UDP-broadcast is used.

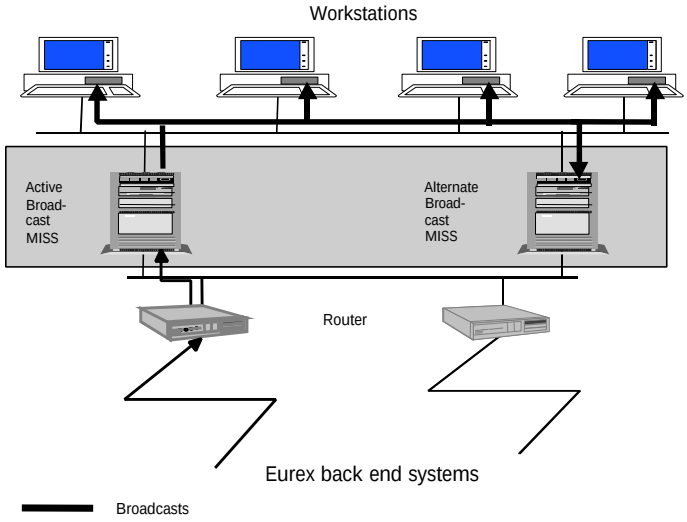


Diagram 2.4-2: Broadcast Processing in a High Availability Front End Configuration

Note that the volume of public broadcasts reflects the overall activity of all market participants while the volume of private broadcast traffic directly depends on each member's individual trading activity.

3. Recommended Platforms and Classification

3.1 Overview

Supported server platforms are Compaq AXP/OpenVMS, IBM RS/6000 with AIX, Microsoft Windows/NT (Intel), and SUN Solaris, and can be combined with trader workstations on the same platforms to form homogeneous configurations. Heterogeneous configurations are supported using Windows/NT 4.0 (Intel) as the workstation component with any server platform. This is shown in the diagram below.

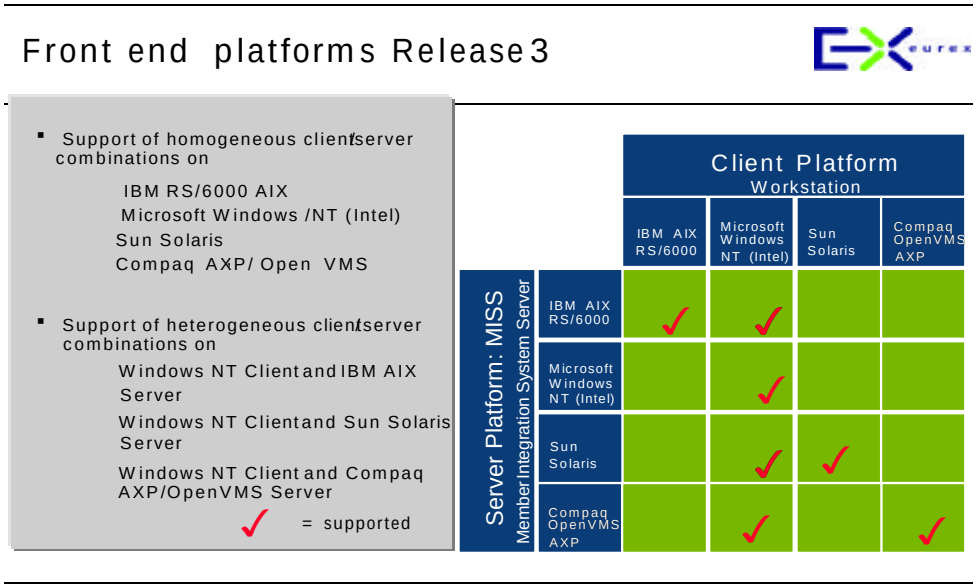


Diagram 3.1

3.2 Classification of System Configurations

As described above, Eurex ensures that members can choose from a range of hardware and software platforms. However, not all of the possible combinations of hardware, software and network topologies are supported or feasible. All members' proposed installations are evaluated by Eurex's technical staff for classification in the member's migration or admission process.

The technical implementation regulations of Eurex define three categories for the classification of applicants' system configurations:

- Supported Configurations recommended by Eurex. Admission to membership of Eurex can be granted on the basis of supported configurations
- Possible Configurations which should be technically possible, but which are not recommended by Eurex. Such configurations may be tolerated in the Eurex admission process. Eurex, however, will not support such configurations.
- Not allowed Configurations that are not possible. Eurex neither allows nor supports such configurations as they do not fulfil the admission requirements.

When Eurex supports a configuration, Eurex will help the member in analysing problems that occur and in identifying and providing solutions or workarounds.

3.3 Classification Process

Institutions are asked to describe in detail the configuration to be implemented and send the specifications to Eurex for certification. In addition to the sections dealing with member LAN installations below, the Eurex 3.0 Sizing Guidelines document should be used to help members configure their installations. Assistance in this process is provided by Eurex technical staff. On the basis of the applicant's proposal, Eurex will classify the configuration in line with the technical implementation regulations and inform the members of the decision.

Changes to a member's installation after Eurex approval must also be reported to Eurex to allow for the possibility for reclassification. Further details of the process will be given by Eurex Customer Service.

3.4 Hardware Sizing

The Sizing Guidelines for Release 3 contain statements on the technical environment (hardware, software and network) as well as sizing proposals for Eurex workstations and Eurex MISSs. Details on recommended CPU specifications, memory size and disk space, are given for each of the following platforms: IBM AIX, SUN Solaris, and Windows/NT (Intel) in both their workstation and MISS roles. Heterogeneous configurations are automatically covered by this approach as the sizing for workstations and MISSs are independent. Details on the Compaq AXP/Open VMS platform will be available shortly.

The appendix of the Sizing Guidelines contains detailed information about operating system versions and patch levels, as well as recommendations for router models to be used.

3.5 Registration of Non-Eurex Applications

Member-developed or third-party applications need to be registered with Eurex to be granted access to the Eurex back end services. Further details of the registration process will be given by Eurex Customer Service.

4. The Eurex Network

4.1 Overview

Eurex has built an efficient network Infrastructure for electronic trading The Eurex network backbone consists of the Exchange's host computers and the installed peripheral network of access points of the Exchange which adopt the role of mediator/distributor within the Eurex network. The access points are redundant (duplicated) components in order to increase fault tolerance. The access points are each connected to the Eurex hosts via redundant lines. The geographic unit 'Access Point' is implemented by two individual access point halves connected to the back end separately. Members are connected to the access point via dedicated lines.

Eurex is responsible for the provision and maintenance of the Eurex network up to the wall plug at the member's site. From the Exchange's point of view, the member's local network installations do not belong to the Eurex network for administrative purposes. However, due to the technical implementation regulations, the Exchange does stipulate the necessary peripheral parameters for the configuration and layout of the network connection of the member's front end (such as operating system versions, IP address ranges, etc.).

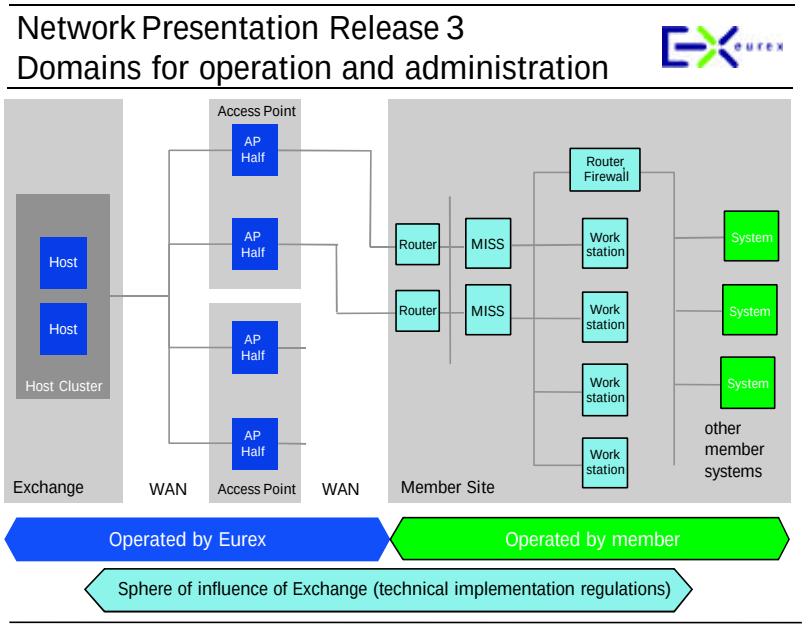


Diagram 4.1

4.2 Network Protocols

The TCP/IP protocol is used for the communications between Eurex access point and a MISS based front end installation.

In the MISS/Workstation LAN, the TCP/IP protocol is used for requests/responses, UDP is used for broadcast distribution between MISSs and workstations.

The broadcast address of a MISS needs to be assigned by the member network administration. The mask assigned to the network address and to the broadcast address of a MISS has to correspond.

Example of a broadcast address:

The address of the MISS (MISS/Workstation LAN):	A.B.C.H
Network mask of the MISS address:	255.255.255.0
Broadcast address:	A.B.C.255

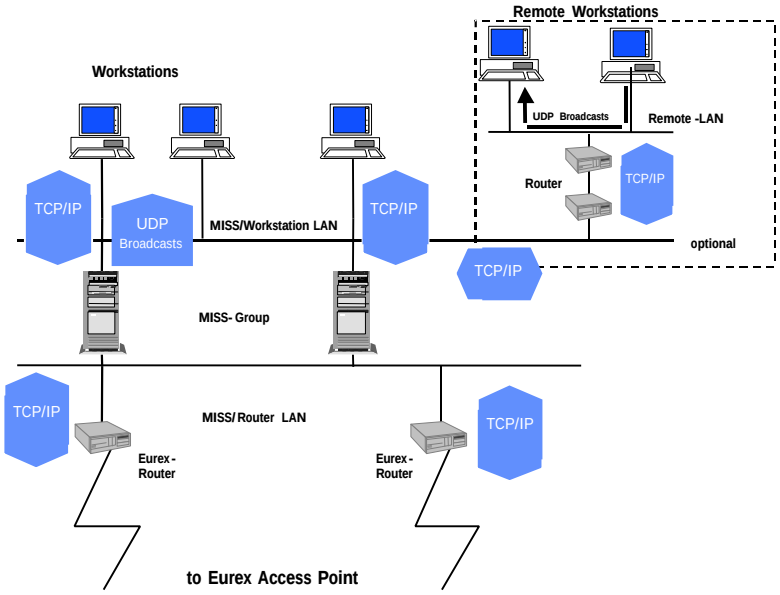


Diagram 4.2

In the member LAN, transactions are transported via TCP/IP and broadcasts via UDP-Broadcast. TCP/IP is used exclusively for forwarding transactions and broadcasts in the WAN from the member to the access point.

4.3 Addressing / Internet Compliance

The Eurex network is generally a private IP network, which does not comply with the Internet. The Exchange does not provide for Internet compliance. Unambiguous and consistent IP addressing for large applications across several companies can only be guaranteed through utilisation of MISSs with two network interfaces. These MISSs and the Eurex routers are connected to the Exchange's network via a separate LAN. Inside the institute, MISSs and workstations are also in a separate LAN.

The addressing concept for the Eurex network is based on the following principles:

- All new IP systems of Eurex including those of the Exchange and those of the member belong to the network 90.0.0.0. The different addressing methods described below already take the different requirements of the members into account.
- By reserving the networks 89.0.0.0 and 90.0.0.0 (Eurex and Xetra), address conflicts can be avoided to a large extent.
- Network class A[4] is used with a class C mask (255.255.255.0). This procedure enables the set-up of 64.516 IP networks with 254 nodes per network.
- The two-LAN option helps to avoid these conflicts (see Section 5.3)

4.4 Network Security and Firewalls

The 'rlogin' and 'telnet' services of the 'inetd' (TCP/IP) subsystem must be switched off on the different platforms, if a member wishes to eliminate any remote access of its MISSs. System administration tools existing on the platforms can be used to this end (e.g.: SMIT on IBM RS/6000). Maximum network security can be reached by removing the services 'rlogind', 'rshd', 'telnetd' and 'tftpd' from the sub-server list.

The Access Points between the MISSs and the Eurex hosts act as a firewall to the Exchange and between individual members. An Access Point can only be reached from external systems via application-specific authorisation processes. All typical IP services like telnet, ftp, finger SMP, rcp and others are not available on Access Points. An Access Point and a MISS communicate via a router. Passive and active security mechanisms are designed for all Eurex routers that make sure that members' systems are not able to communicate across the network through means other than the Eurex application.

[4] The network classes are specified by the top-most (higher-value) 3 Bits in the first octet of the network address. Networks of class A have 0 'in the first Bit, class B networks have 1 'in the first Bit and 0 'in the second Bit. Networks of class C have 1 'in the first two Bits and 0 'in the third Bit. The address area for class A networks thus ranges from 1 to 126; 127 is reserved for loopback.

The MISSs in return act as firewalls to the workstations.

The utilisation of additional firewalls between the MISS and the Exchange's back end for security reasons is neither necessary nor recommendable. The use of firewalls can be reviewed in collaboration with Eurex if special in-house provisions of the member require their utilisation.

However, member-specific firewalls can be used for dividing member LANs (MISS and workstations) and other in-house networks.

The individual members are responsible for the installation, acceptance and operation of additional firewalls.

5. Member Front End Installations

5.1 Overview

Member front-end installations may consist of one or more Member Integration System Servers (MISSs) and a number of separate workstations (optional).

In all cases the Eurex application requires the set-up of a LAN-based network within the member institution. A prerequisite is that the member LAN is able to transport protocols of the IP family and that a nominal bandwidth of 10 Mbit/s or higher is ensured. The LAN can also be implemented as an extended LAN, i.e. with bridged connections between the segments (based on network layer 2).

Member LAN configurations may be set up with a:

- Single address spaces topology
- Two address space topology

5.2 Single Address Space

In this topology all components (e.g. MISSs, Eurex routers) of a member front-end installation are connected on one LAN. All network components belong to the exchange-owned address space. The single address topology is only recommended for small installations, using only one or two integrated MISS/Workstations.

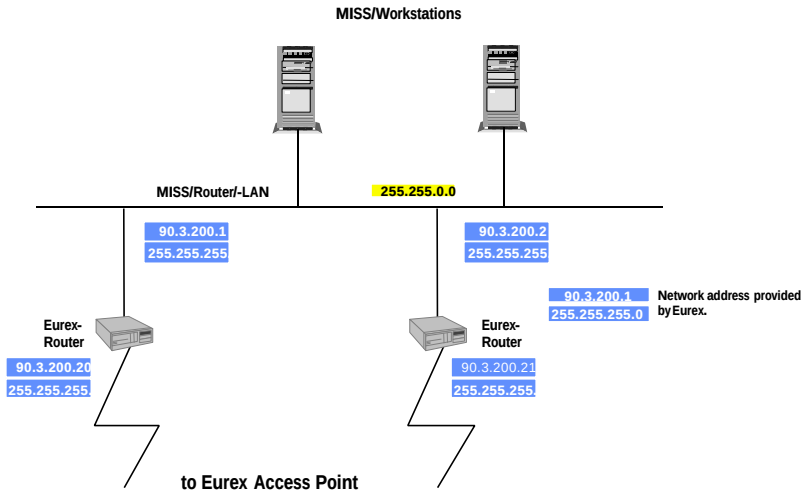


Diagram 5.2 – One LAN configuration

The IP network for a one-LAN installation and explicit addresses for MISSs and routers are assigned by the Exchange.

The diagram above shows a small high-availability configuration based on a single LAN.

5.2.1 Minimum Configuration

The minimum configuration on which trading is allowed on Eurex Release 3 is shown in Diagram 5.2.1 below. It provides the full functionality of Eurex Release 3 but does not provide scalability or high availability. It is recommended for only the smallest of member installations.

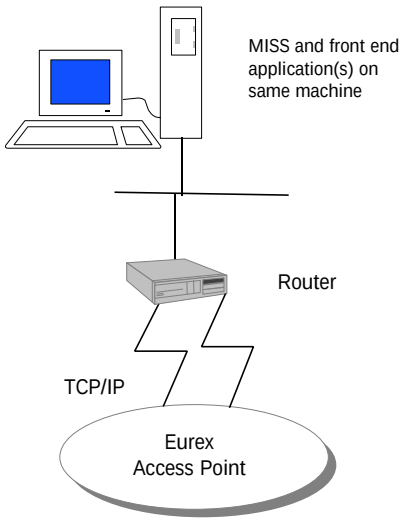


Diagram 5.2.1 - Eurex Release 3 Minimum Miss-based Front End Configuration

5.3 Two Address Spaces

The recommended configuration consists of two LANs, the MISS/Router LAN and the MISS/Workstation LAN. The main goal of this solution is to separate the member and the Exchange networks. This is achieved by installation of two separate LAN infrastructures and use of two separate IP addressing spaces (see Diagram 5.3 - Two LAN configuration).

The MISS/Router LAN belongs to the exchange-owned address space. The MISS/Workstation LAN belongs to member-owned address space.

The advantage of this solution is that a dedicated Eurex network segment is used. Conflicts, e.g. regarding IP addressing, can be prevented and member internal network configuration and set-ups are not affected when Eurex is installed. Data passed between MISS and access point do not affect the network load of the member's existing in-house networks. This configuration also shows an advantage regarding security. Since the MISS set-up/configuration does not permit dynamic routing, it is not possible to exchange the *routes* (IP networks) known by the router connected to these different LANs for the Eurex installation.

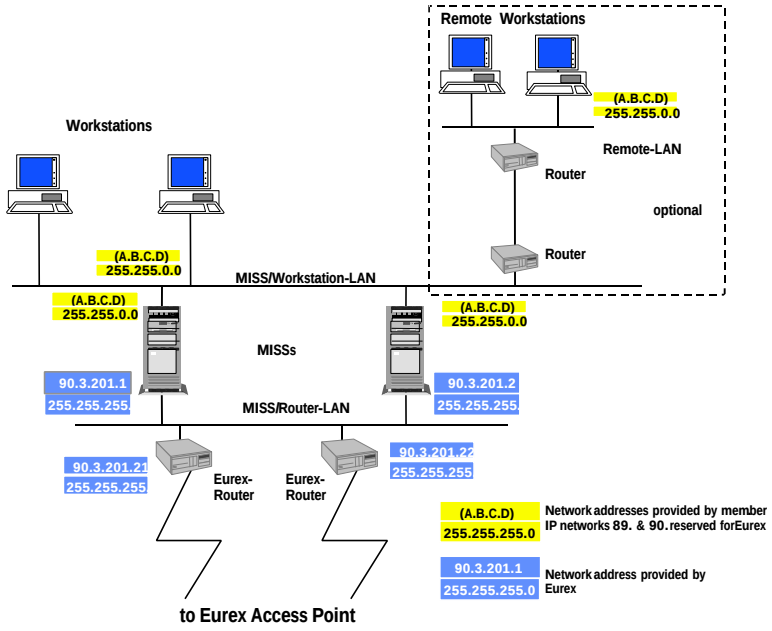


Diagram 5.3 - Two LAN configuration

The MISS/Router LAN comprises the Eurex MISSs and Eurex routers connecting the member front-end installation to the respective Eurex access point. No other components are allowed within this LAN. Network addresses for the components within the MISS/Router LAN are assigned by the Exchange (see Diagram 5.4 - example of a multiple LAN configuration).

The MISS/Workstation LAN connects the member MISSs to the workstations. Other member-defined components are allowed. Assignment of addresses within this LAN is at the discretion of the member.

5.3.1 Normal Availability Configuration

The standard “normal availability” configuration for Eurex Release 3 is shown in Diagram 5.3.1. It provides a scaleable solution, but is not fault tolerant. This configuration is supported, but is not recommended, by Eurex.

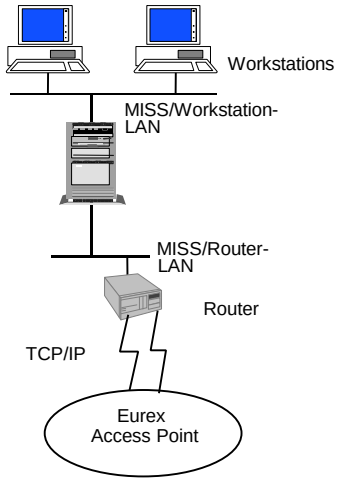


Diagram 5.3.1 - Eurex Release 3 - Standard “normal availability” configuration

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5.3.2 High-availability Configuration

A high availability configuration for Eurex Release 3 is shown in Diagram 5.3.2.

It provides a scaleable solution and transparent fail-over for the respective redundant component in case of a failure of MISS and/or router.

In addition, the high-availability configuration provides for configurable load balancing during normal operations for request/response processing between the two MISSs and routers.

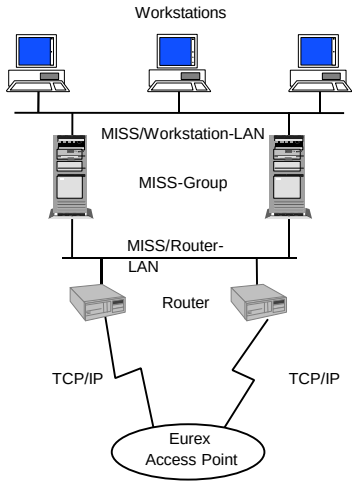


Diagram 5.3.2 - Eurex Release 3 – High-Availability Configuration

5.4 Multi-segment LANs and Remote Workstation Connections

The components of Eurex member front ends may be distributed on different LAN segments. If separate LANs are set up in different locations they can be connected to different access point halves to ensure a maximum of fault tolerance (see Diagram 5.4 - example of a multiple LAN configuration).

On request from members the Exchange may support in-house LANs that comprise several segments which are interconnected with routers. Thus MISSs and workstations can be connected to different network segments with routed connections of workstations to MISSs.

Remote workstation connections make it possible to install trader stations in distant locations with support and maintenance held centrally. In this way the central computer centre is able to support different locations of the same institute, including cases where subsidiaries can have their own membership.

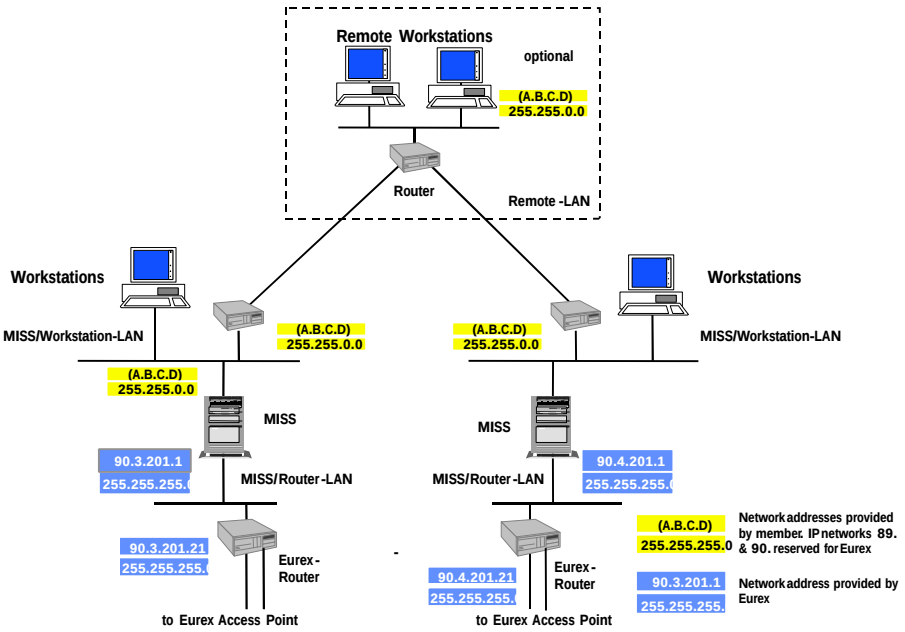


Diagram 5.4 - example of a multiple LAN configuration

Note that the diagram above does not represent a MISS group but single MISS installations in different locations.

In addition, the following points need to be considered:

- Front-end installations may be configured using extended LANs. In this case it is important to make sure that sufficient bandwidth is provided in the network (see bandwidth requirements for a LAN defined in the ‘Sizing Guidelines’ for Release 3).

- If a MISS group is configured, a common MISS/Workstation LAN infrastructure is needed. If the LAN is segmented, an extended LAN has to be used.

- If no MISS-group is formed, the MISSs act as a self-sufficient server on the respective segments.

- If it is desired to achieve a redundant configuration of the workstations with access to the distributed MISSs, a Remote Workstation solution has to be considered. In this case, the workstations need to have a TCP/IP connection to the respective MISSs. This situation is also depicted in Diagram 5.4 - example of a multiple LAN configuration.

5.5 Remote Workstations

Remote workstations can be connected via a “broadcast bridge” which is an extension of the broadcast components described earlier. This broadcast bridge is provided by the Exchange as part of the front-end software. It offers reduced bandwidth on the segment between the remote LAN and the MISS LAN due to TCP/IP packaging of UDP and specific filtering options.

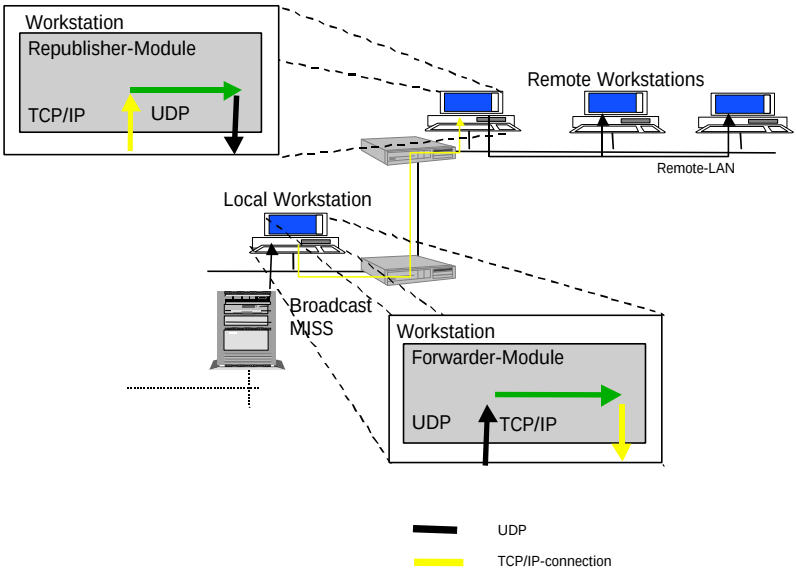


Diagram 5.5 - Remote Workstation Concept

- The forwarder module is set up on a workstation or the MISS in the primary workstation/MISS-LAN
- The re-publisher module is set up on a workstation in the Remote-LAN
- The forwarder module filters and compresses broadcast data and routes it to the re-publisher module using TCP/IP
- The re-publisher module disseminates broadcast data to workstations in the remote LAN using UDP-broadcast

The characteristics of the broadcast bridge concept are:

- The remote site requires a LAN.
- The transport mechanism is transparent for the user.
- The broadcast bridge formats data for transport via TCP/IP to the remote location.
- The bandwidth of the line connection to the remote location depends on the member's trading activity and broadcast streams subscribed to from that location.
- Members can reduce the volume of data on remote lines by the following means:
  - The forwarder module can be configured to apply filters.
  - Subscriptions to specific broadcast streams can be switched off for remote workstations.

5.6 Failover and High-Availability Mechanisms

Failover mechanisms have been provided in different places of the network and the applications. Some failover mechanisms are implemented in the area of the network operated under the Exchange's authority (Diagram 4.1). Others are provided through the front end software and are dependent on the member's front end configuration i.e. they are under the responsibility of the members (MISS and workstation). The failover mechanisms implemented in the architecture of the Exchange software enable a largely transparent failover in case of a breakdown of Eurex hardware or software components.

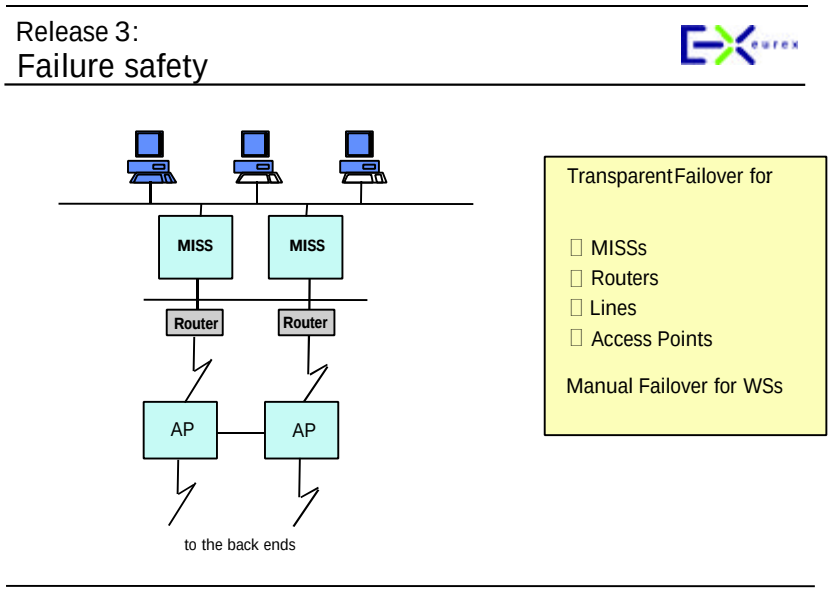


Diagram 5.6-1

In the event of a breakdown of hardware or software components (back end computer, an access point half, a MISS, a dataline within the Eurex network) the transparent failover guarantees that another component of the same type carries out the task of the failed element. This can be the case, for example, if the access point connecting the MISS to the Exchange's back end fails. In this case, the MISS selects the other access point half and links up with this autonomously. This procedure is largely transparent to the member.

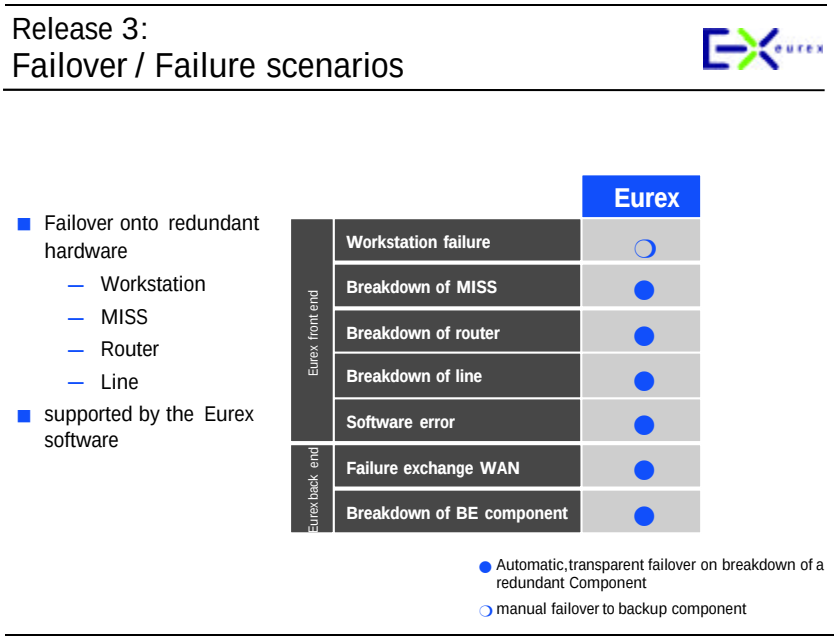


Diagram 5.6-2

Diagram 5.6-2 lists the failure scenarios for Eurex with Release 3. The redundant layout of all components (MISSs, routers, lines, back end) in the Eurex system provides the possibility of automatic, transparent failover for nearly all failure scenarios. This applies to all components from the MISS to the back end. In the event that a MISS, as part of a MISS Group, fails, an automatic failover is carried out onto the other machine provided the member's MISSs are laid out in duplicate for backup and load balancing purposes. If a workstation should fail, the member must log in again via another workstation. In this case, a manual failover is necessary.

Fault tolerance of the back end is achieved by redundant configuration of all components concerned (disks, hosts, routers, lines).

5.7 Load Balancing

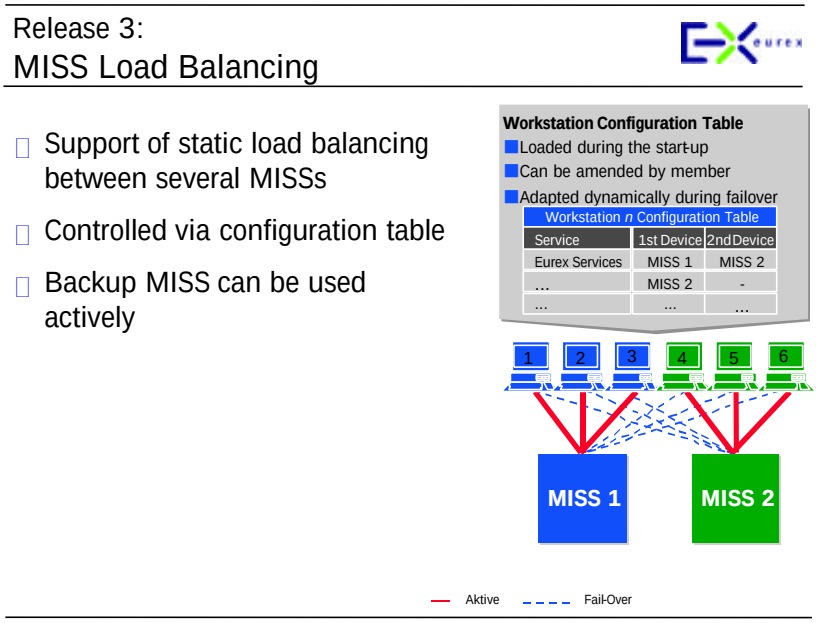


Diagram 5.7

The use of several active MISSs, which also provide mutual backup, enables static load balancing, which defines a fixed share of the load distribution between the servers. Load balancing is controlled by a table that is reloaded at every start-up of the workstation.

The internal table in Diagram 5.7 is laid out in a way that some of the trader stations (1 - 3) are connected to MISS 1 and the others (trader stations 4 - 6) are connected to MISS 2. E.g: MISS 2 is entered as backup or failover device for the trader stations 1 - 3 and MISS 1 is entered as backup for the trader stations 4 - 6. This configuration ensures static load distribution between MISS 1 and MISS 2 during standard operations. If one of the machines should fail, e.g. MISS 2, then an automatic failover of the trader stations 4 - 6 is carried out to MISS 1. Under the condition that both MISSs are in the same MISS-Group, this procedure is completely controlled by the functional and technical services software components so that the member need not intervene.

6. Multi-Member Support

6.1 Overview

This chapter describes the technical and functional requirements for multi-member front-end installations as well as their features and restrictions.

Multi-member front-end installations will generally be centrally administered by a third-party service provider or by an institute with special legal conditions. Central administration is likely for two reasons:

- To reduce the overall costs for each member.

- Responsibility for the security of the multi-member environment. The administrator has to ensure that mutual data privacy for the members sharing the multi-member installation is guaranteed, i.e. no member must be able to access another member's private data (i.e. reports, trade confirmations, etc.) or front end environment. These requirements and the administrator's neutrality are defined in a (multi-member) contract between Eurex and the administrator.

Multi-member related technical descriptions focus on the aspects of broadcast distribution, because subscription to and dissemination of broadcast streams is the crucial process in a multi-member front-end environment. Other processing in a multi-member front-end environment (request/reply processing) is handled in the same way as for a single member installation.

6.2 Characteristics and Restrictions

A **basic** multi-member front-end installation can be either a combination of several MISSs serving at the same time as trader workstations (normal availability configuration) or a combination of dedicated MISS groups per member with workstations connected either locally or remotely (high availability configuration).

An **extended** multi-member front-end installation is based on a central MISS group which provides all Eurex trading and trading support services for a number of different members which have their workstations connected to the extended multi-member MISS group.

All multi-member installations should be based on the two address space topology (optionally with segmented LANs) and should be high availability configurations.

The following summarises the characteristics of a multi-member front-end installation:

- Accessible by different members with different Eurex memberships.

- Allows unrestricted access to Eurex back end.

- Reduced expenditure per member for network components (Routers, Network lines etc.) and ongoing costs (system administration).

- Administered by a third-party service provider or by an institution with special legal conditions.

6.3 Basic Multi-Member Support

For members with more than one active trader wishing to share a basic multi-member front-end installation providing high availability, the front-end installation can be realised as shown in the following diagram:

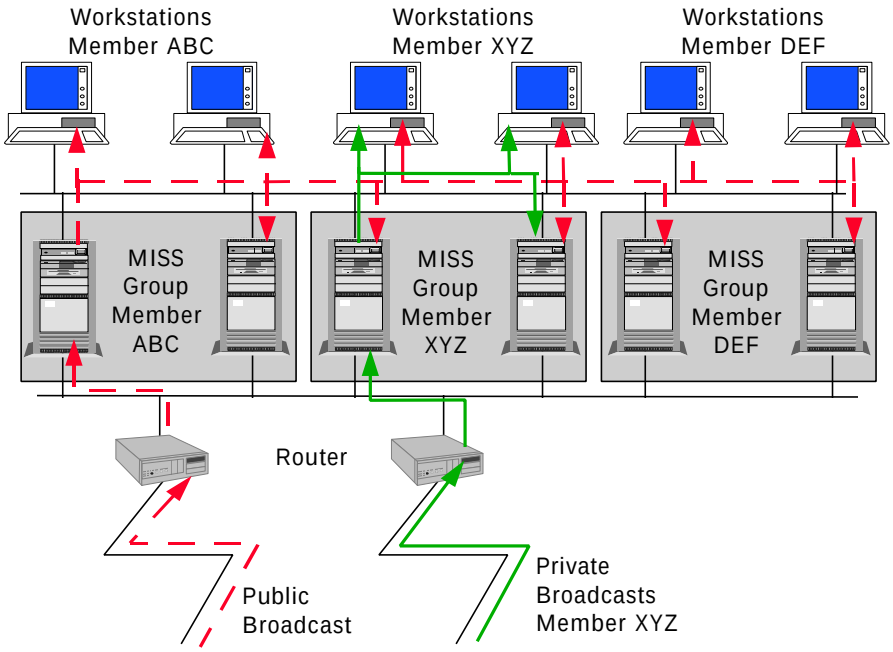


Diagram 6.3.3 - High Availability, Basic Multi Member Front End Installation; only one MISS subscribes to public broadcast streams

Characteristics of a high availability basic multi-member front-end installation:

- One dedicated MISS group for each member organised in a shared installation
- 2 LAN configuration (Router/MISS LAN and MISS/Workstation LAN)
- Automatic and transparent failover in case of failure of individual MISSs within a MISS group

Note that the use of a separate MISS group for managing public broadcasts is also possible for high availability basic multi-member front-end installations.

6.4 Extended Multi-Member Support

The **'extended multi-member'** Eurex Front-end installation allows orders to be sent from different members via the same MISS group (see Diagram 6.4 - Extended Multi Member Support).

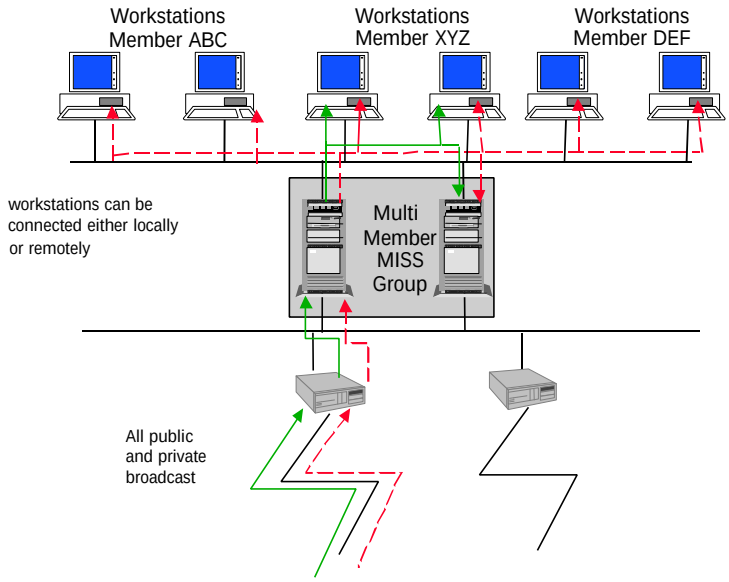


Diagram 6.4 - Extended Multi Member Support

The same principles as for basic multi-member support regarding broadcasts apply to the extended multi member configuration. The main difference between **basic multi-member support** and **extended multi-member support** is that the extended version uses a single MISS group to serve all connected members. There are also additional operational requirements that apply to the extended multi member support feature:

- Member reports and raw data downloaded to the front end are placed in separate directories dedicated to the membership for which each report was run.

- Member specific reference data is created for several members and transported to the respective multi member MISS.

Members sharing a front-end configuration must not be able to see or modify private information belonging to other members sharing the same front end configuration via any application. However, private broadcasts for all members participating in a multi-member MISS configuration are published on the multi-member configuration LAN.

6.5 Broadcasts in a Basic Multi-Member Front-end Installation

In the following description the concept for the subscription and dissemination of broadcasts within a basic multi-member front-end installation is summarised.

- One dedicated MISS (or MISS group) subscribes to the public broadcast data stream for all members sharing the multi-member front end and disseminates it to all other MISSs and workstations. Subscription to the public broadcast data stream is not enabled on any other MISS.
- Reception and dissemination of public broadcasts should be done by a high availability MISS group, because failure of a normal availability MISS leads to the unavailability of the public broadcast data stream within the multi-member front end.
- Instead of using a member's broadcast MISS (or MISS group) as public broadcast MISS, it is also possible to set up a neutral MISS (or MISS group) for the exclusive purpose of public broadcast processing. Note that the node addresses of all MISSs must be known to the Eurex back end systems.
- Private broadcast streams are subscribed and disseminated individually by member-specific MISSs or MISS group.

This approach optimises the subscription and the dissemination of public broadcasts within a multi member front end installation. It is possible because public broadcasts are the same for all members.

Private broadcasts contain information which is specific distinct for each individual member. Therefore these broadcast streams are subscribed to individually by the member-specific MISSs (or MISS groups, in a high availability configuration).

6.6 Multi-Member Private Broadcast Streams Security

Private broadcast streams contain information specific to each member, e.g. trade confirmations. A service provider operating a multi member front end installation must ensure that no member sharing the installation can access other members' private data.

In particular the following three aspects should be taken into account:

- Data privacy is supported when the member sharing the multi-member front-end installation exclusively use the standard exchange front-end software to access Eurex.
- If third-party front end, middle office or back office software products are used, either on workstations or MISSs, then it has to be ensured that this software also guarantees mutual data privacy regarding private broadcast streams.
- On all MISSs and workstations within the multi-member front-end installation, access to VALUES API, the exchange's standard programmable interface, must be restricted. It must not be possible for a member sharing the installation to use some kind of software tool which provides access to other members' private information by subscribing to their private data streams via VALUES API.

6.7 Security in Multi-Member Installations

As mentioned above, a multi member front-end installation will be operated by a third-party service provider or by an institute with special legal conditions. The service provider must establish a security concept which guarantees mutual data privacy for the members which share the multi-member front-end installation.

The administrator takes the responsibility for ensuring the overall physical data security within a multi-member front end installation.

In particular the following two different kinds of private information have to be taken into account:

- Member-Specific Reports
- Private Broadcast Streams (e.g. Trade Confirmations, etc.)

The Public broadcast streams are not relevant, because the information is identically available to all members.

The Eurex trading application provides privacy regarding request/response processing.

Member-specific reports which contain private information concerning the trading activities of each member are transmitted from the Eurex back end systems to the MISSs on a daily basis, after the nightly batch processing on the back end systems has completed. This process also applies for multi-member front-end installations.

A service provider operating a multi-member front-end installation must take appropriate measures to ensure that no member sharing the installation has access to other members' reports which are stored in their individual directories.

7 Installation and Administration

7.1 Overview

The Eurex front end comprises the MISSs, the workstations, the routers as well as the entire local network. Members are responsible for the preparation of their facilities, platform selection, design, equipment purchase, configuration and operation of the front end installation. This includes the operating system software components which must be installed at the correct patch levels as defined by Eurex.

The Exchange's technical implementation regulations define parameters for the set-up and operation of the Eurex front end. To that end, the Exchange is authorised to carry out checks in order to guarantee that members comply with the regulations. The technical implementation regulations also specify that qualified personnel must be available on the member's premises during the entire operating time of Eurex.

The administration of the system accounts on the MISSs and the workstations is the responsibility of the member.

7.2 Installation Steps

As soon as the applicant has submitted the documents "Declaration of Intent to Start the Connection Procedure" and the order for the network lines, a representative of Eurex customer service will contact the applicant’s system administrator for the initial technical consultation. For this consultation the administrator should have prepared himself with the design concepts of the trading environment and hardware requirements according to the supported platforms, recommended configurations, and the sizing guidelines. In addition the administrator must be aware of the delivery time for his preferred hardware with respect to internal and external procurement.

During the consultation the Eurex technician will explain the different tasks of the connection process and help to find the best configuration for the customer.

The administrator then has to provide a diagram of his planned installation, which will be evaluated against the ‘Implementation Regulations of Eurex concerning Technical Equipment’. This procedure is a requirement for certification and admission to Eurex. Only with this diagram is Eurex able to configure a failsafe connection and distribute node addresses.

Following this approval the applicant can order the specified hardware and software.

When the carrier has confirmed a date for the line installation the customer will be contacted by a Eurex technician in order to co-ordinate and schedule the following steps:

- distribution of node names, addresses and passwords by EUREX
  the customer will also receive specifications for a file transfer account.
- installation of 64kb data-lines
  The person in charge (system administrator or technician) must be on site for the installation.

- line test, failover test
  all hardware must be on site and configured. The operators of the Eurex network will check the quality of the lines and simulate a line and router failure in order to test the failsafe configuration. By copying a file the technicians will verify that the file transfer account for the delivery of the software was created properly.
- delivery of the software
  using the file transfer account the software for simulation and production will be copied over the now established network link to the server overnight.
- installation of the software
  the software kit includes installation and release notes which the applicant's operations staff should follow. After conclusion of the installation, Eurex must be contacted for the following post-installation steps
- establishing system parameters, user accounts etc.
  The back end copies the node-specific security file, the USIM, to a transfer directory on the server. The administrator has to move this file to a different directory in order to get access to the simulation environment.
  If desired, the automatic start-up needs to be activated.
- testing in simulation
  the simulation software is shipped with the three standard accounts <5-letter member id>sim001 to 003 for immediate use in simulation.

> It is highly recommended that members make initial and regular use of the simulation environment!

Delivery and installation of software, establishing of systems parameters and testing will be carried out in the same way for simulation and for production. After successful activities in simulation the administrator can set up the production environment by installing the production software and performing the post installation tasks for the production environment. To get access to the production system the member needs the production USIM. This file will only be copied to the member server after the legal admission of the member.

For access to the production system the member needs at least one admitted trader whose account has to be created on the member installation and on the Eurex back end. This account needs to be activated on the Eurex back end by Eurex market supervision before the member can trade.

7.3 Certification process

The platform certification process is a substantial part of the Eurex admission process. It will be done in close co-operation between members' technicians and the Eurex customer service team.

Process Steps:

1 Specification of the configuration the member plans to implement:

By filling in and returning a questionnaire on the System Configuration for Eurex Release 3, the members communicate the specifications of the environment they plan to implement.

The specifications cover the platform, network, applications, user interface and topology domains.

2 Classification through Eurex:

Based on the information the member provides, Eurex will classify the configuration applying the guidelines and including additional technical considerations.
Eurex will provide specific feedback and information on the classification decision.

3 Re-Specification and Re-Classification:

In case the classification of the configuration through Eurex or specific implications/risks motivate the member to modify/amend the configuration specifications and implementation plans, Eurex will - within reasonable limits - accept specification changes and re-evaluate the classification based on the new specifications.

4 Formal "admission":

The agreed specification will become a formal part of the admission to membership of Eurex

When implementing the configuration, the member needs to adhere to the agreed specifications and, in case he plans to implement additions or changes which deviate from the agreed specifications, the member needs to have any changes re-certified by Eurex prior to implementation in order to not to lose the admission. After re-certification, the renewed "admission" will then be based on the agreed changed configuration.

Note: All changes to submitted specifications or implementations need to be communicated to Eurex in writing for review and (re-)approval.

7.4. Installation and Operation Responsibilities

An overview of the various activities and objects of administration is given in the following tables:

Objects of administration		
	MISS	Workstation
User accounts	❍	❍
Executables *	❍	❍
Configuration Files *	❍	❍
Error/Message Logs *	❍	❍
User Settings File *	❍	❍
Exchange WAN Access	❍	
Data Files *	❍	

* files and executables can be located on a file server

User accounts are set up on the MISS (if the MISS is used as trader station) and on the workstations. All files relevant for the Eurex software may also reside on a file server. However, the file server then is a single point of failure.

Administration activities			by
	MISS	Workstation	
User Account Administration	❍	❍	member
Software Installation	❍	❍	member
Software Configuration	❍	❍	member
Troubleshooting	❍	❍	Exchange and member
LAN Administration	❍	❍	member
WAN Administration	❍		Exchange and member
Data backup	❍	❍*	member

* Limited requirement in the standard Exchange application because mainly static files reside on a workstation (exceptions: user settings, logs)

User account maintenance, installation and configuration of the software as well as administration of the LAN is carried out exclusively by the member. The Exchange and the member jointly work on WAN administration and troubleshooting.

The Exchange's infrastructure which comprises the hosts, the communication servers and the lines to the member's MISS location(s) is provided and operated by the Exchange. Members have no direct access whatsoever to the access points or hosts.

7.5 Release Change and Simulation

The software for the Eurex front end is delivered to the members over the network in the form of an installation kit prior to starting the simulation.

The installation kit includes:

- the actual Eurex software
- the basic administration processes needed for operating the front end
- the script for installing the software

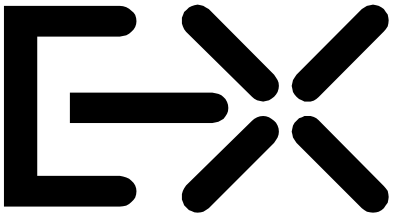
The member is responsible for the installation of the software by means of the installation script.

In cases of normal enhanced Eurex system releases to existing members, the new software is first used for simulation purposes. Updates or patches required for the software during the simulation stage are delivered to members via the network and installed by the members. This procedure ensures that the simulation software develops into a production version in a controlled fashion. Finally a completely newly built production kit is distributed to all members in time for the live introduction of the new release into production.

Simulation and production environments are completely separate at all system levels except for network line connections.

The simulation environment as well as the production environment are supported on a MISS or a workstation for each release, so that members can trade in production on one machine and are provided with a simulation environment (e.g. for training purposes) at the same time on the same machine. Furthermore, it is possible for the production environment of the current release to be operated at the same time as the simulation environment of the following release on the same MISS in the event of a change in the release.

X-pand into the **Future**



Eurex Release 3.0

Sizing Guidelines

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1 INTRODUCTION

1.1 Purpose

This document explains the sizing guidelines for users of the new Eurex MISS (Member Integration System Server) based front end. Existing UD (User Device) based front end sizing guidelines are not covered by this document. These guidelines were developed based on test installations for Eurex. The document is based on Eurex Release 3 software.

The sizing guidelines are preliminary recommendations only for members. They are not binding.

The document is intended to support the network and system administrators of Eurex members in planning their network, hardware and Eurex software configuration.

1.2 Scope

These guidelines cover Release 3 of Eurex and are focused on a single MISS group installation. A MISS group consists of one or two MISSes and optionally connected workstations. The guidelines do not cover UD-based front ends.

Eurex members are strongly urged to test their own configurations as differences in hardware, software and settings can have a material impact on the system's performance and capacity behavior.

This document is not intended to give information about the general technical concepts implemented with Eurex Release 3. It also does not provide installation or operation procedures. Installation procedures are described in the documents "Front-End Installation Guide". Operation procedures are described in "Front-End Operations Guide".

1.3 Contents

Section 2 TECHNICAL ENVIRONMENT contains short definitions of the hardware and software components used to build a Eurex front end configuration. It describes the basic front end configurations in relation to the Eurex member's requirements for availability and throughput. It is possible to set up other configurations using different components but these other configurations have not been examined regarding their sizing.

Section 3 SIZING GUIDELINES gives figures for sizing the supported front end hardware components. The approach for determining the recommendations is focused on the number of processing requests and broadcasts. CPU, memory, disk and network recommendations are covered. The numbers given relate only to the software provided by Eurex. Additional software installed on the Eurex front end may affect sizing requirements and performance and are purely the end user's responsibility.

The Eurex Release 3 software continues to support the ability to run multiple environments (e.g. parallel execution of the software). The sizing guidelines provide recommendations only for one environment.

Section 4 APPENDIX describes the required operating system software versions.

2 TECHNICAL ENVIRONMENT

2.1 Overview

This section describes the hardware, software and network configuration to be used to access the derivative market trading systems of Eurex.

The Eurex front end must be able to run the Eurex Release 3 software components necessary to establish and maintain a connection with the Eurex back end applications. The configuration components of a Eurex front end configuration are shown in Figure 1 and are defined in the following sections. Note that the configuration shown in Figure 1 is a high availability configuration provided through redundancy of MISSes, routers and WAN lines.

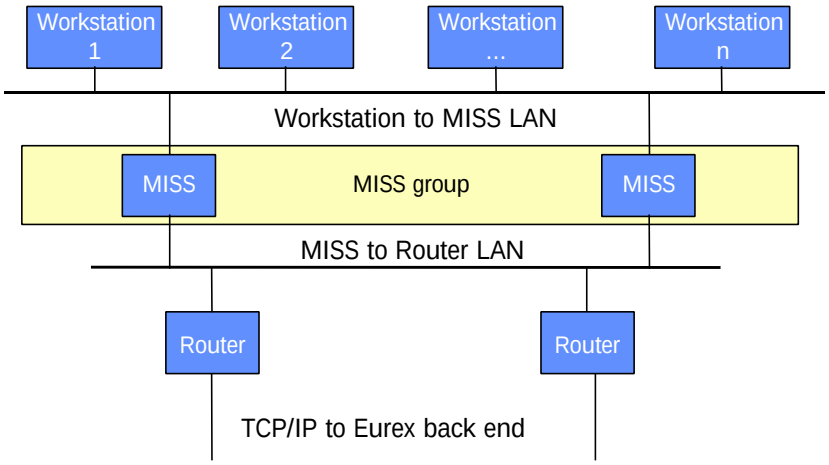


Figure 1 Eurex front end configuration

2.2 Workstation

A workstation is a computer system, which is connected to a MISS via a local area network (LAN). The workstation has the Eurex workstation software installed.

The workstation is responsible for the presentation of market information and handling of Eurex member requests for the Eurex back end applications. Eurex provided software, which runs on the workstation, are Eurex Trading Application using the VALUES API (Virtual Access Link Using Exchange Services Application Programming Interface) and the front end architecture services that support the applications.

Eurex member as well as third-party developed applications may also run on the workstation in addition to or instead of the Eurex Trading Application. However, this document provides no information about sizing for these types of applications, as they are the responsibility of the end-user organizations.

2.2.1 Workstation Platforms

The following workstation platforms are supported:

- IBM AIX 4.3.1
- Microsoft Windows NT (Intel) 4.0 Service Pack 3
- Sun Solaris 2.6

Detailed information about required patch levels is contained in section 4.1.1 Detailed Requirement Specification.

Note: For Eurex Release 3 homogeneous front end configurations (MISSes and workstations of the same platform) were tested by Eurex as well as the combination of AIX or Solaris based MISSes with Windows NT (Intel) workstations.

2.2.2 Workstation Software

The software that the Eurex members will be expected to run on a workstation consists of:

Eurex software:

- Electronic Trading Application

Architecture software:

- Architecture services

System software:

- Window manager corresponding to the operating system (Solaris and AIX: CDE, Windows NT (Intel): Win32)
- Communication software (TCP/IP, UDP/IP)
- Operating system software (IBM AIX, Sun Solaris or Windows NT (Intel))

2.2.3 Workstation to MISS LAN

Communication between the MISS and Eurex workstation is done via a local area network (LAN). Communication protocols required within the communication architecture are TCP/IP and UDP/IP. The MISS and the workstations should be connected to the same LAN segment or to bridged LAN segments. The only LAN type, which has been tested by Eurex, is Ethernet.

2.3 MISS

A MISS is a computer system, which enables connection to the Eurex back end and has installed the MISS software.

The MISS can be used as a standalone machine running the Eurex front end application for the presentation of market information and capture of the Eurex member requests for the Eurex back end applications. Additionally, it can serve connected workstations. In this case, the MISS coordinates Eurex workstation communications.

2.3.1 MISS Platforms

The following MISS platforms are supported:

- IBM AIX 4.3.1
- Microsoft Windows NT (Intel) 4.0 Service Pack 3
- Sun Solaris 2.6

Detailed information about required patch levels is contained in section section 4.1.1 Detailed Requirement Specification.

Note: For Eurex Release 3 homogeneous front end configurations (MISSes and workstations of the same platform) were tested by Eurex as well as the combination of AIX or Solaris based MISSes with Windows NT (Intel) workstations.

2.3.2 MISS Software

The software that the Eurex members will be expected to run on a MISS consists of:

Architecture software:

- Architecture services

System software:

- Window manager corresponding to the operating system (Solaris and AIX: CDE, Windows NT (Intel): Win32)
- Communication software (TCP/IP, UDP/IP)
- Operating system software (IBM AIX, Sun Solaris or Windows NT (Intel))

2.3.3 MISS to Router LAN

Communication between the MISS and the router is done via a local area network (LAN). The communication protocol required for the MISS to the router is TCP/IP.

The only LAN type, which has been tested by Eurex, is Ethernet.

2.4 Router

Routers maintain the TCP/IP connections from the MISS to the Eurex back ends. In Release 3 communication is done via TCP/IP to the Eurex back end. Fault tolerance is achieved by providing multiple routing paths to the Eurex back end applications.

The router platform approved by Eurex for the use with Eurex are CISCO models. Detailed information about model series and operating software is contained 4.1.1 Detailed Requirement Specification.

2.5 Basic Eurex MISS-based Front End Configuration

To participate in Eurex, the Eurex member can choose to use a UD- or a MISS-based front end. Using a MISS-based front end, there are many possible configurations, ranging from a standalone MISS to large configurations with several MISSes and workstations arranged in logical MISS groups. In a MISS group, all MISSes must be on the same LAN segment. If the active MISS fails then automatic switchover takes place. For disaster recovery, an additional MISS or MISS group may be established. However, failover to the disaster recovery site must be managed by the Eurex member organization.

Release 3 supports more than one MISS per Eurex member. Two MISSes in one MISS group support dynamic failure recovery between them. For disaster recovery, an additional MISS or MISS group may be established. However, failover to the disaster recovery site must be managed by the Eurex member. Splitting of MISSes of a MISS group across different physical locations has not been tested.

There are several possibilities for the set up of the Eurex front end configuration. The drivers for choosing one of the described configurations are:

- Number of Eurex end users entering requests to the Eurex back end applications.
- Member's availability requirement.

Figure 2 Availability-Size-Relation shows four configuration alternatives that are a function of the number of Eurex end users and availability requirement. Configurations for normal availability contain single points of failure. High availability configurations have no single points of failure or have stand-by equipment available for recovery purposes.

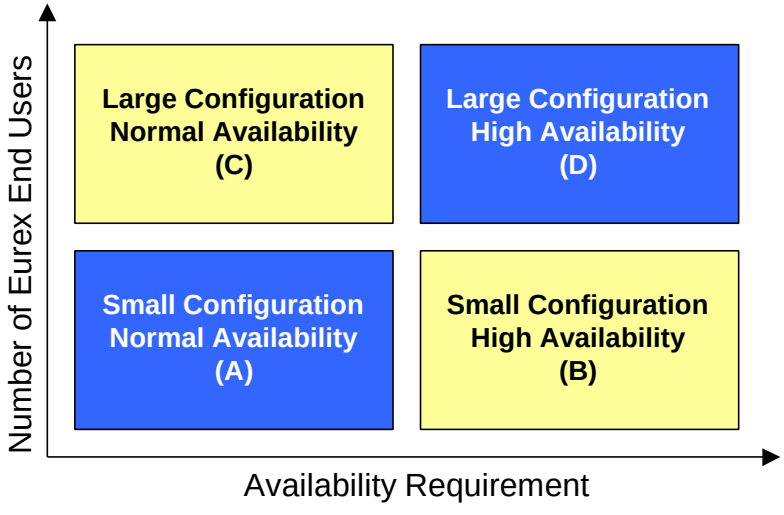


Figure 2 Availability-Size-Relation

Each of the next four sections depicts one of the proposed configurations.

2.5.1 Small Configuration, Normal Availability (A)

Figure 3 shows a Eurex front end configuration that provides normal availability for one user. The user runs the Eurex Trading Application directly on the MISS.

Note that failover is not supported if any of the components fail.

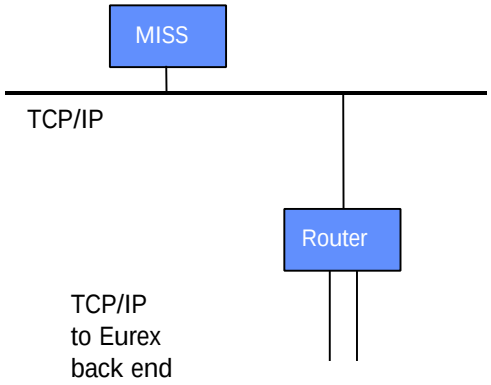


Figure 3 Small configuration for normal availability

2.5.2 Small Configuration, High Availability (B)

In Figure 4 a Eurex front end configuration is shown that provides high availability (no single point of failure) for one user. The user runs the Eurex Trading Application directly on the MISS. If any individual configuration component fails, there is a parallel component available to support continuing Eurex operations.

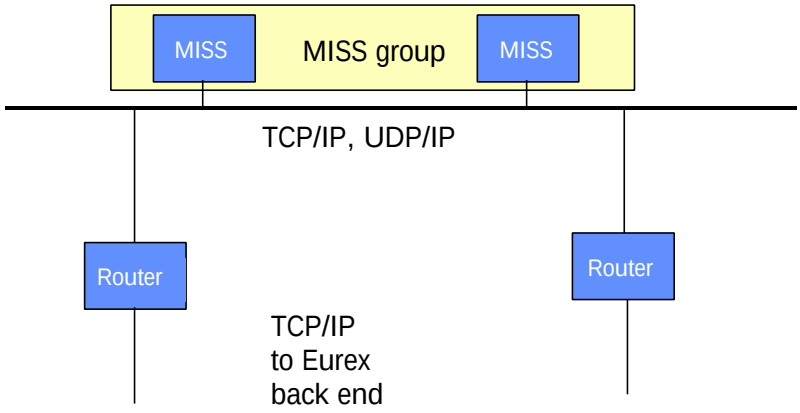


Figure 4 Small configuration for high availability

2.5.3 Large Configuration, Normal Availability (C)

Figure 5 shows a Eurex front end configuration that provides normal availability for multiple users. Each user runs the Eurex Trading Application on their own workstation. Note that failure of any component other than a workstation will terminate all user access to the Eurex back end. Failure of any individual workstation will affect only the individual user of that workstation. The presented configuration supports a large number of workstations for multiple users. It is recommended to have the routers and MISSes in one separate LAN segment and the MISSes and workstations in another. This type of front end configuration allows to be independent from the Eurex network addressing in the workstation MISS LAN.

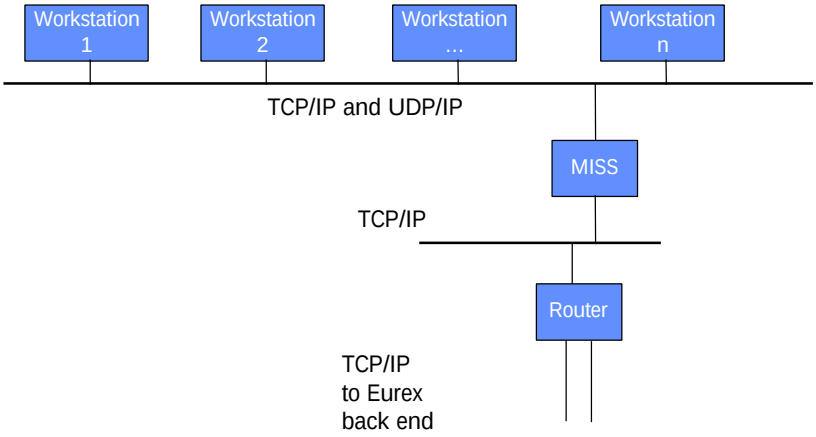


Figure 5 Large configuration for normal availability

2.5.4 Large Configuration, High Availability (D)

Figure 6 shows a Eurex front end configuration that provides high availability for multiple users. Each user runs the Eurex Trading Application on its own workstation. Failure of any individual component other than a workstation is recovered via the remaining components. Failure of any individual workstation will affect only the individual user of that workstation.

If a MISS fails, requests from the workstations can be routed via the other MISS. Broadcasts and responses are sent from the other MISS to the workstations. If a router fails the request can be routed via the other router and the broadcasts and responses are sent from that router to the MISSes. Depending on the sizing of the configuration, operation following a failure may occur at degraded levels of performance.

It is recommended to have the routers and MISSes in one separate LAN segment and the MISSes and workstations in another. This type of front end configuration allows to be independent from the Eurex network addressing in the workstation MISS LAN.

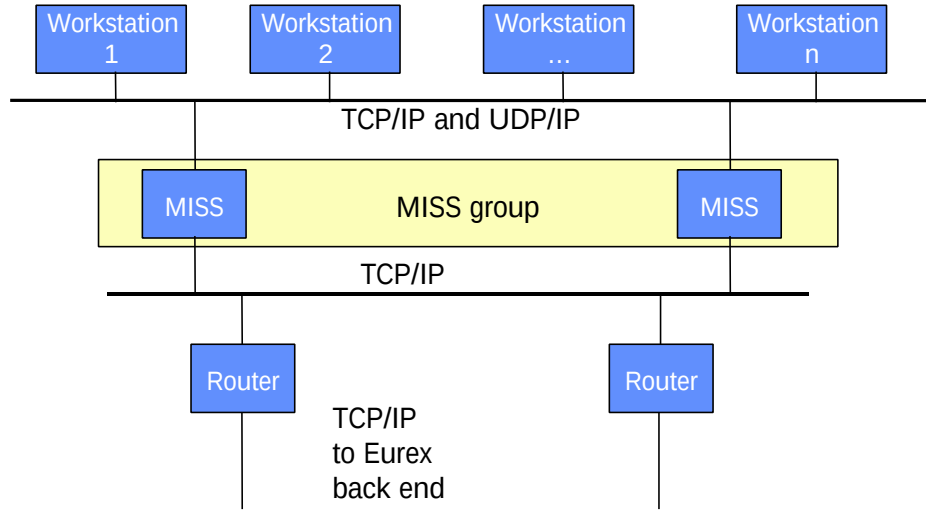


Figure 6 Large configuration for high availability

3 SIZING GUIDELINES

3.1 Introduction

This chapter provides guidelines to support Eurex members in sizing CPU, memory, disk and network resources of their Eurex Release 3 MISS-based front end installations.

The sizing parameters are separated into base resource recommendations and incremental recommendations. The base resource recommendations are necessary to run the software without entering requests but processing the data generated by the general market activity (broadcasts). The incremental recommendations depend on the number of requests entered by the users of a MISS group.

The following sizing guidelines cover only the MISS and workstation software recommendations. They do not include MISS and workstation requirements caused by the operating system, layered products (e.g. NFS or NIS) or other application software.

3.2 Assumptions

The guidelines are based on the following assumptions:

1. Each workstation will run only one instance of the Eurex Trading Application (using the VALUES API) and the architecture services.
2. On the MISS no instance of the Eurex Trading Application is running, if it is not stated explicitly (as in 3.6. Sizing Information – MISS running the Eurex Trading Application) i.e. the sizing guidelines described in sections 3.4 Sizing Information – Workstation and 3.5 Sizing Information – MISS relate only to large front end configurations (see 2.5.3 Large Configuration, Normal Availability and 2.5.4 Large Configuration, High Availability).
3. There are no remote workstations connected to the LAN. No processes to support remote workstations (e.g. broadcast bridge forwarder) run on either the workstations or the MISSes.
4. No third party products using VALUES are running on either the workstations or the MISSes; e.g. quote machines etc.

3.3 Sizing Drivers

Front end sizing recommendations are driven by the level of activity to be supported. The front end key activities are the processing of requests and responses (order entry, inquiries, etc.), and the general level of activity in the market (broadcast data processed by the front end).

The aggregate number of orders, inquiries, etc. entered by a front end's users determines the level of processing on a MISS that is directly under control of the Eurex member. Additional processing by a MISS is driven by the total activity in the market as market activity generates broadcasts, which are delivered to front ends.

The number of users drives the sizing of the front end only in terms of the number of workstations required and the total number of orders that may be entered into the system.

One slow workstation or one slow MISS can slow down the performance of the whole front end connected to a MISS group.

3.4 Sizing Information - Workstation

The recommendations for CPU, memory and network are dependent on the activity on the machine. The tables present the sizing recommendations for Eurex Release 3.

3.4.1 CPU - Workstation

CPU load is caused by running the Eurex Trading Application and architecture services. The majority of the load on the workstations is generated by market activity (e.g. own order overview updates).

Statistical data gathered from current Eurex operations shows that at peak times there are approximately 100 to 150 broadcasts per second sent out to the front ends by the Eurex back end. The duration of the peak can be more than one minute. This peak is assumed to be generated by market makers entering mass quote entries (e.g. via quote machines).

In addition to the public broadcasts, each workstation needs to handle the traffic generated by orders/quotes entered by the traders in the same group. One order/quote generates approximately 2.5 broadcasts on average. In the case of 10 orders/quotes per second this results in a total of 25 additional broadcasts per second.

The following table shows the CPU recommendations of the Eurex workstation software for each platform:

Visualized broadcasts per second to this machine (market activity)	**IBM AIX [SPECint95]**	**Microsoft Windows NT (Intel) [SPECint95]**	**SUN Solaris [SPECint95]**
50	9	11	9
75	10	14	10
100	11	16	11
150	14	21	14
200	17	26	17
250	20	29	20

If 30-50% of the market activity is visualized in the trading application, it is recommended to choose at least a CPU size in the light grey area. Eurex members should account for their private orders/quotes rates in addition.

Note: One slow workstation on a front end can slow down the performance of the whole front end connected to the same MISS group.

3.4.2 Physical Memory - Workstation

The main memory required, which is provided in the next table, should be used as minimum recommendation. It is important that on workstations paging should be avoided as much as possible for maximum performance.

IBM AIX [MByte]	**Microsoft Windows NT (Intel) [MByte]**	**SUN Solaris [MByte]**
128	128	128

3.4.3 Disk Space - Workstation

Local disk space is required for each environment (production/simulation) of a workstation. The space must be provided on the disk where the corresponding workstation file tree is located. The following table shows the disk space recommendations for one environment (production or simulation).

	IBM AIX [MByte]	**Microsoft Windows NT (Intel) [MByte]**	**SUN Solaris [MByte]**
Workstation software	150	150	150
Swap area	500	500	500
Internal data files [per day]	50	50	50

3.4.4 Workstation to MISS LAN

The following table shows the usage of the workstations to MISS LAN. The left column displays the maximum broadcast rate received by the workstations that are connected to a MISS group.

Broadcasts per second to this machine (market activity)	**Usage of 10 Mbps Ethernet [%]**
50	6
100	12
150	18
200	24
250	30

3.5 Sizing Information - MISS

The recommendations for CPU, memory and network are dependent on the activity on the machine. No instance of the Eurex Trading Application is running on the MISS. The tables present the sizing recommendations for Eurex Release 3.

3.5.1 CPU - MISS

CPU load is caused by running the MISS processes and architecture services. The majority of the load on the MISSes is generated by market activity (orders, quotes etc.).

Statistical data gathered from current Eurex operations shows that at peak times there is approximately 100 to 150 broadcasts per second sent out to the front ends by the Eurex back end. The duration of the peak can be more than one minute. This peak is assumed to be generated by market makers entering mass quote entries (e.g. via quote machines). In addition to the public broadcasts, each MISS needs to handle the traffic generated by orders/quotes entered by the traders connected to it. One order/quote generates approximately 2.5 broadcasts on average. In the case of 10 orders/quotes per second this results in a total of 25 additional broadcasts per second.

The following table shows the CPU recommendations of the Eurex MISS software for each platform:

Broadcasts per second to this machine (market activity)	**IBM AIX [SPECint95]**	**Microsoft Windows NT (Intel) [SPECint95]**	**SUN Solaris [SPECint95]**
50	4	5	4
100	6	9	6
150	8	13	8
200	11	17	11
250	14	21	14

It is recommended to choose at least a CPU size in the light grey area. Eurex members should account for their private orders/quotes rates in addition.

Note: One slow MISS on a front end can slow down the performance of the whole front end connected to the same MISS group.

3.5.2 Physical Memory - MISS

The main memory required, which is provided in the next table, should be used as minimum recommendation. It is important that on MISSes paging should be avoided as much as possible for maximum performance.

IBM AIX [MByte]	**Microsoft Windows NT (Intel) [MByte]**	**SUN Solaris [MByte]**
128	128	128

3.5.3 Disk Space - MISS

Local disk space is required for each environment (production/simulation) of a MISS. The space must be provided on the disk where the corresponding MISS file tree is located. The following table shows the disk space recommendations for one environment (production or simulation). The Eurex member can select which reports he wants to be delivered via the network to the MISS, therefore the space requirements for the reports depend on the trading volume and the reports selected by the Eurex member. These are estimates for one trading day.

	IBM AIX [MByte]	**Microsoft Windows NT (Intel) [MByte]**	**SUN Solaris [MByte]**
MISS software	350	350	350
Swap area	500	500	500
Report files and internal files [per day]	200	200	200
Static data files	500	500	500

If reports of more than one trading day are to be stored on the MISS, additional disk space is required. It is the system administrator's responsibility to maintain the file system where the reports are stored and to provide the required disk space.

3.5.4 MISS to router LAN

The usage of a 10 Mbps Ethernet to connect the MISSes with their routers to the access points is recommended. Its load is less than the one on the workstation to MISS LAN as the traffic is less and compressed.

3.6 Sizing Information – MISS running the Eurex Trading Application

The recommendations for CPU, memory and network are dependent on the activity on the machine. One instance of the Eurex Trading Application is running on the MISS. There are no workstations connected to the MISS. The configuration corresponds to the ones described in 2.5.1 Small Configuration, Normal Availability (A) and 2.5.2 Small Configuration, High Availability (B). The tables present the sizing recommendations for Eurex Release 3.

3.6.1 CPU – MISS running the Eurex Trading Application

CPU load is caused by running the MISS processes, the Eurex Trading Application and the architecture services. The majority of the load on the MISS is generated by market activity (orders, quotes etc.).

The following table shows the CPU recommendations of the Eurex MISS software for each platform:

IBM AIX [SPECint95]	Microsoft Windows NT (Intel) [SPECint95]	SUN Solaris [SPECint95]
13	18	13

The table assumes that the user visualizes 30-50% of the market activity in the trading application and enters no more than 3 orders/quotes per second.

3.6.2 Physical Memory – MISS running the Eurex Trading Application

The main memory required, which is provided in the next table, should be used as minimum recommendation. It is important that on MISSes paging should be avoided as much as possible for maximum performance.

IBM AIX [MByte]	Microsoft Windows NT (Intel) [MByte]	SUN Solaris [MByte]
256	256	256

3.6.3 Disk Space – MISS running the Eurex Trading Application

Local disk space is required for each environment (production/simulation) of a MISS. The space must be provided on the disk where the corresponding MISS file tree is located. The following table shows the disk space recommendations for one environment (production or simulation). The Eurex member can select which reports he wants to be delivered via the network to the MISS, therefore the space requirements for the reports depend on the trading volume and the reports selected by the Eurex member. These are estimates for one trading day.

	IBM AIX [MByte]	Microsoft Windows NT (Intel) [MByte]	SUN Solaris [MByte]
MISS software	200	200	200
Swap area	1000	1000	1000
Report files and internal files [per day]	200	200	200
Static data files	500	500	500
Internal data files [per day]	50	50	50

If reports of more than one trading day are to be stored on the MISS, additional disk space is required. It is the system administrator's responsibility to maintain the file system where the reports are stored and to provide the required disk space.

3.6.4 MISS to router LAN

See 3.5.4 MISS to router LAN.

4 APPENDIX

4.1 Configuration for Release 3

4.1.1 Detailed Requirement Specification

4.1.1.1 Operating System

The next tables show the software versions and patches supported by Eurex for the Eurex front end configuration of Release 3. The PAL (Portable Abstraction Layer) run time library required by the Eurex front end architecture and GUI as well as a Perl interpreter required for the operations procedures are contained in the installation kits for the MISS and workstation software. Eurex supports the software only with the given versions.

Workstation and MISS Software Release 3	IBM AIX	Microsoft Windows NT (Intel)	SUN Solaris
Operating System	AIX 4.3.1 (English version)	MS Windows NT (Intel) Workstation 4.0 (English version)	Solaris 2.6 (English version)

4.1.1.2 Patch levels for IBM AIX

The supported version of the IBM AIX operating system is release 4.3.1 with the following patches installed additionally:

Package	Version
bos.adt.base	4.3.1.1
bos.adt.debug	4.3.1.3
bos.adt.include	4.3.2.2
bos.adt.prof	4.3.2.1
bos.adt.samples	4.3.1.2
bos.adt.sccs	4.3.1.1
bos.adt.syscalls	4.3.1.2
bos.diag.com	4.3.2.0
bos.diag.rte	4.3.2.1
bos.net.nfs.client	4.3.2.3
bos.net.tcp.client	4.3.2.2
bos.net.tcp.smit	4.3.1.1
bos.powermgt.rte	4.3.1.1
bos.rte	4.3.2.0
bos.rte.aio	4.3.1.2
bos.rte.archive	4.3.1.1

bos.rte.bind_cmds	4.3.1.3
bos.rte.boot	4.3.1.2
bos.rte.bosinst	4.3.1.2
bos.rte.commands	4.3.1.3
bos.rte.compare	4.3.1.1
bos.rte.console	4.3.1.1
bos.rte.control	4.3.2.0
bos.rte.cron	4.3.1.2
bos.rte.date	4.3.1.1
bos.rte.devices_msg	4.3.1.1
bos.rte.diag	4.3.1.1
bos.rte.edit	4.3.1.1
bos.rte.filesystem	4.3.1.1
bos.rte.ifor_ls	4.3.1.1
bos.rte.ILS	4.3.1.1
bos.rte.im	4.3.1.1
bos.rte.install	4.3.1.3
bos.rte.libc	4.3.2.2
bos.rte.libcur	4.3.1.1
bos.rte.libpthreads	4.3.1.4
bos.rte.loc	4.3.1.1
bos.rte.lvm	4.3.2.2
bos.rte.man	4.3.1.1
bos.rte.misc_cmds	4.3.1.1
bos.rte.net	4.3.2.0
bos.rte.odm	4.3.2.1
bos.rte.printers	4.3.1.3
bos.rte.security	4.3.2.0
bos.rte.serv_aid	4.3.2.2
bos.rte.shell	4.3.1.3
bos.rte.SRC	4.3.1.1
bos.rte.streams	4.3.1.3
bos.rte.tty	4.3.2.1
bos.sysmgt.serv_aid	4.3.2.0
bos.sysmgt.smit	4.3.1.2

bos.sysmgt.sysbr	4.3.1.2
bos.sysmgt.trace	4.3.2.0
bos.terminfo.ibm.data	4.3.0.1
bos.txt.spell	4.3.1.1
bos.txt.tfs	4.3.1.2
bos.txt.tfs.data	4.3.0.2
bos.up	4.3.2.2
devices.graphics.com	4.3.1.2
devices.isa_sio.IBM0005.IBM	4.3.2.0
devices.isa_sio.PNP0501.rte	4.3.2.0
devices.isa_sio.PNP0600.rte	4.3.2.0
devices.pci.00100100.rte	4.3.2.0
devices.pci.22100020.rte	4.3.2.0
devices.pci.33531188.rte	4.3.1.1
devices.pci.3353c088.com	4.3.1.2
devices.pci.3353c088.rte	4.3.1.1
devices.pci.3353c088.X11.co	4.3.1.2
devices.pci.3353c188.rte	4.3.1.1
devices.pci.3353c288.rte	4.3.1.1
devices.pci.3353c388.rte	4.3.1.1
devices.pci.86808404.rte	4.3.2.0
devices.rspc.base.rte	4.3.2.0
devices.scsi.disk.rte	4.3.1.1
devices.sys.pci.rte	4.3.2.0
devices.tty.rte	4.3.2.0
ifor_ls.base.cli	4.3.1.1
Java.rte.bin	1.1.4.4
Java.rte.classes	1.1.4.4
Java.rte.lib	1.1.4.4
perfagent.tools	2.2.31.3
printers.rte	4.3.1.1
sysmgt.websm.apps	4.3.1.1
sysmgt.websm.framework	4.3.1.2
sysmgt.websm.rte	4.3.1.1
X11.adt.ext	4.3.1.2

X11.adt.motif	4.3.1.1
X11.apps.aixterm	4.3.1.1
X11.apps.clients	4.3.1.1
X11.apps.pm	4.3.1.1
X11.apps.rte	4.3.1.1
X11.apps.xterm	4.3.1.2
X11.base.lib	4.3.1.4
X11.base.rte	4.3.2.0
X11.base.smt	4.3.1.1
X11.compat.lib.X11R5	4.3.1.3
X11.Dt.lib	4.3.1.2
X11.Dt.rte	4.3.1.3
X11.Dt.ToolTalk	4.3.1.2
X11.motif.lib	4.3.1.3
X11.vsm.lib	4.3.1.2

4.1.1.3 Patch levels for SUN Solaris

The supported version of the Sun Solaris operating system is version 2.6 Final Customer Shipment with the following patches installed additionally:

Package	Patch ID #
SunOS 5.6: kernel update patch	105181-11
SunOS 5.6: libc & watchmalloc patch	105210-17
SunOS 5.6: /usr/sbin/rpcbind patch	105216-03
SunOS 5.6: sbus driver patch	105222-03
SunOS 5.6: /kernel/drv/ssd patch	105356-07
SunOS 5.6: /kernel/drv/ses patch	105357-02
SunOS 5.6: BCP patch	105377-03
SunOS 5.6: /kernel/misc/nfssrv patch	105379-05
SunOS 5.6: SGML Manual Pages Patch	105390-02
SunOS 5.6: at & cron utility patch	105393-07
SunOS 5.6: /usr/lib/sendmail patch	105395-03
SunOS 5.6: /usr/sbin/passmgmt patch	105397-02
SunOS 5.6: Greek keyboard layout incorrect on Sparc	105400-02
SunOS 5.6: libnsl and NIS+ commands patch	105401-16
SunOS 5.6: ypbind/ypserv patch	105403-02
SunOS 5.6: libcurses.a & libcurses.so.1 patch	105405-02

SunOS 5.6: /usr/bin/volrmmount patch	105407-01
SunOS 5.6: /usr/lib/acct/acctdisk patch	105416-01
SunOS 5.6: /etc/init.d/asppp patch	105421-01
SunOS 5.6: /usr/lib/libtnfprobe.so.1 patch	105426-01
SunOS 5.6: /usr/lib/autofs/automountd patch	105472-06
SunOS 5.6: /kernel/fs/hsfs patch	105486-04
SunOS 5.6: linker patch	105490-07
SunOS 5.6: cgsix driver patch	105492-02
SunOS 5.6: /usr/lib/fs/ufs/fsck patch	105516-01
SunOS 5.6: /kernel/drv/be patch	105528-01
SunOS 5.6: /kernel/drv/tcp patch	105529-05
SunOS 5.6: /usr/sbin/rpc.nisd_resolv patch	105552-02
SunOS 5.6: chkey and keylogin patch	105562-03
SunOS 5.6: /kernel/misc/rpcsec patch	105564-03
SunOS 5.6: /usr/lib/libthread.so.1 patch	105568-12
SunOS 5.6: /kernel/fs/ufs patch	105572-07
SunOS 5.6: /kernel/drv/glm patch	105580-08
SunOS 5.6: Shared library patch for C++	105591-02
SunOS 5.6: /kernel/drv/isp patch	105600-07
SunOS 5.6: ebus/pci/rootnex driver patch	105604-05
SunOS 5.6: /usr/lib/nfs/mountd patch	105615-04
SunOS 5.6: libbsm patch	105621-09
SunOS 5.6: /usr/bin/fncreate_printer patch	105623-01
SunOS 5.6: /usr/lib/power/powerd patch	105637-01
SunOS 5.6: prtdiag patch	105642-05
SunOS 5.6: ac/environ/fhc/sysctrl driver patch	105651-08
SunOS 5.6: driver_aliases/driver_classes/name_to_major patch	105654-03
SunOS 5.6: /usr/bin/login patch	105665-03
SunOS 5.6: /usr/bin/rdist patch	105667-02
SunOS 5.6: Cachefs patch	105693-05
SunOS 5.6: /usr/kernel/drv/audiocs patch	105705-02
SunOS 5.6: /usr/bin/su patch	105718-02
SunOS 5.6: /kernel/fs/nfs patch	105720-06
SunOS 5.6: /usr/lib/fs/ufs/ufsdump patch	105722-01
SunOS 5.6: /usr/lib/fs/ufs/ufsrestore patch	105724-01

SunOS 5.6: /kernel/drv/ecpp patch	105741-05
SunOS 5.6: /kernel/drv/le patch	105742-03
SunOS 5.6: /usr/lib/libxfn.so.2 patch	105743-01
SunOS 5.6: /usr/bin/cpio patch	105746-01
SunOS 5.6: libresolv, in.named, named-xfer, nslookup, nstest patch	105755-07
SunOS 5.6: /usr/bin/echo patch	105757-01
SunOS 5.6: /kernel/fs/specfs patch	105778-01
SunOS 5.6: /kernel/fs/fifofs patch	105780-01
SunOS 5.6: /kernel/drv/ip patch	105786-07
SunOS 5.6: /usr/sbin/tar patch	105792-03
SunOS 5.6: /kernel/drv/hme patch	105795-05
SunOS 5.6: /kernel/drv/sd patch	105797-05
SunOS 5.6: sun4m, sun4u & sun4u1 cprboot patch	105798-03
SunOS 5.6: /usr/bin/admintool, y2000 patch	105800-05
SunOS 5.6: /kernel/drv/qe patch	105836-03
SunOS 5.6: /kernel/drv/st.conf patch	105847-01
SunOS 5.6: /usr/sbin/tapes patch	105867-01
SunOS 5.6: libspmisoft.so.1 patch for upgrade	105874-01
SunOS 5.6: devlink.tab/iu.ap/minor_perm & se driver patch	105924-05
SunOS 5.6: /usr/sbin/static/tar patch	105926-01
SunOS 5.6: /usr/bin/xargs patch	105953-01
SunOS 5.6: /usr/kernel/strmod/ppp patch	105959-01
SunOS 5.6: /usr/sbin/rwall patch	105988-01
SunOS 5.6: vi/ex/edit/view/vedit patch	105990-01
SunOS 5.6: POINT PATCH: 4074114 - bugfix for /kernel/strmod/ms	106017-01
SunOS 5.6: /usr/ccs/bin/make patch	106029-01
SunOS 5.6: /usr/bin/getopt patch	106035-01
SunOS 5.6: X Input & Output Method patch	106040-10
SunOS 5.6: /usr/lib/nss_nisplus.so.1 patch	106044-01
SunOS 5.6: /usr/sbin/in.telnetd patch	106049-01
SunOS 5.6: sgml patch	106123-02
SunOS 5.6: Patch for patchadd and patchrm	106125-05
SunOS 5.6: /usr/bin/mkdir patch	106141-01
SunOS 5.6: in.dhcpd and pntadm patch	106150-02
SunOS 5.6: Jumpstart install fails searching for profile()	106152-01

SunOS 5.6 HW398: Jumpstart install fails searching for profile()	106154-01
SunOS 5.6: dma driver patch	106168-02
SunOS 5.6: sbusmem driver patch	106169-02
SunOS 5.6: /kernel/drv/esp patch	106170-03
SunOS 5.6: /kernel/drv/lebuffer patch	106171-01
SunOS 5.6: /kernel/drv/fas patch	106172-04
SunOS 5.6: /kernel/misc/scsi patch	106173-03
SunOS 5.6: cfgadm utility & libraries	106183-04
SunOS 5.6: y2000 sysid unzip patch	106193-03
SunOS 5.6: /platform/sun4u/kernel/drv/envctrl patch	106216-02
SunOS 5.6: luxadm.1m Manual Page Patch	106219-02
SunOS 5.6: /usr/sbin/format patch	106226-01
SunOS 5.6: lp patch	106235-02
SunOS 5.6: /usr/lib/libpam.so.1 patch	106257-04
SunOS 5.6: Manual Pages Patch for ffbconfig.1m	106260-01
SunOS 5.6: Manual Pages Patch cfgadm.1m config_admin.3x libcfgadm.4	106261-01
SunOS 5.6: Manual Pages Patch for qfe.7d	106262-01
SunOS 5.6: /usr/lib/security/pam_unix.so.1 patch	106271-04
SunOS 5.6: /kernel/sys/msgsys patch	106285-01
SunOS 5.6: pkgadd/pkginstall & related utilities	106292-02
SunOS 5.6: /usr/sbin/in.ftpd patch	106301-01
SunOS 5.6: /usr/lib/netsvc/yp/rpc.yppasswdd patch	106303-01
SunOS 5.6: upgrade_script terminated abnormally during upgrade	106317-01
SunOS 5.6: /etc/inet/services patch	106323-01
SunOS 5.6: csh/jsh/ksh/rksh/rsh/sh patch	106361-03
SunOS 5.6: /platform/sun4u1/kernel/drv/cvc patch	106381-03
SunOS 5.6: /usr/bin/localedef patch	106388-01
SunOS 5.6: patch for ide and atapi misc. fixes	106407-03
SunOS 5.6: /kernel/drv/mm patch	106429-01
SunOS 5.6: /usr/kernel/drv/pm patch	106435-01
SunOS 5.6: /usr/sbin/syslogd patch	106439-02
SunOS 5.6: /usr/sbin/ping patch	106448-01
SunOS 5.6: /usr/sbin/df & /usr/xpg4/bin/df patch	106466-01
SunOS 5.6: /kernel/fs/autofs patch	106471-01
SunOS 5.6: truss & truss support library patch	106495-01

SunOS 5.6: Manual Pages Patch for ldap	106497-01
SunOS 5.6: /platform/SUNW,Ultra-250/kernel/drv/envctrltwo patch	106504-01
SunOS 5.6: /usr/bin/cat patch	106507-01
SunOS 5.6: /usr/bin/ftp patch	106522-01
SunOS 5.6: bad iso-2022-cn string cause crash in iconv problem	106556-01
SunOS 5.6: /usr/sbin/aspppd patch	106561-01
SunOS 5.6: libauth.a & libauth.so.1 patch	106569-01
SunOS 5.6: /usr/lib/nfs/statd patch	106592-01
SunOS 5.6: Japanese UTF-8 iconv patch	106613-01
SunOS 5.6: bad iso-2022-cn string cause crash in iconv problem	106618-01
SunOS 5.6: /kernel/strmod/rpcmod patch	106639-02
SunOS 5.6: /usr/lib/fs/nfs/mount patch	106641-01
SunOS 5.x: rpc.pcnfsd accepting "." as printer name fix	106646-01
SunOS 5.6: /usr/lib/netsvc/rstat/rpc.rstatd patch	106651-01
SunOS 5.6: /usr/lib/sa/sadc patch	106653-01
SunOS 5.6: iostat/mpstat/vmstat patch	106655-01
SunOS 5.6: /usr/lib/libposix4.so.1 patch	106797-01
SunOS 5.6: /usr/bin/dc patch	106808-01
SunOS 5.6: /usr/sbin/sar patch	106818-01
SunOS 5.6: /usr/bin/date patch	106828-01
SunOS 5.6: Feature patch for Euro currency support	106842-03
SunOS 5.6: /etc/cron.d/logchecker patch	106863-01
SunOS 5.6: /usr/lib/nfs/nfsd patch	106882-01
The PC Card are not recognized in Ultra5_10	106901-01
SunOS 5.6: /usr/sbin/uadmin patch	106929-01
SunOS 5.6: /usr/ucb/ucblinks patch	106994-01
SunOS 5.6: Ejecting a cdrom when still accessing causes panics	107068-01
SunOS 5.6: /usr/lib/fs/ufs/quota patch	107099-01
SunOS 5.6: multiple xterm fixes	105464-01
OpenWindows 3.6: printtool patch	105497-01
OpenWindows 3.6: Xcms patch	105618-01
OpenWindows 3.6: Xsun patch	105633-14
OpenWindows 3.6: ToolTalk patch	105802-07
OpenWindows 3.6: mp fails to set correct A4 paper size information	106138-01
OpenWindows 3.6: filemgr (ff.core) fixes	106222-01

OpenWindows 3.6: Xview Patch	106331-03
OpenWindows 3.6: libXext patch	106404-01
OpenWindows 3.6: w returns wrong login user number in xdm	106415-01
OpenWindows 3.6: libce suid/sgid security fix	106648-01
OpenWindows 3.6: libdesksetpatch	106649-01
OpenWindows 3.6: mailtool attachment security patch	106650-03
OpenWindows 3.6: Keytables patch	106841-01
OpenWindows 3.6: fstobdf core dumps with 2-byte fonts	106957-01
CDE 1.2: dtterm libDtTerm.so.1 patch	105160-07
CDE 1.2: dtmail patch	105338-14
CDE 1.2: dtpad patch	105558-03
CDE 1.2: calendar manager patch	105566-05
CDE 1.2: libDtWidget patch	105630-01
CDE 1.2: dtwm patch	105634-05
CDE 1.2: libDtSvc Patch	105669-04
CDE 1.2: dtlogin patch	105703-07
CDE 1.2: dtappgather Patch	105837-02
CDE 1.2 sdtfprop: patch for group permissions	106025-01
CDE 1.2 dtsession: patch for screenlock	106027-02
CDE 1.2: dtfile patch	106112-02
CDE 1.2: libDtHelp.so.1 fixes	106242-01
CDE 1.2: sdtimage fixes	106267-02
CDE 1.2: Print Manager Patch	106437-01
CDE 1.2: Actions patch	106660-02
Creator 2.6: FFB Graphics Patch	105360-20
VIS/XIL 2.6: Graphics Patch	105361-07
PGX 2.6: M64 Graphics Patch	105362-16
Motif 1.2.7: Runtime library patch	105284-18

4.1.1.3 Patch levels for Windows NT (Intel)

The supported version of the Microsoft Windows NT (Intel platform) operating system is Version 4 Service Pack 3 with the following patches installed additionally:

Package	Patch ID#
User Manager Does Not Recognize February 2000 As a Leap Year	Q175093
Control Panel Date/Time applet	Q183123
Custom date properties on Word documents	Q183125
Find File entry fields	Q183123

4.1.1.4 Router

The table shows the router recommended by Eurex.

Router Recommendations Release 3	**Product Number**	**Product Name**
Router for IP protocol support	Cisco2610 S26C-12.0(2) ***or higher*** WIC-1T CAB-X21MT	1 Ethernet Modular Router with Cisco IOS IP Software Cisco 2600 Series IOS IP 1-Port Serial WAN Interface Card X.21 Cable, Male, 10 Feet

The router CISCO 2610 is the recommended router type for Eurex because of its improved failover functionality (HSRP, Hot Standby Routing Protocol).

The formerly recommended router CISCO Series 25nn and 36nn are also fully supported by Eurex.

Router also supported for Release 3	**Product Number**	**Product Name**
Router for IP protocol support	Cisco2501 S25C-11.3(6) ***or higher*** CAB-X21MT	Ethernet/Dual Serial Router Cisco 2600 Series IOS IP only Feature Set X.21 Cable, Male, 10 Feet
Router for IP protocol support	Cisco3620 S362C-11.3(6) ***or higher*** NM-1E2W WIC-1T CAB-X21MT	2-Slot Modular Router-AC Cisco 3620 Series IOS IP only Feature Set 1 Ethernet 2 WAN Card Slot Network Module 1-Port Serial WAN Interface Card X.21 Cable, Male, 10 Feet

CISCO Systems router greater than Series 36nn are oversized (but allowed) for Eurex purposes.

X-pand into the **Future**

Eurex Release 3.0

Preliminary Release Notes

User Device Interface

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Abstract

This document reflects the enhancements to the Eurex – User Device Interface with respect to Eurex Release 3.0.

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1 Introduction

This document reflects the enhancements to the Eurex User Device Interface with respect to Eurex Release 3.0.

The documentation concerning the VALUES API interface is addressed in a separate document.

The Eurex Release 3.0 will reflect the following new functional enhancements and new features with respect to Eurex Release 2.0:

→ Increased system capacity

→ GUI-based Front-End

→ VALUES API.

Technically these changes are reflected in the following enhancements to the Eurex User Device:

→ Within the Backoffice Interface (BOF). changes were made to the position transaction record layout. In the Maxvalues Clearing Area the maximum Premium Amount per Trade has been increased from ±99,999,999.99 to ±999,999,999.99. Consequently the length of that field has to be increased in the BOF message as well.

→ Within the Raw Data File (RWTD930) the series monthly trade quantity has been extended from 9,999,999,999 to 99,999,999,999.

All User Device interfaces except for the Raw Data File interface will support Eurex Release 2.0 with the introduction of Eurex Release 3.0.

2 Backoffice Interface

The Backoffice Interface is provided on designated Eurex User Devices to enable member applications to update the backoffice accounting system. Information resulting from trading and position maintenance is sent by BOF messages to the member back office systems. The transferred data can be divided into member-specific data (mainly position transactions) and broadcast information (capital adjustment, contract changes, settlement prices, status messages and margining parameters). The transferred data is then processed by member specific backoffice applications. The Backoffice Interface provides information to members using nine transaction record layouts.

2.1 Position Transaction

Information resulting from trading and position maintenance is sent by BOF messages to the member back office systems. Position movements result from trading, on-line trade, position maintenance, and batch processing activity.

A change will be made to the premium_amount field which contains the premium amount, if any, that was calculated by Eurex for the transaction.

- The PREMIUM_AMOUNT_LEN is part of the BOF_POSITION_TRN_TYPE.
- The PREMIUM_AMOUNT_LEN field will be extended from a length of 11 to 12 to accommodate this change. The first byte is a leading separate sign.
- The maximum value that may then be entered is±999,999,999.99.

The enhanced data structure is described in the following paragraph. The modified field is underlined as it occurs in the data definition.

#define PREMIUM_AMOUNT_LEN 12

```
typedef struct
{
    char trans_id_no[TRANS_ID_NO_LEN];
    char trans_id_suffix[TRANS_ID_SUFFIX_LEN];
    char                        order_number[ORDER_NUMBER_LEN];
    char                        order_type_code[ORDER_TYPE_CODE_LEN];
    char                        buy_code[BUY_CODE_LEN];
    char                        open_code[OPEN_CODE_LEN];
    char                        premium_amount[PREMIUM_AMOUNT_LEN];
    char                        fee_amount[FEE_AMOUNT_LEN];
    char                        tran_time[TRAN_TIME_LEN];
    char                        order_part_fill_code[ORDER_PART_FILL_CODE_LEN];
    char                        comb_type_code[COMB_TYPE_CODE_LEN];
    char                        order_restrict_code[ORDER_RESTRICT_CODE_LEN];
    char                        post_long_bal[POST_LONG_BAL_LEN];
    char                        post_short_bal[POST_SHORT_BAL_LEN];
    char                        cash_value_date[CASH_VALUE_DATE_LEN];
    char                        security_value_date[SECURITY_VALUE_DATE_LEN];
    char                        bond_security_id[ISIN_LEN];
    BOF_GIVE_UP_GRP_TYPE        give_up_grp;
    BOF_DSGN_POS_BAL_TYPE       dsgn_pos_bal;
    BOF_BASIS_TRADE_TYPE        basis_trade;
    char                        exer_prc_decimal[EXERCISE_DECIMAL_LEN];

}   BOF_POSITION_TRN_TYPE;
```

2.2 Settlement Price Transaction

The settlement prices are broadcasted to provide members with the price information. They are used by members to calculate their variation margin receivable or payable and to calculate their total margin requirement to Eurex.

No changes will be made to the settlement price transaction record layout.

2.3 Capital Adjustment Transaction

The Capital Adjustment Transactions allow the members to handle the capital adjustment in their backoffice system according to guidelines provided by Eurex. This transaction type applies only to stock options.

The following Capital Adjustment types are provided by Eurex:

- Right Issue,
- Stock Dividend,
- Stock Split, and
- Other.

No changes will be made to the capital adjustment transaction record layout.

2.4 Contract Change Transaction

These transactions are sent to all member backoffice systems for each addition or deletion of a contract.

No changes will be made to the contract change transaction record layout.

2.5 Status Message Transaction

These transactions are sent to all member backoffice systems to inform about the status of the Eurex system.

No changes will be made to the status message transaction record layout.

2.6 Margin Parameters Transaction

These transactions are sent to Clearing members backoffice systems to support risk based margining. These messages allow a Clearing member to verify the amount of risk based margin.

No changes will be made to the margin parameters transaction record layout.

2.7 Order Confirmation Transaction

These transactions are sent to members backoffice systems when Eurex receives an order add, change or delete transaction.

No changes will be made to the order confirmation transaction record layout.

2.8 Product Change Transaction

These transactions are sent to all members backoffice systems when product specifications change with respect to the number of decimals places of an exercise price. They are applied only to stock options.

No changes will be made to the product change transaction record layout.

2.9 Exchange Rate Transaction

The BOF exchange rate transaction delivers members exchange rates used by the Eurex system. The BOF exchange rate transaction is sent at the end of the trading day.

No changes will be made to the exchange rate transaction record layout.

3 Pricing Model Interface (PMI)

The pricing model interface (PMI) broadcasts price information, quote request data, cross request data, and status messages to member applications. The information is used in the members pricing models.

No changes will be made to the PMI interface.

4 Trading Interface (TRAD)

The trading interface (TRAD) forwards quotes from member applications to the Eurex system, delivers transaction responses and update messages real-time to members applications. The quotes are handled in the matching of the Eurex like all other quotes.

No changes will be made to the TRAD interface.

5 Order Routing Interface (ORI)

The order routing basic component currently provides acceptance and validation of add, change, delete or inquiry orders from a member's application. ORI provides acceptance of the response from the system. It also transmits the response back to the member's application.

No changes will be made to the ORI interface.

6 Pricing Model Output Interface (PMO)

The pricing model output interface is used to display the theoretical prices calculated by the member on the MASS quote screen.

No changes will be made to the PMO interface.

7 Printed Trade Confirmation Interface (PTC)

The printed trade confirmation interface provides the market member with reports that confirm the single trades matched in the course of the trading period. The reports are produced during the trading period immediately after settlement of trades and printed directly to the market member concerned.

There is no change in the PTC layout.

8 Theoretical Prices File (THEO)

The Theoretical Prices File (THEO file) interface allows members to use Eurex calculated theoretical values (i.e. risk arrays) to verify Eurex's margin calculation and the margins of their customers and Non-Clearing Members.

No changes will be made to the THEO file.

9 Raw Data File (RWTD930)

The Raw Data File RWTD930 contains the daily information on all options series/futures contracts. The daily prices and trade volumes are listed for all options series of a product or all futures contracts of a security.

A change will be made to the series monthly trade quantity field.

- The SERI-MTH-TRD-QTY-RWTD930 field will be extended from a length of 10 to 11 bytes to accommodate this change.
- The maximum value that may then be entered is 99,999,999,999.

The enhanced data structure is described in the following paragraph. The modified field is underlined as it occurs in the data definition.

```
01  RWTD930-WS-REC.
    05  RAW-KEY-GRP-RWTD930.
        10  RAW-ID-COD-RWTD930                  PIC X(8).
        10  RAW-DAT-GRP-RWTD930.
            15  RAW-EFF-DAT-RWTD930             PIC 9(8).
            15  RAW-CRT-PROC-DAT-RWTD930        PIC 9(8).
        10  ENV-NO-TXT-RWTD930.
            15  ENV-NO-1-TXT-RWTD930            PIC X(1).
            15  ENV-NO-2-TXT-RWTD930            PIC X(1).
        10  SERI-GRP-ID-COD-RWTD930.
            15  SECU-ID-COD-RWTD930             PIC X(4).
            15  SERI-CLAS-COD-RWTD930           PIC X(1).
            15  SERI-EXP-DAT-RWTD930.
                20  EXPI-YR-DAT-RWTD930         PIC 9(2).
                20  EXPI-MTH-DAT-RWTD930        PIC 9(2).
            15  EXER-PRC-RWTD930                PIC 9(5).
            15  SERI-VERS-NO-RWTD930            PIC 9(1).
    05  REPT-DATA-GRP-RWTD930.
        10  REPT-REC-1-GRP-RWTD930.
            15  SECU-PRV-CLS-PRC-RWTD930        PIC X(11).
            15  SECU-LST-CLS-PRC-RWTD930        PIC X(11).
            15  SERI-LST-TRD-PRC-RWTD930        PIC X(11).
            15  SERI-LST-STL-PRC-RWTD930        PIC X(11).
            15  SERI-LST-OPN-PRC-RWTD930        PIC X(8).
            15  SERI-DLY-HGH-PRC-RWTD930        PIC X(11).
            15  SERI-DLY-LOW-PRC-RWTD930        PIC X(11).
            15  SERI-STL-PRC-RWTD930            PIC X(11).
            15  SERI-TRD-TOT-QTY-RWTD930        PIC ---------9.
            15  SERI-OPN-INT-QTY-RWTD930        PIC  --------9.
            15  SERI-MTH-TRD-QTY-RWTD930        PIC ----------9.
```